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Real Estate and the Credit Crunch

Proceedings of a Conference
Held in September 1992

Lynn E. Browne
and
Eric S. Rosengren, Editors

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Real Estate and the Credit Crunch: An Overview

*Lynn E. Browne and Eric S. Rosengren**

Declining real estate values have shaken financial markets, undermined consumer confidence, and slowed economic growth around the world. From homeowners in California to billionaire real estate developers operating in New York, London, and Tokyo, all have seen their net worth dwindle as real estate prices have fallen. Sizable holdings of nonperforming real estate imperil the financial health of stodgy New England banks, aggressively managed Southwestern thrifts, and even the financial giants of Japan.

Direct investors in real estate are not the only ones adversely affected by declining real estate values. Capital-impaired banks and insurance companies may be less willing to make loans. U.S. taxpayers may be required to ante up for real estate bets lost by federally insured institutions, while in other countries governments work behind the scenes to shore up their financial institutions. And everyone suffers from the drag on the economy that these real estate losses have exerted.

In the fall of 1992 the Federal Reserve Bank of Boston convened a conference on "Real Estate and the Credit Crunch" to explore the causes of these real estate problems and their implications for financial institutions and public policy. The focus was real estate developments in the United States, but the discussion extended the topic to the world economy.

The conference consisted of six sessions. The first two examined the causes of the fluctuations in real estate markets in the 1980s, focusing on housing prices and on commercial construction and real estate values.

*Vice President and Deputy Director of Research for Regional Affairs, and Vice President and Economist, respectively, Federal Reserve Bank of Boston.

Through much of the decade, housing prices in the Northeast and the West rose very rapidly and construction of commercial buildings was very strong. As the decade ended, however, home prices were falling and commercial construction had plummeted. Both sessions asked whether economic fundamentals could explain the swings in real estate activity or whether speculative bubbles played a role. The third and fourth sessions considered the consequences of real estate problems for financial institutions and the availability of credit. Why were some institutions more drawn to real estate lending than others? Have problems with real estate loans induced a credit crunch, as many small business representatives have alleged? The fifth and sixth sessions considered the implications of these problems for public policy. Could federal regulatory policy have prevented banks' and thrift institutions' overconcentration in real estate? And to what degree did tax changes and general macroeconomic policy contribute to the fluctuations in real estate markets and lenders' aggressive movement into real estate?

Several themes ran through the conference. First, real estate prices and construction levels do respond to economic fundamentals. These economic conditions may vary from one part of the country to another. Thus, local housing prices reflect local employment and income growth, as well as national interest rates. However, economic fundamentals alone cannot explain the extreme fluctuations in real estate values and construction that occurred in some regions.

Changes in federal tax policy and financial institution regulation contributed to increased real estate investment through much of the 1980s and to the eventual bust at the end of the decade. In addition, both residential and nonresidential real estate markets are prone to speculative bubbles and overshooting. Past price appreciation appears to generate expectations of future gains.

Speculative bubbles require financing, and the enthusiasm of depository institutions, particularly commercial banks, for real estate loans fed rising values and excessive construction. But while banks and thrifts had tax and regulatory incentives for financing real estate, their willingness to become so exposed was a subject of lively debate. Some participants were adamant that banks knew the risks they were incurring, while others were equally convinced that banks were victims of a lemming mentality.

The bursting of the real estate bubble directly affected banks by reducing their capital. And the regulatory response has been procyclical, as banks have had to reduce their lending in order to comply with directives to boost capital ratios. This curtailment of lending was seen by some participants as impairing the nation's recovery from recession, but others attributed the decline in bank lending to a lack of creditworthy borrowers.

What triggers a bubble remains unknown. However, public policy

should avoid reinforcing such speculation. With the benefit of hindsight, bank regulatory policy, fiscal policy, and tax policy all appear to have been procyclical in the 1980s. As these policies are reassessed, one lesson to be drawn from recent experience is that greater attention should be paid to the short-run transition effects of policy changes, and to the possibility that policy changes in one arena may interact with changes in a seemingly unrelated area. Thus, the investment incentives created by the Economic Recovery Tax Act of 1981 (ERTA) were reinforced by financial deregulation and an expansionary fiscal policy.

Explaining the Pattern of Real Estate Activity

What explains the gyrations in real estate activity that occurred in the 1980s? Although such economic fundamentals as employment and income growth, construction costs, and real interest rates all contributed, speculation also seems to have driven price movements and construction levels in both the residential and nonresidential real estate markets.

Patterns and Determinants of Metropolitan House Prices, 1977 to 1991

Jesse M. Abraham and Patric H. Hendershott attempt to explain the volatility in local house prices that characterized recent years. Using a data set on repeat transactions developed at Freddie Mac, they first document that housing prices have changed at very different rates over different intervals and in different parts of the country. An examination of price changes in 30 metropolitan areas shows that the Northeast and the West had the highest rates of housing price appreciation from 1977 to 1991, with prices rising most rapidly in the West in the late 1970s and late 1980s and in the Northeast in the early and mid 1980s. Within each of these regions, the price changes in the individual metropolitan areas were fairly similar. In contrast, the experience of metropolitan areas in the central part of the country was quite diverse. The authors suggest that the Freddie Mac repeat-transaction data base is superior to the more familiar median price data from the National Association of Realtors because the repeat-transaction prices are better explained by construction costs and land prices.

The heart of the Abraham-Hendershott paper is a series of pooled time series cross-section regressions in which they test whether economic variables such as employment and income growth, inflation of real construction costs, and changes in real, after-tax interest rates can explain the variation in metropolitan area housing prices. While these economic variables are statistically significant determinants of residen-

tial real estate prices, they explain only 40 percent of the movement in prices. Including the lagged appreciation in housing prices increases the explanatory power to more than 50 percent. The regressions were also run over smaller geographic subsamples and shorter time intervals. The variables generally had the expected signs, but the coefficients varied considerably in magnitude over the different subsamples. The model explained a higher fraction of the price variation in the Midwest and Southeast, where price movements have been less volatile. The large increases in prices in the Northeast through most of the 1980s and in California in the late 1980s remain largely unexplained by the regressions.

The authors conclude that while economic fundamentals account for some of the variation in metropolitan housing prices in the 1980s, they do not explain the extreme changes that occurred in some parts of the country. Both this result and the finding that the past appreciation in housing prices increases the explanatory power of the equations seem consistent with arguments that bubbles can occur in real estate prices. However, the mechanisms that trigger both the extreme increases and the subsequent declines remain unknown.

William C. Apgar, Jr. expressed some concern about the Freddie Mac data base and the parsimonious nature of the Abraham-Hendershott model. The Freddie Mac data include refinancings; thus appraisal values rather than actual sales account for a portion of the price data. Also, because Freddie Mac purchases only conforming conventional loans, the data set does not include low-valued homes that received FHA insurance or high-valued homes that exceed Freddie Mac guidelines. Finally, the Freddie Mac data do not include information on property characteristics; therefore, one cannot adjust for any changes in value that occur because of property improvement or deterioration. These weaknesses in the data may distort the pricing patterns developed in the statistical analysis. For example, if renovations are more likely in areas experiencing a housing boom, the rapid appreciation in real estate prices will be overstated unless corrections are made for the quality improvements.

With respect to the model, many factors frequently cited as causes of regional price variations have been omitted. Apgar notes specifically demographic factors and variations in zoning and land use restrictions. Apgar concludes by emphasizing the need for greater understanding of the links between regional housing and regional economic cycles. Housing is a major component of household wealth. Thus, rising housing prices may spur consumption and even increased housing expenditures. He also points out that regional housing cycles were much less synchronous in the 1980s than they were in the 1970s.

James A. Wilcox stresses the daunting task facing the authors. Not only are they trying to estimate short-run changes in the price of a

long-term asset, but they are also doing so for diverse regions of the country over an economically turbulent period. All things considered, the equations perform very well. Moreover, Wilcox views the Freddie Mac data set as a considerable step forward, as it standardizes for location even if not for other property characteristics. He recommends, however, that the model include an error-correction mechanism that would allow housing prices to revert to a "steady state" level.

Wilcox also argues that a model of housing based on economic fundamentals may have considerable value even if it cannot explain extreme price changes. Indeed, the failure of economic fundamentals to explain rapid price increases may be evidence that a bubble is occurring and that market participants should be cautious. Not only does the autocorrelation of housing price changes suggest that housing markets may be inefficient and prone to bubbles, but Wilcox suggests that such a phenomenon could also exist in the commercial real estate market and, in light of recent declines in values, could explain the drying up of credit to this sector.

How the Commercial Real Estate Boom Undid the Banks

Lynn E. Browne and Karl E. Case examine the causes of the commercial construction boom of the 1980s and attempt to explain why banks were so damaged by the oversupply of commercial space. They argue that the commercial real estate market is prone to overshooting. Inherent cyclical tendencies are reinforced by lenders' enthusiasm or distaste for real estate investments, as attitudes formed in one time period may persist after economic conditions have changed.

Following very low levels of commercial construction in the late 1970s, construction, especially of office buildings, soared in the mid 1980s, plateaued, and then plummeted at the end of the decade. Echoing a theme introduced by Abraham and Hendershott, the authors find considerable variation in construction patterns in different parts of the country. The surge in construction in the 1980s was particularly pronounced in New England and further down the East Coast.

A number of factors contributed to the construction boom. Strong growth in the late 1970s and early 1980s in financial services and other industries that occupy commercial space pushed down vacancy rates and drove up rents at the start of the decade. The Economic Recovery Tax Act of 1981 provided additional incentives to invest in real estate. Commercial real estate offered particularly attractive opportunities for wealthy individuals to shelter income, as these properties could be financed largely by debt, depreciated at ERTA's rapid rates, and then sold for a capital gain. Further reinforcing these trends was the enthusiasm of lenders, especially commercial banks, for commercial real estate investments. Banks were both pushed and pulled into commercial real

estate. Banks in the early 1980s had experienced increased competition in other lending areas; at the same time, real estate investments were seen as offering very attractive returns.

The authors point out how these seemingly separate influences interact with the long lead times required to put up a commercial building and with traditional commercial rental agreements to create a market that is inherently vulnerable to periodic overbuilding. Because of the long lags from planning to project completion, the stock of office space is relatively fixed in the short run. Thus, an increase in the demand for space temporarily pushes rents above the levels that will result when supply has adjusted. In a situation reminiscent of the "hog cycle" of elementary economics, developers and lenders may forecast a continuation of these short-run rents and build too much. Aggravating such tendencies are rental agreements that extend over several years. Because tenants signing new leases cannot compete for the space already under lease, a tight market can produce a spike in marginal rents, which may be misinterpreted as a permanent increase.

Lenders' favorable experience with real estate loans during the period of rising rents may also cause them to continue to finance real estate projects after conditions have started to change. In addition, because many tenants of office buildings are lenders themselves or in professions associated with construction and real estate, their prosperity during the real estate boom may create the impression that the long-term demand for office space is much stronger than is actually the case.

The authors illustrate how, under commonly used valuation approaches, real estate values are extraordinarily sensitive to the assumptions made about vacancy rates and rent levels. If values are based on current rental agreements and occupancy rates, the value of the Boston metropolitan area office stock appears to have fallen more than 70 percent since 1987. Because many projects were highly leveraged and because the owners were frequently individuals or partnerships whose assets were protected from the banks' reach or concentrated in real estate, which declined in the bust, banks have had to absorb much of the loss on commercial real estate projects.

Peter C. Aldrich touched off a lively debate that continued throughout the conference by asserting that bankers were well aware of the risks that they were incurring in their commercial real estate lending. Constrained by regulation and facing increased competition from mutual funds, pensions, and others, they adopted higher-risk lending practices in order to bolster returns. In this regard, Aldrich contends that the paper focuses too much attention on the mistakes of ERTA and too little on the failure of public policy to deal with a constrained and fragile financial system.

While Aldrich views ERTA as providing an unfortunate stimulus to commercial construction, a more fundamental cause of the real estate

boom was investors' efforts to hedge against inflation. Foreign investors and pension funds held a significant share of the commercial real estate market, despite their inability to receive the tax benefits available to real estate syndications and U.S. corporations. Even so, Aldrich believes that the returns that ERTA made possible were greater than indicated by Browne and Case. Moreover, the incentives for corporations to invest in real estate were even more powerful than those for individuals. However, because corporations frequently chose to invest through single-purpose entities, general corporate assets were not available to draw upon if projects floundered.

Aldrich agrees with the applicability of the "hog cycle" to the commercial real estate market and particularly with the observation that customary lease agreements can be an important contributor to overshooting. With respect to the authors' statement that once a real estate boom unwinds, "it does so with surprising speed," Aldrich counters that the reaction is actually very slow to get started but very deep.

David Shulman also believes that the paper overemphasizes the role of tax policy in the commercial real estate boom. Commercial construction and real estate prices soared in London, Paris, and Tokyo, despite very different tax and bank regulatory environments. In addition, much of the commercial real estate boom occurred after the tax benefits were removed. Instead, Shulman attributes the boom to the Plaza Accord of 1985, which he argues resulted in easier monetary policy worldwide and set in motion an inflation in the prices of all kinds of assets, including real estate.

Schulman also thinks the paper devotes insufficient attention to the role of demand in stimulating the growth and contributing to the subsequent collapse of commercial real estate. Rapid growth in office employment in the early 1980s created conditions highly favorable to commercial construction, while the "white collar" recession at the end of the decade was the "final nail in real estate's collapse." The creation of suburban office centers also was an important phenomenon of the 1980s that reduced the value of downtown office locations.

In the ensuing general discussion, both Schulman's assertion that a global easing of monetary policy was a major cause of the boom and Aldrich's contention that banks had deliberately taken risks in order to generate higher earnings were debated. Slow growth in monetary aggregates and declining rates of inflation seemed inconsistent with the international easy money hypothesis. Several participants agreed that banks had expanded into a higher-risk type of lending intentionally because their franchises were being eroded by competition. Others countered that banks could not have known the risks, pointing out that even banks that were not facing competition in their core businesses had pursued real estate lending aggressively.

Real Estate and the Banking Industry

The real estate boom would not have been possible if lenders had not been willing to supply financing. This section of the conference focused on the reasons financial institutions expanded so aggressively into real estate lending and the consequences of the real estate collapse for bank lending today.

Financial Institutions and the Collapse of Real Estate Markets

Donald D. Hester reviews the mortgage lending activity of commercial banks, thrift institutions, and life insurance companies and concludes that changes in mortgage lending by thrifts and life insurance companies in the 1980s were a rather "passive" response to regulatory changes, economic pressures, and other developments over which the institutions had little control. In contrast, commercial banks aggressively sought to expand their share of real estate lending and their concentration in real estate lending.

During the 1980s, commercial banks accounted for an increasing share of direct residential and commercial mortgage lending. Thrifts also increased their share of commercial mortgages in the first half of the decade. The insurance companies' share of the commercial market fell slightly, and their already small holdings of residential mortgages declined further. Insurance companies appear to have been shifting to more liquid assets. This shift was probably driven by the insurance companies' large, growing role as pension fund managers and by the increased public demand for term insurance rather than the traditional straight-life product.

Thrifts' increased mortgage lending stemmed from their dire financial circumstances at the start of the decade. Soaring interest rates not only caused operating losses but meant that the net worth of many thrifts, if marked to market, was negative. To dig themselves out of this hole, thrifts took advantage of financial deregulation, deposit insurance, and brokered deposits in an attempt to grow sufficiently rapidly that profits would be large enough to build back their net worth. While theoretically feasible, the strategy failed.

Hester offers three explanations for commercial banks' aggressive mortgage lending. Better hedging tools enhanced control of interest rate risk and made the risks of real estate lending appear more manageable. In addition, the Tax Reform Act of 1986 encouraged individual borrowers to use residential mortgages as a means of borrowing for other purposes. Hester attributes banks' increased exposure to commercial real estate loans to growing competition in traditional banking markets from the commercial paper market and other financial intermediaries, here and abroad.

Because of these developments, banks may have seen real estate loans as offering higher returns than other lending opportunities. However, evidence was accumulating that real estate markets were weakening. Office vacancy rates rose sharply in the mid 1980s. Rates of return on commercial properties deteriorated in the second half of the decade. Moreover, macroeconomic problems, highlighted by declining real wages, may have reduced the economy's ability to service debt. Hester points out that the economy has suffered a deadweight loss from overbuilding and that the allocation of this loss among lenders, taxpayers, and others will be contentious.

James R. Barth agrees that the pattern of real estate lending by savings and loan associations can be explained by their financial problems in the early 1980s and by changing laws and regulations. Commercial banks' expansion into real estate is harder to explain. Commercial banks continued to expand their real estate portfolios even after the Tax Reform Act of 1986 had reduced the attractiveness of real estate investments. Various explanations have been proposed, including changes in monetary policy, the temptation to take risks with federally insured deposits, and managers' desire for larger empires, but sorting out the relative contributions is difficult.

Opinions differ, even among depository institutions, on the appropriate response to these problems. Barth advocates relaxation of regulatory restrictions on the activities depository institutions may engage in. He would expand the powers only for healthy institutions, however, and he would have regulators move more quickly to eliminate unhealthy institutions.

Gerard S. Cassidy reiterated the importance of nonbank competitors' encroaching on the profitable lines of traditional banking markets as an explanation for banks' expansion into commercial real estate. Nonetheless, he also believes that banks underestimated the risks in real estate lending because of the widely held perception that real estate prices rarely decline. The long duration of real estate cycles means that most of the loan officers making decisions in the 1980s had not experienced a weak real estate market. Their expectations were shaped by the inflationary years of the late 1970s and early 1980s. The unusual vigor of the Texas economy in the early 1980s and New England later in the decade also contributed to the enthusiasm for real estate loans in those areas.

Cassidy also attributes the banks' problems to management failures. Underwriting standards were relaxed in order to compete. Rapidly growing portfolios were not monitored carefully. And the use of interest reserves delayed the realization that problems were developing in commercial loan portfolios, as loans on projects that were unable to generate sufficient cash flow to cover debt service were still current because of the cash reserves.

Crunching the Recovery: Bank Capital and the Role of Bank Credit

The paper by Joe Peek and Eric S. Rosengren presents evidence that the collapse of real estate markets has induced a "credit crunch." The losses on real estate loans significantly eroded the capital of banks at a time of increased emphasis on capital requirements. To satisfy mandatory capital-to-asset ratios while their capital continued to decline, banks were forced to shrink their assets. This shrinkage occurred primarily in loans rather than securities. As a consequence, Peek and Rosengren argue, banks have not been able to meet the credit needs of legitimate borrowers, many of whom are dependent on banks.

Reduced lending, by itself, is not sufficient to indicate a credit crunch, which the authors define as nonprice rationing of the supply of credit. In a weak economy, the demand for loans may have fallen or the creditworthiness of prospective borrowers may have deteriorated. Peek and Rosengren argue that it is possible to distinguish a capital-induced contraction in the supply of credit from a reduction in the demand for credit by looking at the lending behavior of different institutions facing similar demand conditions. If a reduction in capital was responsible for the reduced lending, poorly capitalized institutions would cut back their assets and liabilities more than their healthier competitors, whereas if demand conditions were responsible the contraction would be more uniform.

Peek and Rosengren use regression analysis to show that capital-to-asset ratios were a statistically significant determinant of deposit growth at New England banks in 1990. Thus, institutions with lower capital ratios experienced slower deposit growth or reduced their deposits more than better-capitalized institutions. Peek and Rosengren also present an examination of recent regulatory agreements issued in New England that links bank shrinkage to regulatory policy. These regulatory agreements required capital-to-asset ratios that were much higher than official minimum capital requirements, as well as being higher than the institutions' actual capital-to-asset ratios. The banks subject to these agreements responded by reducing their assets, especially their lending.

The authors argue that the large number of undercapitalized banks in New England means that regulatory-induced restrictions in lending have the potential to seriously hinder the ability of small and mid-sized firms in New England to obtain bank credit. To reduce the capital crunch, they recommend ending restrictions on interstate branching so that capital will flow into capital-depleted regions, eliminating procyclical implementation of capital regulation, and focusing greater regulatory attention on the risks taken by banks when they initially increase their exposure rather than after the loans become troubled.

Albert M. Wojnilower agrees that imposition of more stringent regulatory scrutiny and increases in capital requirements at a time when bank capital was being eroded by loan losses has contributed to a serious contraction of credit. Nor is the problem confined to New England. The steep yield curve and a decrease in banks' managed liabilities are consistent with a national aversion to taking risks. Wojnilower takes issue with the term "crunch," however. Crunch implies a sudden and brief tightening of credit; Wojnilower fears that the current contraction will persist longer than past credit crunches because it is the result of regulatory policy.

Wojnilower argues that banks seeking to reduce their assets will call their soundest loans first, because these borrowers can pay. He also points out that a denial of credit to one customer will have a ripple effect on that customer's suppliers and servicers. These businesses may, as a consequence, curtail their own borrowing; and this, in turn, may be interpreted as a reduction in the demand for credit, whereas the precipitating cause was a reduction in the supply of credit.

While in agreement with the policy prescriptions offered by Peek and Rosengren, Wojnilower is skeptical that they will do much to alleviate current credit constraints. Instead, he advocates requiring banks to increase credit, preferably to the private sector, in line with the Federal Reserve System's targets for national credit growth. While this proposal could result in more loan losses in the future, he argues that defaults will be fewer if banks lend than if they do not. If a bank does not lend, he asks, who needs it?

William M. Crozier, Jr. argues that the supervisory agencies' emphasis on capital-to-asset ratios is preventing banks from taking advantage of attractive earnings opportunities that would enable them to build their capital back up. He disputes, however, that capital regulations account for the drop in bank lending and that there is a large unmet demand from creditworthy private sector borrowers. Rather, if not restricted by capital constraints, banks would be buying government securities, which are highly liquid and are offering attractive yields.

With respect to private sector demand for bank credit, Crozier asserts that good projects are few and can easily secure financing. Many projects are unsuitable because the collapse of the real estate market in the Northeast has made gauging the value of collateral very difficult; also, borrowers have become more cautious and will not put their own funds at risk.

Crozier's contention that the decline in bank lending is attributable to a lack of creditworthy borrowers prompted a spirited general discussion. Some participants supported this view, citing surveys of small businesses in which credit disruptions were not identified as a problem. Other participants countered that New England banks that had aggressively sought new business customers received a flood of loan applica-

tions, many from seemingly qualified borrowers. One participant noted that banks could generate significant earnings from purchasing U.S. government securities only by exposing themselves to increased risk from interest rate changes.

Policy Implications

The final two papers looked for lessons that could be drawn from the real estate and banking crisis. One focused on the implications for the regulation of financial intermediaries, while the other considered how changes in tax policy may have contributed to the fluctuations in real estate and financial markets and how such disruptions might be avoided in future.

Banks and Real Estate: Regulating the Unholy Alliance

Robert E. Litan observes that a central objective of bank regulation with respect to real estate lending should be a structure that dampens the inherently cyclical nature of real estate markets. Regulatory policy did not achieve this objective in the 1980s. At a minimum, it failed to prevent banks' excessive concentration in real estate lending; and once problems developed, more stringent regulation appears to have worsened the downturn in real estate markets and may have impeded the recovery. Nevertheless, Litan does not think regulatory policy should be eased. Rather, monetary and fiscal policy should be used more forcefully to offset the effects of tighter but appropriate regulation.

Litan's paper addresses four questions: Could regulation have prevented banks' shift into real estate loans? Did regulation exacerbate real estate difficulties once they developed? What changes should be made to regulatory policies in light of current problems? How should such changes be phased in?

With respect to regulators' ability to limit bank involvement in real estate, Congress passed several laws at the beginning of the decade that removed restrictions on banks' and thrift institutions' investments in commercial real estate. Had these restrictions remained in place, depository institutions would not have been able to shift so heavily into commercial real estate lending. But whether such restrictions would have prevented banks and thrifts from taking excessive risks is a more difficult question.

If banks and thrifts pursued commercial real estate loans as a strategy to earn high returns by taking large risks, then limiting their involvement in real estate might simply have caused them to look for high-return, high-risk opportunities in other areas. Conversely, if banks and thrifts shifted into real estate because they saw others doing so and

seemingly making high profits, then restricting their real estate involvement would have reduced the general level of risk. Litan characterizes the former as the "moral hazard" motivation and the latter as the "lemming" mentality; he argues that the moral hazard motivation seems to characterize the actions of thrift institutions and some of the larger banks, but that most banks seem to have acted like lemmings. Even banks that were well capitalized and had a lot to lose from taking large risks expanded their commercial real estate lending aggressively. Accordingly, a more restrictive regulation of real estate lending might have prevented subsequent problems.

Regulatory policy became more restrictive at the end of the decade as real estate markets were weakening. Litan shares the view expressed by Peek and Rosengren that more stringent regulation has exacerbated the problems in real estate and contributed to a general slowdown in bank lending. Litan is especially concerned that the risk-weighted capital standards established in the Basle Accord create a bias against lending and towards investment in government securities.

Litan favors a return to restrictions on loan-to-value ratios. He would also like to see larger banks required to meet some of their capital requirements through the issuance of subordinated debt. This would introduce more market discipline, as banks that could not sell subordinated debt would not be able to expand. For smaller banks that cannot issue subordinated debt, he suggests that excessive concentrations in commercial real estate should be offset by higher capital requirements.

To ameliorate the procyclical bias in current regulatory procedures, Litan proposes altering capital regulations and reserving procedure. To eliminate the incentives for investing in securities rather than lending created by the risk-weighted capital standards, he suggests allowing countries to obtain waivers permitting them to alter risk weights as long as the overall level of bank capital is not significantly diminished. The United States could then promote lending by increasing the risk weight on government securities and reducing that on conventional loans.

Litan also advocates changes in the procedures for establishing loan loss reserves. Banks should not be required to establish reserves for loans that are current on principal and interest payments but have suffered a decline in the market value of the underlying collateral. Furthermore, for loans that are truly nonperforming, reserves should be based on long-run economic values rather than current liquidation values.

Robert R. Glauber agrees with several of the regulatory changes proposed by Litan, but he is skeptical that the use of subordinated debt would do any more than provide an "early warning" of potential problems and he strongly opposes the reestablishment of loan-to-value restrictions on real estate loans. Loan-to-value ratios would have done little to discourage banks from investing in real estate during the boom

period when real estate values were rising. Furthermore, designing a set of regulations that could accommodate diverse and complicated real estate projects would be very difficult. The inevitable result would be a proliferation of regulations that would stifle bank vitality. More generally, bank regulators should focus on broad institution policies rather than micro-managing specific types of loans.

Glauber believes that the fundamental problem facing banks is that deposit insurance gives them an almost unlimited capacity to raise funds, while regulation allows very limited opportunities to put those funds to work. This imbalance leads banks to take excessive risks in those areas where they can invest. Banks need broader powers so they can compete more effectively with financial intermediaries that are not so constrained.

Glauber also disputes the existence of a regulator-induced credit crunch and attributes slow growth in bank lending to lack of demand. He notes that loan growth has also slowed at unregulated, nonbank sources of business financing and that funds raised through the commercial paper market contracted in 1991.

While Sherman J. Maisel concurs that banks behaved like lemmings in their eagerness to make commercial real estate loans, he also believes that the inherent cyclical biases of real estate financing should have been recognized. Long lags, high leverage, and appraisals that reflect the past rather than the future all interact to create a cyclical market with infrequent but very large risks of loss. Because the risks are so large, real estate warrants special regulatory attention aimed at preventing banks from becoming overexposed and from lending in a procyclical manner.

With respect to Litan's recommendation that banks be required to hold reserves only against loans that are actually nonperforming, Maisel notes that many construction loans are performing solely because of prefunded interest reserves and that requiring banks to recognize problems on these loans early may avoid larger losses later. Also, examiners may find it difficult to follow Litan's counsel that properties should be based upon long-run economic values rather than liquidation values. Maisel is dubious that appraisers can ascertain true value better than the market, although he suggests that replacement cost might be a useful indicator of value. Finally, he believes that the risk-weights used in capital standards should reflect true risks as accurately as possible and should not be altered to encourage lending.

Rather than making ad hoc regulatory adjustments to ameliorate the real estate cycle, Maisel advocates revising regulations so as to dampen cyclical tendencies. He proposes, first, treating the rapid growth of any asset category as an early warning signal and, second, raising required capital-to-asset ratios during expansions and allowing them to decline during recessions.

Tax Reforms and the Housing Market in the Late 1980s: Who Knew What, and When Did They Know It?

James M. Poterba examines the effect of federal tax changes on housing values and residential construction levels. He concludes that the analyses made at the time the tax bills were enacted were generally accurate in predicting the changes that would occur, but that these analyses focused on the long term and ignored the adverse consequences for construction levels, asset values, and the health of financial institutions in the short run. Housing is one of the more volatile sectors of the economy, but the falloff in multifamily housing starts since the mid 1980s has been the largest contraction of the past 30 years. Changes in federal tax policy contributed to the falloff, first by encouraging "overbuilding" in the early 1980s and then by sharply reducing the incentives to invest in rental housing even as signs of weakness in the rental market were emerging.

By shortening depreciation lives and reducing the capital gains tax, ERTA increased the incentives for investment in rental housing. Stimulating residential construction was not the focus of ERTA, however, and Poterba believes that the favorable consequences for real estate were largely unintended. In contrast, one of the central purposes of the Tax Reform Act of 1986 was discouraging tax shelters, many of which were based on rental housing. Policy analysts were well aware that the Tax Reform Act would reduce rental housing construction. Real rents were expected to increase significantly. However, analysts emphasized the potential long-run efficiency gains, and understated or ignored the short-term consequences for construction and property values.

While warning signs of rising vacancy rates and falling commercial property values were already appearing in 1986, little consideration was given to how removing tax incentives would affect an industry already on the verge of a downturn. Moreover, even the long-term effects may have been underestimated, as the analytical models failed to take account of the investment incentives that passive losses and churning opportunities had provided prior to tax reform.

Finally, policymakers failed to anticipate the implications of falling asset prices for financial intermediaries. By lowering the prices of existing as well as new assets, the Tax Reform Act eroded the capital of lenders. Some institutions failed as a consequence. Many found their ability to fund new investments limited. For public finance economists, this result runs counter to conventional wisdom, which views taxes that change the values of existing assets as non-distorting.

Martin Feldstein emphasizes the role of declining inflation on the incentives to invest in real estate. Inflation distorts the tax code, and the reduction in inflation in the 1980s had a larger impact on the user cost of capital than did the changes in tax rates and depreciation allowances

that were enacted. Macroeconomists too frequently view inflation or money growth as neutral in their effects; but unexpected changes in inflation can interact with the tax code to significantly alter the incentives to save and invest.

Although the changes in tax rates and depreciation rules did not have much effect, the tax shelter provisions of the Tax Reform Act of 1986 substantially reduced the attractiveness of real estate investments. Feldstein particularly faults the retroactive character of the tax shelter changes. The retroactive changes encouraged limited partners of real estate partnerships to dump their properties, thereby depressing real estate values; but the changes produced no efficiency gains, since the properties already existed.

Richard A. Musgrave points out that major economic reforms can be undertaken only when public and political support exists. And because the sentiment for change can be short-lived, it may be necessary to enact these reforms when current economic conditions are less than ideal. Musgrave argues that 1986 was a unique period in that support existed for fundamental tax reform. Little attention was paid to short-term effects because of the prospect of long-term equity and efficiency gains. He believes this was the correct decision, and he opposes those who would try to undo the Tax Reform Act of 1986 and restore the inefficiencies it eliminated. Rather, the appropriate response to the short-term problems tax reform created is to find a way of helping those who were harmed. Musgrave also suggests that if tax shelters are to be used as policy tools, they should be used judiciously to encourage investment in areas that will enhance productivity and increase growth over the long term—and housing is not such an area.

Conclusion

The effects of declining real estate prices have been far-reaching. While economic fundamentals, including changes in inflation, contributed to the real estate cycle, the price changes and fluctuations in construction levels in some parts of the country confounded fundamentals. Both residential and commercial real estate markets through much of the 1980s seemed to be driven by speculative bubbles.

As these bubbles collapsed, financial institutions as well as property-owners experienced substantial losses. With hindsight, it is apparent that banks and thrift institutions were concentrating their risks excessively. For thrift institutions, this risk-taking was a deliberate strategy, followed in an attempt to recoup earlier losses. Whether banks were following a similar strategy is more problematic. Some contend that banks knowingly took high risks to earn high returns; others believe that banks were caught up in a lemming-like mentality and simply

followed others' lead. Real estate losses have eroded banks' capital and, in some cases, have forced banks to shrink their assets and liabilities. Some believe this shrinkage has resulted in creditworthy borrowers being denied credit; others argue that slow growth in bank lending reflects a lack of demand from suitable borrowers.

Federal tax policy and changes in financial regulation exacerbated the boom-bust nature of the real estate cycle. The effects of these policy changes were not fully anticipated, in part because they reinforced one another. Thus, tax policy, macroeconomic policy, and regulatory policy all encouraged real estate investment in the early 1980s; and both tax and regulatory policy became more restrictive in the second half of the decade. Moreover, as policies became more restrictive, little attention was paid to signs that real estate markets were already weakening. Some would contend that the short-run transitional problems created by these policies may prevent achievement of the long-term goals of more efficient investment patterns and a more vital banking sector. Others would argue that opportunities to enact major reforms are rare, and that the pursuit of long-term goals for tax policy or bank capital standards cannot be forever delayed because current economic conditions are not optimal.

Patterns and Determinants of Metropolitan House Prices, 1977 to 1991

*Jesse M. Abraham and Patric H. Hendershott**

Local real house prices have exhibited substantial volatility in the United States in recent years. In virtually all of the widely dispersed selection of 30 cities in this paper, real prices increased by over 10 percent and decreased by more than 5 percent in individual years during the period from 1977 to 1991. In fact, one-half of the cities experienced real price increases above 15 percent and one-third real decreases greater than 7.5 percent.

Swings in regional house prices clearly mimic regional economic cycles. Between 1977 and 1980, the average real appreciation in 11 western cities was 27 percent; between 1980 and 1983, real prices rose by 17 percent in three New England cities, but fell by 12 percent in nine Rustbelt cities. Real prices rose by a full 78 percent in the same three New England cities between 1983 and 1987, but fell by 35 percent in Houston. And between 1987 and 1991, real prices fell by 17 percent in New England and 25 percent in Dallas, but rose by 32 percent in the West (although five of the 10 California cities studied have probably experienced real price declines of close to 10 percent since the middle of 1990).

For a wide array of business and policy reasons, it is important to understand the extent to which regional cycles of changes in real house prices are systematically related to economic cycles. To date, empirical studies have not resolved this question (Abraham 1989; Capozza and

*Principal Economist, Federal Home Loan Mortgage Corporation, and Professor of Finance and Public Policy at Ohio State University, respectively. The authors thank Roger Brinner, Dennis Capozza, their discussants, and other conference participants for useful comments.

Schwann 1989; Case and Shiller 1990; Poterba 1991). These papers have focused on other issues, and, it seems, the authors have been discouraged by their generally poor statistical fits.

A common theme in popular explanations of real house price changes involves overshooting followed by reversal. For example, a thoughtful "event study" of the recent Boston experience by Case (1991) concluded that the local cycle in real estate values drove the employment cycle to extreme heights and then depths. Seattle's sharp reversal in the period from 1981 to 1983, the Northeast's decline since 1988, and California's current reversal seem consistent with this theme. When this evidence is combined with that of an earlier Case-Shiller study (1988), one is left with the impression that "speculation"—a force that moves prices beyond what economic trends justify—was responsible for the extreme run-ups in real prices and subsequent busts. If this is the case, economic modeling would contribute little to understanding real house price changes.

This paper seeks to analyze and explain real house price movements in metropolitan areas during the 1980s, undaunted by statistical fits that are less than spectacular. The source for metropolitan price data is the Freddie Mac repeat-sale data base (Abraham and Schauman 1991). The Appendix discusses the construction of this price series.

The first section begins with the simple identity that house value is the sum of structure and land values, and illustrates that construction costs and land values can, in fact, explain a significant amount of the variation in real house prices over five-year periods. The extended framework, which draws heavily on Capozza and Helsley's (1989, 1990) modeling of real land prices, is described in the following section. The primary determinants of appreciation in real house prices are seen to be the rate of change in employment, real income growth, real construction cost inflation, and changes in real after-tax interest rates.

The model then is tested with data from 29 cities over the period from 1979 to 1991. While all the model variables work as expected, with substantial statistical significance, the empirical estimates are not as stable across areas and over time as the authors would like. Nonetheless, the next section illustrates that the model can explain a significant portion of the price variation described above, at least for the cities in the Upper Midwest and the Southeast. The major driving forces have been growth in employment and in real income (per adult). A concluding section draws together the paper's findings and provides some suggestions for future research.

Preliminary Findings

House prices are analyzed for 30 metropolitan areas, using data drawn from the Freddie Mac repeat transaction data base. This represents the maximum number of areas with sufficient house sales to compute indexes for the period from 1977 to 1991 (and even here a few adjacent years in the early 1980s had to be "smoothed"). This brief introduction describes the data and reports on results of some preliminary five-year regressions.

The Data

Table 1 presents growth rates in nominal house prices in 30 metropolitan statistical areas (MSAs) for selected periods between 1977 and 1991. The data are averages during the year; thus, the change in the 1977–80 period, for example, should be interpreted as the change from the middle of 1977 to the middle of 1980. The 30 areas in the table have been grouped into the West (10 California areas plus Seattle), the Midwest (11), and the East (eight). These three areas are then subdivided into their northern and southern parts. At the bottom of the table is the national consumer price index, cleansed of its mismeasurement of homeowner shelter costs (the CPIU-X1 index).

Northern and Southern California exhibited quite similar appreciation rates, while rates in the East showed modest dispersion, with the northern areas stronger in the early 1980s and the southern areas stronger later in the decade. In contrast, the Midwest exhibited much diversity. House prices in the two Texas cities appreciated at an annual rate nearly 5 percentage points faster than prices in the Upper Midwest in the 1977–83 period and over 5 percentage points slower in the 1983–91 period. Annual appreciation rates in Dallas and Houston even differed from each other by about 5 percentage points in three of the four periods, and individual Upper Midwest cities had appreciation rates that differed by more than 6 percentage points in three of the four periods.

Viewed over the entire 15-year period, New England and the West are the clear winners, averaging 10 percent annual appreciation (versus 5.6 percent annual appreciation in the consumer price index). However, appreciation rates varied widely between the two coasts during subperiods. The West had far and away the greatest gains in the first and last periods, while New England was the clear leader in the middle two periods and was the worst in the nation from 1987 to 1991. The rates for the two areas may be converging, however. In the 1990–91 period, the four MSAs with the greatest nominal deflation were Boston, Nassau-Suffolk, San Francisco, and San Jose, the rates ranging from −7.6 percent to −4.0 percent.

Table 1
Appreciation of Nominal House Prices[a] in Selected Metropolitan Areas and Time Periods
Annualized Percent Change

Area	1977–80	1980–83	1983–87	1987–91	1977–91
EAST					
Northeast	12.0	11.7	19.3	.2	10.4
Boston	14.3	11.0	20.0	−.3	10.8
Nassau-Suffolk	9.1	17.1	18.7	.4	10.8
Newark	12.8	7.1	19.2	.5	9.6
Southeast	11.5	3.8	6.3	5.8	6.7
Atlanta	10.9	3.7	6.0	2.3	5.5
Baltimore	10.5	3.7	7.2	8.2	7.4
Charlotte	13.9	4.0	6.4	4.8	7.0
Richmond	9.3	3.7	5.0	5.3	5.7
Washington, D.C.	12.8	3.8	6.8	8.6	7.9
MIDWEST					
Upper Midwest	10.7	1.9	4.6	5.1	5.4
Chicago	8.1	2.1	6.9	7.6	6.3
Cincinnati	10.2	1.1	4.0	6.0	5.2
Cleveland	7.1	.8	3.9	7.0	4.8
Columbus	9.8	1.7	4.5	5.5	5.3
Detroit	14.3	−1.8	6.4	7.4	6.5
Kansas City	12.9	1.6	3.5	1.3	4.4
Louisville	9.9	4.4	2.7	4.7	5.2
Minneapolis	14.1	2.7	4.8	3.5	5.9
St. Louis	9.8	4.4	5.2	2.5	5.2
Texas	15.5	6.5	−2.5	−.5	3.6
Dallas	18.3	5.4	3.1	−2.9	4.9
Houston	12.8	7.7	−8.0	2.0	2.4
WEST					
North	19.3	3.0	5.9	12.5	9.8
Oakland	18.9	3.3	7.1	11.2	9.8
Sacramento	19.8	2.5	4.3	13.7	9.7
San Francisco	18.5	3.6	8.1	12.6	10.5
San Jose	18.2	4.0	7.3	12.0	10.2
Santa Rosa	19.9	3.1	5.2	14.5	10.4
Seattle	23.7	.4	4.0	11.6	9.3
Stockton	16.3	3.9	5.0	11.6	9.0
South	17.6	3.5	5.1	11.8	9.2
Anaheim	16.0	5.4	4.6	11.6	9.1
Los Angeles	19.5	3.7	6.3	13.1	10.4
Riverside—SB	17.5	2.9	3.9	11.1	8.5
San Diego	17.4	2.1	5.5	11.2	8.8
Addendum:					
Change in U.S. Consumer Prices (CPIU-X1 Index)	9.2	6.6	3.3	4.6	5.6

[a]Average prices during the year; the 1977–80 period, for example, should be interpreted as the middle of 1977 to the middle of 1980.

Source: Federal Home Loan Mortgage Corporation repeat sales data base; U.S. Bureau of the Census.

Overall appreciation rates for the cities in the Midwest and Southeast ranged from 4.4 percent to 7.9 percent, with the exception of Houston, which appreciated at a rate of only 2.4 percent. These generally low rates mask some especially dismal performances over selected subperiods. The clearest loser was Houston, where *nominal* prices fell by a cumulative 37.5 percent between 1983 and 1988. Dallas, which had an enormous appreciation from 1977 to 1980, suffered a 20 percent cumulative nominal price decline between 1986 and 1990. Northern areas also did poorly. The two Lake Erie cities, Cleveland and Detroit, experienced no nominal increase between 1979 and 1984, a period when the consumer price index rose by one-third.

Table 2 presents appreciation rates calculated in real terms, using local consumer price indices (CPIs) net of shelter as deflators. Also, for the Midwest cities only, the first two periods are partitioned at 1979, not 1980, reflecting the fact that real house appreciation turned negative a year earlier in that region than in the rest of the country. The interpretation of these data is quite similar to that of Table 1. The West did incredibly well in the first and last periods, appreciating at roughly 7.5 percent per year in real terms. The Northeast did remarkably well in the middle two periods, experiencing 5 percent real growth in the 1980–83 period when the rest of the country was undergoing real price declines, and a remarkable 15 percent in the period from 1983 to 1987. Real prices fell by 5 percent in the Texas cities during the last two periods (with especially large declines in Houston in the first and in Dallas in the second), but rose by 9 percent from 1977 to 1979. The Upper Midwest had strong (6 percent) real appreciation in the late 1970s, but real prices fell by almost 5 percent annually throughout the period from 1979 to 1983.

Results of Five-Year Regressions

By definition, the value or price of a "house" is the sum of the values of the structure and the land. Further, the value of an existing structure typically is close to its replacement cost. When values of existing properties rise above replacement cost, new construction accelerates, raising replacement cost and eventually lowering existing values as the additional supply comes on line. Values below replacement cost reduce new construction, eliciting the opposite responses. Thus, a construction cost index and an accurate land value index might be expected to largely explain house prices.

Poterba (1991) tested the importance of land values to house prices by regressing five-year changes in real median house prices (National Association of Realtors or NAR) on five-year changes in estimates of the real values of an "improved, 10,000 square-foot lot" for 29 city observations, from 1980 to 1985 and 1985 to 1990 (Black 1990). The estimated

Table 2
Appreciation of Real House Prices[a] for Selected Metropolitan Areas and Time Periods
Annualized Percent Change

Area	1977–80	1980–83	1983–87	1987–91	1977–91
EAST					
Northeast	3.1	5.3	15.5	−4.5	4.7
Boston	4.7	4.8	16.1	−5.5	4.8
Nassau-Suffolk	.6	10.3	15.0	−4.0	5.2
Newark	4.1	.8	15.5	−4.0	4.1
Southeast	2.2	−2.4	3.1	1.2	1.2
Atlanta	1.7	−2.5	2.7	−2.2	−.1
Baltimore	1.1	−2.2	4.2	3.5	1.9
Charlotte	4.6	−2.4	3.2	.3	1.4
Richmond	.4	−2.7	1.8	.7	.2
Washington, D.C.	3.3	−2.1	3.5	3.6	2.3
MIDWEST (1977–79, 1979–83)					
Upper Midwest	6.0	−4.8	2.1	.7	.2
Chicago	3.0	−4.9	3.9	3.1	1.0
Cincinnati	5.6	−5.3	1.6	1.8	.2
Cleveland	2.0	−6.4	1.5	2.4	−.5
Columbus	3.2	−4.0	2.0	1.1	.2
Detroit	10.5	−7.1	3.8	2.8	1.2
Kansas City	7.3	−4.0	.8	−2.8	−.7
Louisville	4.0	−3.8	.8	.2	−.3
Minneapolis	10.4	−3.1	1.6	−1.0	.7
St. Louis	8.2	−4.3	2.7	−1.8	.1
Texas	8.8	−1.0	−5.1	−4.5	−1.9
Dallas	11.4	−.8	−.2	−7.0	−.8
Houston	6.2	−1.1	−10.0	−2.1	−3.0
WEST					
North	8.6	−3.0	2.9	7.6	4.1
Oakland	7.7	−2.6	4.0	6.4	4.0
Sacramento	9.6	−3.5	1.4	8.5	4.0
San Francisco	7.4	−2.3	5.0	7.7	4.7
San Jose	7.1	−1.9	4.2	7.1	4.3
Santa Rosa	8.7	−2.8	2.1	9.6	4.5
Seattle	13.2	−5.5	1.9	6.8	3.9
Stockton	6.8	−2.2	1.7	7.1	3.4
South	7.4	−2.5	1.9	6.5	3.4
Anaheim	5.8	−.7	1.3	6.4	3.3
Los Angeles	9.1	−2.3	3.1	7.9	4.5
Riverside—SB	7.2	−3.0	.7	6.0	2.7
San Diego	7.4	−3.9	2.4	5.7	3.0

[a]Prices deflated using local CPIs net of shelter. For other notes and sources, see Table 1.

Table 3
Explaining Five-Year Changes in Real House Prices[a]

Equation	3.1	3.2	3.3	3.4	3.5	3.6
Constant	−.045	−.098	.107		−.057	−.023
	(−1.8)	(−3.5)	(2.0)		(−.8)	(−.3)
Change in Real Land Costs	.166	.409	.328	.384	.281	.128
	(1.9)	(4.9)	(4.6)	(5.6)	(2.6)	(1.2)
Change in Real Construction Costs			2.361	1.356	2.104	.098
			(4.3)	(5.5)	(2.6)	(.1)
R^2	.10	.42	.63	.58	.52	.10
Number of Observations	33	35	35	35	17	17

[a]Both the dependent variable and the real construction cost variable are lowered by 1 percent annually to account for possible upward biases from sample selection and home improvements.

coefficient on land value was 0.29, and the R-squared was 0.27. Poterba concluded that, while statistically significant, land prices do not tell much of the story about metropolitan variation in house prices. Of course, the "improved" lot values are those of land on the peripheries of the metropolitan areas, and likely would not adequately reflect how the land under "prime, close-in" suburban houses is valued. That is, land "not mattering enough" in this equation does not necessarily mean that land, appropriately measured, does not matter enough.

This study has attempted to duplicate Poterba's results, but without success. As can be seen in Table 3, the land coefficient is only 0.17 and the R-squared but 0.10 (equation 3.1). Two data differences may be involved. First, this study found 33, not 29, city observations where data are available on both NAR median house prices and Urban Land Institute land prices. Second, the prices are deflated using local CPIs less shelter; Poterba does not discuss his deflators.

This paper reports similar equations using changes in real construction costs, as well as real land values, as regressors to explain real appreciation in the repeat-sale house price series. In order to use as large a data set as possible, five-year appreciation rates were computed for all the metropolitan areas in which Black reports land values, even when "reasonable" data for the full 1977–91 period were not available. While this paper's basic annual data set for 1977 to 1991 includes only 13 of Black's 30 areas, reasonable data could be computed for 16 areas for the 1980–85 period and 19 areas for 1985 to 1990, yielding 35 observations.

For a general construction cost measure, this study uses the National Income and Product Accounts (NIPA) residential deflator, which is really the Census Bureau deflator for new houses excluding the value of the lot, and not an index for both multifamily and single-family construction. To obtain city-specific cost estimates, the general index

was multiplied by the appropriate R.S. Means Company city index adjustment factor. The R.S. Means cost survey is applicable for industrial and commercial construction projects. Using the NIPA residential deflator instead of the Means national index makes a difference. The real residential deflator fell by 6 percent in the period from 1980 to 1985 and was constant in the 1985 to 1990 span. In contrast, the real Means index was flat in the earlier period and fell by 6 percent in the later one.

These results are also reported in Table 3. In all these regressions, the repeat-sales indices are reduced by 1 percentage point annually to account for possible upward biases from sample selection and home improvements.[1] The growth in construction costs was also reduced by 1 percentage point annually, permitting the replacement cost measure to reflect depreciation in the structure. These adjustments affect only the constant term.

Equation 3.2 uses only real land inflation as a regressor. Both the coefficient on real land costs and the R-squared are about 0.4. When the change in real construction costs is added (equation 3.3), the R-squared jumps to 0.63. The cost coefficient is three times a plausible size. When the constant term is constrained to zero, the cost coefficient drops to a value insignificantly different from unity (equation 3.4). Especially in light of concerns regarding the likely location of the land at the periphery of the metropolitan area, it can be concluded that construction and land costs explain a large proportion of house price changes.

The last two equations in Table 3 are run for the 17 data points common to both this study's data set and the NAR data set. Using Freddie Mac data, coefficients (except for the constant) similar to those in equation 3.3 are obtained, and the R-squared is 0.52 (equation 3.5). With NAR data (equation 3.6), the R-squared is only 0.10, and no variables are statistically different from zero. At a minimum, these results suggest substantial superiority of the Freddie Mac repeat-sale data over the NAR median price data.

Modeling Metropolitan House Prices

Assuming that movement in the value of structures can be captured with movements in a construction cost index, the challenge is to explain land values. The urban economics literature offers a framework for doing this, specifically Capozza and Helsley (1989, 1990). In their first paper, they derive real land value as the sum of four components: the real value of agricultural land rent, the cost of developing the land for

[1] See Abraham (1990), Abraham and Schauman (1991), and Peek and Wilcox (1991a) for discussions of these issues.

urban use, the value of "accessibility," and the value of expected future real rent increases. The first component introduces the real after-tax discount rate (R), which converts a constant real rental stream into a value equivalent. The value of accessibility is greatest at the center of the city and increases with the size of the city, introducing the number of households (H) and real transportation costs per unit of distance (T) as determinants of metropolitan land values. Lastly, the "growth premium" owing to increases in expected future rent depends on expectations of future household growth. Capozza and Helsley's equation (24), which expresses the average value of developed land in a city, can be summarized as

$$\begin{matrix} & + & + & + & - & - \\ P = P(H, & T, & h, & R, & hR), \end{matrix} \tag{1}$$

where h is the expected rate of household growth.

Because Capozza and Helsley assume that the consumption of land per household is fixed, real income does not appear in (1). Allowing consumption of land to rise with real income would make the city boundary dependent on real income; higher real income would raise the accessibility premium and thus land values. Allowing consumption of land to change in response to transportation costs would dampen the price response changes in these costs. While higher transportation costs would immediately raise real land prices (the gradient for land would steepen), as people demanded less land, real prices would revert toward their initial values (the city radius would shrink).

Capozza and Helsley (1990) switch gears somewhat. Population becomes endogenous (migration is costless), and real income growth is introduced. Because consumption of both land and the composite nonhousing good are assumed to be fixed, all real income changes are translated into real rent changes via the budget constraint. A relationship like that expressed in Equation (1) is shown to hold, except that households and expected household growth are replaced with real income and expected real income growth. Capozza and Helsley also introduce uncertainty and argue that uncertainty, and the irreversibility of development, slow development and thus raise the value of developed land if the boundary of the urban area is exogenous. However, with the boundary endogenous, the price of urban land is unaffected by uncertainty. Proxies for uncertainty should thus be incorporated, but only for areas with restricted boundaries (for example, cities bounded by water or mountains).

This paper draws on both of these frameworks and includes the replacement cost value of the structure, because the issue addressed here is the price of homes, not land. For the household and real income per household variables, employment and real income per working-age

(25 to 64) adult are used (E and Y), and construction costs are denoted by C. The equation in percentage-rate-of-change form is:

$$p = \phi(c,e,y,\dot{e},\dot{y},r), \quad \begin{matrix} & + & + & + & + & + & - \end{matrix} \tag{2}$$

where lower-case letters refer to unexpected percentage changes in upper-case variables. Note that the equation does not include a transportation variable or a variable for a change in uncertainty (which would be relevant only for bounded cities). Preliminary testing did not yield promising results for transportation costs.

Earlier Studies

Equation (2) above can be compared with earlier empirical work. Capozza and Schwann (1989) have tested the Capozza-Helsley model with Canadian data from 20 areas over the 1969/1975 to 1984 period. The price level of newly constructed houses was significantly and positively related to the number of households, to an estimate of expected housing completions, and to the nominal interest rate. The level was significantly and negatively related to the real pretax interest rate and a time trend. Because newly constructed houses are generally on peripheral land, the urban land model would not be expected to work as well for new as for existing houses.

Poterba (1991) analyzed real appreciation in the median (NAR) house price in 39 cities over the period from 1980 to 1989. Of the variables used in this study's model, he used construction costs and real income per capita. Because he used year dummy variables, no user cost measure was employed. Peek and Wilcox (1991a) analyzed a variety of national real house price series over the 1950–89 period. Real construction costs, adjusted real income per adjusted household (see their paper for the adjustments), the user cost, and the unemployment rate were significant in their preferred equation. Using 18 city data points from the 1982–85 period, Hendershott and Thibodeau (1990) found real NAR prices to be positively related to real income and negatively related to the extent to which area growth is restricted by water.

Mankiw and Weil (1989) found an age-composition variable to have a large influence on the real U.S. residential construction deflator over the 1947–89 period. Poterba tested their national variable in his equations, and it entered insignificantly with the unexpected sign. This is not surprising, because Hendershott (1991) has shown that the Mankiw-Weil relationship did not hold in the 1970s and 1980s, the period Poterba

studied.[2] Peek and Wilcox found a significant negative relationship between real house prices and the ratio of population aged 20 to 29 and 30 to 54.[3] Demographic influences beyond the employment and real income variables used here are not supported by the theoretical model, however.

Case and Shiller (1989) investigated real price changes in four cities over the 1970–86 period. They find a significant positive relationship between current real appreciation and real appreciation lagged one year, the coefficient being about one-third. In a follow-up study (1990), they tested a variety of other variables and found that real income growth, the growth in population aged 25 to 44, and the ratio of construction costs to prices had some explanatory power.

Empirical Proxies

The real (adjusted for local general inflation) house price and construction cost series were described above. The local CPIs net of shelter are from Data Resources, Inc./McGraw Hill. Employment data and population aged 25 to 64 are from Regional Financial Associates. Because no employment data were available for Seattle prior to 1985, this city has been deleted from the sample. Income data are from the Bureau of Economic Analysis, U.S. Department of Commerce. Because the 1991 MSA income and population estimates are not yet available, the WEFA Group forecasts are used to estimate these numbers. The general deflator is the CPIU-X1, the national consumer price index purged of the mismeasurement caused by rapid increases in mortgage rates in the late 1970s and early 1980s (U.S. Bureau of the Census 1991).

Two formulations of the real after-tax interest rate are tested. The first takes a longer-term (or fixed-rate mortgage, FRM) approach. The calculations use the seven-year Treasury bond rate (excluding the values of the call and default premiums built into the FRM rate) for the basic financing rate, an average of the rate of change in the national CPI over the past five years for expected inflation, and Poterba's marginal tax rate for households with real adjusted gross income of $30,000 in 1990. The second formulation takes a short-term (or adjustable rate mortgage, ARM) approach. The one-year Treasury bill rate is used for the financing rate, and the previous year's national rate of appreciation in the CPI proxies for expected inflation.

Deviations of local rates of expected appreciation in house prices

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[2] See the January 1992 issue of *Regional Science and Urban Economics* for four critiques of Mankiw and Weil and their reply.

[3] See their follow-up paper (Peek and Wilcox 1991b) for a detailed explanation of the population ratio and an explanation of why the aging of the baby-boomers should raise, not lower, real house prices in the 1990s.

from the national rate of inflation are presumably captured by unexpected changes in the employment and real income growth variables. Unexpected changes are proxied by observed changes. Alternatively, these deviations could be estimated directly as functions of past general and local appreciation rates.

Say that the correct specification of the real after-tax interest rate is

$$R = (1 - \tau)i - [wpn + (1 - w)pl],$$

where pn is the expected national inflation rate, pl the expected local house price inflation rate, and w the weight given to the national rate. This expression can be rewritten as

$$R = [(1 - \tau)i - pn] + (1 - w)(pn - pl).$$

If the bracketed first term (the real after-tax interest rate using the expected national inflation rate) and (pn − pl) are included as regressors, and estimated coefficients of a and b, respectively, are obtained, 1 − w would be computed as b/a.

Metropolitan Results

The results are reported in three parts. First, estimates for the full 29-city sample are provided. Then the paper discusses results for a geographical partitioning of the data: the Northeast, Texas, and West (15 cities) versus the Southeast and Upper Midwest (14 cities). Finally, results are reported for the 1979–82, 1983–87, and 1987–91 cycles. Note that the 1982–83 change has been deleted from the sample because the boundaries defining the metropolitan areas were expanded in that year, creating a spike in employment growth. The purpose of the subsample estimates is to determine whether the results are robust across space and time.

The regressions were estimated using generalized least squares for pooled time series cross-sectional data. The technique is described in Kmenta (1971, pp. 508–12) and implemented using SHAZAM (White and others 1990). Heteroskedasticity is permitted across cities by a two-step procedure that estimates an ordinary least squares (OLS) regression, transforms each variable by the estimated standard error, and then runs a second OLS regression. This procedure was followed in all reported regressions.

In selected regressions, individual cities are allowed to have nonscalar covariance matrices and separate autoregressive parameters. This requires two transformations before the final OLS estimation, as described in Kmenta. Even with the autoregressive correction, the first observation is kept. The covariance matrix of the complete regression is

Table 4
Estimates for the Full 29-City Sample

Equation	4.1	4.2	4.3	4.4	4.5	4.6
Constant	−.008	−.010	−.006	−.007	−.006	−.001
	(−2.5)	(−2.8)	(−1.7)	(−2.2)	(−2.1)	(−.4)
Real Construction Cost Inflation	.541	.581	.552	.468	.457	.579
	(4.4)	(4.7)	(4.6)	(4.2)	(4.2)	(5.7)
Employment Growth	.515	.465	.496	.342	.313	.367
	(4.2)	(3.9)	(4.2)	(3.1)	(3.2)	(3.6)
Real Income Growth	.835	.866	.603	.581	.565	.433
	(5.2)	(5.5)	(3.8)	(4.0)	(4.4)	(3.3)
Change in Real After-Tax Interest Rate						
Seven-Year	−.604					
	(−2.9)					
One-Year		−.502	−.578	−.542	−.593	−.606
		(−3.0)	(−3.4)	(−3.5)	(−4.4)	(−5.5)
Change in Employment Growth	−.158	−.113	−.144	−.061		
	(−1.6)	(−1.1)	(−1.3)	(−.6)		
Change in Real Income Growth	−.556	−.520	−.384	−.078		
	(−3.7)	(−3.4)	(−2.5)	(−.5)		
Change in Local Price Deviation			−.230	−.076	−.072	−.172
			(−4.8)	(−1.5)	(−1.5)	(−4.6)
Lagged Real Appreciation				.392	.402	
				(7.9)	(8.7)	
R^2	.39	.39	.43	.53	.54	.38
Number of Observations	319	319	319	319	319	319

therefore assumed to be block diagonal. Estimation of Kmenta's full cross-sectionally correlated and autoregressive model did not converge. The reported R-squared uses Buse's formula, which gives the proportion of explained variance of the transformed dependent variables.

Total Sample

The first two equations in Table 4 (equations 4.1 and 4.2) are estimates of equation (2) based on the two alternative user cost series, excluding any measure of transportation costs. Coefficients on all variables except for the proxies of local expected growth are statistically different from zero with the expected sign. Both changes in growth rates enter with unexpected negative coefficients, and the coefficient on the

real income term is statistically different from zero.[4] The negative sign on the change variables can be interpreted, however, as indicating a positive lagged response to the change. Consider the real-income coefficients in equation 4.1. Combining them, the current period response to an increase in real income growth is 0.279 (0.835 − 0.556) and the lagged response is 0.556. Thus, a 1 percentage point increase in real income growth would cause prices to rise 0.279 percentage points faster than otherwise in the period in which the increase occurred and another 0.556 percentage points faster (for a total increase of 0.835 percentage points over the original growth rate) in the subsequent period.

Next, equation 4.3 includes as a regressor a more direct proxy for the change in the deviation of expected inflation in real local house prices from expected national general inflation—the change in the deviation between lagged real growth in local house prices and lagged real appreciation in the national CPI. As was shown above, the ratio (with sign reversed) of the coefficients on this variable and on r measures the relative weight given to expected local house price inflation in the formulation of house price expectations. Unfortunately, this procedure removes observations, because data are unavailable for the years before 1977: one additional observation would be lost for the formulation of the one-year real after-tax interest rate, and five for the seven-year formulation. As a result, this relationship is reported only for the one-year formulation. As can be seen in equation 4.3, the local component is statistically significant, as is r itself. The implied weights on the local-house and national-general inflation components are 0.4 and 0.6, respectively.

Equation 4.4 allows for a direct influence of lagged real local house price appreciation, à la Case and Shiller.[5] Naturally, the statistical fit improves. The 0.39 coefficient is somewhat larger than Case and Shiller's 0.33 average for their four cities. The "long-run" impact (coefficient divided by 1 − 0.39) of changes in real income is substantially increased in this equation vis-à-vis equation 4.3, and the impact of local price appreciation is decreased. Not surprisingly, including the lagged dependent variable eliminates the statistical significance of the change in growth variables which, as argued above, was simply capturing lagged responses. Equation 4.5 drops these insignificant variables.

The final specification introduces an autoregressive error structure

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[4] Examination of the correlation matrix suggests the problem. The correlation of each of the changes in rate-of-change variables with its respective rate-of-change counterpart exceeds 0.5. When variables are highly collinear, they tend to take on coefficients with opposite signs.

[5] Unlike Case and Shiller, this study does not create a separate price index to use as a regressor; see Abraham and Schauman (1991, p. 337) for comments on measurement error and negative serial correlation in repeat-sales indices.

that varies by city, thereby permitting a different lagged response from one area to another. Cities with autoregressive parameters above 0.5 are Cleveland, Detroit, Kansas City, Los Angeles, Nassau-Suffolk, Riverside-San Bernardino, and Santa Rosa. The coefficients in equation 4.6 are similar to those in equation 4.3.

Comparing the estimates with those in the literature, the impact and long-run (impact divided by 0.6) coefficients on construction costs in equation 4.5, which are 0.46 and 0.77, respectively, surround the 0.65 estimate of Peek and Wilcox. In contrast, Poterba's estimate is almost unity. The real income and employment coefficients are all in the 0.3 to 0.6 range, far above the 0.1 Peek-Wilcox estimate (recall that they include the unemployment rate as a regressor), but only a fraction of Poterba's 1.75. Finally, the impact of the real after-tax interest rate coefficient of -0.5 to -0.6 is below Peek and Wilcox's -1.0, but the long-run response in equation 4.5 is -1.0. The similarity between these city results and the Peek-Wilcox national results suggests that this study's coefficients are probably being driven more by the time series characteristics of the data than by the cross-sectional characteristics.

Geographic Subsamples

Table 5 provides estimates with this study's sample divided into two parts based upon geography. One consists of the 14 "similar" Southeast and Upper Midwest cities, and the other contains the more volatile Texas, West, and Northeast cities. The specifications reported are the same as those in equations 4.5 and 4.6.

All coefficients have their expected signs, but the explanatory power is better in the more stable area. Comparing equations 5.3 and 5.1, the R-squared for the Southeast/Upper Midwest area is 0.62, while it is 0.46 for the rest of the country, and the lagged dependent variable is doing more of the work. A comparison of equations 5.4 and 5.2 indicates just how much more of the Southeast/Upper Midwest price variation is explained by the model. Real income growth has a far larger impact in the Southeast/Upper Midwest, while employment growth has a greater impact in the other area. The change in the real after-tax interest rate works roughly similarly in both areas, although a little more strongly in Texas/West/Northeast. Real construction cost inflation has a larger coefficient in the Southeast/Upper Midwest, and changes in lagged local prices work predominantly in the other area.

Time Subsamples

While the data sample begins in 1977, taking first differences and allowing for lags has brought the effective start date to 1979. Thus the first subperiod listed in Tables 1 and 2 cannot be examined. The results

Table 5
Regional Sample Estimates

	Texas, West, and Northeast		Southeast and Upper Midwest	
Equation	5.1	5.2	5.3	5.4
Constant	−.000	.015	−.009	−.006
	(−.0)	(2.0)	(−3.1)	(−2.2)
Real Construction Cost Inflation	.325	.229	.433	.564
	(1.6)	(1.4)	(3.6)	(5.3)
Employment Growth	.497	.598	.040	.100
	(2.9)	(2.8)	(.3)	(1.1)
Real Income Growth	.454	.255	.989	.832
	(2.5)	(1.2)	(5.9)	(5.9)
Change in Real After-Tax One-Year Interest Rate	−.424	−.690	−.603	−.527
	(−1.5)	(−2.6)	(−4.5)	(−4.9)
Change in Local Price Deviation	−.152	−.261	−.000	−.103
	(−2.0)	(−4.1)	(−.0)	(−2.4)
Lagged Dependent Variable	.443		.230	
	(6.3)		(3.6)	
R^2	.46	.27	.62	.64
Number of Observations	65	65	54	54

from estimating equations with and without the lagged dependent variable for the 1979 to 1982, 1983 to 1987, and 1987 to 1991 subperiods are listed in Table 6. (Note the deletion of 1983, as discussed earlier.) Given the short time series, estimates with different autoregressive parameters for individual cities are not reported.

The explanatory power of the relationship, with or without the lagged dependent variable, is greatest in the most recent period. This may reflect improvement in the quality of the Freddie Mac data over time. All variables have the expected sign, except real income growth in the first period and the change in the local price deviation in the middle period. Real construction cost inflation is significant in all periods, while employment growth is significant in the first and third periods, and real income growth in the middle period. Both the real after-tax interest rate and the local price deviation variables are significant in the first and third periods.

Table 6
Period Sample Estimates

	1979–82		1983–87		1987–91	
Equation	6.1	6.2	6.3	6.4	6.5	6.6
Constant	−.019	−.018	.006	.003	.004	−.014
	(−4.6)	(−4.5)	(.8)	(.6)	(.4)	(−1.6)
Real Construction Cost Inflation	.380	.390	.827	.501	.921	.779
	(2.8)	(3.9)	(6.5)	(4.3)	(3.3)	(3.0)
Employment Growth	.689	.596	.007	.058	1.170	.960
	(7.2)	(3.9)	(.1)	(.5)	(7.5)	(5.5)
Real Income Growth	−.067	−.018	.573	.538	.261	.330
	(−.5)	(−.1)	(3.0)	(3.4)	(1.1)	(1.4)
Change in Real After-Tax One-Year Interest Rate	−1.252	−1.168	−.103	−.256	−1.769	−2.038
	(−4.5)	(−3.9)	(−1.0)	(−2.9)	(−3.7)	(−4.7)
Change in Local Price Deviation	−.201	−.177	−.054	.209	−.437	−.310
	(−3.2)	(−2.6)	(−1.0)	(3.6)	(−5.4)	(−3.8)
Lagged Dependent Variable		.077		.570		.304
		(.8)		(7.6)		(4.0)
R^2	.49	.51	.40	.59	.65	.65
Number of Observations	87	87	116	116	116	116

Explanation of Regional Price Variation

Of obvious interest is the ability of the estimated equations to explain the sharp regional swings in real house price appreciation documented in Table 2. Assuming sufficient ability, of further interest is the source of the variation (real construction cost inflation, real income growth, employment growth, or changes in real after-tax interest rates). This section responds to such interests.

Explanation of Regional Cycles

Table 8 indicates the ability of the equation estimates to explain average real appreciation in four areas in each of three periods since 1979. The areas are California (10 cities), the Southeast and Upper Midwest (14 cities), the Northeast (three cities) and Texas (two cities). But first, Table 7 presents data on employment growth, real income growth, and real construction cost inflation, as well as changes in real house prices, for each of the four areas during each of the three periods. The first period was one of real income decline (except in the Northeast), positive employment growth (except in the Southeast and Upper Midwest), and declining real construction costs. The second period had strong income growth (especially in the Northeast, but little in Texas),

Table 7
Variations in Determinants of Regional Real House Price Changes over Selected Periods
Cumulative log changes

Area Variable	1979–82	1983–87	1987–91
Northeast			
Employment Growth	.025	.114	−.066
Real Income Growth (per Adult)	.027	.161	.007
Real Construction Cost Inflation	−.033	.066	−.037
Change in Real House Prices	.109	.576	−.184
Texas			
Employment Growth	.132	.053	.108
Real Income Growth (per Adult)	−.040	.011	.046
Real Construction Cost Inflation	−.020	−.040	−.095
Change in Real House Prices	−.070	−.215	−.188
California			
Employment Growth	.031	.187	.091
Real Income Growth (per Adult)	−.087	.103	−.005
Real Construction Cost Inflation	−.009	.025	−.074
Change in Real House Prices	−.014	.104	−.280
Southeast and Upper Midwest			
Employment Growth	−.040	.156	.052
Real Income Growth (per Adult)	−.051	.118	.019
Real Construction Cost Inflation	−.041	.025	−.069
Change in Real House Prices	−.134	.096	.032
Change in Real After-Tax Interest Rate	−.013	.019	−.042

employment growth and rising real construction costs (again, especially in the Northeast, but not in Texas). The most recent period has seen negligible real income growth (except in Texas), employment falling in the Northeast but rising in the rest of the country, and declining real construction costs. As shown at the bottom of the table, real after-tax interest rates fell in the first period, rose in the second, and then fell sharply in the third.[6]

Each part of Table 8 begins with actual real appreciation (average cumulative log difference across all cities) and then provides estimates based on the equations with the lagged dependent variable in Table 4 (full sample, equation 4.5); Table 5 (regional sample, equations 5.1 and 5.3); and Table 6 (time sample, equations 6.2, 6.4, and 6.6). While the

[6] When the real after-tax interest rate is recomputed using the Livingston expected inflation rate, the rate rises, not falls, in the first period. However, using this measure does not significantly alter the equation coefficients.

Table 8
Actual and Forecast Growth in Real House Prices
Simple average of total log change, by city, with lagged dependent variables

Area Variable	1979–82	1983–87	1987–91
Northeast (3 cities)			
Actual	.109	.576	−.184
Full sample	.017	.334	−.039
Regional sample	.048	.384	−.051
Time sample	−.018	.400	−.127
Texas (2 cities)			
Actual	−.070	−.215	−.188
Full sample	−.019	−.069	−.103
Regional sample	.014	−.033	−.077
Time sample	.003	−.057	−.033
California (10 cities)			
Actual	−.014	.104	.280
Full sample	−.027	.118	.134
Regional sample	.004	.171	.191
Time sample	−.041	.100	.165
Southeast & Upper Midwest (14 cities)			
Actual	−.134	.096	.032
Full sample	−.112	.116	.028
Regional sample	−.110	.096	−.003
Time sample	−.100	.105	.037

generalized least squares regressions are estimated using transformed variables, Table 8 reports results using estimated coefficients and untransformed variables. Consequently, the forecast growth rates are a little worse than the regression R-squares would suggest.

The full-sample equations explain about one-half of the changes in real house prices over the various periods. The equations do relatively poorly for the Northeast; less than a quarter of the first and third period changes and about 60 percent of the huge 58 percent run-up in the 1983–87 period are explained. Texas is only marginally better; a third to one-half of the real declines in the second and third periods are explained. All of the 10 percent real rise in California in the middle years is explained and half of the rise since 1987. Lastly, the explanatory power for the 14 Southeast and Upper Midwest cities is excellent for all periods.

The regional and time-specific estimates do better in only a few instances. The regional estimates, which for the coastal areas give relatively more weight to employment growth and less to income growth, are better for the Northeast in all periods and in California in the last period. The Southeast and Upper Midwest regional estimate for

the final period is worse than for the full sample because it does not recognize the employment gains. The time-specific estimates are better only in the third period and, again, only for the coastal areas. (These estimates also give more weight to employment growth and less to income growth, which improves both fits.)

Table 9 reports the portion of the real house price changes in the regions during the three time periods that can be explained by the preferred regression (equation 4.5), and it indicates which variables account for the explanation. The first number, the actual change, and the second, the static prediction (labeled "fitted change"), are the same as those in Table 8. Also reported is the dynamic prediction, labeled "derived change," in which the lagged dependent variable used is that predicted by the equation, rather than the actual (except in the first year where the lagged value is "known").

The ability to explain either the rapid real price increases in the Northeast during the middle 1980s and in California during the late 1980s, or the declines in Texas since 1983, is sharply reduced when observed lagged real house price inflation is not used (except for the first year of the cycle). Only a trivial amount of these real price movements is explained, except for the extraordinary rise in the Northeast, where 20 points of the 52-point rise are accounted for. On the other hand, the two Southeast/Upper Midwest movements—the decline during the 1980–82 recession and the rebound in the 1983–87 period—are well explained. These areas include one-half of the cities studied. The run-up in California in the middle 1980s is also explained.

The contributions of variables specific to the region are listed below the derived changes in the table. The contributions of changes in the real after-tax interest rate and in the constant, which are the same for all regions, are listed at the bottom of the table. Certainly the most important variables are the rates of growth in employment and real income. These are key to both the real price declines outside the Northeast and the real rise within the Northeast during the 1979–82 period, and also to the real price increases outside Texas in the middle 1980s. Construction costs matter, but only a little. Real construction cost increases contributed to the Northeast's 1983–87 surge in prices (or were caused by it) and real decreases reinforced the continual declines in Texas, but a substantial decline in California's real construction costs during the 1987–91 period did not prevent a sharp increase in real house prices there. Changes in the real after-tax interest rate just as often worked against, rather than supported, the real house price changes observed.

As noted in the discussion of similarities between these results and the national estimates of Peek and Wilcox, this study's equation estimates seem to be driven more by time series variation than by cross-section variation. This can be seen when considering the ability to

Table 9
Decomposition of Forecasts of Changes in Real House Prices

Area Variable	1979–82	1983–87	1987–91
Northeast			
Actual Change	.109	.516	−.184
Fitted Change	.017	.334	−.039
Derived Change	−.003	.198	−.012
Real Construction Cost Inflation	−.027	.042	−.021
Employment Growth	.010	.053	−.011
Real Income Growth	.022	.128	.021
Local Price Deviation and Lagged Dependent	.005	.023	.004
Texas			
Actual Change	−.070	−.215	−.188
Fitted Change	−.019	−.069	−.103
Derived Change	.002	−.027	−.002
Real Construction Cost Inflation	−.015	−.030	−.057
Employment Growth	.059	.031	.049
Real Income Growth	−.028	.016	.040
Local Price Deviation and Lagged Dependent	.008	.004	−.031
California			
Actual Change	−.014	.104	.280
Fitted Change	−.027	.118	.134
Derived Change	−.059	.130	.015
Real Construction Cost Inflation	−.008	.011	−.045
Employment Growth	.017	.084	.047
Real Income Growth	−.059	.082	.003
Local Price Deviation and Lagged Dependent	.005	.002	.014
Southeast and Upper Midwest			
Actual Change	−.134	.096	.032
Fitted Change	−.112	.116	.028
Derived Change	−.093	.132	.010
Real Construction Cost Inflation	−.024	.011	−.039
Employment Growth	−.009	.070	.028
Real Income Growth	−.039	.095	.020
Local Price Deviation and Lagged Dependent	−.010	.004	.004
Common Variables			
Real After-Tax Interest Rate	.011	−.014	.030
Constant	−.024	−.034	−.034

explain the differences across regions for a given time span. From 1979 to 1982, the largest difference was between the Northeast (+0.11) and the Southeast/Upper Midwest (−0.13). Of this 0.24 difference, only 0.09 is accounted for by differences in the derived changes. For the middle

period, this study accounts for only 0.23 of a 0.79 difference (0.07 of 0.48 if Texas is excluded), and for the last period, only 0.02 of a 0.47 difference.

When equation 4.5 is run with time dummy variables, the coefficients on real income and construction cost inflation decline by nearly 50 percent, the coefficient on employment growth rises by about 50 percent, and the coefficient on the lagged dependent variable barely moves, from 0.40 to 0.38. While these coefficient changes are significant, in total they do not increase the ability to explain the large real price swings outside of the Upper Midwest/Southeast group. The alternative coefficients explain roughly 5 points less of the rise in the Northeast in the middle 1980s and 5 points more of the rise in California prices in the late 1980s.

Conclusion

Substantial movements in real house prices have occurred in various regions of the United States during periods of the 1980s. This paper specifies an explanatory framework based on the Capozza-Helsley models. The determinants of real house price changes are seen to be employment and real income growth, changes in real construction costs, and changes in the real after-tax financing cost. Empirically all variables work as expected, with comfortingly high t-ratios. The major driving forces are the growth variables. But the variables are able to explain only about two-fifths of real price changes. The explanatory power rises to above one-half when the lagged appreciation rate is added as an explanatory variable, and to three-fifths with the inclusion of time period dummy variables.

The explanatory power varies widely by region. For half of the cities located in the more stable Upper Midwest and Southeast, the equations explain virtually all of the real decline in the early 1980s and the rebound in the middle 1980s. The equations also pick up the mid 1980s bounce in California, but miss totally the surge in the late 1980s. Increasingly restrictive land use controls may account for much of the seemingly unmotivated increase. In addition, a data problem may also be present. Proposition 13 undoubtedly led many California households to substantially rehabilitate their existing houses, rather than trade up, in order to keep their property tax base down. When these properties finally were traded in the late 1980s, the improvements were reflected in higher prices; in other words, part of the surge in "real prices" was likely an increase in quality.

The inability to explain the sharp price movements in the Northeast and the almost continual real decline in Texas is especially troublesome. Only one-third of the extraordinary run-up in the Northeast in the

middle 1980s is explained and virtually none of the subsequent decline. Part of this seems to be a speculative bubble; using the observed, rather than the simulated, lagged appreciation rate explains another quarter of the increase. But that is not nearly enough. It appears likely that the extraordinary stock market rebound beginning in August 1982 had a disproportionately favorable impact on the Northeast because residents of that region hold a disproportionately large share of stock market wealth.

Texas is even more of a problem. The data suggest positive real income and employment growth after 1983. In fact, the growth in Texas after 1987 is the strongest in the country. Possibly, as in the Northeast in the middle 1970s, this seemingly aberrant price behavior is a response to wealth changes, although in this case the change was a negative one associated with the plummeting price of energy.

The explanatory power of the lagged dependent variable confirms the results of others regarding the "inefficiency" of the owner-occupied housing market. Whether these inefficiencies are sufficient for households to make money by "trading" houses seems doubtful, given the tax treatment of this asset and the transactions costs involved. It is doubtful, for example, that many Bostonians shifted to renting in 1987 and 1988 and are now returning to owning.

The authors have both short-run and long-run research agendas. For the near term, the search continues for reasonable employment growth estimates for 1982 and 1983 to eliminate the break in the data at that point, and for some measure of growth restrictions or constraints on city expansion. The authors also plan to test deviations of real house price levels from their trend values, to see if a general tendency exists for real prices to revert to "normal," independent of the model variables. Finally, the hypothesis that recent real stock market capital gains affected the Northeast (and energy price declines affected Texas) more than the rest of the country will also be tested.

In the longer run, the authors' research will be directed toward explaining the full nexus of variables treated here as independent—employment, real income, population, and real construction costs. As Case (1991) and Poterba (1991) have argued, sharp increases in real house prices will stimulate economic activity. Housing starts will increase (the marginal q exceeds 1), and wealthier households will demand more goods and services generally. Greater economic activity will, in turn, attract workers to the metropolitan area. Fully documenting these responses would substantially increase our understanding of regional economic cycles.

Data Appendix

The city house price series are derived using the (geometric) weighted repeat sales technique described in Case and Shiller (1989), as implemented in Abraham and Schauman (1991). Even when creating annual series, the data in some areas are thin enough that it was necessary to smooth a few adjacent years in the early 1980s for three cities. This was done by forcing a constant real appreciation rate (using the local CPI less shelter) over the periods in question: 1977–80 in Boston, and 1980–84 in both Louisville and Minneapolis. This is equivalent to assuming no data are available to permit identifying the timing of inflation during those periods.

A number of technical issues with the Freddie Mac indices, initially raised in Abraham and Schauman, have been given new voice by discussant Bill Apgar. He rightly points out that the measurement of house price changes, as well the explanation of those changes, is fertile ground for intellectual debate.

Apgar questions the magnitude and timing of the local weighted repeat sales indices used in this paper by comparing them to "truth" as revealed by statistical derivations done by Harvard's Joint Center for Housing Studies. Those indices are fitted values or interpolations from hedonic regressions applied to a sample of starter homes identified in the American Housing Survey. Different approaches, especially over small geographic areas and with different population samples, cannot help but be at variance in their behavior.

In addition to the house price indices themselves, the choice of deflators will affect the measurement of real price appreciation. The Joint Center numbers use the national CPIU-X1 to deflate all areas; we use local CPI (less shelter) indices. This can make a difference. For example, in Cleveland the CPI (less shelter) grew 0.5 percent a year faster in the 1980–83 period than the CPIU-X1, and 0.9 percent a year slower between 1983 and 1987. The effect of these differences is to exacerbate the spread between the reported real Joint Center and weighted repeat sales indices.

One issue of concern with the Freddie Mac series is the use of appraisals (from refinancings), rather than arms-length transactions only, for creation of the indices. Since refinancings account for two-thirds of the matched-transactions data set, their use makes possible the creation of many local area indices. Involved statistical work is necessary to test for possible biases in these calculations. Still, cumulative growth rates with and without refinancings for Anaheim, Boston, and Detroit are virtually identical over the period from 1977 to 1991. A slight pattern of differences can be seen over the 15 years: the indices without refinancings grew a little more slowly from 1979 to 1982, more quickly from 1983 to 1987, and more slowly from 1987 to 1991.

The Freddie Mac repeat sale growth rates are adjusted for renovations with a time invariant constant, which implies that dollar expenditures are perfectly procyclically correlated with house values. Apgar's numbers confirm this pattern and match the changes in Table 2 rather well. The finest regional breakout of nominal expenditures on home improvements is the four-Census-region level reported in Census Bureau publication C50. Deflating those numbers with repeat sales price series reduces the dispersion in expenditures across areas. Squinting at the results, one can detect some residual procyclical behavior of "real" improvements, but these deviations from a constant adjustment can reasonably be viewed as a second-order adjustment of a small number (0.5 percent).

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Discussion

*William C. Apgar, Jr.**

Jesse Abraham and Patric Hendershott undertook the formidable challenge of preparing a paper that examines the determinants of price changes in residential real estate over the past several decades. During the 1980s, real estate prices soared in some areas, only to fall back later in the decade. Using metropolitan area price data developed by Freddie Mac, Abraham and Hendershott attempt to address the seemingly simple question, "Was the volatility of the 1980s really a departure from the past?"

Yet the question remains unanswered, largely, I suspect, because of important biases present in the Freddie Mac price measures themselves. This is understandable. Today as much controversy exists about how best to measure historical real estate price trends as about the determinants of these price trends. Nevertheless, "undaunted by statistical fits that are less than spectacular," the authors push ahead in their efforts to develop improved measures of single-family home prices, to use these created estimates of home prices to test a theory of the determinants of the spatial variation in housing prices over time, and to outline a program of future research that will increase the understanding of regional housing and economic cycles.

My comments on the paper, then, are divided into three parts. First, the merits of the Freddie Mac data in examining regional and metropolitan level variation in single-family home price appreciation will be assessed. Brief comments follow on the modeling effort, although my confidence in the results is severely undermined by concern

*Executive Director, Joint Center for Housing Studies, John F. Kennedy School of Government, Harvard University.

about the basic price measures themselves. Finally, some observations will be offered on the research necessary to enhance future knowledge about regional economic housing cycles.

Freddie Mac Repeat Transactions Data Base

The paper analyzes data for 30 metropolitan areas, developed using the Freddie Mac repeat transaction data base. As described more fully by Abraham and Schauman (1991), this data base contains some 8 million single-family home loans that Freddie Mac has purchased and securitized over the past 20 years. Of these transactions, Freddie Mac researchers have identified some 200,000 properties that passed through this process more than once, and they have used information contained in the loan documentation files to develop a transaction-based home price index. Given that for nearly two-thirds of the cases the transaction recorded involves a property refinancing as opposed to an "arm's length" sale to a third party, the Freddie Mac data do not yield a true repeat sales file, but rather a series that blends price trends as measured by market sales and by appraisals.

Since first appearing, the Freddie Mac price indices have generated extensive discussion as to their merits, including published articles by Abraham and Schauman (1991), Peek and Wilcox (1991a) and Haurin, Hendershott, and Kim (1991). Recognizing that Freddie Mac purchases are limited to conforming conventional loans, each paper notes that the Freddie Mac indices may suffer from truncation bias. For example, truncation bias may result from the fact that Freddie Mac data exclude low-valued homes typically covered by Federal Housing Administration insurance, as well as high-valued homes that exceed conforming loan limits. Next, since some share of the data involves appraisals as opposed to sales, the data may be biased to the extent that appraisers systematically overstate or understate market value in particular locations or at a particular point of the housing cycle. Finally, lack of property attributes (including vintage or quality measures) makes it impossible to cleanse the Freddie Mac indices of the possible bias that may result from property improvement or deterioration that may occur between the transactions recorded in the file.

Comparison of the Freddie Mac data with other available price measures suggests the magnitude of these potential problems. In our annual report on *The State of the Nation's Housing*, the Joint Center presents constant quality home price indices for 12 metropolitan areas, derived from hedonic price equations estimated with American Housing Survey data (Joint Center for Housing Studies 1992; DiPasquale, Somerville, and Cawley 1992). Of these 12 metropolitan areas, nine (Boston,

Chicago, Cleveland, Detroit, Houston, Los Angeles, Minneapolis, St. Louis, and Washington, D.C.) are also found in the Freddie Mac series.

Simple comparisons of growth rates for four periods (1977–80, 1980–83, 1983–87, and 1987–91) suggest that these two measures of price appreciation differ both in general and in their details. For example, the simple average annual appreciation for these nine metropolitan areas (measured in constant 1989 dollars as deflated by the all-items CPI-UX) derived from Freddie Mac repeat transactions data is some 0.4 percent higher than the Joint Center estimates for the same period. These differences in turn result from the tendency of the Freddie Mac data to fall below the Joint Center estimates early in the period (3.1 percent versus 3.4 percent for 1977–80, and −2.6 percent versus −1.6 percent for 1980–83) and to overshoot later (2.4 percent versus 0.7 percent for 1983–87, and 1.0 percent versus 0.3 percent for 1987–91).

Differences for individual metropolitan areas are also pronounced. For example, Joint Center data for Cleveland suggest that annual home price declines continued well into the mid 1980s (−3.4 percent for 1980–83 and −1.3 percent for 1983–87). In contrast, the Freddie Mac data suggest a sharp reversal over the 1980s (from −5.4 percent for 1980–83 to +0.5 percent in 1983–87).

Recognizing the potential flaws in the Freddie Mac series, several efforts have been made to generate an adjusted series. While these efforts may yield appropriate adjustments for a national level price index, I am less than optimistic about the success of these adjustments for individual metropolitan series. To illustrate this concern, consider the Peek and Wilcox (1991a) proposal to adjust the data for omission of the effect on dwelling unit quality of unreported expenditures for repair, maintenance, and improvement. Drawing on Census Bureau data on these types of homeowner expenditures, Peek and Wilcox estimate a national average net residential investment measure. Using these data, they estimate that adjusting for the omitted quality effect alone could reduce the overall national real home price appreciation, as measured by the Freddie Mac series, from 31 percent to 14 percent for the period from 1970 to 1989.

Abraham and Hendershott recognize this problem and, indeed, following the lead of Peek and Wilcox, adjust their metropolitan repeat-sales indices by 1 percentage point annually to account for possible upward biases from sample selection and home improvements. While this adjustment may work to correct the national index, it seems unlikely that a single national average adjustment is the correct adjustment in all metropolitan areas. In particular, the extent to which homeowners invest in their homes varies over time and location. Moreover, there is reason to believe that part of this variation itself is related to the same demand factors that stimulated rapid price appreciation in selected regions.

Consider, for example, the "rehab boom" that occurred in the mid 1980s. Measured in 1989 dollars, from 1984 to 1989 the per unit expenditure on residential upkeep and improvement grew by more than 60 percent in the Northeast and West, while real per unit expenditures declined slightly in the Midwest and South (U.S. Bureau of the Census 1991). As a result, by 1989 per unit expenditures ranged from highs of $1,501 and $1,399 in the Northeast and West to the lower figures of $1,078 and $880 recorded in the Midwest and South. While these figures undoubtedly mask even greater variation at the individual metropolitan area level, the conclusion seems clear: a simple adjustment may be sufficient to correct national data, but it seems unlikely that such a simple fix will go far in adjusting local data for the effects of unobserved home improvements.

In addition to the need to develop regionally specific adjustment factors, users of the Freddie Mac data would also be wise to consider the effect of the various types of truncation biases present in the sample. While the two types of truncation may offset one another at the national level, it seems likely that the relative importance of each type of truncation will differ from one area to the next. In particular, in low-cost areas, Federal Housing Administration programs may account for a larger share of sales, and hence truncation at the low end of the distribution may be relatively more important. In high-cost regions, in contrast, concerns about changes in the upper limit may be more pronounced.

This review does not offer any suggestions as to possible types of metropolitan area corrections, in large measure because the Abraham and Hendershott paper presents no information on the sample size or other aspects of the specific Standard Metropolitan Statistical Area (SMSA) estimates required to complete such a detailed assessment. While recognizing the need for further review, I emerge from this exercise with serious reservations as to the use of the Freddie Mac series to measure house price trends at the metropolitan area level. Oddly enough, I now share the conclusion reached by Hendershott when he wrote just last year with Haurin and Kim (1991) that "Both our regional and annual calculations cast doubt on the rapid appreciation of house prices recorded in the Freddie Mac repeat-sales index in recent years." This is unfortunate, since local area price measures are exactly what is needed. While further research on possible correction methods may serve to offset some of the concerns raised here, for now I have much more confidence in the validity of the Freddie Mac measures when applied to national, as opposed to metropolitan area, price analysis.

Modeling and Estimation Issues

In this paper, Abraham and Hendershott assume that spatial variations in construction costs fully capture changes in structure value and thus "the only task is to explain land values." While this formulation ignores the possibility that structure prices may diverge significantly and for some extended period above or below the replacement cost of similar structures, there can be little doubt that variations in land prices are a major component in both cross-sectional and time series variation in home prices.

In their effort to explain home prices, Abraham and Hendershott draw on a model initially presented by Capozza and Helsley. Under the formulation presented here, in addition to real construction cost inflation, metropolitan variation in home price appreciation is a function of local employment growth, local real income growth, changes in the real after-tax financing cost, and area-specific measures of expected appreciation in real house prices.

Despite the obvious data problems, Abraham and Hendershott do manage to produce plausible equations for the entire sample of observations. Yet they take little comfort from their initial equations when they also report decidedly less satisfactory results for subsamples based on time and broad regions of the country. Unfortunately, the authors provide little interpretation of the observed differences in the coefficients generated from the geographic and time samples.

Absent more careful assessment of why the coefficients ought to vary over time or location, I have little confidence in the findings as presented. My doubts are enhanced, of course, by my conjecture that measurement errors may differ by time period and region. For example, consider the concern about the potential upward bias in the price indices for the mid 1980s. Abraham and Hendershott argue here that increased sample size actually has improved the quality of the metropolitan area estimates for the mid to late 1980s. Thus they observe that the improved performance of the model at the end of the period could, in fact, reflect this improvement in the quality of the price information. Alternatively, of course, improved model fit for the 1983–87 and 1987–91 segments could also simply reflect the fact that a misspecified model was fortuitously rescued by a spurious correlation induced by non-random measurement error in the estimates of metropolitan area price changes.

Concern about model performance is further heightened by even a quick review of what is omitted from the model. Most obvious is the failure of Abraham and Hendershott to incorporate demographic factors into their model. Since the release of the Mankiw and Weil paper (1989) on the influence of the population's age structure on housing prices, numerous papers have examined the linkage between demographics and housing price dynamics. While the Mankiw and Weil formulation

has been widely discredited, other studies have discovered significant linkage between various measures of the age structure of the population and home price appreciation (for example, Peek and Wilcox 1991b; Case and Shiller 1990). In any event, the omission of demographic factors here is striking.

Equally striking is the omission of any discussion of the ways that growth controls, zoning, or other land use restrictions may have contributed to the increase in land prices and in turn single-family home prices. Recently, home builder groups have stressed the potential adverse effects on home prices of the growing use of exactions to finance urban infrastructure development. Indeed, support appears to be increasing for the observation that exactions do in fact raise home prices.[1] In any event, I remain less than convinced that the simple formulation presented by Abraham and Hendershott adequately captures the regional and temporal variations in the effect of changing land use regulations on housing cost. At minimum, this issue deserves some comment in their paper.

Future Research

Given my generally critical comments about the Freddie Mac data and the specific modeling exercise, I close with some comments on future research. First, I applaud the spirit with which Abraham and Hendershott present their findings. The lack of residential housing and land price indices represents a major impediment to developing an improved understanding of regional economic and housing cycles. Abraham and Hendershott approach the task given them with energy and skill. One can only praise Abraham and Hendershott and other researchers at Freddie Mac for developing an admittedly problematic but nevertheless valuable new source of housing price data. It is to be hoped that other major institutions involved in housing will join in Freddie Mac's effort to develop improved measures of housing and land prices.

Admittedly, much remains to be done. I firmly believe that the required data will be difficult to develop, and that new prices indices like Case and Shiller's will be created, city by city, where historical home sales data can be retrieved and examined. Promising in this regard is the effort now underway at the Department of Housing and Urban Development (HUD) to attach sale price data to observations included in the American Housing Survey. Such an effort will undoubtedly increase

[1] See, for example, the review of the exaction literature by the Kennedy School's Alan Altshuler and Tony Gomez-Ibanez (1993).

knowledge of home price trends, and could eventually lead to creation of Census-based home price indices for individual regions.

Yet as Abraham and Hendershott remind us, improved measures of home prices are but part of the required work. In addition, much work needs to be done to better understand other elements, including local determinants of employment, income, construction costs, land prices, and new and existing housing starts. House prices are important determinants of household wealth, and thus themselves may stimulate consumer expenditures. Ongoing Joint Center research suggests that household wealth is an important determinant in the household's decision to undertake expenditures for residential maintenance, repair, and improvement; but as Case has argued, real wealth accumulation undoubtedly influences other expenditure as well.

Additional work is also needed to examine what appears to be the changing pattern of regional and metropolitan area construction cycles. In particular, preliminary work by the Joint Center's Jim Brown and Chris Herbert, reported in *The State of the Nation's Housing, 1992*, points to the growing influence of local market conditions as determinants of regional building cycles. Nationwide, during the 1970s, the number of housing units built reached a cyclical low in 1974–75, rose to a peak in 1977–78, and then fell sharply to another trough in 1981–82. Residential construction in most states followed this national pattern, with 43 states reporting a low in 1974–75, the same number hitting a high in 1977–78, and 48 falling to another low in 1981–82. The pattern of regional cycles in the 1980s stands in sharp contrast. Unlike the 1970s, construction levels in only 22 states peaked with the national total in 1985–87. Instead, housing production in 18 states moved up quickly after the national recession, peaked in 1983–84, and then declined. In the remaining 10 states, housing construction continued to increase until 1988 or later.

These trends suggest, at a minimum, the need for careful assessment of the interplay between national economic factors and local factors as they influence regional building cycles. They suggest further that the 1980s may differ in fundamental ways from previous periods, confounding the ability of researchers to use time series data to explore metropolitan area-specific relationships. Finally, they are further reminders of how difficult was the task handed to Abraham and Hendershott, in their charge to explain patterns in residential real estate prices.

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Discussion

*James A. Wilcox**

It has long been thought that commercial real estate lending posed a number of risks. That perception has proved correct. Many of the risks associated with holding securities with fixed interest rates, such as fixed-rate mortgages secured by residential real estate, have long been recognized as well. But at least until recently, the credit risks associated with single-family real estate lending were judged to be fairly low and manageable. It may be, however, that recent actual and prospective mortgage default rates, and the magnitudes of the losses per default, now suggest a somewhat different picture. Published reports pointing to trouble in the portfolio of one of the nation's largest originators and holders of single-family real estate mortgages may confirm that revised perception.

A recovery of the macroeconomy may have been under way for some time now, but if so, it has been slow and uneven. In this instance, California has been in the unaccustomed role of follower, not leader. Seemingly immune to serious economic difficulties at the end of the 1980s, California saw its unemployment rate move to nearly 10 percent in the summer of 1992. As California labor markets have softened, the specter has been raised of substantial declines in house prices, generating large numbers of residential and commercial real estate defaults. In light of experience in Texas and New England, concern has grown about banks that have dedicated considerable portions of their portfolios to mortgages collateralized by California real estate, and about the impact those banks' difficulties could have on those who typically rely on them for credit.

Jesse Abraham and Patric Hendershott advance our understanding of residential real estate markets, both local and national, first by

*Associate Professor, Haas School of Business, University of California at Berkeley.

providing us with superior quality data on house prices. They use the Freddie Mac data base to construct time series of annual nominal house prices for 30 cities. One of the primary virtues of this series is that it controls for the effects on house prices of location, one of the three things that realtors contend determine house prices (the other two being location and location). Until the advent of the regional and national house price indexes based on the Freddie Mac data, which were pioneered by Jesse Abraham, studies relied heavily and unavoidably on a number of seriously flawed house price series. Though not perfect, the repeat sales house price indexes based on Freddie Mac data are arguably the best available (Peek and Wilcox 1991).

The citywide house prices that Abraham and Hendershott have constructed have some notable and useful features. First, nominal house prices declined relatively infrequently over the non-overlapping three- or four-year periods shown. These years are not exactly peak-to-trough subperiods, but they are close. In that regard, though the periods should not be strictly interpreted as showing the historical "worst-case scenarios," Abraham and Hendershott's Table 1 may accurately indicate the extent to which nominal house prices exhibit downward stickiness. Or, it may also reflect the circumstance that substantial real declines were warranted during a period of considerable general inflation, which obviated the need for nominal declines. Fortunately, neither after-tax real interest rates nor unemployment rates are likely to increase enough in the near term to warrant real declines in house prices as large as those recorded in the early 1980s.

Second, the data confirm the widespread impression that inter-regional house price movements are not highly correlated over short periods. In Table 1, it is easy to find examples of annualized rates of regional house price appreciation differing by more than 10 percent for periods of three or four years.

Perhaps more interesting is the fact that the data indicate considerable divergences of (at least short-term) price movements within regions. In the most recent subperiod shown, for example, annualized appreciation rates within the Southeast region spanned a range of more than 6 percentage points. This suggests that a portfolio consisting of mortgages originated within a fairly circumscribed geographic area may still exhibit a considerable amount of economic diversification.

The authors derive estimates of the effects of various determinants of house prices, rounding up the usual suspects (income, population, interest rates, and so on). At various places in the paper, they seem disheartened by the difficulty of finding a stable, tight explanation for their house price data.

First, it is worth remembering what a daunting task Abraham and Hendershott have set for themselves. Their goal is to explain short-run changes in the prices of long-term assets that are anchored in dozens of

different cities. These prices ought to, and apparently do, respond to both national and local factors. Furthermore, they are likely to respond to both actual and expected conditions. The sample period covered by the data, which are available from 1977 through 1991, comprises one of the most macro- and microeconomically turbulent periods in memory. Over that 15-year period, major shocks generated some temporary and some permanent reverberations in tax policy (including income tax rates), land use regulations, monetary policy, fiscal policy, international trade patterns, energy markets, labor markets, and other areas germane to house prices. These cities are geographically small areas subject to all kinds of idiosyncratic shocks, in addition to macroeconomic forces. The cities themselves differ in size, diversification, and physical limitations to expansion.

The events of this period, and the wide variance in the severity of their repercussions across cities and regions, could reasonably spur us to consider whether an entity so large and disparate as the United States is best served by having but one central bank. Certainly our experience ought to convey some information to those who are considering an amalgamation of varied Western European economies under the banner of a single monetary authority. Indeed, the house price data produced by the authors may be one of the best available indicators of the dispersion of outcomes across regions subject to some of the same fundamental public policies.

Second, one can take some comfort from the verification of several aspects of conventional wisdom. Like Poterba (1991), Peek and Wilcox (1991), and others, Abraham and Hendershott document the statistical correlation between house prices and construction costs and household incomes. I find it encouraging, though the authors do not mention it, that the estimated coefficient on land value in their five-year-average data sample is in the neighborhood of the share of land in total cost. It is less encouraging, and the authors do mention this, that the coefficient on construction costs vastly exceeds their share of total costs.

Abraham and Hendershott note that all is not well in their estimates of annual real house price appreciation. Though results of formal stability tests are not presented, they indicate that their estimated equations are unstable both across time and across space. As Hendershott (1991) has pointed out, such instabilities should caution us that some important aspects of the determinants of house prices may be missing from the current specification.

One notable, if not altogether explicable, finding is the significant and fairly robust effect of the adjustable rate mortgage (ARM) interest rate on house prices. It is not clear that the ARM rate is more relevant than the rate on fixed-rate mortgages (FRM), based on the results shown in the authors' Table 4. It would be worth knowing which prevails in head-to-head competition. Of course, both may be relevant. One signal

that the ARM interest rate may be proxying for the FRM rate is that, in their Table 6, the estimates show that the ARM measure was relevant even in the 1980–82 subsample, a period when ARMs were still virtually nonexistent.

The authors' estimate of the response of house prices to incomes strikes me as being implausibly high. Suppose that over the longer run, real incomes per adult (due to productivity advance) and employment (due to population growth) each were to grow at 1.5 percent annually. Table 4 implies that real house prices would rise by a similar amount. (The implied increase may be either larger or smaller, depending on which column is used and what interpretation is given to the explicit or implicit lagged dependent variable coefficient. An elasticity of 1.0 for the sum of the employment and income effects was used as an illustrative matter.) One implication of a price elasticity of this magnitude would be that (constant-quality) house prices rise as fast as per capita incomes. If the long-run, real supply price of structures is constant, then the price of land would rise by 1.5 percent times the inverse of the share of land in house prices. Taking land's share of total costs to be about one-third, real land prices would rise by an average of 4.5 percent per year. This is far in excess of what we have observed over the long run.

Another piece of good news, however, is that many of the awkward aspects of these results may be related to a single phenomenon. The problems of instability and of somewhat surprising coefficient patterns may in effect reflect the omission of some relevant variable(s). Here, I focus on one candidate for inclusion in particular: the deviation of the actual from the "steady-state" *level* of real house prices.

The problem with the authors' specification, which uses growth rates only, is that no avenue is provided for real house price levels to revert to their equilibrium or steady-state levels. (It also commonly generates significant constant terms that are difficult to interpret: Are real house prices expected to change continually for unspecified reasons?) In currently fashionable jargon, the specifications used here lack an error-correction mechanism, which provides the channel for the reversion of real house prices to the levels implied by the long-run, possibly co-integrating, relation between house prices, incomes, construction costs, and interest rates. The specification in terms of levels presented in Peek and Wilcox (1991) might be taken as an example of such a steady-state relation. The latter specification, however, may be conversely misspecified: it does not incorporate dynamics.

Allowing an error-correction mechanism might contribute to the explanation for the convergence phenomenon the authors point to when they note that some of the cities that had the largest price increases during the 1980s have more recently seen nominal price declines. To the extent that cities with the greatest price appreciation are also likely to be those whose prices came to most exceed their steady-

state levels, a tendency to revert to those levels may well have contributed substantially to the ensuing price weakness. In that regard, house prices may exhibit characteristics similar to the "winners become losers" phenomenon some have claimed for the prices of individual stocks.

Like Case and Shiller (1989), Abraham and Hendershott report a significant effect of lagged appreciation on current house price appreciation. That may be consistent with inefficient pricing of houses, but the ability to forecast excess returns on housing would be more convincing. Indeed, Case and Shiller indicate that excess returns are even more forecastable than are returns. Thus, this paper's evidence adds to the accumulating stock of indications of the inefficiency of house prices.

Abraham and Hendershott doubt, however, that the extent of price inefficiency is sufficient to provide excess-profit opportunities for households to exploit. The transactions costs in this market may, as they suggest, preclude taking advantage of such opportunities to the fullest; if they did not, we would likely see no evidence of inefficiencies remaining in the data. But it does seem that households have often tried to exploit these opportunities on the up side, either by buying additional houses or by living in larger houses than would otherwise be purchased at that stage of the life cycle. To the extent that they expect that houses would produce negative excess returns, households likewise seem to defer or reduce house purchases.

The data constructed by Abraham and Hendershott illustrate how differently house prices, real or nominal, may behave for extended periods in different areas. Although most observers will not find this surprising, with these data it is possible to readily calculate a fairly high-quality estimate of the extent of covariation. Armed with such estimates, investors can more accurately select the degree of portfolio diversification they prefer. As an aid to such selection, it would be worthwhile to group cities according to the similarity of their house price function estimates.

Cities, as opposed to nations, may be the relevant areas over which to examine whether price inefficiencies in the form of speculative bubbles have emerged. National indexes obscure divergences of local house prices both from national trends and from the fundamentals relevant to a given locality. Thus, the availability of local house price indexes permits investigation of whether past house prices help forecast future excess returns on houses but also whether, for example, significant "spillovers" occur: do developments in one locality help forecast excess returns in (economically or geographically) neighboring markets?

Abraham and Hendershott suggest that the value of economic modeling of house prices is reduced to the extent that house prices are set inefficiently. In that case, a combination of typically considered economic forces and variables designed to measure "speculative" factors may still track and even help forecast house prices. It may even be

that such models become more valuable to the extent that houses are priced inefficiently. When house prices exhibit "overshooting and reversal," it may be that economic modeling will be able to forecast the (excess) returns on houses to some extent. Such models may not always be able to explain house price movements very precisely, but such models may well track or even forecast the overshooting and reversals. And even absent those abilities, they may indicate when house prices are "bubbling." In that regard, a model that is unable to account for the high level of house prices might indicate that houses are "overpriced." A model that can emit those kinds of signals could prove extremely valuable.

Housing market participants may well forecast house price changes, as this paper's results indicate they usefully could, at least partially on past house price changes; those changes exhibit quite strong positive autocorrelation. Such patterns of prices and forecasts may provide some hint about current mysteries. Given sluggish and even declining prices in some areas in recent years, both buyer demand for and lender supply of mortgage credit may have been reduced by the implicit forecasts of negative excess returns. That perspective, perhaps if likewise applied to the commercial real estate market, might provide an alternative to the "credit crunch" as a primary source of the reduced flows of credit to these sectors.

In that case, it may be that no appeal to bank capital developments, or any other source of credit crunch, would be required to observe credit growth that is slower than in earlier periods and slower than predicted by models that omitted such (perhaps irrational) forecasts. Rather than investing in houses or in any other asset whose excess returns appear to be persistent in general, and negative at present, both potential mortgage borrowers and lenders might prefer to move to instruments whose excess returns exhibit little persistence; such as Treasury issues, and instruments whose returns are explicitly or implicitly linked to them, such as money market and bond funds. While that may help explain some of the increased portfolio shares of those instruments in the early 1990s, it would, on the other hand, seem to intensify the puzzlingly slow growth of the demand for M2.

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How the Commercial Real Estate Boom Undid the Banks

*Lynn E. Browne and Karl E. Case**

Commercial real estate is routinely cited as the primary culprit in the recent banking crisis. In metropolitan areas throughout the country, office vacancy rates commonly approach 20 percent or more. Rents have softened and property values have fallen, in some cases precipitously. And while such problems seem most severe for office space, values of retail and warehouse properties have also fallen.[1] Not only have banks failed because of losses on real estate loans, but they have also introduced more stringent credit standards in response to these difficulties, standards that are believed to have offset interest rate reductions and sapped the strength of the recovery.

This paper examines how the glut of commercial real estate space developed and how banks came to be so severely damaged. It concludes that commercial real estate construction, especially construction of office buildings, is inherently cyclical. However, the cycle of the 1980s was magnified by tax and institutional changes and by a conviction—shared by developers, banks, the academic community, and the general public—that real estate was a high-return, low-risk investment.

The paper also argues that the consequences of declining real estate values fell so heavily on banks, first, because they had moved very aggressively into real estate lending in the 1980s, and second, because

*Vice President and Deputy Director of Research for Regional Affairs, Federal Reserve Bank of Boston, and Professor of Economics, Wellesley College, and Visiting Scholar, Boston Fed, respectively. The authors thank David Mann for valuable research assistance. The views expressed in this paper are those of the authors and do not necessarily reflect official positions of the Federal Reserve Bank of Boston or the Federal Reserve System.

[1] National Real Estate Index, *Market Monitor* and *Market History Reports: 1985–1990*, June 1991.

these loans were obligations of borrowers whose only assets were real estate. When real estate values fell, instead of deep-pocketed corporate borrowers to share the losses, there remained only individuals and partnerships whose net worth melted away.

The first section of the paper examines patterns of commercial real estate construction over time and across regions. Following very low levels of commercial construction in the late 1970s, construction activity, especially in office buildings, soared in the mid 1980s, plateaued, and then plummeted at the end of the decade. Patterns varied considerably among regions, with New England an exaggerated example of the national picture. The second section reviews various explanations for the commercial construction boom of the 1980s, focusing on the strong growth in the financial and services sectors, tax code changes, the effect of deregulation on the availability of capital, and expectations of real estate appreciation.

The following section uses regression analysis of building patterns in the nine census regions to evaluate these explanations. It finds that the commercial construction boom was driven by a combination of economic fundamentals, tax changes, and lender enthusiasm for real estate.

Based on this analysis, the paper then discusses the inherently cyclical nature of commercial construction. Boston is used to illustrate the sensitivity of commercial real estate values to changes in occupancy and rental rates and to demonstrate why banks were so vulnerable when real estate values declined. Conclusions follow.

Commercial Construction Patterns

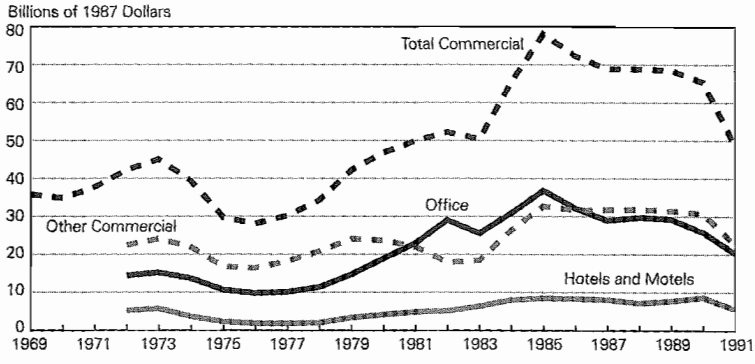
An excess of commercial building space could arise because of too much building or because of an unexpected falloff in the demand for space. The latter certainly played a role in the real estate difficulties of Texas and other Southwestern states, where declining oil prices produced a dramatic reversal of economic fortunes in the mid 1980s. But while unanticipated declines in demand may have contributed to the present nationwide commercial real estate glut, much of the blame lies with overbuilding.

As can be seen in Figure 1, construction of commercial buildings ballooned in the first half of the 1980s. In just the two years between 1983 and 1985, the constant dollar value of commercial construction increased 50 percent. As a consequence, about 14 percent of total nonresidential investment was devoted to commercial construction in the mid 1980s, compared to 8 percent in the second half of the 1970s and 12 percent in the early 1970s.

Office buildings, hotels and motels, and stores and other commer-

Figure 1

Value of New Commercial Construction in the United States



Source: U.S. Bureau of the Census, *Current Construction Reports* C30-9105, Value of New Construction Put in Place.

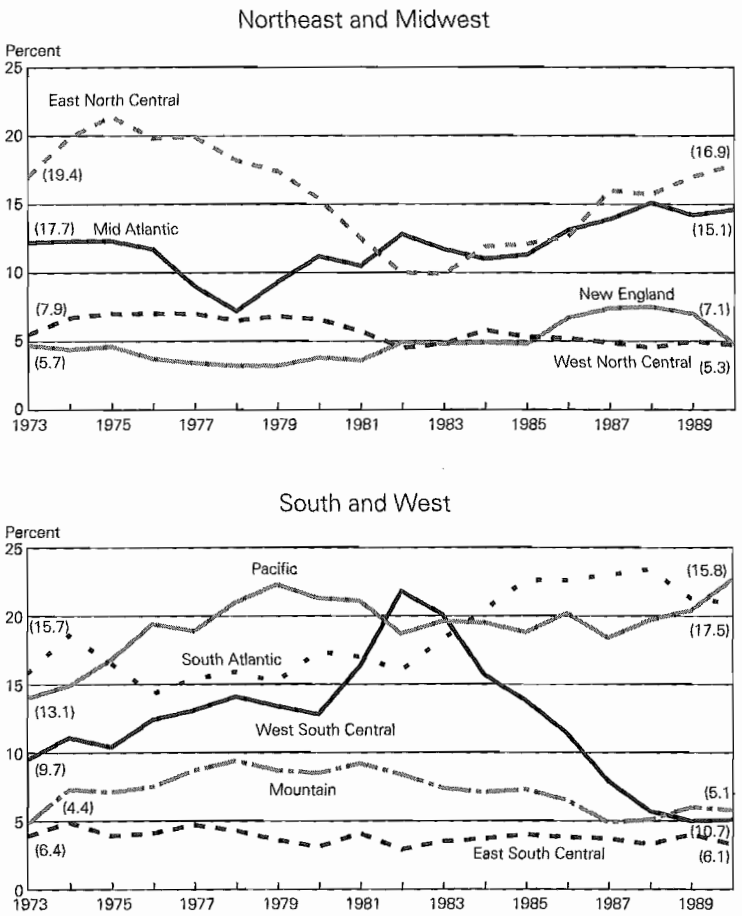
cial buildings all contributed to the increase.[2] However, the increase was more pronounced for offices than for other commercial buildings; the timing was also a little different. In contrast to the commercial sector, construction of industrial or manufacturing buildings was subdued through the 1980s.

While most parts of the country saw increases in commercial construction in the 1980s, the differences were striking. Figure 2 shows the shares of U.S. commercial construction in the nine census regions. The construction boom was particularly pronounced along the East Coast; New England, the Mid Atlantic, and South Atlantic regions all accounted for higher shares of the nation's commercial construction in the 1980s than they had in the second half of the 1970s. In the West South Central states, in contrast, commercial construction soared at the start of the 1980s, but then fell precipitously in the second half of the decade.

[2] The three major categories of commercial construction are office, hotels and motels, and "other commercial." The last consists of "buildings and structures which are intended for use by wholesale, retail, or service trade establishments." Shopping malls, stores, restaurants, auto service stations, and warehouses and storage facilities that are not part of industrial facilities are all considered "other commercial" buildings. Not included are educational and religious buildings and hospitals. Source: U.S. Bureau of the Census, Current Construction Reports C30-9105, *Value of New Construction Put in Place.*

Figure 2

Regional Shares of U.S. Commercial Construction



Note: Regional population shares at beginning and at end of period are shown in parentheses.
Source: See Figure 1.

Causes of the Boom

Some increase in commercial construction in the 1980s was undoubtedly justified by economic fundamentals. Office vacancy rates at

Table 1
Changes in U.S. Employment in 1970s and 1980s, Selected Industries
Percent

Industry	1969–74	1974–79	1979–84	1984–89
Total Employment	10.1	13.3	7.0	13.3
Commercial Tenant Industries:				
Wholesale and Retail Trade	14.0	17.6	8.6	15.2
Finance, Insurance, and Real Estate	25.1	23.9	18.3	17.2
Services	18.6	22.0	22.7	25.0
Other	4.6	7.4	−1.5	5.8

Note: The calculations in Table 1 are based on U.S. data, which are, in effect, a weighted average of the states. Calculations in Table 2 are based on the average of the 50 states (simple mean).

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Information System, computer tape and authors' calculations.

the start of the decade were low, presumably the result of the relatively low rates of construction in the second half of the 1970s, coupled with strong growth in industries that occupy office space. Regional variations in construction patterns also suggest a tie to underlying economic conditions. In particular, the timing of the construction boom and bust in the West South Central states reflects the rise and fall in oil prices.

While economic fundamentals had some role, however, the Economic Recovery Tax Act (ERTA) of 1981 and financial deregulation are thought to have boosted construction beyond what could be supported by the underlying demand for commercial space. The effects of ERTA were magnified by new investment vehicles that brought more owners into the market to take advantage of tax benefits; not only did this encourage more building, but it also had implications for the incidence of the losses that eventually resulted. In addition, the rise in real estate values in the 1970s appears to have resulted in a widespread perception that real estate was a low-risk, high-return investment, thus creating a climate conducive to overbuilding.

Demand Fundamentals

While Figure 1 shows a surge in commercial building in the mid 1980s, it also shows unusually low rates of construction in the late 1970s. Employment growth in the late 1970s, in contrast, was robust. As can be seen from Table 1, employment growth was especially strong in those sectors that occupy commercial space: finance, insurance, and real estate; services; and wholesale and retail trade. As a result, the 1980s started with a substantial pent-up demand for commercial space. In the office market, vacancy rates in downtown areas averaged only 4 percent

Table 2
Variation in State Employment Growth in the 1970s and 1980s
Percent Change

Interval	Standard Deviation	Mean	Coefficient of Variation
All States			
1969–74	7.9	13.4	58.6
1974–79	8.7	15.9	54.6
1979–84	7.9	7.0	112.6
1984–89	7.6	12.7	59.8

Source: See Table 1.

in 1980. In some markets, such as Denver, Los Angeles, and San Francisco, vacancy rates were less than 1 percent.[3]

The recessions of 1980 and 1981–82 sent overall employment plummeting. However, the impact of the recessions was very uneven. Manufacturing bore the brunt. Services and finance, insurance, and real estate held up relatively well in the recessions and then grew strongly as the recovery took hold. Thus, the industries that occupy commercial space fared much better in the early 1980s than the overall economy.

If space were completely fungible, these sectoral differences would be irrelevant. But despite the rather nondescript nature of many modern manufacturing buildings and office complexes, facilities suitable to manufacturers are not ideally situated or designed for the needs of the financial or services industries. Accordingly, surplus space in declining industries was of limited value to those that were expanding.

In a similar vein, the uneven pattern of regional growth in the early 1980s may have contributed to a higher level of construction nationwide. Even given the modest rate of U.S. growth, the variation among states was greater from 1979 to 1984 than it had been in the 1970s (Table 2). Buildings are not mobile, and a surplus of space in one area does nothing to relieve the demand for space elsewhere. Therefore, even when employment growth at the national level is slow, pressure to build in some states and localities may be quite strong.

Changes in the Tax Code

While a pickup in commercial construction may have been justified by underlying demand, it received added impetus from the Economic Recovery Tax Act of 1981 (ERTA). A major goal of ERTA was to

[3] Vacancy rates averaged 10 percent over the 1970s; they were low at the start of the decade, high in the middle, and low at the end. Source: CB Commercial/Torto Wheaton Research.

stimulate investment. High rates of inflation in the late 1970s had reduced the value of depreciation deductions, thereby increasing the cost of capital. ERTA attempted to offset this by reducing asset lives and permitting more accelerated depreciation schedules. Building lives were shortened from about 40 years to 15 years.[4]

ERTA also expanded the investment tax credit for equipment and preserved the 60 percent capital gains exclusion for individuals. The effect of the capital gains exclusion was somewhat offset, however, by cuts in personal income tax rates. In particular, the top individual rate was reduced from 70 percent to 50 percent.

Although ERTA was originally thought to be biased towards investment in equipment, primarily because the investment tax credit did not apply to structures, over time it became apparent that ERTA actually favored real estate over other forms of investment.[5] Bosworth (1985) pointed out that commercial buildings were more amenable to debt financing than most investments and that the greater use of debt conferred additional tax advantages. Hines (1987) focused on the tax shelter opportunities ERTA created for high-income individuals. Commercial properties offered particularly attractive opportunities to shelter income, as they could be financed largely by debt, depreciated at accelerated rates, and then sold for a capital gain to others who hoped to repeat the process. The fact that properties could be resold and depreciated several times ("churned") increased the impact of ERTA's depreciation provisions on the incentive to invest in real estate.[6]

Internal Revenue Service data show a sharp rise in limited partnership investment in real property following ERTA (Hines 1987). And a survey of the downtown Boston office market in the mid 1980s highlights the importance of the individual investor to the commercial real estate market: "about 85 percent of the office buildings" were owned by individuals and partnerships (McClure 1986). The pattern of commercial mortgage obligations, discussed in the next section, provides further confirmation of the importance of noncorporate investors in the real estate market.

The boom in real estate tax shelters led Congress to scale back the depreciation rules allowed for real estate in 1984. Then, the Tax Reform

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[4] ERTA introduced the Accelerated Cost Recovery System (ACRS) that replaced the former Asset Depreciation Range tables with a simple system that classified all property into one of four categories according to asset life: 3-, 5-, 10-, and 15-year property.

[5] For examples of early analysis see Gravelle (1982 and 1983), Auerbach (1983) and Fullerton and Henderson (1984).

[6] In addition, Summers (1987) argued that a very low real discount rate should be used in calculating the present value of depreciation deductions because the pattern is known with virtual certainty once the asset is put in place. A low discount rate sharply increases the present value of future tax benefits. However, Summers also found that businesses do not actually apply a lower discount rate to tax benefits than to riskier income streams when making investment decisions.

Table 3
Present Value of Depreciation Provisions per $1000 of Building Value
Based on 9 Percent Discount Rate

	Pre-ERTA	1982–84	1984–86	Post-1986
No Churning	$ 75.20	$105.80	$ 88.20	$12.60
Churning	$138.80	$195.30	$162.20	$23.30

Note: No churning assumes that the building is depreciated for six years using the optimal method and asset life, and then is sold in the seventh year. Churning assumes that the building is depreciated for six years and sold in the seventh year, then depreciated again and sold in years 14 and 21.
Source: Calculations described in detail in Appendix A.

Act of 1986 wiped out virtually all tax provisions favorable to commercial real estate investment by individuals. Depreciation schedules for structures were lengthened. The top marginal tax rate for individuals was cut from 50 percent to 28 percent. The 60 percent exclusion for long-term capital gains was eliminated, as was the ability to shelter ordinary income from taxation by using "passive" losses on real estate investments.[7]

Appendix A and Appendix Table A-1 describe in detail how changes in marginal rates, depreciation rules, and the capital gains exclusion changed the attractiveness of real estate investment for high-income individuals during four periods: pre-ERTA, from 1982 to 1984, from 1984 to 1986, and post-1986. The results are summarized in Table 3. It seems clear that ERTA should have been a powerful stimulus to individual real estate investment and the Tax Reform Act of 1986 an even more powerful depressant.

The opportunities created by ERTA for individuals to deduct passive real estate losses from ordinary income led syndicators to devise still other ways to use the tax code to the advantage of real estate investments. A number of private placement memoranda for limited partnerships investing in office buildings were analyzed for this paper. While no two deals were the same, they shared some characteristics. Key provisions are illustrated in the box that follows, which presents a simplified typical tax shelter based on a conservative syndication done on an actual office building in 1984.

All the deals examined took full advantage of the depreciation rules and capital gains provisions discussed above. All were able to secure virtually 100 percent debt financing. The new office buildings were

[7] Passive losses are losses incurred on investments in which the investor does not "materially participate" in the management of the project. Most real estate investments are considered passive. Costs associated with passive investments can only be charged against income from passive investments. Prior to the Tax Reform Act of 1986, real estate losses could be set against "active" ordinary income.

Hypothetical Shelter

OFFICE BUILDING: Class A 800,000 sq. ft. 1984

TOTAL PROJECT COST: $120 million ($150 per sq. ft.)
Building $90 million; land $30 million

FINANCING ASSUMPTIONS: $100 million first mortgage (insurance company), 14.4 percent interest. Balloon payable in eight years. Interest only.

$20 million second mortgage from general partner at 16 percent interest accrued plus $1.6 million annually in fees accrued.

Annual cash interest: $14.4 million on first mortgage.

Annual accrued interest and fees: $4.8 million.

Building and land sold at the end of year 8 for $120 million.

LIMITED PARTNERS: 200 shares sold at $140,000 each (private offering). $20,000 payable up front plus $15,000 annually for eight years.

CAPITAL COST RECOVERY: 15-year straight line; no recapture.

ANNUAL INCOME AND EXPENSES (Years 1–8):

Gross Rent ($30/sq. ft. no vacancy)	$ 24.0 million
− Taxes and operating expenses ($10/sq. ft.)	−8.0 million
Net effective rent	$ 16.0 million
− Cash debt service	−14.4 million
Net cash flow	$ 1.6 million
− Accrued interest and fees	−4.8 million
− Depreciation (15-year SL/Bldg. only)	−6.0 million
Net partnership income/loss	$−9.2 million

Limited Partner Gains and Costs ($000)

Year	0	1	2	3	4	5	6	7	8	8
Cash due	−20	−15	−15	−15	−15	−15	−15	−15	−15	
Share of loss		(46)	(46)	(46)	(46)	(46)	(46)	(46)	(46)	
Tax saving		23	23	23	23	23	23	23	23	
Capital gains tax										−48
Partner cash flow	−20	8	8	8	8	8	8	8	8	−48

Assumes: marginal tax rate 50%; share of capital gains tax calculated from depreciated book value of building = $42 million.
Gain = ($48 million/200) × .4 included × .50 marginal tax rate = $48,000

General Partner/Syndicator Cash Flow
($ millions)

Year	0	1	2	3	4	5	6	7	8	8
Construction and land	−120.0									
Loan proceeds	100.0									
Building net cash flow		1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	
From partners	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Sale proceeds										120
Pay loan										−100
"Net cash" flow	−16.0	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	20

Rates of Return:

1st Mortgagor	14.4%
Limited Partners[a]	15.0%
General Partner[a]	30.0%

[a]Returns to partners are those at which discounted net cash flow equals 0.

financed with first and second mortgages, as well as direct loans and working capital loans from the general partner or development company to the limited partners. These loans from the general partner frequently carried high rates of interest that accrued until the building was sold. The accrued interest was, in essence, a way of transferring part of the ultimate gain upon sale to the developer/syndicator, while allowing the limited partners to deduct interest costs before they were actually paid.

Without appreciation in the value of the buildings, the rates of return to limited partners implied by the syndicates' pricing policies were good but not extraordinary. Since they were highly leveraged, however, limited partners earned extraordinary returns if building values were rising. But leverage is extremely dangerous when asset values fall. With a 10 percent down payment, a 10 percent decline in value eliminates a partnership's equity; and as will be shown in a later section, real estate values are very sensitive to changes in assumptions about vacancy rates and rent levels.

Credit Availability

The financial deregulation of the early 1980s is also thought to have fueled investment in commercial real estate, by making financing more available. The Depository Institutions Deregulation and Monetary Control Act of 1980 began a phase-out of interest ceilings on deposits of banks and thrift institutions and broadened the lending powers of federally chartered thrifts. But while the ability to offer higher interest rates enabled banks and thrifts to compete more effectively for deposits with money market funds and other financial intermediaries, it also increased the cost of funds and created pressure to generate higher rates of return on their investments. To pay more they had to earn more.

Thrifts have been castigated for using the expanded powers given them by both federal and state authorities to plunge into high-risk areas with which they were unfamiliar. Whatever the thrifts' failings, commercial banks, not thrifts, were the major suppliers of funds for commercial construction.[8] As can be seen from Table 4, commercial banks' share of all commercial mortgages outstanding rose from just over 30 percent in 1980 to almost 45 percent by the end of the decade,

[8] Thrifts may have contributed to the commercial real estate boom indirectly. To the extent that they competed aggressively for funds by offering higher rates, they would have forced banks to do the same and increased the pressure on bank earnings.

Table 4
Commercial Mortgages as Assets

A. Share of Commercial Mortgages Outstanding Held by Major Lenders
Percent

	1980	1984	1988	1990
Commercial Banks	31.6	36.6	43.7	44.5
Thrifts	24.1	24.8	19.8	14.4
Life Insurance Companies	31.6	26.6	26.4	28.4
Others	12.7	12.0	10.1	12.6

B. Major Lenders' Concentrations in Commercial Mortgages
Percent

	1980	1984	1988	1990
Commercial Banks				
Commercial Mortgages/Total Assets	5.4	7.2	10.3	10.1
Commercial Mortgages/Total Mortgages	30.8	40.2	45.4	39.5
Thrifts				
Commercial Mortgages/Total Assets	7.2	8.0	7.5	6.9
Commercial Mortgages/Total Mortgages	10.3	14.4	14.4	12.5
Life Insurance Companies				
Commercial Mortgages/Total Assets	17.4	15.9	16.3	15.7
Commercial Mortgages/Total Mortgages	61.6	71.0	79.1	80.3

Source: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts, Financial Assets and Liabilities* 2.1, March 12, 1992 and *Balance Sheets for the U.S. Economy 1960–91*, March 1992.

and their concentration in commercial mortgages rose from 5 percent of total assets to more than 10 percent.[9]

The nature of commercial mortgage borrowers contributed to the difficulties that banks subsequently experienced. Roughly 70 percent of commercial mortgages are obligations of partnerships and other noncorporate businesses (Table 5). Corporations and nonprofit organizations, such as churches, hospitals, and universities, make up the balance.

The dominant role played by noncorporate businesses is significant in several respects. First, much of the noncorporate sector is in the business of real estate. Some 80 percent of noncorporate assets are in real estate.[10] While banks are usually thought to lend against a business's general prospects, in the case of commercial mortgages they were lending against the value of the asset. Had commercial mortgages been

[9] Commercial mortgages in the Flow of Funds Accounts include all nonfarm nonresidential mortgages.

[10] Since some noncorporate businesses have nothing to do with real estate, the share of total assets in real estate would be even higher for those in this industry.

Table 5
Commercial Mortgages as Liabilities

A. Share of Outstanding Commercial Mortgages Owed by Major Borrowers
Percent

	1980	1984	1988	1990
Nonfarm Noncorporate Businesses	71.4	84.5	72.4	69.9
Nonfinancial Corporations	15.8	5.2	11.7	12.0
Households, Trusts, and Nonprofit Organizations	12.3	9.9	15.6	17.7
Real Estate Investment Trusts (REITS)	.5	.4	.3	.4

B. Extent of Noncorporate and Corporate Commercial Mortgage Liabilities
Percent

	1980	1984	1988	1990
Nonfarm Noncorporate Businesses				
Commercial Mortgages/ Nonresidential Real Estate[a]	54.8	68.5	66.7	62.4
All Mortgages/All Real Estate	23.6	31.7	35.7	33.9
Real Estate/Total Assets	80.1	78.5	78.1	78.2
Mortgages and Bank Loans/ Total Liabilities	70.9	70.9	70.6	68.7
Total Liabilities/Total Assets	33.6	40.9	44.6	44.1
Nonfinancial Corporations				
Commercial Mortgages/ Nonresidential Real Estate[a]	2.6	1.0	3.2	3.5
All Mortgages/All Real Estate	5.3	2.5	4.4	4.6
Real Estate/Total Assets	36.0	37.2	36.2	34.4
Mortgages and Bank Loans/ Total Liabilities	23.7	22.9	21.3	20.1
Total Liabilities/Total Assets	29.7	33.8	41.3	44.0

Note: Assets include financial assets and the current cost of tangible assets.
[a]Nonresidential real estate was estimated by allocating land in proportion to the values of residential and nonresidential structures.
Source: See Table 4.

obligations of the corporate sector, other resources would have been available to tap when real estate values fell. Most of the corporate sector derives its earnings from other, unrelated activities; real estate is only a means to an end. For much of the noncorporate sector, real estate is the end.[11]

[11] In this regard, commercial mortgages are fundamentally different from residential mortgages. Residential mortgages are generally approved based on the homeowner's income from activities unrelated to the value of the property. The property is a backup, something to draw upon if the ability to service the loan is unexpectedly interrupted. However, for most commercial mortgages, the ability to pay is inextricably tied to the

In addition, noncorporate businesses can be structured in very complex ways and they are not subject to the financial disclosure requirements imposed on public corporations. Banks should hold borrowers to stricter information standards than the general requirements of the Securities and Exchange Commission, but they may not always have done so. The limited partnership agreements reviewed for this paper were dauntingly complicated. Thus, a lack of readily comprehensible financial information on commercial mortgage borrowers may have obscured potential problems.

Banks' shift into commercial real estate is frequently attributed to their unfavorable experience in other lending areas. The early 1980s saw first loans to less developed nations and then energy loans sour. At the same time, banks were encountering competition in lending to their traditional large corporate customers from the commercial paper market, finance companies, and foreign sources. But the movement into commercial real estate was not simply a retreat from other areas. Real estate investments were seen as offering very attractive returns by academics and the general public, as well as by banks.

The Appeal of Real Estate

In the late 1970s and early 1980s a number of articles appeared in scholarly journals comparing returns generated by real estate with those from common stocks, bonds, and government securities. The findings were generally quite favorable to real estate. As one survey of the literature noted, "More than half the studies find that absolute returns on real estate have been higher than returns on either stocks, bonds, or other assets" and "most of the studies indicate that real estate earned a higher return per unit of risk than common stocks and the other assets included in the studies" (Sirmans and Sirmans 1987, p. 22).

These results were qualified by acknowledgement that the measurement of the returns to real estate involved many assumptions. A lack of data on prices and earnings plagues research on nonresidential real estate. With hindsight, it seems that the approximations used in many of these studies understated the risks associated with real estate.[12] At

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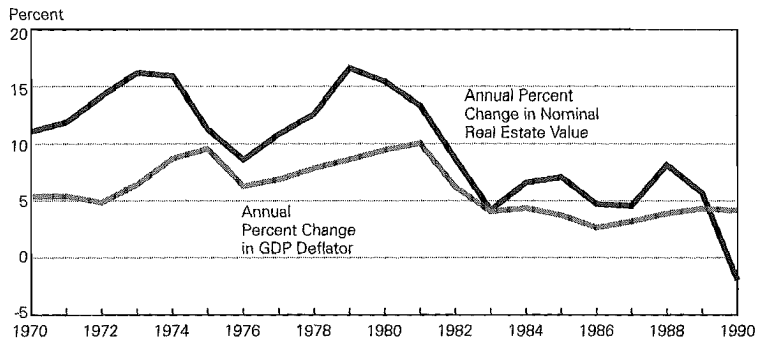
value of the collateral. If the ability to pay suffers because vacancy rates increase and rents decline, the value of the collateral also falls. Reinforcing this lack of diversification is the fact that real estate owners' properties are likely to be regionally, or even locally, concentrated. Thus, if a weakening economy causes problems for one, it is likely to mean problems for all. Moreover, while lenders may require borrowers to provide personal guarantees, a borrower who owns a few large properties may appear to have great personal wealth while remaining vulnerable to problems at just one or two projects.

[12] In a number of cases, returns were calculated using appraised values rather than actual transactions. This approach has been criticized for smoothing out returns on the grounds that appraisals are based on long-run values rather than short-run market

Figure 3

Change in the Value of Nonresidential Real Estate in the United States



Source: Change in real estate value from authors' calculations using Board of Governors of the Federal Reserve System, *Balance Sheets for the U.S. Economy 1960-1991*; GDP deflator from the Council of Economic Advisers, *Economic Report of the President*.

the time, however, the overall message was that real estate compared favorably with other forms of investment.

It seems probable that ownership of nonresidential real estate did indeed generate attractive returns in the 1970s. Construction costs rose rapidly, surpassing the rate of inflation in a number of years. This increase in the cost of new buildings should have pushed up the values of existing structures that were close substitutes. And for building owners who had financed their property in times of lower inflation and lower interest rates, this appreciation would have resulted in real as well as nominal increases in the value of their equity. Land prices also increased rapidly.

Real estate values appear to have increased much more slowly in the 1980s than they did in the 1970s. Figure 3 shows the year-over-year percentage change in the current dollar value of nonresidential real

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conditions. Some in New England have asserted that in the very weak market of recent years appraisals have been closer to liquidation values than to long-run values; but in more normal circumstances, it seems plausible that use of appraisals to measure returns could reduce volatility. This point is made in Hendershott and Kane (1992b). In other studies, returns were not measured for individual properties but based on the returns generated by real estate investment trusts and commingled real estate funds. While this may impart more sensitivity to changing market conditions, the investment funds' portfolios may be more diverse than those of the typical real estate investor.

estate held by nonfarm corporations and noncorporate businesses, as estimated by the Board of Governors of the Federal Reserve System and the U.S. Bureau of Economic Analysis (BEA).[13] Because the value of land and the existing stock of buildings and other structures is so large relative to new construction, the pattern depicted in Figure 3 is driven primarily by changing land prices and by the appreciation in the value of existing structures, and not by investment.[14] As can be seen, the value of nonresidential real estate grew at double-digit rates in the 1970s, and less than half as fast in the 1980s.

While the rapid growth in real estate values in the 1970s is consistent with the conventional wisdom that real estate was a superior investment, the much slower rate of increase in the 1980s does not square with investors' enthusiasm for real estate in that decade. Did the escalation in property values really moderate so rapidly? The BEA estimates of the value of existing structures, upon which these figures are based, do not reflect prices recorded in actual sales transactions (as these are not available) but the replacement cost of the stock.[15] Such an estimation approach assumes, in effect, that the value of the existing stock keeps pace with rising construction costs. The abrupt slowdown in inflation after 1982 resulted in a similarly abrupt slowing in the growth of the replacement cost and, thus, in the estimated value of existing buildings.

Given the pent-up demand for commercial space that existed at the start of the decade and given the various incentives for investment created by tax changes and financial deregulation, commercial real estate values may have continued to rise rapidly in the early 1980s even though construction costs had slowed. Without further stimulus to demand, however, the appreciation in property values would eventually have to slow. If construction costs are rising more slowly than prices, more construction will take place until the increased supply dampens the rise in values. With attitudes shaped by the 1970s, however, investors may not have recognized this inevitability.[16]

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[13] Board of Governors of the Federal Reserve System, *Balance Sheets for the U. S. Economy 1960–91*, March 1992. The structures values in the Board data are from the BEA. In estimating nonresidential real estate for Figure 3 the land component of noncorporate real estate was allocated between residential and nonresidential purposes in proportion to the values of residential and nonresidential structures.

[14] Through most of this period, the value of nonresidential construction amounted to only about 3 percent of the prior year's value of nonresidential real estate. Depreciation charges would reduce the contribution of investment even further.

[15] See the BEA 1987 publication *Fixed Tangible Wealth in the United States, 1925–1985* for a description of methodology.

[16] It is also possible that the conventional wisdom about the high returns to real estate in the early 1980s was wrong. In this regard, it is suggestive that housing prices grew more slowly in the 1980s than they had in the 1970s. For the nation as a whole, the price of new homes of constant quality did not keep pace with inflation. Prices of existing homes

Sorting Out the Causes of Overbuilding

Poterba (1984, 1991) and others have developed a model of the housing market that has considerable applicability to commercial properties and can be used to evaluate the various explanations for the commercial construction boom. In this model, properties are assets, the prices of which equal the discounted stream of rental income net of expenses. Construction is a function of the ratio of the price of the asset to the cost of construction. Thus,

$$I_t = f(P_t/C_t)$$

and

$$P_t = \sum_{s=t}^{\infty} \frac{[R_s - m_s - p_s P_s]}{\frac{(1-\theta z)}{(1-\theta)}(1 + \delta + i(1-\theta) - \pi + a)^{s-t}}$$

where

- I is gross commercial construction,
- P is the price of commercial property,
- C is the cost of construction,
- R is the rental stream, which is a positive function of the underlying demand for space services and a negative function of the stock of property that could supply those services,
- m is maintenance and other costs of operation,
- p is property taxes,
- i is the nominal interest rate,
- a is the risk premium associated with commercial real estate,
- δ is depreciation,
- π is the expected appreciation in the value of the property,
- θ is the marginal income tax rate of the property owner, and
- z is the present value of depreciation allowances, per dollar of purchase price.

In the absence of information on prices, this model implies that investment in commercial buildings depends upon

1. construction costs,

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actually sold rose faster, but at least some of this increase appears attributable to quality changes. A comparison of constant-quality homes and new homes actually sold showed that quality improvements accounted for some of the price increase for new homes. Source: U.S. Bureau of the Census, *Characteristics of New Housing: 1990* and computer printout, and National Association of Realtors, *Home Sales Yearbook.*

2. the underlying demand for space and competition for tenants from the existing stock of buildings,
3. operating costs and property taxes,
4. tax policy,
5. the cost of funds, and
6. expected appreciation.

Thus, the model incorporates most of those factors identified in the previous section of this paper as probable causes of the construction boom of the 1980s. It explicitly recognizes the influence of demand factors, tax policy, and expectations of appreciation.

Table 6 presents the results of regressions based on this model. These regressions attempt to explain the value of the two major components of commercial construction (in 1987 dollars) in the nine census divisions over the period 1977 to 1990. A regional approach was used because the pattern of commercial construction varied so much from one part of the country to another. As noted previously, surplus space can exist in one region while another region is experiencing a space shortage.[17]

Separate regressions were run for the two major components of commercial building, office buildings and "other commercial." The latter is composed primarily of stores and related establishments. The construction values and some of the independent variables were divided by population to adjust for regional size variations. In all cases, it was assumed that the relevant values of the explanatory variables were the values at the time of the construction go-ahead decision, which, in turn, was assumed to be two years earlier.[18]

Results

The equations indicate that the construction patterns of the late 1970s and 1980s had some basis in economic fundamentals. Construction of both other commercial and office buildings was positively related to population growth. In addition, construction of office buildings was spurred by the expansion of finance and insurance and those service industries that occupy office space. Rising unemployment rates were a deterrent to both categories of construction.

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[17] It would be preferable to go below the regional level to states or metropolitan areas; however, data on the value of commercial construction are available only for regions.

[18] The choice of lag was somewhat arbitrary. For larger projects a longer lag seems plausible, while for small projects the lag could be shorter. Accordingly, equations using a three-year lag for office buildings and a one-year lag for "other commercial" are presented in Appendix Table B-1.

Table 6
Regression Results
Dependent variable = per capita value of construction put in place (1987 $)

Independent Variables (All lagged 2 years)	Office Buildings	Other Commercial
Constant	67.8	15.4
	(1.1)	(.5)
Population growth	23.2*	20.3*
	(4.1)	(5.6)
Employment growth in tenant industries relative to population	3212.0	59.1
	(1.9)	(.1)
Change in unemployment rate	−4.1	−6.4*
	(−1.9)	(−4.0)
Past construction relative to population	.06	.1*
	(1.4)	(4.1)
Construction wage relative to overall wage	−74.6	40.4
	(−1.4)	(1.2)
Construction wage relative to U.S. construction wage	52.1	18.3
	(1.1)	(.6)
Property taxes per capita (1987 $)	55.8	−5.5
	(1.9)	(−.3)
Bank deposits per capita (1987 $)	.005	−.002
	(1.9)	(−1.4)
Bank "other real estate owned" (OREO) relative to real estate loans	−7.2*	−6.9*
	(−2.7)	(−3.1)
Percent change in housing prices	−.04	−.4
	(−.07)	(−1.0)
Prime rate[a]	.4	−2.0*
	(.2)	(−3.3)
Dummy for 1982–1986 tax regime[a]	49.2*	38.2*
	(4.6)	(7.4)
Dummy for 1987–1990 tax regime[a]	33.6*	20.1*
	(2.4)	(2.5)
National downtown office vacancy rate[a]	−4.6*	
	(−2.7)	
$\bar{R}^2$	.73	.81

Note: Regressions are pooled time series and cross-section using data on 9 regions over the 14 years, 1977 through 1990.

[a] These variables are the same for all regions.

* Significantly different from zero at the 5% level; t-statistics are shown in parentheses.

See Appendix B for definitions of variables and sources.

But while fundamentals played a role, construction also received a boost from the tax changes enacted in 1981. Three approaches to measuring the effect of federal tax policy were taken. The simplest, which is presented in Table 6, assumed three tax regimes, pre-1982, 1982 to 1986, and post-1986, and represented the latter regimes by dummy

variables.[19] A second approach used the tax component of the corporate cost of capital for investments in commercial structures, as estimated by Henderson and Liebman (1992).[20] The third assumed that the critical tax changes were those affecting individual investors rather than corporations and used the hypothetical returns to an individual investor in a real estate syndicate from Table 3 (no churning) as an individual tax incentive variable. The regressions incorporating these approaches are compared with the results in Table 6 in Appendix Table B-2. All three approaches indicate that ERTA was a significant stimulus. For the post-1986 era they tell somewhat different stories, however, with the individual tax incentive variable implying a more pronounced deterioration in the investment climate than the other two approaches.[21]

Increased lender willingness to finance real estate projects was a further spur to construction in the 1980s. The negative relationship between bank "other real estate owned" (OREO) and construction is consistent with arguments that lenders' perceptions of the risks associated with real estate affect the availability of financing and, thus, the volume of construction. OREO includes property acquired through foreclosure, so that high ratios of OREO to real estate loans are generally indicative of past real estate problems. Unfavorable experience with real estate loans in the mid 1970s resulted in banks having high ratios of OREO to total real estate loans. This tended to depress construction in the latter part of that decade; but by the start of the 1980s OREO had fallen considerably, providing additional impetus to the pickup in construction.

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[19] ERTA was signed into law in August 1981; therefore, its impact was assumed to be felt in 1982.

[20] Henderson and Liebman (1992) estimated the cost of capital for investment by different industries in different asset categories. In estimating the cost of capital, they estimated the effect of changes in tax policy, taking into account changes in depreciation schedules and corporate tax rates. This article used their estimates of the tax component of the cost of capital for investments in commercial structures by the services industries. The estimates for finance, insurance, and real estate were virtually identical.

[21] Because of construction lags, the equation does not provide much insight into the effect of the Tax Reform Act of 1986. Assuming a two-year lag, only construction in 1989 and 1990 would have been affected by the 1986 tax changes. The approaches are all consistent in indicating that ERTA had a substantial stimulative effect. In the tax regime dummy approach, the stimulative effect of ERTA is indicated by the positive coefficient on the dummy variable for the 1982–1986 period. The smaller positive coefficient for the 1987–1990 dummy implies that the Tax Reform Act of 1986 (TRA) reduced investment incentives but that the climate for investment was still more favorable than pre-ERTA. Henderson and Liebman's estimates of the tax component of the corporate cost of capital show ERTA causing a sharp reduction; in contrast, TRA had little effect, as changes in depreciation rules were offset by the reduction in the corporate income tax rate. As shown in Table 3, the variable representing individual investment incentives also indicates that ERTA provided a powerful investment stimulus, but these incentives were sharply diminished by TRA. The sign of the individual investment incentive variable is positive and the sign of the corporate tax effect is negative, since the former is a measure of the incentive to investment and the latter is a measure of the tax cost of investment.

Lender enthusiasm for real estate loans does not necessarily mean that financial deregulation was to blame. Indeed, favorable experience with real estate loans in the late 1970s and early 1980s, when values were appreciating, can be seen as an alternative explanation for banks' subsequent eagerness to make these loans. Bank deposits were included in the regressions because banks were major real estate lenders, particularly in the 1980s; and to the degree that bank lending is regionally concentrated, more banking activity might be associated with higher construction. No significant link was found, however.

Interest rates were a deterrent to the construction of other commercial construction but not to construction of office buildings. Referring back to Figure 1, one can see that office construction was very strong in the early 1980s, right when interest rates were at their peak. One possible explanation for the failure of high interest rates to discourage office construction is that interest on construction loans is commonly accrued until the project is completed. Thus, high interest rates do not impose an immediate cash flow constraint and if property values are expected to rise, this appreciation will enable the developer to pay the accrued interest when the completed project is sold or permanently financed. Additionally, since interest rates have both a real component and a component reflecting expectations of inflation, the interest rate may have picked up investors' hopes of appreciation. Although changes in home values were included in the equation in an attempt to capture expectations of appreciation, their effect was either negligible or negative.

The national downtown office vacancy rate was negatively associated with office construction.[22] In particular, low office vacancy rates between 1979 and 1981 contributed to the surge in office construction in the early 1980s. The effect of low vacancies was undoubtedly reinforced by rising rental rates. The limited information available indicates that office rents soared in this period. In downtown Boston, for example, a vacancy rate of roughly 2 percent coincided with an increase in rents of 50 percent between 1980 and 1982.[23]

While it may seem only logical that low vacancy rates would stimulate high levels of construction, vacancy rates can change very rapidly. Thus, they are not a very reliable guide to market conditions three or four years in the future. The national vacancy rate rose from less

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[22] Regional vacancy rates would be preferable but were unavailable. Since regional data on the stock of commercial buildings were also unavailable, the cumulative volume of commercial construction in prior years was used to represent the competition for tenants from existing buildings. The sign was positive rather than negative, however. It seems likely that this result reflects the long duration of construction projects and carryover from one year to another. Also, a region may be attractive for construction for reasons not captured in these equations.

[23] Coldwell Banker Commercial, *1990 Forecast*, handout.

than 5 percent in 1981 to more than 15 percent in 1985. Changes in individual metropolitan areas were even more abrupt.

In summary, the construction patterns of the second half of the 1970s and 1980s reflect a combination of economic fundamentals, tax changes, and changes in lender enthusiasm for real estate. Low office vacancy rates and strong growth in finance, insurance, and various services industries contributed to an upswing in office building at the end of the 1970s. This was then reinforced by the investment incentives created by ERTA and by lenders' increased willingness to make real estate loans.

Commercial Construction Cycles

One conclusion that follows from the preceding analysis is that the construction of commercial buildings, particularly office buildings, is inherently cyclical. Although tax changes played a significant role in the commercial construction boom of the 1980s, the nature of the market makes it vulnerable to overbuilding. Lags are a critical problem. The ownership and financing of many projects is another.

Because buildings take several years to complete, economic conditions when a project comes to fruition may be quite different from those envisioned at the start. In the extreme the lags can be very long. The Federal Reserve Bank of Boston's building was originally planned in 1968, but not occupied until 1978. Boston's celebrated Fan Pier development, which was ultimately never started, had been in the planning stages for more than a decade and a half, and tens of millions of dollars had been spent on the planning process. The actual construction phase is much shorter. A review of the Boston Inspectional Service Department's files on large office buildings completed between 1978 and 1989 showed the length of time in actual construction to be between 18 months and 42 months.[24]

The long time and considerable dollars that developers spend in planning large projects create a strong predisposition to go forward even when there is evidence that the market is weakening. Typically, developers receive no compensation for work on projects that are never built. Given the longevity of office buildings, it could be argued that economic conditions at the project's completion date should be irrelevant, that what really matters are conditions over the building's entire life. However, because many projects are highly leveraged and their owners are partners whose commitments are limited or whose business is real estate, a project that comes on line when vacancy rates are high and

[24] The average time seemed to be between 24 and 30 months.

rents declining may not generate sufficient cash flow to service its debt and the owners may not have the financial resources to sustain payments until conditions improve.[25]

Apart from increasing the likelihood of mistakes, construction lags create an inherent tendency towards periodic overbuilding. This is illustrated in the diagrams in Figure 4, which represent in simplified fashion the dynamics of supply and demand in the commercial space market. The central feature of the charts is the fact that the supply of space is more elastic over time (SL) than in the short run (SS). Accordingly, an increase in the demand for space initially generates only a small supply response. Rents temporarily rise above the level that will result when additional supply is forthcoming. If developers and lenders react to these temporarily high rents, rather than anticipating the increase in supply, they will build too much and rents will be driven below what would otherwise have been the long-run equilibrium.

Further complicating and aggravating these tendencies is the duration of rental agreements. Rental agreements commonly extend over several years. Thus, when the demand for space increases, most existing tenants do not face automatic rent increases and therefore have no incentive to curtail their present space usage. Typical rental agreements contribute to the problem by prohibiting tenants from subleasing in order to take advantage of higher rents.

The result is that new and expanding tenants cannot compete for the bulk of the space occupied by existing tenants. Instead, they must bid for the small increment to space that is available in the short run, as well as any space released by expiring leases. As a consequence, the rents paid by new and expanding tenants in a rising market are even higher than the levels that would have existed if existing leases could be renegotiated and rents were increasing for all.

If developers and lenders assume these marginal rents represent the new market equilibrium, they will be disappointed. Not only will too much new space be created, but as existing leases expire, tenants will react to the higher rent levels and curtail their usage. Vacancy rates will rise, putting downward pressure on rents.[26]

Do market participants really react to short-term marginal rents? A widely accepted method for determining the value of a commercial

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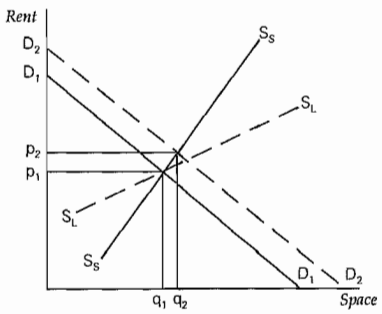
[25] In a world of perfect foresight, the owners could borrow more to tide them over, but that does not seem to be the world of commercial real estate. Also, banks that provide construction financing, based on assurances that an insurance company or pension fund will provide the permanent financing, may find that the permanent loans fail to materialize when the economy sours, leaving them stuck with the project.

[26] It should be recognized that the situations in rising and declining markets are not symmetric. Because buildings do not disappear, supply cannot be contracted as readily in the long run as it can be expanded. Additionally, average rent levels will follow marginal rents down faster than they follow them up, as existing tenants will try to renegotiate their leases.

Figure 4

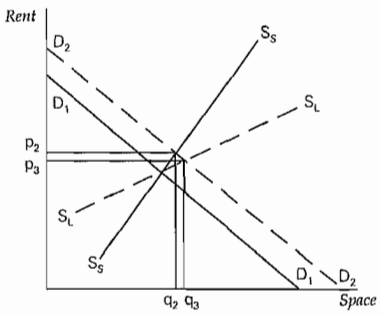
The Hog Cycle: Overbuilding Caused by an Inelastic Short-Run Supply Curve and an Elastic Long-Run Supply Curve

A



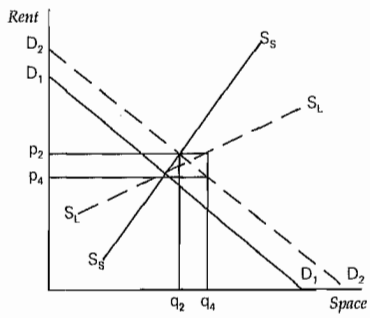
1. Prosperity causes demand curve to shift from D_1D_1 to D_2D_2.
2. Short-run supply curve (S_S) is relatively inelastic. Rents rise to p_2; supply increases to q_2.

B



3. Long-run supply is more responsive (S_L) as new *space can be built. An increase in supply to* q_3 *will result* in an equilibrium rent of p_3.

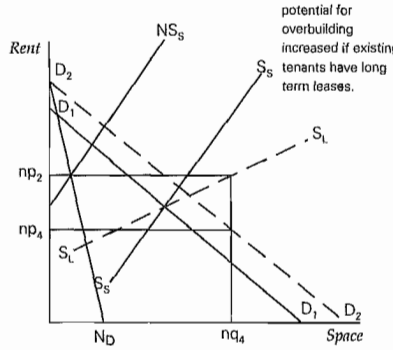
C



4. But suppliers assume that p_2 is the long-term rent level and build out to q_4.
5. Demand will not absorb q_4 at a rent of p_2. With q_4 supplied, rent falls to p_4.

D

Short-run increase in marginal rents is greater and potential for overbuilding increased if existing tenants have long term leases.



a. In the short run, existing tenants (with space q_1) have *multi-year leases with rents fixed at* p_1. *Thus,* q_1 *is not* available to new tenants.
b. *Rent level for new tenants is determined by new* tenants' demand curve (N_D) and the short-run supply minus the space occupied by existing tenants (NS_S). The rent level for new tenants is np_2 - above p_2.
c. If suppliers assume that np_2 represents the equilibrium rent level, they will supply nq_4.
d. With space of nq_4 supplied, demand will support a rent of only np_4.

property is the "income approach," which is based on a forecast of future rents and vacancy rates. Commonly, appraisers use current leases (corrected for tenant improvements and free rental periods) to estimate the current "level" of rents and then project these into the future based on recent "trends." During periods of rising rents, marginal rents are above average rents and projecting a continuation of past upward trends will, if anything, exacerbate the tendency towards overbuilding depicted in Figure 4. In a period of declining rents, marginal rents are below average rents and an appraisal based on marginal rents may be overly pessimistic; when tenants renew their leases, the more favorable terms will encourage expansion and moderate the decline in rents.[27]

An examination of a number of "private placement memoranda" (the legal equivalent of a prospectus for a public offering) for office developments between 1984 and 1986 shows that marginal rents and optimistic assumptions about rates of increase were used in appraisal reports to attract investors and to support debt financing. The public sector also uses marginal rents and assumptions about growth rates to influence investor and developer behavior. For example, an analysis of the Boston market made by the Boston Redevelopment Authority in 1986 predicted that "By 1990 asking rents may be in the $37–46 range, 17 percent to 47 percent above the $31 level seen in 1986" (BRA 1986 p. 41).

Lender attitudes towards real estate loans also contribute to overshooting by prolonging the construction buildup or contraction. Other things equal, construction levels tend to be higher if lenders' past experience with real estate loans was positive. This suggests that following a period in which conditions favored new construction and lenders achieved good results, lenders may remain receptive to real estate lending even if the underlying economic conditions and investment incentives have changed. Similarly, unfortunate experiences with past real estate loans cause lenders to shy away from lending even though current conditions might justify increased construction.

Yet a further complication arises from the fact that the finance and insurance industries that supply much of the real estate financing and generate substantial revenues from this lending are also major tenants of office buildings. Their rapid expansion creates a demand for office space, but their growth depends, in part, on revenues from construction and real estate lending. Thus, the construction boom fueled the growth

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[27] Hendershott and Kane (1992b) present evidence that in the early stages of decline, appraisals tend to be based on average rents, not marginal rents. Thus, during a "turn" in the cycle, the data used in decision-making may lag actual market conditions. Once a downturn is well established, however, assumptions about longer-run average rents that are based on current marginal rents may be overly pessimistic.

of these industries and was, in turn, fueled by their growth (Browne 1992). In similar fashion, the real estate bust has fed back to these same sectors and their difficulties have, in turn, reduced the demand for office space.

Extent and Incidence of the Problem

With rising vacancies and falling rents in many parts of the country, building values deteriorated and cash flows were insufficient to carry contract debt service. Because many buildings were owned by limited partners, whose obligations ended once their equity was lost, and by general partners, whose personal guarantees were backed by real estate, buildings frequently ended up in default to banks and, more recently, to insurance companies and pension funds.[28]

Although high leverage was an important part of the problem, deals with low leverage and high initial equity went sour as well. As a recent example, a major pension fund held a second mortgage position of approximately $70 million in a building that had been appraised at over $200 million dollars three years earlier. The building also carried a $90 million first mortgage. In the summer of 1992, the fund was notified that the second mortgage had no value at all, since the current value of the building had fallen below $90 million. How could a building lose more than 60 percent of its value in such a short period?

The answer can be seen in Table 7. Since the Tax Reform Act of 1986, building values can be approximated using a simple cash flow approach. The starting point is gross rent per square foot; gross rent takes into account all tenant improvements paid for by the landlord, any free rent offered to the tenant, as well as the likely pattern of lease renegotiations and/or rollovers. Gross rent is then adjusted for the expected vacancy rate to obtain effective gross rent.[29] *Net* effective rent is obtained by subtracting taxes and operating costs.

The building's value can be approximated by dividing net effective rent by the appropriate "cap rate" and multiplying by the number of

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[28] Lenders frequently did not require general partners to provide personal guarantees. Projects are often structured so that the general partners' obligations are compartmentalized.

[29] Calculating effective gross rent can be a daunting task in a falling market. An examination of actual office leases in Boston over the past two years reveals an infinite variety of devices that lower effective rents without lowering face rents. One recent negotiation led to a ten-year lease on 70,000 square feet of class A office space. The face rent on the lease was $35 per foot per year, rising to $42 after five years. However, the first two years and five months are free (the five months was added as a $1,000,000 "signing bonus" to the tenant). The landlord also agreed to finance improvements costing $40 per square foot. Over the ten-year period, these concessions reduce effective gross rent to a flat $20.75 per square foot.

Table 7
Sensitivity of Real Estate Values to Rent Levels, Vacancy Rates, and Cap Rates

Item	(1) Starting values	(2) 14 percent decrease in gross rent	(3) Further decrease in gross rent	(4) Vacancy rate of 10 percent	(5) Increase in cap rate
Gross Rent (per square foot)	$ 35	$ 30	$ 20	$ 20	$ 20
Vacancy Rate	0	0	0	10%	10%
Effective Gross Rent	$ 35	$ 30	$ 20	$ 18	$ 18
– Taxes	5	5	5	5	5
– Operating Expenses	5	5	5	5	5
Net Effective Rent	$ 25	$ 20	$ 10	$ 8	$ 8
"Cap" Rate	9%	9%	9%	9%	12%
Present discounted value of 100,000 square feet	$ 27.8m	$ 22.2m	$ 11.1m	$ 8.9m	$ 6.7m
Loss from (1)		−20.1%	−60.1%	−68.0%	−75.9%

Source: Authors' calculations.

square feet in the building. The cap rate is essentially the rate of return that a buyer would require to justify purchasing the building. Cap rates move positively with interest rates and other rates of return and also with the perceived risk in real estate.

Column (1) in Table 7 shows these calculations for an office building renting for $35 per foot with a zero vacancy rate. Subtracting taxes and operating costs of $10 per square foot leaves a net effective rent of $25. A cap rate of 9 percent produces a value of $27.8 million for each 100,000 square feet.

Column (2) shows the result of a 14 percent decrease in gross rent, from $35 to $30. Value falls by more than 14 percent because value depends on *net* rents; and since taxes and operating costs have not changed, the net rent and building value have fallen by 20 percent. This same point is illustrated in column (3). Now gross rents have fallen by just over 40 percent, but building value drops by 60 percent from the original value.

Recent rent declines have been accompanied by increases in vacancy rates. Column (4) assumes a 10 percent vacancy rate, which is equivalent to a 10 percent ($2) drop in gross rent. This reduces building value by 20 percent because, with no change in taxes and operating costs, net rent falls by 20 percent. Finally, column (5) shows the impact of a modest rise in the cap rate that might occur in a period of rising vacancies and falling rent. Putting all this together, a value of $27.8 million is reduced to $6.7 million, a drop of more than 75 percent. Many buildings in the United States have experienced decreases of this magnitude in the past few years.

Table 8
Estimated Value of the Office Stock in the Boston Metropolitan Area, 1987 and 1992

	Downtown		Suburban		Total	
Item	1987	1992	1987	1992	1987	1992
Gross Rent[a]	$35.00	$23.00	$24.00	$15.00		
Vacancy Rate[b]	9%	20%	18%	22%		
Effective Gross Rent	$31.85	$18.40	$19.68	$11.70		
– Taxes[c]	5.00	5.00	3.50	4.00		
– Operating Expenses[c]	5.00	5.00	3.50	4.00		
Net Effective Rent	$21.85	$8.40	$12.68	$3.70		
"Cap" Rate[d]	9%	11%	9%	11%		
Value/Square Foot	$243.00	$76.00	$141.00	$34.00		
Total Square Feet[e]	50m	50m	60m	60m		
Total Value	$12.1b	$3.8b	$8.5b	$2.0b	$20.6b	$5.8b

[a] 1987 figure based on *National Real Estate Index* and verified by interviews with Boston property owners and operators. 1992 figure based on analysis of 20 leases signed during 1991 and 1992. Gross rent is the current average marginal rent charged per square foot, adjusted for free rent and tenant improvements.

[b] Coldwell Banker Commercial/Torto Wheaton Research, Office Vacancy Index.

[c] Based on a review of 50 leases signed between 1987 and 1991 as well as interviews with property owners and managers.

[d] *National Real Estate Index* as well as interviews with real estate portfolio managers.

[e] Figures are approximate based on annual market reports from Whittier Partners, Spaulding and Slye, Grubb and Ellis, and Hunneman. Between 1987 and 1992, approximately 10 million square feet of space was added to the metropolitan area stock. To show the change in value of the stock, however, reported total square feet is the 1987 figure in both years.

Building valuations should not simply reflect today's rents, but the stream of net rents expected over the building's life. Most property was not recorded on balance sheets at peak rents and values and many would argue that calculations based on 1992's depressed rents understate true valuations. Nevertheless, even those who think that values based on today's rents are too low base decisions on these values. It is one thing to think a value is too low; it is another to risk money that the true value is higher.

Table 8 shows the decline in value that seems to have occurred in the Boston office market when values are based on current rental agreements. The downtown market in Boston contains approximately 50 million square feet of office space. At the peak of the cycle, leases were being closed at an average of $35 per square foot per year. An examination of recent lease negotiations revealed a very high variance but suggested a figure of $23 for 1992.[30] Operating costs and taxes have

[30] Effective gross rents in many cases are well below $20. Although marginal effective rents are probably below $20, many buildings still have leases in effect at the old, higher rates.

Table 9
Estimated Value of the Office Stock in the United States, 1987 and 1992

Item	1987	1992
Gross Rent[a]	$ 22.00	$17.00
Vacancy Rate[b]	15%	19%
Effective Gross Rent	$ 18.70	$13.77
– Taxes[c]	4.00	4.50
– Operating Expenses[c]	4.00	4.50
Net Effective Rent	$ 10.70	$ 4.77
Cap Rate[d]	9%	11%
Value/Square Foot	$119.00	$43.00
Total Square Feet[e]	5–6 billion	5–6 billion
Total Value	$594–713 billion	$217–260 billion

[a]Gross marginal rents based on the *National Real Estate Index* for 1987 and interviews with real estate portfolio managers for 1992.

[b]Coldwell Banker Commercial/Torto Wheaton Research, Office Vacancy Index.

[c]Based on interviews with property managers and real estate portfolio investors.

[d]*National Real Estate Index* and interviews with real estate portfolio investors.

[e]Rough approximation based on several sources including National Association of Industrial and Office Parks, and Laing (1992). The figures were assumed to be the same in both years, in order to capture the rough change in the value of the existing stock.

stayed at about $10 per square foot since 1987. Finally, while interest rates have fallen, the perceived risk of commercial real estate has risen. Knowledgeable investors suggested that the cap rate had increased from 9 percent in 1987 to 11 or 12 percent. The table also presents calculations for the 60 million square foot suburban market. The conclusion: since 1987, the value of the Boston metropolitan area office stock, downtown and suburban, appears to have fallen more than 70 percent, from over $20 billion to less than $6 billion.[31] Again, it must be emphasized that, while values are commonly calculated in this manner, assuming current rents in perpetuity is very pessimistic.

Table 9 makes a similar approximation for the United States as a whole. The U.S. office market contains between 5 billion and 6 billion square feet of space. At the peak of the market, that space was probably worth between $600 and $700 billion. In aggregate, it has lost between $350 and $450 billion of that value.

[31] It is interesting to note that the average owner-occupied housing unit has lost about 20 percent of its value since 1987. The value of the 700,000 owner-occupied units in the Boston metropolitan area was approximately $130 billion at the peak of the cycle. A decline of 20 percent means a drop of about $26 billion in household net worth in the Boston area. This is about twice the size of the decline in the value of the office stock. If retail, industrial, and R&D space were added, the decline in the value of nonresidential property is likely of the same order of magnitude and the total decline in real estate values is probably closer to $50 billion.

To put these figures in perspective, a decline of $300 billion is roughly equivalent to a drop in the aggregate value of the U.S. stock market of about 7 percent. Of course, these calculations do not include declines in the value of retail or industrial space. Retail space represents another 4 billion to 5 billion square feet. Moreover, the distribution of real estate losses differs from that of a drop in the stock market. While some buildings back mortgages held by pension funds and insurance companies, many were standing behind the portfolio investments of banks operating on thin capital requirements. Thus, the impact of the decline in commercial real estate values on the banking industry has been much greater than that of a similar decline in the value of the stock market.

Summary and Conclusions

The United States is suffering the aftermath of a boom in commercial construction. The upswing in office construction was particularly pronounced, with the real value of office construction more than tripling between the late 1970s and the mid 1980s. So much building was too much. By 1985, the national downtown office vacancy rate had surpassed 15 percent; and by the end of the decade it was close to 20 percent, and rents and property values were falling.

A number of factors contributed to the boom. Commercial construction levels in the late 1970s were low, while those industries that occupy commercial space, especially office space, grew strongly. As a consequence, office vacancy rates were low at the end of the 1970s and rents were moving up rapidly. A recovery in office construction was already under way when the Economic Recovery Tax Act of 1981 created additional investment incentives. ERTA both encouraged corporate investment and created substantial tax shelter opportunities for individuals investing in commercial real estate.

Further reinforcing these trends was lender enthusiasm for real estate loans. Lenders' experience with real estate loans in the second half of the 1970s was favorable, as real estate values rose rapidly. Nor were lenders alone in thinking that real estate was an attractive investment; a number of scholarly articles appeared in the late 1970s and early 1980s showing how real estate had outperformed alternative investments.

But while the boom had multiple origins, it was not pure chance that these forces came together. Commercial construction, especially office construction, appears inherently vulnerable to overshooting. Time lags and key determinants tend to reinforce one another. Even the 1981 tax incentives were magnified by other developments. In particular, expectations of rising property values and the prospect of capital gains made the returns to investors in real estate syndicates all the more attractive.

Because the supply of office space is relatively fixed in the short run

and because rental agreements extend over several years, an unexpectedly tight market can send rent levels for new tenants and renewals skyrocketing. If developers and lenders assume that these rents represent the new market equilibrium, too much building will occur—with the result that rents will be driven lower and vacancy rates pushed higher than would otherwise be the case.

Before that happens, however, the overbuilding may feed on itself. Real estate valuations that are based on short-term rents and vacancy rates will soar. Lenders will experience very good results with real estate loans: with rising valuations, plenty of eager buyers and lenders will rescue any property in difficulty. Good results with real estate loans will make lenders more willing to lend in the future. In addition, good earnings will encourage lenders' own expansion, increasing the demand for office space.

At some point, the boom comes to an end. An unexpected disruption to the demand for space, such as occurred in the Southwest following the decline in oil prices or in New York City after the stock market crash, may be the precipitating factor. Or the increase in construction may simply push up vacancy rates and rent levels begin to soften, as happened in much of the country in the latter part of the 1980s. But once the boom starts to unwind, it does so with surprising speed. Rents fall, values fall even more, lenders suffer losses and become increasingly cautious. As potential buyers are unable to obtain financing, property values fall even more. And lender-tenants' efforts to bolster earnings by cutting costs further increase the surplus office space.

While office construction seems inherently cyclical, the fallout of the 1980s construction boom was particularly severe for the banking industry, for several reasons. First, banks moved very aggressively into commercial mortgages. Second, borrowers in the 1980s were frequently partnerships and individuals whose assets were either protected from the banks' reach or concentrated in real estate, the value of which collapsed in the bust. Third, commercial real estate values are extraordinarily sensitive to the assumptions made about vacancy rates and rent levels. The difference between the assumptions made in rising and in declining markets can easily wipe out the owners' equity and drop property values below loan amounts.

It is also clear that the recent real estate cycle has created conditions that are a drag on the macroeconomy. Because of overbuilding, commercial construction cannot itself contribute to the recovery. In addition, commercial real estate losses and the resulting poor condition of bank balance sheets appear to have made banks more cautious and pushed them more towards holding government securities and away from making loans.[32]

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[32] This shift also reflects "spreads" between short and long rates that make long Treasuries look very attractive. However, without the weakened balance sheets from bad

Looking forward, it seems probable that commercial construction will remain in the doldrums for some years. Space is now abundant and even when market conditions improve, lenders will initially be reluctant to finance new projects. Eventually, however, as the economy expands, vacancy rates will fall and rent levels will move up. Property values will start to rise. The stage will be set for another swing of the pendulum. Will those making the building and lending decisions in that future time remember the experience of the 1980s?

Appendix A: The Effects of Tax Changes on the Attractiveness of Real Estate Investments for High-Income Individuals

The essence of a real estate tax shelter is the use of depreciation deductions to create paper losses during the time a building is owned. When the building is sold, a tax must be paid on the difference between the selling price and the depreciated book value, but until 1986, 60 percent of such gains were excluded from the tax base as long as the holding period was more than six months. In essence, as long as real estate held its value or appreciated, the tax rules provided individual owners an opportunity to convert ordinary income into capital gains and to defer paying taxes.

The pre-1981 tax code provided significant benefits to investing in real estate. The most important features of the pre-1981 code were the very high marginal tax rate of 70 percent and the preferential treatment of capital gains. The depreciation period was 41 years, but properties could be depreciated using a 150 percent declining balance method. An investment of $1000 made in year 0 and sold in year 7 for $1000 generated tax benefits of $75.20. If we allow for "churning" by assuming that the $1000 asset is sold for $1000 in years 7, 14 and 21, the benefits jump to $138.80.

The 1981 Act reduced the top marginal rate from 70 percent to 50 percent but reduced the depreciation period for buildings from 41 years to 15 years. Buildings could be depreciated using the 175 percent declining balance method; if accelerated methods were chosen, subsequent capital gains were "recaptured" as ordinary income. If, however, straight line depreciation were used, later capital gains were subject to the 60 percent exclusion. Appendix Table A-1 shows that for a holding period of 7 years, straight line methods with no recapture generated almost twice the benefits of accelerated methods.

For this paper, a number of private and public syndicated limited partnerships were examined. All of them opted for straight line depreciation. The straight line method is preferable only if the plan is to resell after a few years; any partnership that intended to hold a building over an extended period of time would choose accelerated methods. Hines (1987) cited the fact that the vast majority of limited partnerships chose straight line depreciation methods as strong evidence of the intent to "churn."

While the lower marginal tax rate after 1981 reduced the tax saving from each dollar of deduction, the shorter life dramatically increased the size of the deductions. As a result, the present value of depreciation deductions on a $1000 asset using a 9 percent discount rate and 7 years to sale increased over 40 percent, from $75.20 to $105.80. If the building were resold in years 14 and 21, the value jumped to $195.30. In 1984, real estate was reclassified as 18-year property, and in 1985 its life was further increased to 19 years. The 1984 changes reduced the present value of tax benefits by about 17 percent.

Then came the Tax Reform Act of 1986; TRA86 extended the depreciation period to 31.5 years, cut the top marginal rate for individuals to 33 percent, and eliminated preferential treatment of capital gains. This combination wiped out essentially the entire tax incentive to own commercial real estate.

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real estate, financial institutions would probably be playing a more active role in stimulating a recovery.

Appendix Table A-1
Tax Shelter Provisions: Value of Tax Deferral and Conversion of Ordinary Income into Capital Gains for Real Property (Per $1000 in Building Value)
Property is sold in year 7 for its original value

Pre-ERTA (150% Declining Balance; 41-Year Life)				
Year	Depreciation	Marginal Tax Rate	Tax Saving	Present Discounted Value (9%)
1	$ 36.58	.70	$ 25.62	$ 23.50
2	35.24	.70	24.67	20.76
3	33.95	.70	23.77	18.35
4	32.71	.70	22.90	16.22
5	31.51	.70	22.06	14.34
6	30.36	.70	21.25	12.68
7	Capital Gains Tax[a]		(56.10)	(30.69)
	Total Benefit			$ 75.17

[a] Accumulated depreciation ($200.35) × (1 − .6) × .7 = $56.10

1982–1984 (Accelerated 175% Declining Balance/Full Recapture; 15-Year Life)				
Year	Depreciation	Marginal Tax Rate	Tax Saving	Present Discounted Value (9%)
1	$120.00	.50	$ 60.00	$ 55.05
2	100.00	.50	50.00	42.08
3	90.00	.50	45.00	34.75
4	80.00	.50	40.00	28.34
5	70.00	.50	35.00	22.75
6	60.00	.50	30.00	17.89
7	Capital Gains Tax[b]		(260.00)	(142.23)
	Total Benefit			$ 58.62

[b] Accumulated depreciation ($520.00) × .5 = $260.00

1982–1984 (Straight Line/No Recapture; 15-Year Life)				
Year	Depreciation	Marginal Tax Rate	Tax Saving	Present Discounted Value (9%)
1	$ 66.67	.50	$ 33.33	$ 30.58
2	66.67	.50	33.33	28.06
3	66.67	.50	33.33	25.74
4	66.67	.50	33.33	23.61
5	66.67	.50	33.33	21.66
6	66.67	.50	33.33	19.88
7	Capital Gains Tax[c]		(80.00)	(43.76)
	Total Benefit			$ 105.77

[c] Accumulated depreciation ($400.00) × (1 − .6) × .5 = $80.00

Appendix Table A-1 *continued*

Tax Shelter Provisions: Value of Tax Deferral and Conversion of Ordinary Income into Capital Gains for Real Property (Per $1000 in Building Value)

Property is sold in year 7 for its original value

1985–1986 (Straight Line/No Recapture; 18-Year Life)

Year	Depreciation	Marginal Tax Rate	Tax Saving	Present Discounted Value (9%)
1	$ 55.56	.50	$ 27.78	$ 25.48
2	55.56	.50	27.78	23.38
3	55.56	.50	27.78	21.45
4	55.56	.50	27.78	19.68
5	55.56	.50	27.78	18.05
6	55.56	.50	27.78	16.56
7	Capital Gains Tax[d]		(66.67)	(36.47)
	Total Benefit			$ 88.14

[d] Accumulated depreciation ($333.33) × (1 − .6) × .5 = $66.67

Post-1986 (Straight Line; 31.5-Year Life)

Year	Depreciation	Marginal Tax Rate	Tax Saving	Present Discounted Value (9%)
1	$ 31.75	.33	$ 10.48	$ 9.61
2	31.75	.33	10.48	8.82
3	31.75	.33	10.48	8.09
4	31.75	.33	10.48	7.42
5	31.75	.33	10.48	6.81
6	31.75	.33	10.48	6.25
7	Capital Gains Tax[e]		(62.85)	(34.38)
	Total Benefit			$ 12.63

[e] Accumulated depreciation ($190.50) × .33 = $62.85

Appendix B: Definitions of Variables and Sources of Regression Variables

All variables refer to the nine census regions except where noted. Census regions:

New England (NE): CT, ME, MA, NH, RI, VT.
Mid Atlantic (MA): NY, NJ, PA.
East North Central (ENC): IL, IN, MI, OH, WI.
West North Central (WNC): IA, KS, MN, MO, ND, NE, SD.
South Atlantic (SAT): DC, DE, FL, GA, MD, NC, SC, VA, WV.
East South Central (ESC): AL, KY, MS, TN.
West South Central (WSC): AR, LA, OK, TX.
Mountain (MT): AZ, CO, ID, MT, NM, NV, UT, WY.
Pacific (PAC): AK, CA, HI, OR, WA.

Dependent Variables

Value of construction put in place per capita: Separate regressions were run for office construction and other commercial construction. Regional current dollar values were converted to constant dollars by dividing by the national deflator (calculated by dividing U.S. current dollar construction put in place by U.S. constant dollar construction).

Source: U.S. Bureau of the Census, *Current Construction Reports—Value of New Construction Put in Place.*

Explanatory Variables

Explanatory variables were lagged two years in the regressions reported in Table 6.

Population Growth: Percent change in population.

Source: U.S. Bureau of Economic Analysis (BEA), Total Personal Income by Major Source and Earnings by Industry, computer tape.

Employment Growth in Tenant Industries Relative to Population: Office—Office tenant industries were defined as including Banking and Credit Agencies, Securities and Commodities Brokers and Services, Insurance Carriers, Business Services, Legal Services, Engineering and Management Services, and Miscellaneous Services. The change in employment from year t−3 to year t was divided by the population in year t.

Other Commercial—Other commercial tenant industries were defined as including Wholesale Trade, Retail Trade, and Services, and excluding Hotels and Other Lodging Places, Private Households, Educational Services, and one-half of Health Services. The change in employment from year t−3 to year t was divided by the population in year t.

Source: U.S. Bureau of Economic Analysis, Total Full-Time and Part-Time Employment by Industry, computer tape.

Change in Unemployment Rate:

Source: U.S. Bureau of Labor Statistics, *Geographic Profile of Employment and Unemployment,* various issues. Data for 1978–1981 were obtained from unpublished tabulations supplied by the BLS.

Per Capita Income: Per capita income was deflated by the U.S. Consumer Price Index.

Source: Income and population figures from BEA. CPI from *Economic Report of the President,* February 1992.

Past Construction Relative to Population: Cumulative constant dollar construction in years t, t−1, and t−2 was divided by population in year t. (As for all explanatory variables, this was lagged two years.) Past office construction was used in the office equations and other commercial in those equations.

Source: as described above for dependent variables.

Construction Wage Relative to Overall Wage and *Construction Wage Relative to U.S. Construction Wage:* The regional construction wage was calculated by dividing regional construction earnings by regional construction employment and the overall wage by dividing total regional earnings by total regional employment. The U.S construction wage was calculated by dividing U.S. construction earnings by U.S. construction employment.

Source: BEA.

Property Taxes per Capita: State and local property tax revenues per capita were deflated by the U.S. CPI.

Source: U.S. Bureau of the Census, *State Government Finances* and *Governmental Finances*, obtained through DRI/McGraw-Hill.

Bank Deposits per Capita: Commercial banks' total deposits per capita were deflated by the U.S. CPI.

Source: Federal Deposit Insurance Corporation, call report data, obtained from Board of Governors of the Federal Reserve System.

Bank OREO Relative to Real Estate Loans: Calculated as other real estate owned divided by loans secured by real estate.

Source: Federal Deposit Insurance Corporation, call report data, obtained from Board of Governors of the Federal Reserve System.

Percent Changes in Housing Prices: State figures on prices of homes purchased with conventional mortgages were weighted according to the 1980 stock of owner-occupied homes to create regional home price figures.

Source: Federal Housing Finance Board, *Rates and Terms on Conventional Mortgages 1991*, and U.S. Bureau of the Census, *1980 Census of Housing*.

The following variables were the same for all regions:

Prime Rate: Prime rate charged by banks.

Source: *Economic Report of the President*, February 1992.

Dummy for 1982–1986 tax regime: This variable had a value of 1 for the years 1982 through 1986 and zero for all other years.

Dummy for 1987–1990 tax regime: This variable had a value of 1 for the years 1987 through 1990 and zero for all other years.

Tax on Corporate Investment: Tax component of cost of capital estimates developed by Henderson and Liebman (1992). The tax effects included both changes in corporate tax rates and changes in the value of depreciation deductions. The authors made separate estimates for investments by different industries in different assets. The figures for services investment in commercial structures were used in the regression.

Effect of tax incentives on individual investors: The "no churning" estimates from Table 3 of the text were used.

National Downtown Office Vacancy Rate:

Source: CB Commercial/Torto Wheaton Research, private communication.

Appendix Table B-1
Regression Results: Alternative Lags
Dependent variable = per capita value of construction put in place (1987 $)

	Office Buildings—Lagged 3 Years			Other Commercial—Lagged 1 Year		
Independent Variables	Tax Regime Dummies	Corporate Tax Effect	Individual Investment Incentive	Tax Regime Dummies	Corporate Tax Effect	Individual Investment Incentive
Constant	95.6	544.1*	58.1	−18.1	118.6*	−.04
	(1.4)	(4.3)	(.8)	(−.7)	(2.2)	(−.002)
Population growth	34.9*	25.5*	24.7*	8.1*	6.3*	4.1
	(5.3)	(4.1)	(3.8)	(2.7)	(2.0)	(1.4)
Employment growth in tenant industries relative to population	1627.3	5325.9*	4765.8*	1263.4*	1612.8*	1838.3*
	(.8)	(2.7)	(2.4)	(3.2)	(3.9)	(4.7)
Change in unemployment rate	−3.6	−1.2	−3.1	−7.4*	−6.6*	−7.2*
	(−1.5)	(−.5)	(−1.2)	(−5.5)	(−4.3)	(−5.2)
Past construction relative to population	−.04	−.02	.007	.2*	.2*	.2*
	(−.8)	(−.4)	(.1)	(8.7)	(7.5)	(9.1)
Construction wage relative to overall wage	−131.5*	−121.7*	−160.5*	33.6	20.9	−20.6
	(−2.2)	(−2.0)	(−2.5)	(1.2)	(.8)	(−.8)
Construction wage relative to U.S. construction wage	82.8	86.0	110.2	6.5	35.6	47.3
	(1.5)	(1.6)	(1.9)	(.2)	(1.3)	(1.9)
Property taxes per capita (1987 $)	113.8*	70.7*	66.4	−21.0	−44.8*	−37.7*
	(3.3)	(2.1)	(1.9)	(−1.2)	(−2.5)	(−2.3)
Bank deposits per capita (1987 $)	.005	.004	.003	.00005	−.0007	−.00007
	(1.8)	(1.4)	(1.1)	(.04)	(−.5)	(−.05)
Bank OREO relative to real estate loans	−10.6*	−8.8*	−8.0*	−3.2*	−2.6	−1.8
	(−2.8)	(−2.3)	(−2.0)	(−2.2)	(−1.7)	(−1.2)

Appendix Table B-1 *continued*
Regression Results: Alternative Lags
Dependent variable = per capita value of construction put in place (1987 $)

	Office Buildings—Lagged 3 Years			Other Commercial—Lagged 1 Year		
Independent Variables	Tax Regime Dummies	Corporate Tax Effect	Individual Investment Incentive	Tax Regime Dummies	Corporate Tax Effect	Individual Investment Incentive
Percent change in housing prices	.2	−.5	−.3	−.5	−.7	−1.0*
	(.3)	(−.6)	(−.4)	(−1.4)	(−1.9)	(−2.9)
Prime rate[a]	1.8	.6	2.5	−.9	−1.2*	−1.3*
	(.8)	(.3)	1.0	(−1.8)	(−2.1)	(−2.6)
Dummy for 1982–1986 tax regime[a]	57.3*			20.5*		
	(4.8)			(4.7)		
Dummy for 1987–1990 tax regime[a]	30.2*			2.8		
	(2.2)			(.4)		
Tax on corporate investments[a]		−332.2*			−93.0*	
		(−4.5)			(−2.3)	
Effect of tax incentives on individual investors[a]			4.4*			2.8*
			(3.2)			(5.1)
National downtown office vacancy rate[a]	−4.3*	−2.9	−1.3			
	(−2.3)	(−1.6)	(−.7)			
$\bar{R}^2$	.66	.65	.62	.86	.82	.85

Note: Regressions are pooled time series and cross-section using data on 9 regions. Office regression ran over 13 years (1978 to 1990), other commercial over 15 years. See Appendix B for definitions of variables and sources.

[a]These variables are the same for all regions.

*Significantly different from zero at the 5% level; t-statistics are shown in parentheses.

Appendix Table B-2
Regression Results: Alternative Tax Approaches
Dependent variable = per capita value of construction put in place (1987 $)

	Office Buildings			Other Commercial		
Independent Variables (All lagged 2 years)	Tax Regime Dummies	Corporate Tax Effect	Individual Investment Incentive	Tax Regime Dummies	Corporate Tax Effect	Individual Investment Incentive
Constant	67.8	250.1*	29.4	15.4	382.8*	69.7*
	(1.1)	(2.1)	(.5)	(.5)	(6.1)	(2.2)
Population growth	23.2*	13.4*	16.2*	20.3*	15.3*	12.7*
	(4.1)	(2.4)	(2.9)	(5.6)	(4.0)	(3.2)
Employment growth in tenant industries relative to population	3212.0	5598.9*	5840.3*	59.1	1117.6*	1140.9*
	(1.9)	(3.1)	(3.4)	(.1)	(2.2)	(2.2)
Change in unemployment rate	−4.1	−3.1	−3.9	−6.4*	−4.2*	−6.0*
	(−1.9)	(−1.3)	(−1.7)	(−4.0)	(−2.3)	(−3.3)
Past construction relative to population	.06	.1*	.09*	.1*	.1*	.2*
	(1.4)	(2.4)	(2.0)	(4.1)	(3.3)	(4.5)
Construction wage relative to overall wage	−74.6	−60.3	−105.4	40.4	−.6	−70.7*
	(−1.4)	(−1.1)	(−1.9)	(1.2)	(−.02)	(−2.1)
Construction wage relative to U.S. construction wage	52.1	56.9	77.1	18.3	71.2*	102.0*
	(1.1)	(1.1)	(1.6)	(.6)	(2.1)	(3.1)
Property taxes per capita (1987 $)	55.8	12.7	20.7	−5.5	−40.9	−38.7
	(1.9)	(.4)	(.7)	(−.3)	(−1.9)	(−1.7)
Bank deposits per capita (1987 $)	.005	.003	.004	−.002	−.003	−.003
	(1.9)	(1.2)	(1.5)	(−1.4)	(−1.8)	(−1.3)
Bank OREO relative to real estate loans	−7.2*	−6.4*	−5.3	−6.9*	−4.2	−4.2
	(−2.7)	(−2.3)	(−1.9)	(−3.1)	(−1.7)	(−1.7)

Appendix Table B-2 *continued*
Regression Results: Alternative Tax Approaches
Dependent variable = per capita value of construction put in place (1987 $)

	Office Buildings			Other Commercial		
Independent Variables (All lagged 2 years)	Tax Regime Dummies	Corporate Tax Effect	Individual Investment Incentive	Tax Regime Dummies	Corporate Tax Effect	Individual Investment Incentive
Percent change in housing prices	−.04	−.6	−.6	−.4	−1.0*	−1.5*
	(−.07)	(−.8)	(−1.0	(−1.0)	(−2.2)	(−3.2)
Prime rate[a]	.4	.4	1.6	−2.0*	−2.7*	−2.9*
	(.2)	(.2)	(.8)	(−3.3)	(−4.2)	(−4.2)
Dummy for 1982–1986 tax regime[a]	49.2*			38.2*		
	(4.6)			(7.4)		
Dummy for 1987–1990 tax regime[a]	33.6*			20.1*		
	(2.4)			(2.5)		
Tax on corporate investments[a]		−145.4*			−249.5*	
		(−2.1)			(−5.4)	
Effect of tax incentives on individual investors[a]			3.4*			3.8*
			(3.5)			(4.9)
National downtown office vacancy rate[a]	−4.6*	−3.0	−1.5			
	(−2.7)	(−1.8)	(−.9)			
$\bar{R}^2$	.73	.69	.70	.81	.76	.75

Note: Regressions are pooled time series and cross-section using data on 9 regions over the 14 years, 1977 through 1990.
See Appendix B for definitions of variables and sources.
[a]These variables are the same for all regions.
*Significantly different from zero at the 5% level; t-statistics are shown in parentheses.

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Discussion

*Peter C. Aldrich**

The paper presented by Lynn Browne and Karl Case alleges that the commercial construction business is inherently cyclical and that its most recent cycle, in the 1980s, was amplified by three notable environmental changes: stimulative changes in tax legislation; institutional changes, in particular the deregulation of financial institutions; and a change in the perception of real estate to that of a low-risk but high-return investment medium. The paper deals primarily with the heavy price paid by banks for their involvement in this construction cycle. The authors allege that the bankers' two primary faults were to increase their lending to the real estate sector and to do so to remote, single-asset borrowers, who lacked the creditworthiness of their former corporate customers. The paper is divided into five parts and a conclusion. These comments will be organized in a similar fashion.

Commercial Construction Patterns

Part one discusses the patterns of commercial construction during the several most recent cycles. This discussion is not important to the paper, and I believe it generally detracts from it. Others have dealt more thoroughly with this phenomenon. But my major complaint comes from this topic sentence: "While most parts of the country saw increases in commercial construction in the 1980s, the differences were striking." This is an odd observation, since the paper goes on to find nothing but

*President, Aldrich, Eastman & Waltch, L.P.

similarities in all regions of the country. It does so by assigning the same three broad causal factors to all sectors of the country.

I interpreted this section of the paper as merely a justification for the rather more complex modeling done in the third section: the application of the Poterba model of the housing market to the commercial property market. This is the least convincing portion of the paper. While the model is certainly interesting, and one could quibble about its construction, as a practitioner I found that no useful results were developed by the analysis. The authors were unable to shed light on the various regional differences in any meaningful way, nor did they choose to explore some of the rather interesting mysteries, hinted at by the outcome of the model, that were at variance with intuition or experience. As an example of such a lost opportunity, the authors did not investigate in greater detail the rather incredibly counterintuitive result that challenges much of the argument of the paper: that no higher construction activity was associated with increased banking activity. Fascinating dynamics of the development of the national real estate market lurk behind this interesting inconsistency.

The authors also miss an opportunity to demonstrate the similarity of the recent scenario to the performance of the real estate boom and bust cycle in the early 1970s, the REIT collapse, a comparison thoroughly supportive of their more important conclusions in the fourth section of the paper. Another lost opportunity to support the heart of their thesis appears in the following observation: "Since buildings are not mobile, a surplus of space in one area does nothing to relieve the demand for space elsewhere." This is simply wrong. Surplus building in satellite markets lowers the cost structure of those markets and does effectively "move buildings," by moving vacancy from the satellite market to the core market. Anyone studying the development of a market such as Phoenix versus its core in Los Angeles knows that over any appreciable length of time, surpluses of space do move away from the low-cost provider. This is an interesting demonstration of the inherent long-term cyclicality that the authors so successfully highlight in the fourth section of their paper. This point speaks directly to the primary value of the Browne-Case paper, which is an explanation of the mechanism that forces substantial cyclical lags on the real estate construction and finance business.

Causes of the Boom

The second section of Browne and Case's paper deals at some length with tax code changes. The Economic Recovery Tax Act of 1981 (ERTA) was definitely a measure that added gasoline to an existing fire.

The fire was *inflation*. This is broadly acknowledged. ERTA was very bad public policy, and the paper adds little to this argument.[1]

The paper jumps from the widely acknowledged impact of ERTA to a presumption that the problem of escalating real estate values and bank involvement derived from too heavy a reliance on limited partnership investments. It misses a point critical to an understanding of this and prior real estate cycles: all capital was seeking inflation-hedging assets. The authors are further misled by the McClure study of Boston that alleges that "85 percent of office buildings were owned by individuals in partnerships." This statement is misleading for a number of reasons:

1) Corporations that were otherwise healthy and robust often used partnerships and other single-purpose remote entities to hold real estate. Indeed, current studies show little significant change in the proportions of holdings of commercial properties by the major classes of holders. Nonfinancial corporations held approximately 62 percent of commercial property, partnerships only 13 percent (Arthur Andersen & Co. for Institute of Real Estate Management).
2) Partnership owners such as those found by McClure in his study of Boston buildings were themselves frequently only "tax lenders" under ERTA. The real economic benefits of ownership were often held by institutional or corporate hybrid lenders.
3) The alleged great move to individual and less creditworthy nonbusiness corporate owners, discussed on a number of occasions in the paper, does not account for the "fact," alleged equally often, that the period from 1975 to 1986 was really the great period of the "depersonalization" of the national real estate market. It was a period of increased "institutionalization" of real estate capital markets. For instance, this was the period when domestic pension funds, in competition with foreigners and insurance institutions, built up a portfolio of over $120 billion in real estate equity. Had the authors acknowledged this, they would have been drawn to look more closely at the tremendous growth in commercial real estate credit outstanding, a major shortcoming of the paper.

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[1] Indeed, a chilling account of what ERTA could do was published by the Boston Fed's Richard Kopcke and me in the Spring 1984 issue of the *Journal of Portfolio Management*: "A Real Estate Crisis: Averted or Just Postponed?" The subheading of the article reads: "The developments that averted the potential real estate crisis did not insulate the market from future crisis; instead, they further exposed it." That article was itself the continuation of an earlier piece produced in the Winter 1983 *Real Estate Review*: "Real Estate Consequences of the New Capital Markets," with a subheading that reads: "Real estate lending is now short-term, liquified, and dominated by a reluctant banking system." It has long been a regret of ours that we so felt ourselves to be Cassandras, thoroughly ignored by the industry in 1984, that we abandoned our ongoing research into funds flows.

4) In October 1979, the nation's property capital markets became subject to a new federal bankruptcy statute. This law motivated lenders to require the use of remote single-purpose borrowers so as to insulate themselves from bankruptcies (and the resultant "cram downs") that would result when real estate or corporate borrowers had difficulty with other assets or businesses. Additionally, creditworthy corporate borrowers were further motivated to accept the use of abundant nonrecourse debt as an effective and *ethical* stop-loss in the holding of real estate assets. Indeed, the use of such nonrecourse debt by otherwise well sponsored, single-purpose entities became a major stimulus to the speculative fever that gripped real estate market prices in the mid 1980s.

The authors observe that "it seems clear that ERTA should have been a powerful stimulus to individual real estate investment. . . ." Indeed it was, but what the authors missed is that it was an even more powerful incentive to corporations to invest in real property. ERTA offered the ultimate in "transportability" or salability of losses. Losses could themselves be magnified beyond the use of straight-line depreciation by the use of nonrecourse (stop-loss) leverage, which itself was turbocharged by deductibility of accrued but unpaid interest and original-issue discounts on borrowings. ERTA in effect became the Reaganite supply-siders' primary means of doing away with the corporate income tax. To see that this was possible, one need only view the real estate and equipment leasing activities of General Electric Corporation during that period.

Given the dimension of the subsidies, it has long been a wonder to this writer that more large public companies did not act as aggressively in this regard. Nonetheless, much of the real estate investment that the authors attribute to individuals (by their presumption that individuals are the partners of the numerous partnerships, and owners of the many single-purpose remote entities that they discover) is misattributed. Similarly, the assumption of Hines[2] on the intent to "churn" may be misguided. This writer's experience at the time was that the intent of syndicators was to hold, but realism required the acknowledgment that after liquidating a depreciated asset to discharge standing accumulating debts, there was unlikely to be enough cash to pay *any* taxes. Therefore, syndicators usually chose straight-line depreciation so as not to force the share buyer into the grim realization that death alone (and the subsequent "step-up" in basis) was the only escape from an intolerably high contingent liability.

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[2] Cited in Appendix A of the Browne/Case paper.

The "box" that conducts an analysis of a typical tax syndication is helpful in understanding how the unbundling of real estate rights into component parts created value during the ERTA regime. Unfortunately, the analysis is badly flawed by presenting the mortgage lender's and the developer's returns as pre-tax internal rates of return, while comparing them to the shelter investor's return, which is an after-tax internal rate of return. Had the calculations been presented correctly, they would have highlighted a fascinating aspect of ERTA: the tax shelter investor's comparative pre-tax equivalent return would be twice that stated, or 30 percent. Since the only threat (other than tax law revision) to the realization of that return was premature foreclosure, that 30 percent pre-tax equivalent yield must be compared favorably to traded corporate bonds, which at the time were yielding approximately one-third of that amount. Given the low-risk profile, this yield could also be compared favorably to tax-exempt industrial revenue bonds (15 percent versus perhaps 6 percent). These staggering differences in returns show the degree to which ERTA perversely favored the flow of capital to real estate, whether it was new construction (as had been intended) or the existing stock of buildings. That perverse incentive, however, had the effect of lowering the overall cost of capital to real estate, since that is truly a measure of the cash cost of the property, which in all instances in the "box" is lower (11.2 percent ($13m ÷ $116m)) than any of the pre-tax equivalent returns.

Had the sums been done correctly, and had Browne and Case looked at the other powerful motivators to investment by corporations, they would have realized that ERTA made real estate investment into the equivalent of equipment leasing: both the buyer and the seller, traditionally adversaries, were now motivated to raise the apparent price at which a transaction occurred. One cannot understand the overexpansion of real estate in the 1980s without understanding this remarkable factor. Knowledgeable institutional buyers found that for a price, sellers would work with them to overstate the effective transfer price of an asset by the use of various accruing, discounted, hybrid debt instruments. The effect was to expand the depreciable base of the asset, thereby further enhancing the value of the tax component of property. Appraisers inexorably were drawn into the business, and the "investor's approach to valuation" became the sordid professional description of a lack of professional discipline. When all is said and done, the paper's extensive description of the effective changes in the tax code understates the power of those changes. This does not mean, however, that the paper gives inadequate emphasis to the importance of ERTA. In fact, it may overemphasize ERTA because other factors are ignored, particularly the expansion of nonrecourse credit, a discussion of which follows.

Credit Availability

The second part of Browne and Case's paper deals extensively with the topic of credit availability. I believe it misses the mark, however. Footnote 11 should by no means be a footnote. It is the heart of the argument: banks, for a whole series of reasons that are unexplored, concentrated their risk in illiquid investment lending backed by nonrecourse assets, and they compounded their error by matching those long-duration assets with short-term liabilities. In effect, they got a very bad case of "thrift disease."

It is a shame that the paper did not deal more extensively with thrifts. Yes, banks did indeed finance more commercial construction. However, thrifts were an extreme case from which one could learn much. They recklessly or unwittingly advanced the riskiest funds (development land equity), making too many projects then appear safely bankable to their commercial bank brethren. The moral hazard transgressions of thrifts were more pronounced, more extreme in their violations, and more illustrative of the stresses that forced otherwise responsible citizens into monstrously damaging economic crimes. The thrifts' lack of a tradition of commercial credit analysis and their complete (and too often fraudulent) reliance on appraisals would have highlighted the very real problem of mismatched assets and liabilities.

The inquiry would also have highlighted the overarching problem: poor public policy. As a nation we experienced poor public policy with respect to inflation, tax reform, deficit expenditures, and savings, to name several. These public policies demonstrated the most serious weaknesses of an archaic national financial system. We were shown in 1974 that we needed reform, and again in 1981 and 1982 markets cried out for reform. Finally, in 1989 the system threatened collapse. Commercial banks, like thrifts, were and still are archaic intermediaries when compared with their less constrained, more flexible, modern competitors such as mutual funds, pensions (both defined contribution and defined benefit), 401(k)s, and even insurers. The real public policy mistake was our failure to come to grips with the need to remake our nation's financial systems to reflect the modern postindustrial economy, which has integrated with a world financial system with a complex mosaic of interest and exchange rates. We are still working with a financial system based on the gold standard and the debt deflation of the 1930s, and indeed if we are not more thoughtful renovators, it will bring us back to another debt deflation in the 1990s.[3]

I believe that too little or superficial a reading of those collections of data on debtholders misled the authors on the importance of partner-

[3] Again, the Aldrich/Kopcke papers are interesting on this topic.

ships as mortgage obligors. The data contain significantly more richness. "Some 80 percent of noncorporate assets are in real estate." Yes, but much of this was a determined shift by worried commercial bankers toward *secured* lending to their *existing* business customers, who were becoming less creditworthy. *Bankers were rational.* Bankers knew they were losing their prime credit franchises to the commercial paper market and to Wall Street generally. Bankers traded down in credit market sectors, hoping to survive. They were at a competitive disadvantage, and so took more risk to pay the inflation-swollen costs of money that were more easily borne by their leaner and more flexible competitors, who were not mismatched in assets and liabilities. A mutual fund investor bore the bond losses of an increase in interest rates. The thrift was unable, and most banks were only imperfectly able, to do so.

I find the authors' remarks relative to the paucity of standardized information on noncorporate businesses unconvincing; they miss the point. Bankers knew what they were doing and to whom they were lending. Their desire to survive caused them to attempt, through asset security in an inflationary time, to improve the acknowledged higher-risk (and return) lending practices forced on them by their comparative disadvantages.

As mentioned earlier, footnote 11 should not be a footnote. The paper would be enhanced if it understood the centrality of the changes in the real estate capital markets brought about by inflation and deregulation: the true distinction between debt and equity disappeared. Indeed, the distinctions between borrower and lender in commercial property began to blur. Debt is debt because of tax law and the deductibility of interest. Otherwise, nonrecourse debt, the rule in commercial property finance, would be idiotic and would be replaced by various preferential equities. If that were the case, then the true risk levels and durations of such "bank-loan assets" would have been apparent. Concentrated high-risk, long-duration, illiquid property investing by banks, disguised as conventional lending, was a dangerous tactic openly and often sensibly employed by highly constrained bankers who, in their own words, faced all the perverse "hedge fund" incentives to take inordinate risk at the expense of the ultimate guarantor (the U.S. government). It is no wonder that so many of the most constrained and least well supervised (the worst of the thrifts) succumbed to a pernicious moral hazard.

Had more attention been given to the flow of funds, I believe that the authors would have been drawn to the inescapable conclusion that bank lending problems were exacerbated by the erosion of previously traditional distinctions between the kinds of real estate lending and the risks that they implied, particularly construction lending versus take-out lending. Under the old rules, a commercial bank did not lend into a commercial construction project until the developer had not only all

permits, but also a fully designed building that was predominantly leased and financed with a binding commitment at a fixed interest rate. In other words, if the developer were successful in accomplishing the construction, without doubt the building would be an economic success that the developer/owner could afford to hold. This practice was gradually abandoned during the late 1970s and the 1980s. Unfortunately, bankers did not learn the disciplined underwriting standards required for permanent take-out lenders, even though they extended that capital. Thrift lenders did not learn the detailed underwriting standards of land development lenders, even though they replaced that capital, and neither bank nor thrift understood sufficiently the difference between margin lending to the price-anticipating speculator and long-term real estate investment. The failure to see this disappearance of the discipline in a highly structured and segmented real estate financial market was also a failure to see the fragility of a highly constrained financial system.

Conventional and bank accounting did not help. Real estate lending was a "wild West" of accounting abuse. Lenders, based on the flimsiest of appraisals, were able to advance funds to thinly capitalized, single-purpose remote entities, to be paid back to the institution as swollen fees, points, and accumulated interest. The practice was aided by ERTA and became an abusive pre-recognition of very uncertain but hoped-for capital gains. When generally accepted accounting clearly lies and distorts, true fraud is not far behind. (One should not assume that the nation's insurance industry's surplus accounting is scot-free of similar abuses.)

The paper, I believe, places too much blame on one piece of bad public policy (ERTA) among many. This hides a dangerous, real, and continuing public policy shortcoming: the lack of major renovation of our insurance industry and our depository and savings collection industries.

The Appeal of Real Estate

Browne and Case deal with changed perceptions of property under the title "The Appeal of Real Estate." Their argument is correct, and the paper would be much enhanced by an exploration of the competition that bankers seeking more security and higher returns (the very low-risk, high-yield argument of the authors) faced from foreign investors, corporate tax avoiders, and domestic pension funds and life insurers. Without regard to the tax deductibility of interest, if one acknowledges that much mortgage debt in the market of the 1980s was really equity in disguise, then a far more interesting picture confronts the analyst of the real estate funds flows of that decade. The Poterba model appears to ignore (other than through the single variable of the cost of funds) the

very real problem that large sources of funds may be seriously constrained from seeking competitive investment alternatives in other sectors. The paper would be much improved by a more detailed description of funds flows. The flow of funds data are readily available, and when combined with an analysis of the effects of ERTA, paint a compelling picture of the desperate scramble by increasingly disadvantaged thrifts, bankers, and life insurers for higher yields to make up for their competitive disadvantages. An analysis of those recent entrants to the property capital markets would help explain one of the great anomalies of the 1980s real estate price structure: the competitiveness of foreigners and tax-exempt buyers.

Had the true pre-tax equivalent returns of tax shelter investors been represented correctly in the analysis of the typical syndication, this question would have arisen again. The tremendous expansion of investment by the Japanese and Western Europeans, and the accumulation of the $120 billion of pension equity and property, were done at a significant competitive disadvantage to tax-subsidized syndicators and corporations. I believe the explanation of this anomaly lies partially with ERTA and the perverse "equipment-leasing pricing" applied to property, but also with a phenomenon unexplored by the paper: the entry of the "collector."

The paper never truly addresses the issue of why the supply-demand relationship was so thoroughly ignored by the market. The answer lies in the unlinking of property value from its utility, by the pressures brought on by long-term investors seeking an effective hedge against inflation. These were in many respects the same pressures that led the collector to purchase art and run that market up to unimagined highs. Property began to be produced for the demand of investors, not for the demand of users.[4] Had the authors further investigated their curiosity as to the insensitivity of office building construction rates to interest rates, they undoubtedly would have come upon the importance of the dramatic shifting down of equity rates of capitalization caused by the buying appetite of these new participants in the market. This realization also would, I believe, have caused them to look at the mechanism for shifting a nearly vertical and inelastic property supply

[4] This linkage is very effectively established in a paper entitled "Equilibrium and Commercial Real Estate Markets: Linking Space and Capital Markets," by Jeffrey Fisher, Susan Hudson-Wilson, and Charles Wurtzebach, produced by Indiana University (1991) and scheduled for publication in the *Journal of Portfolio Management* next year. The National Council of Real Estate Investment Fiduciaries (NACREIF), and the Homer Hoyt Institute supported this research.

curve in the short run to a much more gently sloped, long-term supply curve.[5]

Sorting Out the Causes of Overbuilding

As mentioned above, I am unconvinced by the Poterba analysis because it provides little useful, practical information. In effect the analysis in this section of the paper does little more to explain the nature of the oversupply of commercial property than the commonly voiced assertion that growth in the number of lawyers alone accounted for all the overbuilding of office space.

Commercial Construction Cycles

This is by far the best portion of the paper; here the authors begin to make a real contribution to the thinking about the nature of the nation's real estate capital markets and its construction cycles. The application of the hog cycle (Figure 4) is an insight that I hope the authors will develop further, while carefully noting the work done by Fisher, Hudson-Wilson, and Wurtzebach (1991) referred to above. That thoughtfully derived article begins with the presumption that the supply curve is vertical in the short run and then uses the changes in the supply curve brought about by the marginal pricing of rents to link the construction cycle with the real estate capital market pricing cycle. The most convincing work of Browne and Case in the area of construction cycle lags could be well linked with the other team's research. The Browne/Case paper is particularly helpful in describing the mechanisms by which the lag asserts itself.

The section on leasing, subleasing, and lease negotiations not only is correct, but also is one that all participants in the real estate capital markets would be well advised to study to the point of mastery. Indeed, if one looks at the performance of some of the most spectacularly flamboyant markets (Houston, for instance), one sees that the tenant frustration with the contractual inability to sublease at higher rents led to a fascinating hyper-stimulation of the market through the overcommitment to space by users who chose to become speculators. That overcommitment to new premises made sublease space in Houston the largest single component of the market. Marginal pricing of course crashed, and caused unprecedented declines in that market in the late 1980s.

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[5] The Aldrich/Kopcke article of 1984 deals in considerable detail with this phenomenon.

In effect the nation's real estate capital markets and indeed general financial markets became intoxicated with real estate in the 1980s. The authors do not explain convincingly why the patient turned to drink, but they do explain very convincingly why the besotted became so terribly, terribly, terribly drunk. Again, from my vantage point, the reason why the patient turned to drink is a challenging question whose answer lies in the inability of an archaic and fragile financial system to cope with a dramatically changed global economy.

Extent and Incidence of the Problem

The next section adds to the significant contributions of the previous one and provides a good teaching commentary on how declines can and do occur in real estate. The Browne/Case paper is very convincing on the subject of the many forms of hidden leverage that are embedded in real estate investing. A deeper inquiry in this area would allow the authors to answer a most challenging current question: why are the losses on institutional portfolios that are not subject to mortgage debt often as deep as those experienced by leveraged portfolios? Two answers are obvious. One is that the purchaser of a free and clear asset in the 1980s did not understand the degree to which "operating leverage" was embedded in the acquisition. The paper nicely demonstrates this problem in Table 7, in which it sets forth the sensitivity of real estate values to rent levels, vacancy rates, and cap rates; one should note that the assets in Table 7 are not leveraged. The work is even more effective when extended to examples in the immediate Boston area, demonstrating how a debt deflation in this large asset class can be a serious depressant to a regional economy.

Still another intriguing answer to the dilemma sheds considerable light on the importance to this whole dynamic of the nonrecourse lending contract and the confusion of debt and equity. Portfolio holders of leveraged properties were able to utilize the "stop-loss" characteristic of nonrecourse debt. The more highly leveraged were their assets, the more effective was the stop-loss. This asymmetry of the nonrecourse, highly leveraged investor (heads I win big, tails you lose big) not only sheds light on the aforementioned dilemma, but also adds interesting perspective to those who would seek public policy responses to this extreme cyclicality. (Browne and Case quite correctly point out that growth markets suffer more than others because their very growth is itself one of their own biggest industries. Research in this area could be enhanced by studying some of the more notable examples, such as Houston, Phoenix, Denver, or Miami, and the experiences encountered there. The paper's discussion of Boston is one illustration of this. It would have been a nice touch if the office building economics of Table 7

and Table 8 had been linked again by calculation to the performance of the syndicate described in the box.)

Conclusion

This discussant's conclusion is that the meat of the Browne/Case paper resides in its work on commercial construction cycles. These very useful concepts should be the subject of further research and writing by the authors. The lessons that are set forth therein (the effect of marginal pricing, the shift of the vertical supply curve toward the horizontal with a long and predictable lag, and the sources of embedded leverage in an investment class dominated by tangible assets) are lessons that must be learned both by participants in the market and policy planners.

I would point out, however, my very strong disagreement with a conclusion that states, "But once the boom starts to unwind, it does so with surprising speed." As a practitioner and an observer of market aggregates, I find that this is just not so. I am constantly surprised at how sluggish and viscous the movement is in this market. (And this is central to the authors' thesis on the lag in the appreciation and accumulation phase of the market.) The authors have it wrong; the response is unbelievably *slow*, but unbelievably *deep*. They correctly describe a cascade effect that works only over years: "Rents fall, values fall even more, lenders suffer losses and become increasingly cautious. As potential buyers are unable to obtain financing, property values fall even more. And lenders' efforts to bolster earnings by cutting costs further increase the surplus. . . ." Not only does this cascade effect take years, but it also takes enough time to allow the institutional market to institutionalize the forecasted trend. What threatens to occur is a debt deflation in this asset class, of intolerable proportions. The decline is still going on today, and this is where policy planners must direct their attention if our financial systems are to survive long enough to be thoughtfully renovated.

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Discussion

*David Shulman**

I read with great interest Lynn Browne and Karl Case's version of the role the 1980s real estate bubble played in undoing the banks. I agree with most of the paper's premises and conclusions, as far as they go. In particular they rightly argue that, as with most booms, the initial fundamentals for commercial real estate in the late 1970s were extraordinarily good. Vacancy rates were low, tenant demand was soaring, and the United States was in the midst of its biggest inflation since the Civil War, a factor that embedded a premium into the prices of inflation-sensitive assets. Along with that, the notion of real estate as an asset class for pension funds was attracting a cadre of sycophants in academia. Little did the academics realize that the minute period of history (1972–82) for which consistent data were available represented perhaps the best real estate market in modern history.

Nevertheless, in my opinion Browne and Case's analysis, as good as it is, is incomplete. True, the combination of the Economic Recovery Tax Act of 1981 (ERTA) and the Depository Institutions Deregulation and Monetary Control Act of 1980 certainly put the nascent boom into overdrive by marrying the newly deregulated savings and loan association with the tax-oriented syndicator. (Needless to say, this marriage was not made in heaven.) The problem I have with their analysis is that domestic policy was not the primary culprit. That explanation does not hold water when one looks at the global aspects of the 1980s real estate boom. Under far different regulatory and tax regimes, London, Paris, Tokyo, and Sydney all had real estate booms and busts in the late 1980s and early 1990s. So to my mind, a more global hypothesis has to be

*Managing Director and Equity Strategist, Salomon Brothers Inc.

considered. Further, if tax policy were the culprit, it is difficult to reconcile the continuation of the boom well after the adoption of the Tax Reform Act of 1986, which represented a 180-degree turnabout in policy. Using long lags as an explanation is not good enough, because apartment construction did collapse after the passage of the 1986 Act, but commercial construction did not.

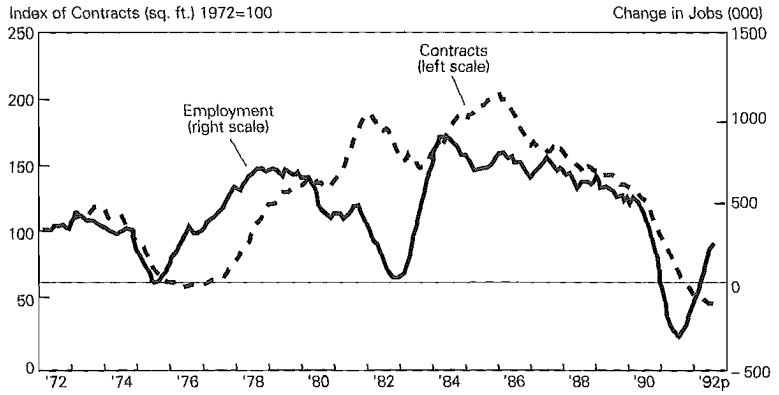
My own explanation for the post-1986 boom has more to do with international economic policy (Shulman 1989, 1990, and 1991). On a weekend in late September 1985, the G-7 finance ministers met in a hotel in New York City and agreed to a coordinated devaluation of the U.S. dollar. In order to accomplish this, the Plaza Accord required a global surge in liquidity to offset the impact of the falling dollar outside the United States. This process gave rise to what Bank of Japan President Yasushi Mieno characterized as "asset price inflation" and later "the bubble economy." In the United States, the Plaza Accord liquidity found its way into the stock and real estate markets. For example, from the first quarter of 1979 to the third quarter of 1985, commercial real estate loans held by commercial banks increased from $78 billion to $195 billion, or about $4.5 billion a quarter. After the Plaza Accord, from the third quarter of 1985 to the second quarter of 1991, commercial real estate loans increased from $195 billion to $377 billion, or about $7 billion a quarter. During approximately the same time period (1985–91), real estate lending by foreign branches in the United States increased sevenfold to about $50 billion. Thus bank deregulation and ERTA do not, in and of themselves, come close to explaining the lending frenzy into real estate.

My second concern is that I believe the authors minimize the role of demand. According to Salomon Brothers' narrow definition of office employment, the year-to-year growth in office employment troughed at 20,000 jobs in October 1982 (Figure 1). By March 1984 growth surged to 888,000 jobs, well above the gains of 600,000 jobs reported in early 1980. Thereafter, while construction continued at extraordinarily high levels, office employment gains trended lower, to 700,000 jobs by October 1987 and just under 600,000 jobs by April 1989. Then, with the onset of the "white-collar" recession in June 1990, the growth in office jobs dropped to 400,000. By July 1991 the level of office employment had declined nearly 300,000 jobs from the previous year, an unprecedented drop (Shulman and Hopkins 1990). In my opinion it was this demand collapse that represented the final nail in real estate's coffin.

My explanation for part of the demand collapse has to do with what I have called a "Say's Law effect" in real estate. Simply put, supply creates its own demand, because a real estate boom in and of itself increases the demand for office workers in law, accounting, finance, title insurance, lease brokering, and architecture. Once the boom stops,

Figure 1

Index of Office Construction Contracts versus 12-Month Change in Office Employment



p = Salomon Brothers Inc. projection.

Source: Dodge/DRI Construction and Real Estate Information Services, U.S. Bureau of Labor Statistics, and Salomon Brothers Inc.

however, the demand for these workers unwinds, with a concomitant rise in vacancy rates.

Third, what happened in the United States in the 1980s was the creation of unique suburban activity centers characterized by Garreau (1991) as "edge cities." These centers offered tenants a multiple choice of office location options within a given metropolitan area, and this had the effect of devaluing the entire concept of location. So when the crash finally came, the notion of real estate as collateral had lost some of its meaning (Shulman 1989).

Lastly, on a macroeconomic level, the disinflation of the 1980s gradually wrung out the inflation premium that was put into real estate asset prices during the 1978–82 period. Because of the mania, investors and lenders alike failed to take note that real office rents had been falling since 1982 (Shulman and Byrne 1991). Once the recognition lag was overcome, however, the pricing effects were brutal, because they had to overcome several years of falling rents along with the removal of the inflation premium.

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Financial Institutions and the Collapse of Real Estate Markets

*Donald D. Hester**

This paper focuses on how financial institutions function in an imperfectly competitive market, one that is repeatedly shocked by financial innovations and governmental interventions and is always in disequilibrium. It does not consider whether or not financial institutions caused the collapse of real estate markets, but instead offers reasons why major lenders moved in the mortgage markets as they did.

The paper is concerned primarily with real estate lending and financial institutions in the 1980s. However, a long history preceded the recent real estate collapse and, as in a Greek tragedy, the hubris of the principals probably made the collapse inevitable. Plenty of signals were given that could have triggered actions by managers and regulators, but neither were likely to act in the political context of the 1970s and 1980s.

The first section of the paper summarizes the turbulent history of mortgage markets that led up to the most recent decade. The next section describes the actions of the three principal private sector financial intermediaries in mortgage markets. Then a number of arguments are reviewed that may account for the actions of these intermediaries. The following section considers the signals that warned of trouble in mortgage markets and suggests scenarios for resolving the current crisis. A final section offers conclusions.

*Professor of Economics, University of Wisconsin—Madison.

Background of the Crisis

It is useful to recall that throughout this century real estate markets have been financed by three major intermediaries, life insurance companies, commercial banks, and savings institutions. An early study by Morton (1947) documented that the home mortgage lending terms offered by commercial banks and life insurance companies were strongly affected by reforms and federal programs enacted in 1934. Maturities of new home mortgage loans doubled and loan-to-value ratios of new mortgage loans increased rapidly. Similar but less dramatic changes were evident in loans booked by savings and loan associations. These changes persisted into the post-World War II era, and indeed received further impetus from Veterans Administration (VA) and Federal Housing Administration (FHA) programs that resulted in even longer mortgage maturities and higher loan-to-value ratios.

Real estate loans on multifamily and nonresidential properties are made principally by life insurance companies and commercial banks, with insurance companies specializing in long-term loans and banks in short-term loans. A study by Fiedler (1971) reports that both loan-to-value ratios and maturities on new loans increased irregularly, beginning in about 1936, and were higher in the immediate postwar period than in the 1920s. For insurance companies, both series trended up steadily between 1951 and 1968. While no comparable data are available for commercial banks, it is likely that they too liberalized commercial mortgage lending during the prosperous postwar era, which came to a close in the early 1960s.

The competitive struggle for market shares of deposits between commercial banks and thrift institutions quickened in the early 1960s (Hester 1981). Until about 1962, commercial banks had allowed savings and loan associations to increase their share of the consumer deposit market, by not matching the interest rates that savings and loans paid. Once savings and loan associations' share in local markets passed a certain threshold, however, an optimal policy for commercial banks was to match the rates paid by savings and loan associations. This resulted in rapidly rising interest rates on deposits.

To cover the higher cost of deposits, all institutions began to shift their portfolios toward mortgage loans, which at the time had the highest net rates of return. Both commercial banks and mutual savings banks increased their mortgage lending in the early 1960s, at a time when mortgage loan interest rates were falling relative to interest rates on other available assets (Hester and Pierce 1975). Rates on mortgage loans were falling in part because of this increased demand by lenders for mortgage loans. Profits of savings and loan associations declined rapidly because of this competitive struggle and also because they had a

large negative "gap"—that is, for short and medium time horizons their fixed-rate liabilities were much smaller than their fixed-rate assets.

In 1966 the Federal Reserve intervened by driving up interest rates and regulators and Congress were forced to impose binding ceilings on the rates that banks and thrifts could pay on deposits. This intervention postponed the crisis and restored the profitability of savings institutions. However, it also spawned a wave of institutional changes and market innovations that would eventually decimate many of them: in particular, the privatizing of the Federal National Mortgage Association (FNMA) in 1968, the introduction of Government National Mortgage Association (GNMA) pass-through securities in 1968, the establishment of the Federal Home Loan Mortgage Corporation (FHLMC) in 1970, and the emergence of money market mutual funds (MMMFs) and negotiable order of withdrawal (NOW) accounts in 1972. Many other important innovations would occur in the years to follow, including the establishment of financial instrument futures markets in 1975 and the introduction of variable interest rate mortgage loan contracts.

Partly because of confusion caused by all these innovations, between 1970 and late 1978 the Federal Reserve allowed the federal funds interest rate to fall below the CPI inflation rate. A "bubble" developed in asset markets (and especially in the price of houses) that led to a situation where one could borrow at interest rates that were lower than the rate of increase in house prices, especially after account was taken of the deductibility of mortgage interest from individual income taxes.[1] So long as lenders could get funds at interest rates lower than those they could net on mortgage lending, this bubble would persist and both house owners and intermediaries could prosper. The game was obviously unsustainable, however, and the housing bubble collapsed around 1980, helped by the Federal Reserve—especially by its actions on October 6, 1979—and by the rapid growth of MMMFs.

Commercial mortgage lending was similarly expansively affected by interest rates during the 1970s, but did not suffer as much of a convulsion when interest rates rose in 1979. Superficially, it appears that commercial lenders were insulated from interest rate movements because they were relatively better immunized and because, in an infla-

[1] Between 1970 and 1980 the price of a new house rose from about $35,300 to $90,100; this corresponds to a continuously compounded annual rate of return of 9.8 percent. A simple arithmetic average of annual interest rates on new home mortgage loans for the same period was 9.2 percent. Between 1980 and 1991 the corresponding rates averaged 5.3 percent and 11.3 percent, respectively. The effective cost of borrowing is much lower when account is taken of the deductibility of mortgage interest. Another indicator of the instability of the housing market is the ratio of the residential construction implicit price deflator to the overall GDP deflator. With 1987 as a base, this ratio rose from 0.895 in 1970 to a peak of 1.043 in 1980 and then fell to 0.953 in 1991. Construction prices rose and fell relative to other prices, depending on whether excess demand was present.

tionary environment, borrowers could afford to pay high rates out of steadily rising nominal revenues. Multifamily residential mortgage lending was less strongly affected by the structure of interest rates and other changes, for a variety of reasons that are outside the scope of this paper.

Mortgage Markets in the Past Twelve Years

From this stormy history ensued a vast transformation of financial markets, and especially mortgage markets. Three major regulatory reform acts, the Depository Institutions Deregulation and Monetary Control Act of 1980, the Garn-St Germain Act of 1982, and the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA), transformed the ground rules. Three major tax laws, the Economic Recovery Tax Act of 1981 (ERTA), the Tax Equalization and Fiscal Responsibility Act of 1982 (TEFRA), and the Tax Reform Act of 1986, drastically altered tax formulas.

This section briefly describes how mortgage markets fared and how the three principal lenders responded to this turbulent environment. Table 1 indicates that these lenders did not maintain their market shares of one- to four-family residential mortgage loans in the 1980s.[2] Mortgage pools (which in this paper have been defined to include mortgages held by sponsored credit agencies) increasingly dominated the residential mortgage markets. The competition from federally sponsored intermediaries reduced the demand for the services of private intermediaries, and thus tended to reduce profits. Although savings and loan associations and savings banks had been savaged by rising interest rates at the beginning of the decade, they attempted to expand their lending rapidly during the first half of the decade, apparently believing that they could offset their enormous book losses through growth and expansion in a newly deregulated environment.[3] This would prove to be a serious miscalculation.

Commercial banks steadily increased their residential mortgage lending throughout the decade, and continue to do so. Several expla-

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[2] This table and the others in this section have been constructed from the Flow of Funds Accounts and National Balance Sheets published by the Board of Governors of the Federal Reserve System. The tables emphasize lending activities by the three principal intermediaries, banks, savings institutions (thrifts), and life insurance companies. Other suppliers of mortgage loans in the Flow of Funds Accounts include households, a number of other insurance industries, governments, nonfinancial corporations, retirement and pension funds, finance companies, and the like.

[3] The response of the savings and loan business to deregulation and Reagan Administration budgetary cutbacks in regulation is described colorfully and in some detail by Strunk and Case (1988).

Table 1
Year-End Holdings of Mortgages on One- to Four-Family Housing

Year (1)	Total (2)	Pools (3)	Banks (4)	Thrifts (5)	Life Insurance Cos. (6)	Pools 3/2	Banks 4/2	Thrifts 5/2	Life Insurance Cos. 6/2
	Billions of Dollars					Percent of Total			
1966	232	5	33	132	30	2.1	14.2	57.2	13.0
1967	245	7	35	139	30	2.7	14.4	56.9	12.2
1968	262	9	39	148	29	3.3	14.8	56.5	11.1
1969	280	13	41	157	28	4.5	14.8	56.2	9.9
1970	294	19	42	165	27	6.3	14.4	56.0	9.1
1971	321	25	48	181	25	7.8	15.0	56.4	7.7
1972	360	31	57	207	22	8.6	15.8	57.6	6.2
1973	403	38	68	233	20	9.3	16.9	57.7	5.1
1974	441	46	75	249	19	10.5	17.0	56.4	4.3
1975	482	56	77	271	18	11.7	16.0	56.2	3.7
1976	546	69	86	310	16	12.6	15.8	56.7	2.9
1977	643	85	105	362	15	13.2	16.4	56.3	2.3
1978	754	106	129	412	14	14.1	17.1	54.7	1.9
1979	871	139	150	455	16	15.9	17.2	52.3	1.8
1980	965	165	160	483	18	17.1	16.6	50.1	1.9
1981	1040	189	170	499	17	18.2	16.4	48.0	1.7
1982	1080	249	174	461	17	23.0	16.1	42.7	1.6
1983	1200	323	183	490	15	26.9	15.2	40.9	1.3
1984	1336	378	197	540	14	28.3	14.7	40.4	1.1
1985	1490	468	214	574	12	31.4	14.3	38.5	.8
1986	1721	623	240	588	13	36.2	13.9	34.1	.7
1987	1943	757	280	630	13	39.0	14.4	32.4	.7
1988	2174	836	317	717	15	38.5	14.6	33.0	.7
1989	2404	966	372	717	14	40.2	15.5	29.8	.6
1990	2765	1118	461	672	13	40.4	16.7	24.3	.5
1991	2905	1271	492	614	12	43.7	16.9	21.1	.4

Source: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts, Assets and Liabilities*, various issues.

nations for this activity are considered in the next section. Banks also greatly increased their holdings of agency securities, which include mortgage pools. As a percentage of net financial assets, banks had about 2 percent in agency securities at the end of 1966 and about 10 percent at the end of 1991. This discussion will be confined to considering directly held mortgage loans, and thus it will understate the involvement of commercial banks in real estate. No information was available about the fraction of banks' holdings of agency securities that are financing real estate indirectly.

Life insurance companies have been withdrawing from the one- to

four-family residential market. This withdrawal may be a response to the changing nature of life insurance company liabilities over the past quarter century. At the end of 1966, 69 percent of their liabilities were life insurance reserves and 20 percent were pension fund reserves. At the end of 1991, 28 percent were reserves for life insurance and 62 percent were reserves for pension funds. Like banks, life insurance companies have greatly increased the fraction of their portfolios invested in agency securities, even though their holdings of residential mortgage loans have decreased. At the end of 1991, about 10 percent of financial assets of life insurance companies were in agency securities. Because of data limitations, however, this discussion also will be confined to mortgage loans directly held in insurance company portfolios.

Table 2 provides comparable information for commercial mortgages. Commercial banks have come to dominate the market. The share of commercial mortgages held by life insurance companies has been relatively constant over the past 25 years, and since 1985 thrifts have been rapidly withdrawing from this market.

Table 3 reports the fraction of total financial assets that each of these three intermediaries has allocated to one- to four-family residential mortgages and to commercial mortgages. Commercial banks have steadily and increasingly shifted their portfolios toward both types of mortgage loans. Thrifts and life insurance companies have been shifting away from one- to four-family mortgages. The share of the thrifts' portfolio in commercial mortgages has been essentially trendless over the past 25 years. Life insurance companies increased the share of their portfolio going to commercial mortgages until about 1980; since then the share has drifted down slightly.

Perhaps it is fair to conclude that thrifts and life insurance companies were rather passively responding to the turbulent 1980s, whereas commercial banks were aggressively increasing both market share and the share of their portfolios going into mortgage loans.

Explanations for Changing Mortgage Lending by Intermediaries

This section reviews some hypotheses that partly explain mortgage market activity by thrifts, commercial banks, and life insurance companies. Before focusing on mortgage lending, it is important to emphasize that the 1980s were a period of gross macroeconomic disequilibrium. The ratio of total credit market debt owed by nonfinancial sectors to gross domestic product, relatively unchanging over much of the postwar period, rose sharply from 1.45 in 1980 to 1.97 in 1991. It is against the background of this borrowing binge by all sectors of the economy that the explosion in mortgage lending must be considered.

Table 2
Year-End Holdings of Commercial Mortgages

Year (1)	Total (2)	Banks (3)	Thrifts (4)	Life Insurance Cos. (5)	Banks 3/2	Thrifts 4/2	Life Insurance Cos. 5/2
	(Billions of Dollars)				(Percent of Total)		
1966	61	16	13	19	26.8	21.9	30.7
1967	66	18	15	21	27.2	22.3	31.2
1968	73	21	17	22	28.3	22.9	30.9
1969	78	22	18	24	28.2	22.8	31.1
1970	86	23	19	26	27.2	22.7	30.4
1971	96	26	24	29	27.4	24.9	29.7
1972	113	32	29	32	28.2	25.8	28.0
1973	132	39	34	37	29.4	25.7	27.7
1974	147	44	37	41	29.7	25.3	28.1
1975	159	47	43	45	29.4	26.7	28.4
1976	171	50	48	49	29.4	28.1	28.6
1977	190	57	53	54	30.0	27.9	28.7
1978	212	66	57	62	31.2	26.7	29.4
1979	236	76	60	71	32.2	25.3	30.0
1980	256	81	62	81	31.6	24.1	31.6
1981	278	91	64	88	32.6	22.9	31.8
1982	301	103	66	94	34.1	22.0	31.1
1983	352	120	83	104	34.2	23.5	29.5
1984	418	153	104	111	36.6	24.8	26.6
1985	480	181	114	128	37.7	23.8	26.6
1986	553	223	119	149	40.3	21.6	27.0
1987	651	267	147	167	41.1	22.6	25.6
1988	699	305	139	184	43.7	19.8	26.4
1989	745	340	137	195	45.7	18.3	26.1
1990	756	336	109	215	44.5	14.4	28.4
1991	751	336	87	218	44.7	11.6	29.1

Source: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts, Assets and Liabilities*, various issues.

Thrifts

The response of thrifts was essentially dictated by the crisis precipitated by soaring market interest rates at the start of the decade. If assets were marked to market values in the early 1980s, the two largest groups of thrift intermediaries, savings and loan associations and mutual savings banks, had massively negative net worth. The only "quick fix" would have been a very substantial early reduction in nominal interest rates, followed by reforms that allowed them to eliminate their negative gap. Interest rates did not fall sufficiently and, as has been documented

Table 3
Percentage of Total Financial Assets Held as Mortgage Loans by Commercial Banks, Thrifts, and Life Insurance Companies

	Commercial Banks		Thrifts		Life Insurance Cos.	
Year	1–4 Family	Commercial	1–4 Family	Commercial	1–4 Family	Commercial
1966	9.0	4.5	64.8	6.6	18.6	11.6
1967	8.8	4.4	63.5	6.7	17.3	11.9
1968	8.7	4.6	63.2	7.1	15.8	12.2
1969	8.8	4.7	63.6	7.2	14.4	12.8
1970	8.2	4.5	61.7	7.3	13.3	12.9
1971	8.3	4.6	58.6	7.8	11.4	13.2
1972	8.6	4.8	57.8	8.1	9.6	13.6
1973	8.9	5.1	58.7	8.6	8.3	14.9
1974	8.9	5.2	57.7	8.6	7.4	16.2
1975	8.7	5.3	55.2	8.7	6.3	16.2
1976	9.0	5.2	54.9	8.5	5.2	15.7
1977	9.8	5.3	55.6	8.1	4.3	16.0
1978	10.6	5.4	56.3	7.7	3.8	16.4
1979	11.0	5.6	57.2	7.5	3.8	16.9
1980	10.8	5.4	56.2	7.2	3.9	17.4
1981	10.5	5.6	55.5	7.1	3.4	17.4
1982	10.0	5.9	48.4	7.0	3.0	16.5
1983	9.6	6.4	44.3	7.5	2.4	16.4
1984	9.2	7.2	41.9	8.0	2.0	16.0
1985	9.0	7.6	40.7	8.1	1.6	16.0
1986	9.1	8.5	38.2	7.8	1.4	16.5
1987	10.1	9.6	37.4	8.7	1.3	16.6
1988	10.7	10.3	39.0	7.6	1.4	16.3
1989	11.5	10.5	41.7	7.9	1.1	15.6
1990	13.8	10.1	42.6	6.9	1.0	15.7
1991	14.2	9.7	43.6	6.2	.8	14.6

Source: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts, Assets and Liabilities*, various issues.

by a very large number of books, savings and loan institutions and savings banks responded in other ways to this crisis.[4] A responsible review of this extensive and contentious literature is beyond the scope of this paper.

As shown in Table 1, thrifts briefly reduced their holding of mortgage loans in 1981, after net deposit inflows fell to a trickle. As inflows of deposits (often brokered) and other funds increased in

[4] Compare Barth (1991); Brumbaugh (1988); Kane (1989); Strunk and Case (1988).

subsequent years, thrifts expanded mortgage lending relatively rapidly until 1989, when a sharp decline began.[5]

Net income was negative in 1981 and 1982 for savings institutions insured by the Federal Savings and Loan Insurance Corporation (FSLIC).[6] It was positive between 1983 and 1986, and massively negative thereafter. Savings banks insured by the Federal Deposit Insurance Corporation (FDIC) had operating losses in 1980, 1981, 1982, and again recently. The more recent string of losses led to the passage of FIRREA in 1989.

A simple reconstruction of events shows that regulators allowed mortgage lending by the thrift intermediaries to grow, so long as profits were positive. In principle, such a policy could succeed, if profits were sufficiently high to permit net worth to quickly reach a reasonable level relative to liabilities. However, the policy was a pipe dream at best, because net income was much too low.

A more accurate, messy, and comprehensive story is available in the volumes cited in footnote 4 and in many others. A cursory reading of this literature leads to the conclusion that regulators, politicians, and many other individuals misunderstood the severity of the crisis and witlessly believed the rhetoric of the Reagan years, that deregulation and the unleashing of animal instincts would cure all. That, we can all agree now, was irresponsible, as should have been obvious at the time.

Commercial Banks

Commercial banks, like thrifts, are depository institutions. Some of the following discussion would also pertain, with the necessary changes, to a thrift institution with positive net worth. Three explanations are proposed to account for the observed rapidly rising share of mortgage loans in bank portfolios.

Explanation one. Mortgage loans have become less risky for banks to hold because the exposure of loan asset values to interest rate changes can now be controlled much better, using financial innovations such as variable rate mortgage loans, swaps, financial instrument options and futures markets, stripped securities, and the like.

Before 1975, when a bank acquired a new residential mortgage loan, it could expect to hold it for perhaps eight to twelve years. If interest rates rose, it would sustain an unrealized capital loss. If interest rates

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[5] This discussion refers to thrifts, rather than their constituent components, savings and loan associations, savings banks, and the like, because considerable shifting of institutions across intermediary types occurred as the crisis bloomed. Information about thrift deposits and earnings is taken from the 1988 *Savings Institutions Sourcebook*, published by the United States League of Savings Institutions.

[6] Net income is defined as gross operating income less operating expenses, interest on deposits and borrowed funds, and taxes.

remained at the higher level over the life of a loan, the bank would sustain an opportunity cost loss. Since 1980, through judicious use of any of the above innovations, a bank has been able to reduce or even eliminate such risk exposure. Therefore, other things being equal, a mortgage loan is less risky and more attractive to risk-averse bankers. Because the dating of the innovations is reasonably clear, ratios of real estate loans to total assets between 1960 and 1990 can be interpreted as providing some rough empirical support for this hypothesis. Beginning in 1960, at five-year intervals, real estate loans were successively 11, 13, 13, 13, 17, 18, and 26 percent of total domestic banking system assets.

Explanation two. Changes in the tax deductibility of interest expenses created a niche for mortgage lending, so that borrowers would channel borrowing for all purposes through mortgages and thus substantially increase the demand for mortgage loans from banks and other lenders.

The Tax Reform Act of 1986 drastically reduced the extent to which individuals could deduct interest from income when preparing federal income tax documents. This reform was phased in over five years. Individuals could exploit the fungibility of loans by borrowing with a residential mortgage and using the proceeds for any activity. The incentive to borrow with mortgages rose between 1986 and 1991 as the fraction of other interest that could be deducted fell from 100 percent to zero. The amount of such fungibility is difficult to measure, because it can be effected through first mortgage loans taken out for renovation, refinancing of existing loans, second mortgage loans, and home equity lines of credit. In 1991 about 1.9 percent of banking system assets were reported to be mortgage loans that originated from home equity lines of credit, and about 16 percent of all one- to four-family mortgage loans from banks were in the form of home equity lines of credit (Brunner, Hancock, and McLaughlin 1992, p. 474). The sharp increase in one- to four-family mortgage lending by banks after 1986 (Tables 1 and 3) suggests that tax law changes were quite important. The niche created by the Tax Reform Act of 1986 is not easily exploited by providers of mortgage pools, because loan contracts that arise from home equity lines of credit or that allow flexible restructuring would be difficult to price and market.

Explanation two does not explain the growth in commercial mortgage loans made by banks. Demand for commercial mortgages by individuals should have decreased because of the Tax Reform Act's more restrictive treatment of passive investments.

Explanation three. Changes in the loan markets served by banks made it likely that banks could expect greater profits if they increased the fraction of their loan portfolios in real estate loans.

This argument is difficult to present, because bankers rarely announce what rates of return they realize and no sane investors divulge

information having value that can be appropriated by others. However, the ongoing collapse of savings and loan associations and savings banks surely enhanced the profitability of mortgage lending for commercial banks, in both the short and the long run. The number and strength of rivals have fallen sharply.

Further, as explanation two implies, the demand for conventional consumer loans must have fallen relative to the demand for real estate loans, because interest on consumer loans was becoming less deductible. Growing securitization also led to a decline in the stock of consumer loans on commercial bank balance sheets, although not necessarily to less bank activity in originating consumer credit. By securitizing credit card debt, banks can increase the ratio of their net worth to risk assets and their return on equity. The controversial proposition by Ausubel (1991) that credit card debt is very profitable, thus, does not imply that bank holdings of consumer debt should be large or rising.

Also in the 1980s, as has been forcefully argued by McCauley and Seth (1992), foreign bank commercial and industrial (C&I) loans to nonbanks in the United States have been rising rapidly. They report that a reserve requirement differential gave foreign banks a 25-basis-point advantage until the end of 1990, when the differential was removed. They estimate that between 1983 and 1990 the share of all C&I loans in the United States from foreign banks rose from 18 percent to 41 percent, and that the share had risen further to 45 percent by the end of 1991. McCauley and Seth provided a number of reasons, including low-cost capital and "regulatory arbitrage," for believing that the foreign share will continue to increase.

In addition, commercial paper, a close substitute for some C&I loans, grew very rapidly through 1990. Also, partly because of outbasing in *maquiladoras* enterprises and the adoption of "just-in-time" technologies, inventories in U.S. enterprises have been falling relative to GDP and national wealth. Because of the close relationship between inventory levels and C&I loan changes at U.S. banks, a continuing decline in the demand for C&I loans seems likely.[7]

The strong positive slope of the yield curve at present provides an additional reason for believing that banks will be expanding the fraction of their portfolios placed in mortgage loans. Banks can make either fixed-rate or adjustable-rate mortgages and, as noted above, do swaps to control their gaps.

Banks' net income as a fraction of their average outstanding assets has been trending down since the early 1960s. For all insured banks, this ratio has been much lower in the past five years than it was in the first

[7] These arguments are developed in Hester (1992).

half of the 1980s. These trends reflect the growing competition that banks have been experiencing in various loan and deposit markets, from rivals both in the United States and abroad. Demand for conventional consumer and C&I loans from U.S. banks is likely to continue to fall. While the competition from mortgage pools has been serious and intensifying, the best and brightest hope for loans in bank portfolios in terms of rate of return may still be in real estate.

Life Insurance Companies

The restructuring of life insurance company activity, from principally providing life insurance to managing pension funds, is likely to have considerably changed how insurance companies view mortgage loans. Life insurance contracts require that payments be funded at the time of the insured's demise. If premiums are sufficient and portfolios adequately immunized against future interest rate fluctuations, a stock chartered company can be expected to allocate excess funds to maximize its surplus.[8] Managing pension fund portfolios differs in that payouts are spread over time and the number of beneficiaries changes and cannot be fully controlled by a fund manager. Clearly, differences exist among pension funds, and they may also have restrictions on assets that can be held in the different portfolios.

Life insurance company portfolios cannot be decomposed in the Flow of Funds Accounts to reflect their life insurance and pension fund roles. The assets that have grown most in percentage terms in life insurance company portfolios over the past decade are (in descending order) mutual fund shares, money market fund shares, U.S. agency securities, U.S. Treasury securities, miscellaneous assets, open market paper, and corporate and foreign bonds.[9] It would appear that, for prudential or regulatory reasons, life insurance companies have been shifting into highly liquid and relatively safe assets. This shift away from mortgages and equities appears to be a consequence of the changing structure of life insurance company liabilities. It also reflects shifts in the public's demand for coverage from straight-life to term insurance.

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[8] It is never clear what mutually chartered insurance firms attempt to maximize, but that question is beyond the scope of this paper.

[9] The percentage changes were calculated from the end of 1979 through the end of 1991, using the Federal Reserve's *Flow of Funds Accounts, Financial Assets and Liabilities*, June 11, 1992. All of the assets reported in the text, except corporate and foreign bonds, had a higher percentage rate of growth than total financial assets of life insurance companies over this period.

Problems in Real Estate Markets and Scenarios for Resolution

The preceding sections have argued that thrift institutions and life insurance companies have been rather passive participants in mortgage markets while commercial banks were actively trying to expand. The explanations offered for the banks' expansion efforts are based on changing technology and market conditions; rates of return in mortgage markets looked relatively more attractive, at least in the short and medium term. The other two intermediaries are represented as guided by structural considerations that were externally imposed.

This section relies on additional information that has become increasingly accessible over the past decade. First, it briefly considers a proposition about the relation of demographic changes to housing prices and their relation to defaults. Second, it reports that commercial real estate markets have been deteriorating for many years. Third, it presents and interprets a chart suggesting a substantial deterioration in the U.S. economy, which should have alerted lenders and regulators that commercial mortgage borrowers would have trouble meeting their obligations. Finally, it suggests a few scenarios for resolving the crisis.

One- to Four-Family Mortgages

It is important to address first a proposition about housing markets that was raised in a paper by Mankiw and Weil (1989) and recently has been discussed by Garner (1992). Briefly, Mankiw and Weil argue that, with the passing of the crest of the baby boom generation beyond the ages when individuals traditionally first buy a house, it is likely that the demand for houses will decline dramatically. They project that this will culminate in a glut of housing and a sharp decline in housing prices. Garner does not question the demographic facts, but does claim that the decline in housing prices is likely to be modest because of an elastic supply of new houses, growing real incomes, and a rising incidence of single-adult households. Space does not allow a full discussion of the arguments, but the financial implications of a collapse in housing prices must be explored.

Would a decline in housing prices imply an increased rate of default and additional losses for lenders? The answer of course depends on the amount of leverage, which is a function of the ratio of the balance on a mortgage loan secured by a property to the market value of the property. In the past decade, the loan-to-price ratio for new loans on primary mortgage markets has varied procyclically between 72 and 81 percent; in April 1992, it was 76.9 percent. Most mortgages have been outstanding for some years, so some principal has been retired. In some

Table 4
Annual Rates of Return and Vacancy Rates on Commercial Properties, Nationwide

	NCREIF Property Rate of Return Indices[a]			Coldwell Banker Vacancy Rate Indices[b]	
	Annual Rates of Return			Downtown Commercial	
Year	Total	Income	Capital	Office	Industrial
1979	17.1	8.8	7.8	5.2	2.7
1980	22.7	8.9	13.0	3.4	3.5
1981	15.2	8.3	6.5	3.8	3.8
1982	16.3	8.0	7.9	5.5	3.8
1983	8.6	8.0	.6	10.8	4.8
1984	14.8	7.5	6.9	13.1	4.8
1985	11.8	7.4	4.2	15.4	4.8
1986	9.7	7.5	2.0	16.5	5.3
1987	6.2	7.2	−.9	16.3	5.9
1988	5.4	7.0	−1.5	16.3	5.8
1989	6.9	7.0	−.1	16.1	6.0
1990	5.5	6.6	−1.0	16.7	6.5
1991	.1	6.7	−6.3	17.4	7.5
1992	−5.8	7.0	−12.1	18.8	8.6

[a] Source: Reproduced with permission of National Council of Real Estate Investment Fiduciaries. (Copyright 1992 by NCREIF and Frank Russell Company, Tacoma, WA. All rights reserved.) Data are for years ending March 31.

[b] Source: CB Commercial Real Estate Group, Inc. The values of the indices are for March in each year.

parts of the country, however, housing prices have fallen faster than loans are being amortized.

While the possibility of a collapse cannot be ruled out, it is my view that leverage has been sufficiently controlled that such an event is very unlikely. Whatever danger exists comes more from a failing U.S. economy than from demographic wiggles. And if a collapse did occur, the outcome would be strongly affected by the actions of mortgage pool managers and their regulators.

Commercial Mortgages

Table 4 provides information about the ex post rate of return from investments in commercial properties and about vacancy rates of commercial and industrial structures. The National Council of Real Estate Investment Fiduciaries (NCREIF) collects data from a group of institutional investors on the rates of return they earn from their properties. The survey began in 1977; its scope and the number of reporting investors have increased over time. The aggregate value of property underlying the series was about $600 million in 1977 and $22 billion in

early 1992; properties are located throughout the United States, but this is not a random sample.[10]

The three rates of return for commercial property reported in the table are the overall Russell-NCREIF property index (labeled "total") and two components. The "income" rate is calculated by dividing net operating income by the value of the properties. The "capital" rate of return is the percentage change in property market values. As is evident from Table 4, both component rates have been trending down. The capital rate of return has been negative for the past six years and has plunged recently. Capital rates of return in 1991 were uniformly negative across regions and types of properties. Clearly conditions in commercial real estate have been deteriorating for some time.

The last two columns in Table 4 report national vacancy rates for commercial and industrial properties, published quarterly by CB Commercial Real Estate Group, Inc.[11] The rates pertain to the first quarter of the year. Both vacancy rate series have positive trends and have roughly tripled between 1979 and 1991. The rise has been remarkably steady over those 13 years, although each rate had a temporary pause around 1988.

Real commercial construction spending peaked at the end of 1985. Between 1986 and 1989 it was roughly constant at $70 billion (1987 dollars), and then it began to fall steadily. The puzzle is why it remained as high as it did and why commercial banks would increase their commercial mortgage lending in such conditions.

One possible explanation for the anomaly is that information is being lost when vacancies are aggregated from regional to national markets. Banks and contractors may have been lending and building in expanding regions of the country, while vacancies and declining returns were occurring in other regions. If this were happening, vacancy rates in different cities should not be highly positively correlated. This study developed a correlation matrix of commercial vacancy rates for the 15 cities that had been in the Coldwell Banker Series since its inception in 1978. There were 56 quarterly observations for each city. Specifically, the

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[10] The Russell-NCREIF Property Index is designed to describe the performance of unleveraged properties that are owned by pension funds and profit-sharing plans. Properties in the index have been operational for at least one year or have 80 percent occupancy and are held in a fiduciary setting where they are periodically revalued. Properties include offices, warehouses, hotels, retail establishments, and apartments.

[11] The commercial index refers to properties in downtown areas and is the percentage of vacant square feet in the total square footage of a set of "major competitive multi-tenant office buildings." The national downtown series is reported rather than the suburban or metropolitan series because it is longer. In recent quarters, vacancy rates for suburbs and metropolitan areas are higher than for downtown areas. The industrial index is generated from a survey of industrial properties that could accommodate a tenant requiring at least 100,000 square feet.

principal components were calculated for this 15 × 15 matrix in order to determine the extent to which vacancy rates in different cities moved together. The largest principal component accounted for 72 percent of the generalized variance and had positive loadings for all cities. All but four cities had correlations with the largest component that exceeded 0.90.[12] Percentages of the generalized variance that were accounted for by the next four largest components were 14, 7, 3, and 2 percent respectively. This suggests strongly that no serious aggregation problem is confounding the interpretation of movements in the national index of commercial vacancy rates.

Commercial real estate lending by life insurance companies was somewhat responsive to the deteriorating market conditions. The fraction of insurance company portfolios in commercial mortgages declined in the 1980s, but too slowly with the benefit of hindsight. Life insurance commitments for income property loans shot up from $5 billion to $21 billion between 1982 and 1985, and then remained roughly unchanged through 1989, the latest date for which information is available.[13] The loan-to-value ratio for commercial loans fell in 1982 from 73 to 70 percent, and stayed at the lower value until 1989, so life insurance companies appeared to be a little better secured by property values in the 1980s than they were in the 1970s. Nevertheless, there can be little doubt that the profitability of life insurance companies has been declining over the past decade, in part because of losses on real estate.

The puzzle remains about why banks were increasing their commercial real estate lending. One possible explanation is that banks were looking at different information from that presented in Table 4. For example, since the fourth quarter of 1985 the National Real Estate Index has published semiannual information on price per square foot, rent per square foot, and a capitalization rate for commercial buildings, including offices, warehouses, retail buildings, and apartments. These national indexes were relatively unchanging between 1985 and 1990. Alternatively, perhaps real estate lending was simply the most promising activity for banks in a generally dour national economy.

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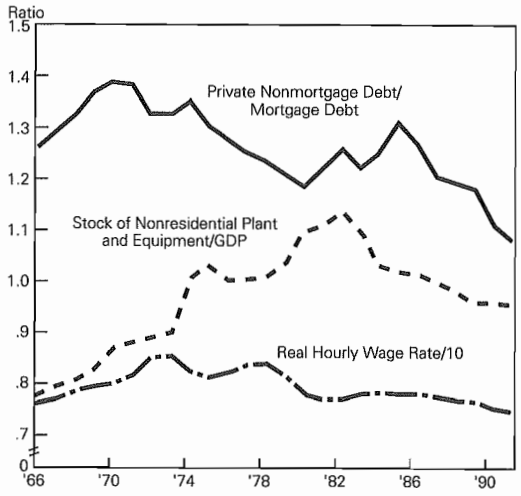
[12] The cities are Atlanta, Chicago, Dallas, Denver, Houston, Kansas City, Los Angeles, Miami, Minneapolis, Phoenix, Sacramento, San Diego, San Francisco, Seattle, and Washington. Those that had correlations of less than 0.9 with the largest component were Atlanta, Kansas City, Sacramento, and San Diego.

[13] The survey, conducted by the American Council of Life Insurance, is of 21 life insurance companies that control 61 percent of industry assets. The source here is the Federal Reserve Board's *Annual Statistical Digest*, various issues.

Figure 1

Summary Economic Ratios and the Real Wage Rate: 1966 to 1991



Source: *Economic Report of the President*, and Board of Governors of the Federal Reserve System, *National Balance Sheet Accounts*.

Trends in the National Economy

The U.S. economy has been performing poorly in the last decade in several dimensions. When an economy unexpectedly underperforms, perhaps it should be no surprise that real estate markets and their long-term financiers suffer. Space does not allow a thorough analysis of this unfortunate experience, but several indicators are suggestive. The poor performance of the economy can be attributed to five widely recognized phenomena: large federal government deficits, the federalizing of mortgage markets through sponsored pools, a low saving rate, a global decline in the rate of technical progress, and rapid growth in the fraction of the labor force that is inexperienced.

Figure 1 is an attempt to summarize their combined effects in three indicators, the ratio of nonmortgage debt to mortgage debt in the Flow of Funds Accounts, the ratio of the stock of nonresidential plant and equipment to gross domestic product (GDP), and the real hourly wage rate. The ratio of aggregate private nonmortgage debt to mortgage debt has trended down; it had a peak value of 1.398 in 1970, a local peak of 1.314 in 1985, and its three lowest values in the years 1989 to 1991. One

interpretation is that federal mortgage pools and government deficits were crowding out business borrowing. The ratio's decline in the late 1980s is particularly remarkable because it coincides with the leveraged-buyout mania. Crowding out is also indicated by the high real short-term interest rates throughout the 1980s, relative to other years since World War II.[14] The high real rates also reflect restrictive monetary policy, the low saving rate, and an associated population bulge in the age bracket where individuals begin to work and form families, as might be predicted by a simple life-cycle model. Crowding out should reduce the rate of commercial and industrial capital formation, if the demand for such capital is relatively more interest elastic.

The ratio of the stock of nonresidential plant and equipment (at current cost) to nominal GDP rose steadily from 1966 to 1975. After a one-year hiatus, the ratio continued to rise until 1982.[15] Since 1982 the ratio has declined monotonically. The rate of producer capital formation increased when short-term real interest rates were low or negative and fell when they were high. The fact that the onset of the decline in the ratio coincides with the onset of large federal deficits suggests that private nonresidential capital formation is being crowded out by large federal deficits. A declining domestic capital-output ratio in the context of very low technical progress suggests that individual borrowers' capacity to service and repay mortgage loans is decreasing. If the decline was unanticipated, commercial and household mortgage loans should experience more defaults and more building space will be vacant.

The hourly wage rate in 1982 dollars had a global peak in 1973 of $8.55 and experienced a local peak in 1978 of $8.40. It was essentially constant between 1980 and 1988. In the past three years it has fallen sharply and is currently below its level in 1966. With a declining capital-output ratio, a rising rate of participation by adults in the labor market, and slow technical progress, a downtrend in wage rates is hardly surprising. Since the decline in real wages was unanticipated, it might be postulated that borrowers would have increasing difficulty servicing and repaying mortgages, especially home mortgages. Two reasons why this difficulty has not become more evident are that the incidence of homeownership by families has been decreasing since about 1981 (Gabriel 1987, p. 895) and that the participation rate of adults in the labor market has been rising.

The conclusion to be drawn from this gloomy recitation is that serious macroeconomic problems have adversely affected markets that

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[14] The interest rate referred to is the quarterly federal funds rate minus the percentage change in the GDP deflator, measured as an arc elasticity.

[15] In 1970–71, in 1974–75, in 1980–82, and presumably in 1990–92, this ratio was positively distorted, because in recessions income falls faster than the book values of physical assets.

provide capital services. Some of these problems have been long-standing, but their cumulative effects may not have been fully appreciated by lenders in mortgage markets.

Alternative Scenarios for Resolution

High vacancy rates in commercial and industrial structures, the declining rate of return on income properties, and the worsening macroeconomic situation must be addressed if the condition of mortgage lenders is to improve. Quite apart from the macroeconomic situation, recent Federal Reserve Board staff studies by Passmore (1991) and by McAllister and McManus (1992) indicate, respectively, that 1) mortgage lending by "efficient" savings and loan associations and 2) aggressive overall lending by banks are not very profitable. The good name and growing market share of government-sponsored mortgage pools argue that putting more one- to four-family mortgage loans on the balance sheets of private intermediaries is a dubious strategy. With a glut of commercial property, all lenders will be forced into painful givebacks when restructuring deals with mortgagees who fail to make payments. The net rate of return from real estate lending in the coming years cannot be large.

With the benefit of hindsight, it is easy to see that a serious misallocation of resources occurred when contractors overbuilt offices and factories. This is a deadweight loss that is and will be borne by the economy, and its sharing will be contentious. It is the same sort of loss that accompanied the savings and loan debacle, although it now appears to be an order of magnitude smaller. Much of the loss in efficiency has already occurred; its subsequent redistribution is what the various scenarios at least partly determine.

First, the basic, "non-bailout" scenario is to allow excess capacity, however misplaced, to be absorbed by a slowly growing economy. Owners of banks, insurance companies, and other lenders who are inadequately collateralized have already absorbed a large hit, and more hits will surely follow. Owners of the properties have paid a price for their wrong decisions. Individuals who made commitments based on false signals emitted by the new structures have been penalized. Government revenues share the losses in proportion to the declines in corporate or personal income multiplied by the appropriate marginal tax rates, with obvious implications for public finance.

Second, in the unlikely event that banks and other lenders are unable to absorb the losses, a bailout might occur that would broaden the base of losers to the population of taxpayers. The cost could be staggering, if the soundness of mortgage pools were threatened.

Third, a tax of a different form might be incurred if lenders manage to shift mortgages on vacant properties to the pension funds and other

trusts that they manage. This is a distinct possibility in thin markets where prices are determined through negotiation, and unavoidable for life insurance companies that already manage pension funds. It essentially would be a replay of the real estate investment trust (REIT) fiasco of the early 1970s. The loss would be absorbed through lower revenues received by beneficiaries for many years into the future.

Fourth, a dose of unanticipated inflation tends to annihilate nominal debts and would, of course, lighten the burden of all debtors. However, the steeply sloped yield curve, in the context of excess physical capacity, strongly suggests that many investors anticipate inflation. Inflation has unfortunate time-consistency implications in capital markets. The loss would be borne not only by holders of debt, but by future potential borrowers. The incidence of the loss is not easy to predict in a world of derivative securities and variable rate loans.

Finally, a restructuring of financial markets in response to bad portfolio management in real estate markets has already resulted in large, fortuitous gains and losses, based on agility and informational advantages. The ongoing reduction in the number of financial institutions may improve the profitability of the survivors, and it will continue to have effects on employment in intermediaries and on quasi-rents in myriad markets. Efficiency gains may result from this restructuring as well.

Elements from all these scenarios will be present in the final resolution.

Conclusion

Thrift institutions, commercial banks, and life insurance companies continue to hold large amounts of commercial mortgages. While it is too early for a full accounting, all providers of commercial mortgages almost surely are absorbing large losses because of the high national vacancy rates and the recent negative rates of return on real estate.

Thrifts and banks continue to hold large amounts of one- to four-family mortgage loans. Banks have been rapidly expanding their holdings, and both banks and life insurance companies have also been greatly expanding their holdings of agency securities, which are to a large but unknown extent backed by one- to four-family mortgages as well.

While the ex ante basis for decisions to invest in mortgage loans cannot be known, this paper has proposed separate interpretations for each intermediary. Thrifts made a desperate attempt to grow out of their dire condition in 1980, which itself was a result of mismanagement and ill-advised regulatory policies dating from the 1960s. Using brokered deposits and other funds, thrifts rapidly increased their holdings of both

one- to four-family and commercial mortgage loans. The attempt had little chance of success, but because of deregulation and staff cuts in regulatory agencies it was allowed to continue until 1989, with disastrous consequences.

Three explanations for commercial bank mortgage market activity have been proposed: 1) financial innovations have allowed banks to reconfigure mortgages to control gaps; 2) a niche was created by the 1986 Tax Reform Act, which banks were well positioned to exploit; and 3) changes in the market power of rivals drove banks into mortgages. Banks face very stiff competition from government-sponsored mortgage pools, but have an advantage in the tax avoidance business because of the flexibility of home equity lines of credit and their other mortgage loan instruments. It is not terribly edifying to rationalize banks' success in terms of their ability to reduce federal revenues, but that is where their advantage lies.

Banks' plunge into commercial mortgage lending has no such convenient justification. It seems to be another in a long series of miscalculations by large banks, in the tradition of the REIT mess and Third World and leveraged-buyout bridge loans. Of course, banks have had some big successes too, and it is through bearing risk that intermediaries serve the public. If they had more capacity to bear risk, we probably would not be having this conference. The 30-year slow erosion in the industry's ratio of net income to assets and the condition of the FDIC and the Bank Insurance Fund indicate that some major reconstructive surgery is needed.

The ongoing transformation of life insurance companies from insurance to pension providers makes them very difficult to model. A similar transformation is occurring within providers of other types of insurance. We need a much deeper understanding of all the new contracts being written, before we can evaluate performances. In my view we badly need a major national study of the provision of accident, health, and life insurance and pension services by both the public and private sectors.

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Discussion

*James R. Barth**

Real estate lending has been disastrous for thousands of financial institutions during the past decade. Savings and loans, savings banks, commercial banks, and life insurance companies, in particular, have suffered from the changing nature of real estate markets and from collapsing real estate values. Donald Hester documents many of these developments and provides some explanations for them. Since the scope of his paper is quite broad, these comments will focus on areas meriting additional emphasis.

More Competition and Declining Profits for Depositories

Major and ongoing changes have occurred in the shares of financial assets held by financial service firms in the United States. In particular, the share of assets held by all depository institutions has declined, from 65 percent in 1950 to 39 percent in March 1992. U.S.-chartered commercial banks have seen their share fall by 30 percentage points, to 21 percent. Of all the nondepository financial service firms, only the life insurance companies' share has declined since 1950, falling by 9 percentage points over the entire period to 12 percent.

Among the financial service firms that have experienced expanding market shares, money market mutual funds and issuers of securitized credit obligations did not even exist in 1970, yet now account for

*Lowder Eminent Scholar in Finance, Auburn University.

significant shares of financial assets. Mutual funds alone account for a larger share of financial assets today than savings and loans, savings banks, and credit unions combined. Substantial growth in share has also occurred among pension and retirement funds, nonlife insurance companies, and security brokers and dealers.

At the same time that competition among new and old firms to provide intermediation services has been intensifying, the growth in the commercial paper market and the expanding securitization process have left all depositories with fewer lower-risk customers and with depressed returns on many of their traditional products. These developments reflect improved informational technologies, a more volatile financial environment, and limitations on the geographic location of depositories, their ownership, and their allowed products. Not surprisingly, profits have eroded while risks have increased, as depositories have struggled to meet the competition. The struggle has been exacerbated by the ever higher insurance premiums depositories must pay, and by the destructive pricing practices of weak and even insolvent depositories that were able to grow imprudently using subsidized federally insured deposits and under inadequate regulatory supervision.

On average, access to federally insured deposits no longer provides depositories with a sufficiently low-cost source of funds to acquire assets producing the same overall risk-return combinations as in earlier years. For savings and loans, the average rate of return on assets has steadily declined throughout the post-World War II period, reaching a negative 30 basis points in the period from 1980 through 1991. Moreover, the differential between the rate of return on equity and the rate on longer-term U.S. Treasury securities has declined in every decade. At the same time, the standard deviations of both the return on assets and the return on equity of depositories have tended to increase over this 40-year period.

For commercial banks, the return on assets has fallen from 80 basis points in the 1970s to 62 basis points in the period from 1980 through 1991. The differential of the return on equity over the rate on longer-term U.S. Treasury securities has declined in each of the past four decades, turning negative in the most recent period. The standard deviations of both the return on assets and the return on equity have increased markedly in the 1980 through 1991 period, while the ratio of net charge-offs to assets has increased steadily throughout the entire post-World War II period.

The reported improvement in financial performance for depositories in the first half of this year largely reflects an extremely steep yield curve and the gains on sales of assets, and the longer-term deterioration indicates that the more fundamental problem still remains. I agree with Donald Hester's statement that "some major reconstructive surgery is needed."

Depositories' Unpleasant Expansion into Real Estate Markets

A major shift has occurred in the commitment to real estate lending among the different depositories. In particular, the share of home mortgage loans (for one- to four-family homes) accounted for by savings and loans declined dramatically, from 43 percent in 1980 to only 15 percent in March 1992. Over the same period the share accounted for by commercial banks was relatively stable at 17 percent. Savings banks' share declined by nearly 4 percentage points, while credit unions' share increased by 1 percentage point; government-sponsored enterprises now hold the same share as these two types of depositories combined—5 percent. At the same time, the share accounted for by mortgage pools increased from 11 percent to 39 percent.

The securitization of home mortgages represents a fundamental change in the economics of home finance. The process has created a much more liquid market for these mortgages and hence has allowed for a much wider ownership. The net result is that the home mortgage market has been integrated into the capital market, with correspondingly lower mortgage rates. The increasing securitization of other types of assets should produce similar results, with further mixed blessings for depositories.

Commercial banks have increased their share of mortgages on multifamily properties from 9 percent in 1980 to 12 percent in March 1992. The share accounted for by the shrinking savings and loan industry declined from 27 percent to 19 percent, while the savings banks' share declined from 11 percent to 5 percent. Credit unions are not active in this market. The share accounted for by mortgage pools increased from 4 percent to 10 percent over the same period, with government-sponsored enterprises accounting for a relatively stable 5 percent.

As regards commercial mortgages, commercial banks have increased their share throughout the post-World War II period. In 1950 the share was 18 percent; it had increased to nearly 47 percent by March 1992. Savings and loans increased their share from 18 percent in 1980 to 20 percent in 1985, but it then declined to 8 percent by March 1992. The share accounted for by savings banks has declined steadily throughout the period, reaching 3 percent in March 1992. The share for life insurance companies has remained relatively stable at about 30 percent.

Effect on Depositories' Portfolios

These changes in overall real estate lending by depositories have meant corresponding changes in the importance of real estate mortgage

lending within their portfolios. In particular, the percentage of savings and loan assets devoted to home mortgage loans decreased from 67 percent in 1980 to a low of 41 percent in 1989, and this decline was not offset fully by increases in mortgage-backed securities. Since then, a 6-percentage-point gain in home mortgages has occurred, as many of the more nontraditional institutions have failed and been turned over to the Resolution Trust Corporation (RTC). Overall, savings and loans held 77 percent of their assets in home mortgages and mortgage-backed securities in 1980; this figure declined to 68 percent in March 1992 and can be expected to decline still further with the recent loosening of the Qualifying Thrift Lender test.

Commercial real estate mortgages rose from 6 percent of total savings and loan assets in 1980 to 9 percent in 1985. The percentage commitment remained high but tapered off slightly in 1986 and 1987, then returned in 1992 to slightly below the level that had prevailed 10 years earlier. Construction and land development loans rose more significantly, from 0.9 percent of total savings and loan assets in 1980 to a high of 6 percent by 1987. By the beginning of 1990 the percentage had dropped to 5 percent and then fell sharply, reaching 0.7 percent by early 1992. Multifamily mortgages remained a relatively steady percentage of savings and loan assets throughout the period, with a slight increase in the middle of the decade and again in 1991 and early 1992.

Reasons for the Shifts in Lending

The pattern of commercial real estate mortgage lending and construction and land loans for savings and loans during the 1980s is roughly consistent with changes in the laws and regulations. Following the devastating interest-rate spread problems of the late 1970s and early 1980s, savings and loans responded to federal and state legislation permitting lending and investment in commercial real estate. The savings and loan institutions also responded to the increasing demand for commercial real estate loans stimulated by federal tax changes in 1981 that encouraged investment in real estate. Greater involvement in commercial real estate was viewed by many institutions as a way to overcome the difficulties that had been created by funding fixed-rate home mortgages with variable-rate liabilities, a situation brought about in large part because savings and loans were not given authority to offer adjustable-rate mortgages or to engage in futures transactions until after the industry was economically insolvent.

By 1986 federal regulators began increasing capital requirements, limiting direct investment in real estate (which in some cases had taken the form of commercial real estate loans), and expressing concerns about savings and loans' commercial real estate loan activities. Also, federal

tax law changes in 1986 reversed much of the stimulus for real estate investment provided in the 1981 law. The subsequent decline in savings and loans' lending for commercial real estate and construction and land reflects these regulatory and legislative changes as well as the considerable excess supply of commercial real estate.

In contrast to the savings and loans, commercial banks increased their commitment to real estate in all forms throughout the 1980s and generally even into early 1992. In addition to increased home mortgage lending, including home equity loans, the commercial banks' commercial mortgage lending grew from 3 percent of total assets in 1980 to slightly more than 7 percent in March 1992, with each percentage point of increase now being applied to an asset base of $3.4 trillion. Construction and land loans rose from 2 percent to a high of 4 percent in 1989, falling thereafter to nearly 3 percent by early 1992. Multifamily mortgages remained a relatively small though increasing percentage of commercial bank assets throughout the period.

The massive shift of commercial bank assets in the 1980s into real estate loans went largely unnoticed until late in the decade, in comparison to the attention paid to savings and loans. Even late in the decade, as Donald Hester notes, the industrywide shift toward real estate by commercial banks continued, running counter to the negative effects on real estate values of the 1986 tax law changes and the increasing vacancy rates in most parts of the nation. Commercial banks also lengthened the maturity of their commercial real estate loans during the 1980s. Construction loans were extended into "miniperms" and some loans were made without a commitment for permanent financing. Regulatory inducements for such behavior were provided by the Garn-St Germain Depository Institutions Act of 1982, which deleted the rigid statutory limitations on the real estate lending authority of national banks in the hope of encouraging more creative and flexible financing. Life insurance companies experiencing real estate problems in recent years have had difficulty providing the permanent financing for the maturing construction loans and miniperms at commercial banks. Only as late as 1990 and 1991 did the decline in the construction and land loan percentages and the slowing growth in home mortgages indicate a tapering off in the overall real estate loan growth at commercial banks.

The share of savings banks' assets allocated to real estate lending fell from 59 percent to 52 percent between 1980 and 1983, and then rose to 60 percent by the end of the decade. In March 1992, about one-third of the $236 billion total in savings bank assets was in commercial, multifamily, and construction and development mortgage loans. In addition to the credit unions' substantial and increasing commitment of nearly $230 billion in assets to home mortgages, their other real estate loans rose from 5 percent of assets in 1986 to 9 percent in 1991.

The Current Situation at Depositories

Many depositories now have substantial troubled (noncurrent and foreclosed) real estate loans in their portfolios, whose weak condition has been a drag on industrywide averages for several years, to the dismay of the healthier institutions. In March 1992 commercial banks had $68 billion, savings and loans $36 billion, and savings banks $13 billion in troubled real estate holdings; and in April 1992 the Resolution Trust Corporation had $96 billion in receivership assets under its management, of which $12 billion was in real estate owned and $7 billion in noncurrent loan construction and land loans. The highest noncurrent rates at depositories occur in construction and land loans, multifamily mortgage loans, and commercial mortgage loans.

Weakened real estate markets, risk-based capital requirements, closer scrutiny of real estate loans by regulatory examiners, and now the proposed limits on loan-to-appraised-value ratios (not to mention overall sluggish economic growth) are inducing many depositories to restructure their asset portfolios. In particular, the risk-based guidelines require savings and loans and banks to hold twice the capital per dollar for commercial real estate loans that is required for qualifying single-family mortgage loans, and five times the capital per dollar for commercial real estate loans, relative to most mortgage-backed securities.

In the first quarter of 1992, the average spread between short-term and long-term yields on Treasury securities was 390 basis points (up from 218 basis points a year earlier) and the average spread between 30-year fixed-rate mortgages and 30-year Treasury bonds was 75 basis points (down from 139 basis points a year earlier). With 911 problem commercial banks holding $463 billion in assets, commercial banks understandably increased their holdings of U.S. government obligations (non-mortgage) by $57 billion and their collaterized mortgage obligations by $37 billion, compared to the first quarter of 1991. At the same time, all real estate lending increased by $16 billion and commercial and industrial loans fell by $54 billion. Such portfolio changes are interpreted by many as having created a credit crunch, thereby retarding economic growth.

Where Do We Go from Here?

Most disturbing about the events of the recent financial past is the fact that 4,350 federally insured depository institutions failed from 1980 through 1991, with combined assets totaling more than $580 billion and collective costs to resolve the failures exceeding $150 billion. Some argue that the policies of the Federal Reserve to combat inflation in the late 1970s helped destroy the savings and loans, and that the Fed's more

recent policies to stimulate the economy helped the banks. Others argue that depository institutions gambled with federally insured deposits—the moral hazard problem. Still others argue that managers of depository institutions pursued their own interests, which included an emphasis on sheer size, even when profits suffered—the agency problem. Add fraud and mismanagement, exogenous financial innovations, tax and regulatory factors, regional and macroeconomic shocks, and greater domestic and international competition, and one has relatively little difficulty explaining what happened to depository institutions and their involvement in real estate during the past decade. But weighing the relative contribution of each factor is extremely difficult, as Hester indicates.

Despite all the difficulties and challenges confronting depository institutions, even they do not agree as to where we go from here. At year end 1991, the 87 percent of all savings and loans that were under $500 million in size held 25 percent of total industry assets; the 95 percent of banks that were of similar size also held 25 percent of their industry's total assets. These institutions disagree over what the legally permissible banking and branching choices across state borders should be. Moreover, not only do depository institutions differ among themselves but they also differ with securities and insurance firms as to whether depositories should be permitted to offer products and services in these areas, even as inroads are increasingly being made through limited authority granted by states and the Federal Reserve. Interestingly enough, depositories in several other countries have already been granted such broader authority.

Meanwhile, telecommunications and computers continue to slash information and transaction costs. As these developments occur, one must question the tradition of viewing and therefore regulating depositories as separate and distinct financial service firms, serving narrowly circumscribed geographical areas and owned by a limited class of entities. Indeed, it is time to let healthy depositories, with the demonstrated ability to measure, manage, and price risk, compete more fully rather than continually subjecting them to the enforceable guesses of regulators as to which specific menu of products and services adequately protects taxpayers in an ever-changing global marketplace. At the same time, it is incumbent upon regulators to remove unhealthy institutions promptly and cost-effectively from an already overcrowded financial services industry. This requires careful monitoring, since the interest rate risks and credit risks for depositories are asymmetric and nonlinear, insofar as good earnings on assets typically range from 70 to 100 basis points, while losses on assets have recently averaged from 10 to 45 percent.

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Discussion

*Gerard S. Cassidy**

Donald Hester has presented an incisive paper on the impact of the recent real estate collapse on financial intermediaries. He first discusses the reasons why major lenders moved so far into the mortgage markets during the 1980s. His analysis summarizes the history of the mortgage markets that led up to the most recent decade; the reasons for the involvement of the three principal private sector intermediaries—commercial banks, savings and loans (and savings banks), and life insurance companies—in the mortgage markets; and the warning signs that became evident during the 1980s. Finally, he offers solutions to the problems the intermediaries now confront. Overall, I agree with most of Hester's observations, analyses, and conclusions regarding the mortgage market and its participants. These comments will briefly summarize some key sections of his presentation, in particular the areas where I disagree with him and the areas that I believe were underemphasized.

Expanded Real Estate Lending

The essence of Hester's paper, and the reason we are gathered here today, lies within his section titled *Explanations for Changing Mortgage Lending by Intermediaries*. Here he hypothesizes as to why each type of intermediary entered the real estate mortgage market. I will focus most of my attention on the commercial banks, but will first discuss briefly the thrifts and the life insurance companies.

Hester argues that, as a result of the interest rate problems the thrift

*Senior Vice President and Equity Analyst, Tucker Anthony, Inc.

industry experienced in the early 1980s, many thrifts expanded aggressively into the real estate mortgage markets; I agree with this entirely. The expansion into the mortgage markets led eventually to significant losses for the industry and subsequent failures of hundreds of thrifts. Excluding failures attributed to fraud, embezzlement, and the like, it is important to note that many of the thrift failures reported in the 1980s were the direct result of aggressive growth in commercial real estate lending, particularly in the construction and development markets. Residential mortgage lending was not a significant factor in causing thrift failures, in my opinion. I should also point out that the thrift failures I refer to are those in New England.

An example to support this statement is the failure of the Maine Savings Bank. This bank was a traditional thrift, established in 1859 as the Portland Five Cents Savings Bank. It survived the Civil War, World War I, the Great Depression, and World War II, but was unable to survive the real estate boom-to-bust cycle of the 1980s. The bank failed on February 1, 1991. Its demise began in the mid 1980s as it aggressively expanded its commercial real estate lending, particularly in construction and development. From 1984 to 1988 (the peak in the company's loan portfolio), commercial mortgages grew from $151.1 million or 13.7 percent of total assets to $714.8 million or 27.9 percent of total assets. Construction loans expanded from $54.9 million or 5.0 percent of total assets to $450.9 million or 17.6 percent. Residential mortgages grew from $351.3 million or 32 percent of total assets to $671.1 million, but as a percentage of assets they declined to 26 percent. In 1984 commercial real estate and construction loans represented 150 percent and 54.5 percent, respectively, of shareholders' equity. In 1988 they represented 715 percent and 297 percent of shareholders' equity. By year end 1990, the company charged off close to $175.0 million in its commercial real estate portfolio; this eliminated the company's net worth.[1]

The implication of Hester's hypothesis is that all real estate lending led to the thrift crisis. I would suggest that the primary problem leading to the failure of hundreds of thrifts and banks in the 1980s was aggressive commercial real estate lending, not residential lending.

I accept Hester's hypothesis regarding the life insurance industry's change in the asset side of its balance sheet. The industry moved into more liquid assets because of the changing nature of its liabilities. I would add the following: the increased competition from the thrifts and commercial banks for commercial mortgages may also have influenced the life insurance companies' ability to attract mortgage loans. As the competition intensified, life insurance companies were unable or unwill-

[1] These financial data are taken from the company's annual reports, 1985 to 1990.

ing to compete on the terms the market was dictating and were forced to invest in other, more liquid securities.

Hester offers three explanations for the aggressive increase in mortgages outstanding for the commercial banking industry. First, the capital markets have provided numerous financial derivatives such as interest rate swaps, options, and futures that banks can utilize to immunize themselves against interest rate risk. Additionally, the advent of the adjustable rate mortgage has given banks increased flexibility to hold loans in their portfolios rather than sell them in the secondary market. As a result of these changes and options, banks have been more willing to retain mortgages, which has led to the greater exposure to the real estate mortgage market.

Second, changes in the tax-deductibility of interest expense have encouraged borrowers to use mortgage financing (home equity loans) for multiple purposes. This has led to an increased demand for mortgage loans.

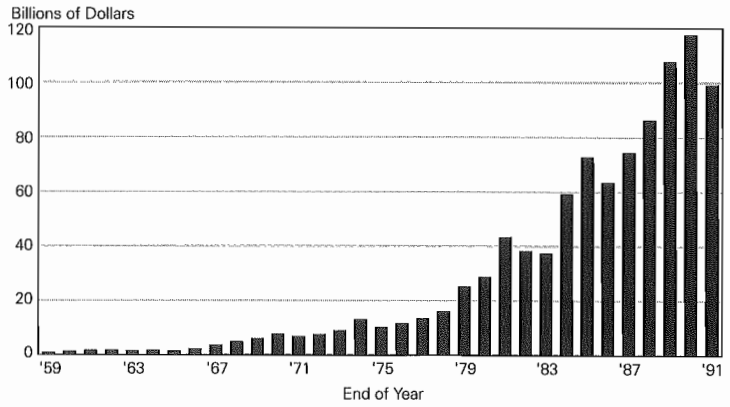
Third, changes in the loan markets that banks serve have made it likely that banks would have greater expected profits if they increased the percentage of their loan portfolios in real estate loans. As Hester points out, however, this argument is difficult to support because bankers rarely announce the rates of return they realize. I would suggest that the average yields on a selected group of assets, say, commercial mortgages, could be used as a method of measuring potential rate of return. Hester also argues that increased competition from foreign banks conducting business in the United States, and the growing commercial paper market, have taken away banks' lucrative commercial and industrial loan business. It is this area I will expand upon.

Nonbank Competitors of Banks

The banking industry has seen a significant increase in competition from nonbank competitors over the past 30 years. The nonbank competition has an advantage over the banking industry in two areas, cost and revenue opportunities. Nonbank competitors do not have to deal with the higher costs associated with the banking business, empirical or anecdotal. Empirically, deposit insurance premiums have steadily increased over the past two and one-half years from $0.12 per $100 in deposits to $0.254 per $100 in deposits, effective January 1993. Banks also are required to keep upwards of 10 percent of their net transaction accounts on reserve at the Federal Reserve in non-interest-bearing accounts. Finally, the Community Reinvestment Act forces banks to accept loans from borrowers that may not meet the banks' underwriting standards and may have a higher degree of potential for loss. Nonbank competitors are not restricted by any regulatory agency that determines

Figure 1

Volume of Commercial Paper Outstanding



Board of Governors of the Federal Reserve System: *Balance Sheets for the U.S. Economy 1945-90,* March 1991, & *Flow of Funds Accounts,* Third Quarter 1992.

which businesses are acceptable. Even more important, nonbank companies are expanding aggressively into lucrative banking products such as credit cards.

Perhaps the most important financial event of the past 30 years has been the development of the commercial paper market (Figure 1). I believe the development of this market has been the primary reason for bank expansion into riskier loan areas. With the development of this market, the banking industry's primary customers—Fortune 500 companies—have been able to bypass the banking industry for their primary borrowing needs. Expansion into the commercial real estate market was needed to offset the loss of this commercial and industrial loan business.

I believe that encroachment on the banks' most profitable businesses by nonbank competitors will continue to affect banks adversely. Merrill Lynch is a good example of a nonbank competitor that operates in many traditional bank markets. Today, Merrill Lynch offers money market savings accounts that include a credit card and check writing privileges. The company also originates small business loans and home mortgages. Ranked by its money market deposits, which are estimated to be over $60 billion, Merrill Lynch would be the fourth largest bank in the United States. Thus, nonbank competition and the development of the commercial paper markets are two primary reasons why banks have been forced to increase their exposure to commercial real estate markets.

Other Economic Factors

In his section titled *Problems in Real Estate Markets and Scenarios for Resolution,* Hester mentioned that problems in the residential and commercial real estate markets were evident throughout the 1980s, which should have alerted lenders and regulators that borrowers of commercial mortgages would have trouble meeting their obligations. I concur with many of the hypotheses presented; however, regional economic cycles also have to be considered when interpreting the growth of commercial real estate mortgages. Second, many of the financial intermediaries did not have adequate systems in place to monitor their loan portfolios. Finally, the use of interest reserves in commercial real estate lending disguised the true performance of commercial mortgage portfolios.

Hester discusses the impact that demographic shifts and falling home prices will have on residential real estate delinquencies. He cites Mankiw and Weil (1989) and Garner (1992), who hypothesize that these trends are likely to deteriorate in the future and should lead to lower residential real estate prices. Hester believes that a significant rise in home mortgage delinquencies is not likely to occur as long as the residential property is not over-leveraged. I agree, but would also add that as long as the homeowner is employed, the probability of default is low. Lower home prices would prevent the homeowner from trading up to a larger, more expensive house (assuming the current value of the home is below the amount the owner paid) rather than cause massive numbers of defaults on home mortgages.

Hester presents data supplied by the National Council of Real Estate Investment Fiduciaries (NCREIF) that measure the return on commercial real estate from 1979 to 1992. The capital rate of return has been negative from 1987 through 1992. The income rate of return has been positive every year in the time period covered. He also presents the national downtown vacancy rates, as compiled by CB Commercial Real Estate Group, Inc. from 1979 to 1992. The deterioration in vacancy rates has been dramatic, rising from 3.4 percent in March 1980 to 18.8 percent in March 1992. These two indices suggest that aggressive lending into the commercial real estate markets was misguided.

Why did the banking industry expand so aggressively into the commercial real estate markets? First, as indicated earlier, the rapid growth of the commercial paper market forced the banking industry to look for new areas of lending. Second, a generation of bankers grew up with the misperception that commercial real estate prices rarely decline. The REIT crisis in the early 1970s suggested otherwise, but most commercial loan officers either were in high school at the time or had short memories. Lending against commercial real estate was considered less risky than unsecured commercial and industrial lending because the

lender had collateral supporting the loan. Third, the high inflation rates of the late 1970s and early 1980s added tonic to the rising values of commercial real estate.

Fourth, regional economic growth encouraged increased commercial real estate lending. Two vivid examples were Texas and New England. In my discussions with bankers in both regions during the periods of rapid economic growth, bankers held the attitude that their regions were recession-proof. In Texas, the common refrain was "The economy is recession-proof because of the oil industry." In New England five years later, the refrain was "New England is not another Texas because the economy is more diversified than the Texas economy." Obviously both of these statements proved to be untrue.

Fifth, underwriting standards were eased to boost bank competi-

"Well, it sure looks like Texas, and yet . . ."

Drawing by Ziegler; © 1990 The New Yorker Magazine, Inc.

tiveness. Sixth, the banking industry was not equipped to handle the rapid growth in loan portfolios. The banks were unable to maintain adequate control over the loan review process, and in some cases a bank had no independent loan review function. Finally, the creation of interest reserves disguised the true performance of the commercial loan portfolio. Interest reserves typically were established at the time the commercial real estate loan was originated, to carry the developer through construction and into the first two years of lease-up. Although the loan was current the building may not have been generating cash flow adequate to cover debt service. In such cases, the cash flow shortfall was offset by the interest reserve. Furthermore, developers would divert cash flow from other properties to keep the loan current.

Conclusion

In offering solutions to problems in the commercial real estate market, Hester suggests that excess capacity will be absorbed over time by an expanding economy. In the event the financial system cannot sustain the losses created by real estate problems, a taxpayer bailout may be required. The transfer of ownership to large pension funds and other trusts would assist in the recovery. However, large losses would be incurred by the lending institution that had the original loan. Finally, a restructuring of the financial markets, together with an ongoing reduction in the number of financial institutions, may improve the profitability of the survivors.

I agree with the author's solutions, painful though they are. In fact, I agree with nearly all of his work, but I would place greater emphasis on the impact that deregulation of the capital markets had on the banking industry. I believe that the deregulation of the capital markets was the primary catalyst in forcing commercial banks to expand rapidly into commercial real estate lending.

Crunching the Recovery: Bank Capital and the Role of Bank Credit

*Joe Peek and Eric S. Rosengren**

Other papers presented at this conference have documented the substantial recent decline in real estate prices and the impact of this decline on financial institutions. This paper will take the decline in bank capital as a result of exposure to real estate as given, and address how banks have responded to their deteriorated financial condition. The paper will show that real estate losses, combined with increased regulatory scrutiny of bank capital, have resulted in substantial shrinkage of bank assets. Thus, the conclusion will be that New England is suffering from a regulatory-induced capital crunch.

Complaints of reduced credit availability have been widespread during both the recession and the anemic recovery. As early as July 1990, Federal Reserve Chairman Greenspan attributed weak economic growth to problems with credit availability. Despite the statements by major policymakers and the public outcry concerning the credit crunch, its importance, both in macroeconomic fluctuations and in the transmission of monetary policy, continues to be hotly contested.

Questions about the importance of credit crunches remain unresolved for two reasons. First, the term is not well defined and thus is applied to a wide range of circumstances. Second, while much theoretical work has been done on credit rationing, definitive empirical tests for a credit crunch are lacking.

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*Professor of Economics at Boston College and Visiting Economist, Federal Reserve Bank of Boston, and Vice President and Economist, Federal Reserve Bank of Boston, respectively. The authors thank Robert Chicoski for able research assistance. Helpful comments were received from Alicia Munnell and Richard Kopcke. The views expressed in this paper are those of the authors and do not necessarily reflect official positions of the Federal Reserve Bank of Boston or the Federal Reserve System.

The term "credit crunch" often serves as the description of any unexplained sluggishness in the economy. To make the term operational, it should be reserved for a situation of widespread nonprice rationing of credit. Thus, a credit crunch can be characterized as a period of extensive excess demand at the going "price" in the credit markets. As such, a credit crunch implies a nonrate "pricing" of credit supply rather than a disruption of demand.

But even with a precise definition, identification of a credit crunch episode remains difficult. Because weak loan demand is often associated with reduced aggregate demand, observed slow growth in credit cannot necessarily be attributed to a reduction in the supply of credit. The inability to completely disentangle supply and demand effects in empirical analyses prevents researchers from showing conclusively that credit crunches are a significant economic phenomenon.

Credit crunches have been the subject of much previous research. Historically, this research has had two focuses. One approach, the equilibrium credit rationing model (Stiglitz and Weiss 1981), tries to explain why prices (or interest rates) would not adjust to equate demand and supply in credit markets. The other, the disintermediation credit rationing model (Wojnilower 1980), examines institutional impediments that could disrupt credit markets. Unfortunately, neither of these areas of research is particularly applicable to the current situation.

The more recent capital crunch model tries to explain current problems with credit availability by emphasizing the importance of capital regulation (Syron 1991; Peek and Rosengren 1992b). Banks suffering large losses of capital are required by regulators to quickly restore capital ratios. With earnings reduced and investors resistant to purchasing new equity from a capital-depleted institution, banks satisfy capital-asset ratios by shrinking their assets. This shrinkage frequently requires the calling of loans and refusals to either extend credit or renew limits on existing lines of credit, as agreements mature.

The first section of this paper describes some of the problems that have generated the widespread complaints of a credit crunch. The second section briefly discusses past research. The third section describes the capital crunch hypothesis and summarizes recent research that has documented the widespread loss of bank capital and the subsequent shrinkage of bank assets. The fourth section extends this research by describing the clear regulatory link between low bank capital and shrinkage of bank assets. The final section offers some conclusions and policy recommendations.

Table 1
Real Growth in GDP after the Six Most Recent Recessions, Ordered by the Size of the GDP Gap at the Trough

Recession Trough	Real GDP Gap[a] (Percent)	Real GDP Growth Rate One Year from Recession Trough	Real GDP Growth Rate Two Years from Recession Trough
1982:IV	9.0	6.7	5.8
1975:I	6.1	6.4	5.0
1980:III	4.7	3.5	.3[b]
1991:II	4.6	1.5	2.1[c]
1961:I	3.6	6.4	4.9
1970:IV	2.5	3.6	5.3

[a]The Real GDP Gap is calculated as 100 * (full-employment real GDP – actual real GDP)/full-employment real GDP, using the DRI series for full-employment real GDP.

[b]The two-year growth rate following the 1980:III trough includes the decline associated with the subsequent recession and thus is not representative of a recovery period.

[c]1992:III-1993:II calculated using DRI (August 1992) forecast.

Source: Data Resources, Inc.

Are We Experiencing a Credit Crunch?

The renewed interest in credit crunches has been inspired, in part, by the widespread and vocal complaints of small and medium-sized businesses unable to obtain credit. The outcry has been particularly noticeable in New England, where such complaints have attracted the attention of the press and politicians. Despite the anecdotal evidence produced by a series of congressional hearings and press reports, many observers have remained skeptical. However, concerns with credit availability have been buttressed by the perception that recent economic patterns have been unusual. Before describing past and current research on credit crunches, it is useful to review the atypical economic patterns that have been cited as evidence that we are experiencing a credit crunch.

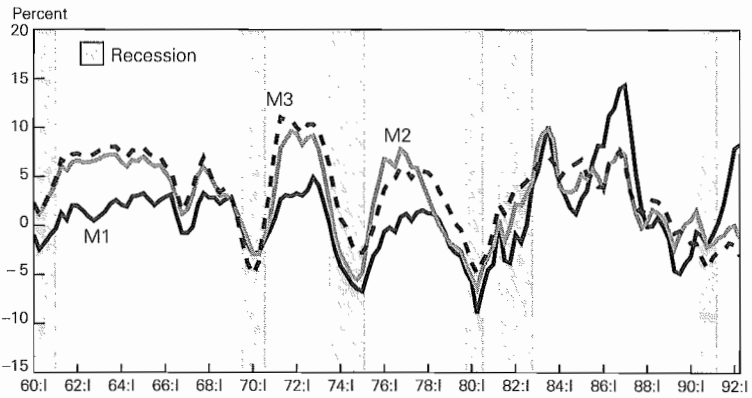
Weak Economic Growth

Economic growth has been unusually weak during this recovery. Table 1 provides growth rates of real gross domestic product (GDP) for the one-year and two-year periods immediately following the six recession troughs since 1960, ordered by the size of the real GDP gap at the trough. Even though the GDP gap for the 1991:II trough is in the middle of the range for the six recessions, the growth rate for the first year of this recovery has been only 1.5 percent, less than half the rate of the next slowest recovery. If the growth rate for the two-year period following 1991:II is projected by combining the actual growth rate for the first year

Figure 1

Growth in the Real Money Stock

1960:I to 1992:II
Four-Quarter Moving Average



Source: Data Resources, Inc.

and the DRI forecast for the 1992:III to 1993:II period, that growth rate is anticipated to be less than one-half the fairly uniform rates of the four other recoveries not distorted by a subsequent recession.

This recovery is clearly an outlier, and its slow speed cannot be attributed to a particularly shallow recession as measured by the GDP gap. Furthermore, of the six recessions since 1960, only this most recent one had a larger real GDP gap one year after the trough than it had at the trough. That is, not only has the recovery been atypically slow, but the first year was not truly a recovery: the economy continued to lose ground relative to the full-employment level of real GDP and thus continued to suffer from a growth recession.

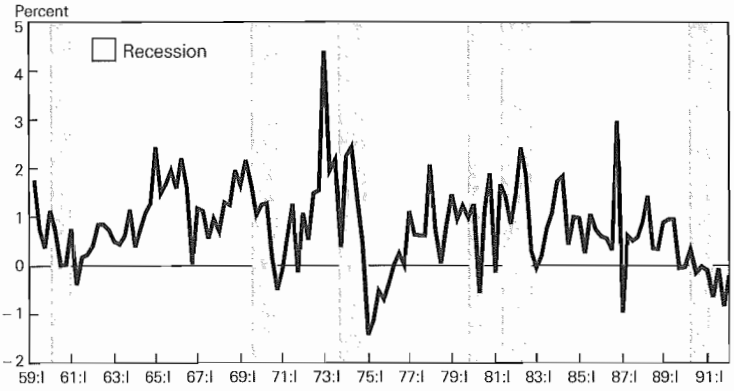
Behavior of the Monetary Aggregates

The monetary aggregates have been following an unusual pattern. Figure 1 shows the growth rates of three measures of the real money stock for the period since 1960. Recession periods have been shaded. During previous recoveries, all three monetary aggregates have shown robust growth in the initial stages of recovery. The broader aggregates have picked up before M1 and generally have grown much faster than M1 during the recovery period. The recent recovery period has been an exception, however. Neither M2 nor M3 has rebounded. Both continue

Figure 2

Flow of Bank Loans Relative to Tangible Bank Assets

1959:II to 1992:I



Source: Board of Governors of the Federal Reserve System, *Flow of Funds Accounts.*

to experience negative growth rates, and the most recent data show that their growth rates have begun to decline again. In contrast, M1 has rebounded sharply. And, atypically, its rebound has both preceded and exceeded that of the broader aggregates.

Limited Availability of Bank Credit

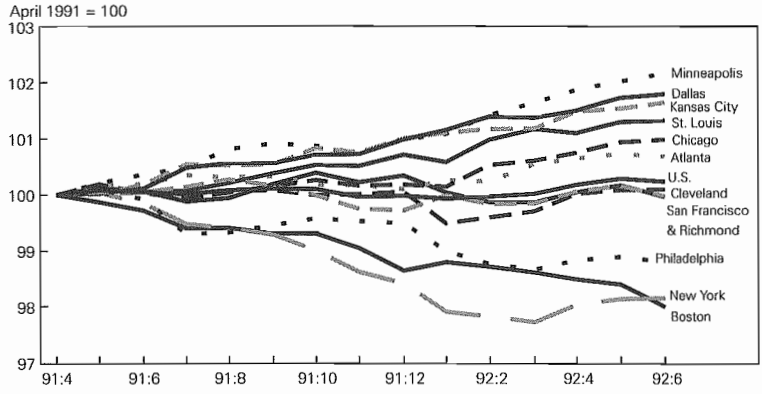
Bank credit has been unusually weak during the recovery. Figure 2 shows the flow of total bank loans to nonfinancial corporations, scaled by nonfinancial corporations' tangible assets. Recession periods have been shaded. In earlier recessions, bank loans declined sharply but then began to grow soon after the recovery was under way. While the most recent recession appears to have ended in the spring of 1991, bank lending continues to decline and still shows no evidence of a turnaround more than a year later.

Varying Regional Conditions

Economic problems are not uniform across geographic regions. The most recent economic downturn has been particularly concentrated in New England and the Mid Atlantic states, regions that also have been experiencing a slump in real estate prices. Figure 3 presents indexes for

Figure 3

Index of Total Nonagricultural Employment, by Federal Reserve District



Source: Federal Reserve Bank of Dallas.

total nonagricultural employment since April 1991 for the nation and for each Federal Reserve District. Three Districts stand out: Boston, New York, and Philadelphia. They represent the Northeastern portion of the country and are the regions exhibiting the most noticeable declines. In fact, without these three Districts, the horizontal national index instead would have an upward slope, albeit a rise at a much slower pace than is typical of a recovery. While several regions of the country experienced regional recessions during the 1980s, the Northeastern slump became a national recession and, unlike previous regional recessions, has been associated with a credit crunch.

Past Research on the Credit Crunch

Previous research into credit crunches has focused on two major themes. Equilibrium credit rationing describes why nonprice credit rationing can exist in a world of flexible interest rates. Thus, it shows that even without institutional impediments, credit rationing can persist. The disintermediation model describes how credit markets can be particularly dysfunctional if institutional impediments prevent the free flow of credit.

Equilibrium Credit Rationing

Equilibrium credit rationing models such as the one presented in Stiglitz and Weiss (1981) show that excess demand for loans may persist because of the high cost to the lender of obtaining information. These models show that the interest rate charged by a bank can affect both the composition of the pool of borrowers seeking loans and the incentives that borrowers have to undertake risky projects.

Bank profits depend on the riskiness of the loans they make (the probability of repayment) as well as the interest rate charged on the loans. Borrowers have different probabilities of repayment, but banks may have difficulty distinguishing those likely to pay from those who are not. This leads to an adverse selection problem, which causes banks to behave differently than might be expected in models that assume costless information.

Faced with an excess demand for loans, banks may not increase the interest rate they charge sufficiently to clear the loan market. If banks were to eliminate the excess demand for credit by raising the interest rate enough to shrink the pool of potential borrowers to the available supply, primarily low-risk borrowers would be driven out of the market. Those left in the pool would tend to have riskier projects with a higher probability of default. That is, given the well-known trade-off between risk and return, only those investing in high-risk projects with high expected returns (or, alternatively, those not intending to repay the loan) would be able to afford the higher interest costs of the loan. If the decreased probability of loan repayment from the remaining lending opportunities more than offsets the gains from the higher interest rate on the loans that do not default, banks' expected profits from making loans to this smaller pool of potential borrowers would fall.

Similarly, the terms of the loan contract can alter the behavior of borrowers (the moral hazard problem). Borrowers who pay high interest rates have an incentive to invest in projects with high expected payoffs and, thus, high risks and high default probabilities. Because of the moral hazard and incentive problems associated with lending, bank profits may be maximized at an interest rate that reduces the average risk of default but leaves some borrowers who are willing to pay higher interest rates still unable to obtain credit.

The equilibrium credit rationing model is one explanation of why credit rationing might occur. However, it is of limited use in explaining the current situation. The key insight of the equilibrium credit rationing model is that the high cost of information may result in excess demand for loans, as banks have difficulty differentiating risky from less risky borrowers. While the problems of adverse selection and moral hazard are likely to be more severe in any economic downturn, there is no reason to believe that credit information has become unusually costly or

that borrowers have become unusually risky in this recession as compared to previous recessions.

The equilibrium credit rationing model also does not explain the larger than normal declines in bank credit. Furthermore, to address the geographic disparities in economic performance, it must explain why information is dramatically more costly or borrowers dramatically more risky in the Northeast relative to the remainder of the country. For example, could the behavior of real estate values in the Northeast account for enough additional uncertainty to make the equilibrium credit rationing model consistent with the geographic differences in economic performance? While this model does explain why credit rationing might occur and persist, it does not describe the unusual conditions of the current period.

Disintermediation

The disintermediation model of credit crunches emphasizes institutional impediments that prevent banks from satisfying credit demands (Wojnilower 1980, 1985). Usually, crises in the banking system have been relatively brief, triggered by monetary restraint and a sharp rise in market interest rates. As market rates rose, interest rate ceilings prevented banks from raising deposit rates commensurately. Depositors reacted to the higher market interest rates by removing deposits from the banking system and placing them in other assets paying market rates; that is, disintermediation occurred. As their liabilities were drained, banks had to shrink their assets. Because of longer-term loans currently outstanding and commitments to provide lines of credit, banks continued to provide credit to many of their customers, although demand loans might be called and maturing loans might not be renewed. Furthermore, borrowers without insurance against a credit crunch via their banking relationship were unable to obtain credit, even at sharply higher interest rates.

While the disintermediation model is an attractive explanation of previous credit crunches, it does not appear to explain current problems. The interest rate patterns and regulatory impediments that made the model so cogent in the past do not fit current circumstances. Furthermore, the credit crunch problem has persisted, rather than being a brief disruption to credit flows as in past episodes. Finally, the degree of severity has differed markedly across geographic regions, unlike the more general nationwide phenomenon that might be expected in a liquidity squeeze associated with disintermediation.

The Capital Crunch Model

While the disintermediation hypothesis was predicated on a liquidity squeeze, the capital crunch hypothesis is based on a capital squeeze. A reduction in bank capital lowers a bank's capital-asset ratio. If the reduction is large enough to push the capital-asset ratio below that required by capital regulations and those regulations are enforced, the bank must increase its capital-asset ratio. Banks with low or no earnings have only two options: raise new capital or reduce assets and liabilities. Accurate assessments of troubled banks are virtually impossible without an in-depth appraisal of the loan portfolio, and so banks that have recently lost capital have difficulty convincing investors that prospects for the future, rather than problems of the past, motivate their attempts to raise new equity. When such incentive problems make it impossible for viable banks to raise new equity quickly and at a "fair" price in order to replenish their capital, they are forced to shrink.

Banks can shrink by selling securities, selling assets, or reducing loans. Because of potential liquidity problems, many troubled banks prefer to increase rather than reduce their securities holdings. Banks frequently can sell assets, although it may require shedding their most profitable lines of business. Outstanding loans can be reduced by making no additional loans and either calling or refusing to renew existing loans. Any of these forms of asset shrinkage can help satisfy capital ratios, but a reduction in the loan portfolio can seriously impair not only the long-run viability of the bank but also the operations of local business community members dependent on the lending relationship.

While reducing loans to satisfy a capital ratio at one particular bank can disrupt historical lending relationships, the disruptions should be short-lived so long as some well-capitalized banks are available as lending alternatives. If, however, all banks in a region experience large losses simultaneously, no immediate alternative source of funds may be available. This is particularly true for small and medium-sized businesses that are not large enough to be customers either of large banks outside the region or of nonbank lenders such as insurance companies or pension funds, and not large enough to access capital markets directly. For bank-dependent borrowers, this situation can cause financial distress and even financial collapse associated with the problems of the lender rather than problems of the borrower. Binding capital regulations on capital-impaired banks might be salutary (at least for the Federal Deposit Insurance Corporation) as long as financial difficulties are isolated, but they can worsen macroeconomic performance if banking problems are widespread.

Recent Research on the Capital Crunch Hypothesis

Recent research has focused on two of the links in the capital crunch hypothesis. The first is the widespread loss of bank capital that resulted from declines in real estate prices, documented in Peek and Rosengren (1992a). The second is the shrinkage in bank assets, which has been most concentrated in poorly capitalized institutions; this has been investigated by Bernanke and Lown (1991), Hancock and Wilcox (1992), and Peek and Rosengren (1992b, 1992c). The next section briefly describes the evidence to date with particular reference to New England, where the problem is most acute.

Real Estate and the Decline in Bank Capital

New England real estate, like the New England economy, boomed during the early 1980s. Increases in defense spending and strong sales for computers and other high technology items manufactured in New England resulted in sharp declines in unemployment. Between 1986 and 1988 the unemployment rate averaged less than 3.5 percent, significantly below that of the nation.

Tight labor markets were soon followed by tight housing markets. House prices accelerated rapidly, with the median sales price of a house in Boston doubling between 1984 and 1988. As house prices rose, the incentive for new construction also rose. From 1980 to 1988, the population of New England increased by only 5 percent, yet employment in the construction sector grew by 76 percent.

The boom in construction was possible only with substantial new financing, much of which came from commercial and savings banks. The first column of Table 2 highlights the rapid growth in real estate loans by commercial banks in New England. While real estate loans grew rapidly in the nation (97.8 percent), they grew much faster in New England (269.9 percent). The growth was particularly rapid in construction loans, the most speculative of real estate loans, which increased more than three times faster in New England than they did in the rest of the country. This rapid expansion caused New England banks to be more highly exposed to any downturn in the real estate sector. In 1984 New England commercial banks had a slightly greater share of their total assets in real estate loans than banks nationwide (16.6 percent versus 14.6 percent). But by 1989 New England banks had nearly doubled that share, raising it to 31.4 percent compared to only 21.9 percent for commercial banks nationwide.

When the bubble burst, little could be done to save many of the lending institutions that were overly concentrated in real estate. The ratio of nonperforming loans (defined here as the sum of loans 90 days past due and nonaccruing loans) to total loans outstanding in New

Table 2
Percentage Change in the Assets and Liabilities of FDIC-Insured Commercial Banks, New England and the United States

	New England Growth Rates			United States Growth Rates		
Item	1989 1984	1991:I 1990:I	1992:I 1991:I	1989 1984	1991:I 1990:I	1992:I 1991:I
Assets	95.1	−8.3	−5.3	31.9	1.2	2.4
Loans	136.8	−13.9	−11.1	49.9	1.8	−2.8
C&I	95.2	−17.7	−12.9	24.0	−2.5	−9.9
Consumer	62.0	−16.7	−8.6	55.3	−.6	−3.7
Real Estate	269.9	−9.6	−9.3	97.8	7.5	2.4
Construction	332.1	−35.2	−47.1	89.3	−10.4	−21.0
Liabilities	95.1	−8.3	−5.3	31.9	1.2	2.4
Total Deposits	87.9	−4.6	−6.1	30.9	2.7	2.4
Capital	114.4	−7.2	2.7	37.2	5.7	7.0

Source: Call Reports.

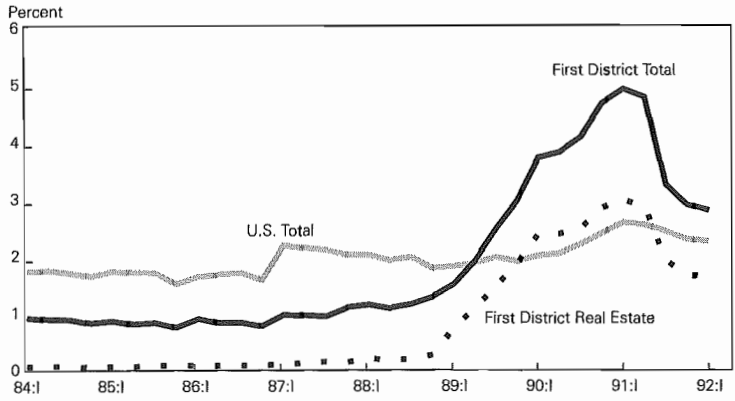
England rose sharply in 1989, primarily because of real estate lending (Figure 4). As banks and examiners realized that loan losses would be substantially greater than anticipated, they increased loan loss reserves dramatically. This, in turn, seriously depleted bank capital.

Banks quickly tried to reduce their exposure and rebuild their capital-asset ratios. As the second and third columns in Table 2 show, the decline in commercial bank lending in New England has been substantial over the past two years. Although loans by commercial banks nationwide grew by 1.8 percent between the first quarter of 1990 and the first quarter of 1991, and declined by 2.8 percent between the first quarter of 1991 and the first quarter of 1992 (columns 5 and 6), commercial bank lending declined by 13.9 percent and 11.1 percent respectively in New England during the corresponding periods. Bank capital in New England declined significantly in 1990, in contrast to the nationwide experience; however, it increased by 2.7 percent between the first quarter of 1991 and the first quarter of 1992. This improvement in bank capital levels and the decline in nonperforming loans are hopeful signs of a mitigation of the capital crunch in New England.

Any effective attempt to relate capital to risk during the construction boom would have required a significant buildup of capital while banks were increasing their exposure to real estate. The capital ratios of banks did improve somewhat during the boom, but the gains were quickly depleted once real estate prices declined. Unfortunately, instead of enforcing more stringent capital ratios during the boom, regulators adopted them during the bust. The result has been weakened banks attempting to satisfy capital ratios by shrinking. If the increased expo-

Figure 4

Nonperforming Loans as a Percentage of Total Bank Assets



Source: Call Reports for FDIC-insured institutions. Changes in a data series also reflect changes in the number of FDIC-insured institutions.

sure to real estate lending had been isolated among a few banks, the problem would have had little impact on the regional economy. Borrowers unable to find financing from capital-depleted institutions would have been able to turn to their better-capitalized competitors. However, because most banks significantly increased their exposure to real estate, virtually all the large lenders in New England suffered large losses of capital.

Bank Capital and Bank Shrinkage

Once banks had experienced large losses, capital regulations became binding on many of New England's largest banks. Unable to raise new equity and expecting only a gradual improvement in earnings, some banks were forced to shrink both their assets and their liabilities. While such shrinkage could be the result of weakened loan demand associated with the recession, the capital crunch hypothesis predicts that poorly capitalized institutions would shrink their assets and liabilities more than their better-capitalized competitors. This hypothesis can be tested by estimating the following equation, with a positive predicted sign for a_1:

$$(1) \qquad Dep_i = a_0 + a_1 \frac{K_i}{A_i} + a_2 \log(A_i) + a_3 FEE_i + a_4 \frac{CI_i}{A_i} + a_5 \frac{RE_i}{A_i} + \epsilon_i.$$

The dependent variable is the percentage change in total deposits (DEP) from the first quarter of 1990 to the first quarter of 1991. While this study focuses on total deposits, similar results were obtained using disaggregated assets and liabilities. The beginning-of-period capital-asset ratio is calculated using first-quarter 1990 data for total equity and assets.

Limiting the sample to New England banks greatly reduces (though it may not eliminate) the variations in loan demand shocks across banks in the sample. It is still possible that banks specializing in particular types of loans experience different demand shocks. Consequently, the regression includes four control variables in an attempt to capture potential differences in demand across New England banks: the logarithm of assets (A), as of the first quarter of 1990; and calendar year 1989 average values for the remaining three variables, the ratio of fee income to the sum of total interest and fee income (FEE), the ratio of commercial and industrial loans (CI) to total assets, and the ratio of real estate loans (RE) to total assets. These control variables are intended to capture changes in demand across banks that otherwise might be attributed incorrectly to the capital-asset ratio.

In order to further control for demand shocks, institutions are categorized by whether they had a commercial or a savings bank charter, since New England savings banks generally have been less active in lending to businesses. The sample is further split into large bank and small bank categories. (Large is defined as any institution with at least $300 million in assets, consistent with the classification used in call reports.)

Table 3 reproduces the results from Peek and Rosengren (1992c) of estimating equation (1) for all FDIC-insured banks in New England and for the four subcategories: large commercial banks, large savings banks, small commercial banks, and small savings banks. The results provide substantial support for the capital crunch hypothesis. Capital ratios are a statistically significant determinant of deposit growth in four of the five regressions, with the estimated capital ratio coefficient significant at the 1 percent confidence level in the large savings bank and the all banks samples. A 1 percentage point decrease in a bank's capital-asset ratio corresponds to a decline of more than 1 percent in its deposit growth rate for the small savings bank and all banks samples, and an even more dramatic 1.47 percent drop for the large commercial bank sample.

Asset size has a statistically significant negative estimated coefficient in all five regressions, with coefficients significant at the 1 percent confidence level for the all banks regression and the two savings bank regressions. Fee income has a positive effect in four of the five regressions, although none of the coefficients are statistically significant. This is consistent with the hypothesis that banks that relied heavily on fee income were more insulated from the recent demand shocks. Differential demand shocks, as measured by bank portfolio shares of commercial

Table 3
Determinants of the Percentage Change in Total Bank Deposits[a,b] at FDIC-Insured Banks in New England 1990:I to 1991:I

Institution	Constant	K/A	Assets	FEE	C&I	RE	n	$\bar{R}^2$	SEE
Large Commercial Banks	.21 (.19)	1.47* (.72)	−.03* (.01)	.29 (.17)	.04 (.14)	−.10 (.08)	49	.15	.080
Small Commercial Banks	.31 (.20)	.81 (.53)	−.03* (.01)	.17 (.25)	.03 (.13)	.04 (.12)	146	.01	.120
Large Savings Banks	.58** (.16)	.93** (.22)	−.05** (.01)	−.35 (.24)	−.10 (.12)	.01 (.07)	81	.44	.056
Small Savings Banks	.50** (.13)	1.08* (.47)	−.04** (.01)	.45 (.58)	−.04 (.15)	−.18* (.08)	143	.15	.084
All Banks	.38** (.06)	1.03** (.24)	−.03** (.00)	.11 (.14)	−.03 (.07)	−.07 (.05)	419	.23	.093

[a]Total bank deposits are defined here as total bank liabilities less bank capital.
[b]Estimated with a White correction for heteroskedasticity; standard errors in parentheses.
*Significant at 5% confidence level.
**Significant at 1% confidence level.
Source: Peek and Rosengren (1992c, Table 3).

and industrial loans and real estate loans, generally do not have significant effects, with real estate loans having a statistically significant effect only in the small savings bank sample.

The results shown in Table 3 support the capital crunch hypothesis: institutions with lower capital ratios grew more slowly (or shrank more rapidly) trying to satisfy capital requirements. These findings are quite robust. In addition, Peek and Rosengren (1992b) found that banks have contracted deposits most in those categories that serve as their marginal source of funds. While in the regressions reported here the dependent variable is expressed as a percentage change, similar results have been obtained using changes in the absolute levels of both aggregated and disaggregated categories of liabilities (Peek and Rosengren 1992b). On the asset side, after correcting for charge-offs, loan sales, and changes in classification of assets, Peek and Rosengren (1992a) find that declines in real estate lending are highly correlated with banks' capital positions.

Bank Shrinkage and Bank Regulation

While recent research has shown that poorly capitalized banks have shrunk more than their better capitalized competitors, the link to regulators has been indirect. Bernanke and Lown (1991), Hancock and Wilcox (1992), Baer and McElravey (1992), and Peek and Rosengren

(1992b) have all associated bank shrinkage with the introduction of new bank capital regulations. By examining the formal agreements regulators have signed with banks, this study provides a more direct link to regulators.

Bank Capital Regulation

The recent losses in bank capital occurred at the same time that regulatory attention increasingly was focused on the adequacy of bank capital relative to assets. The Basle Accord provided international capital standards for commercial banks. Its purpose was twofold: (1) it standardized capital regulation across nations, preventing banks from achieving a competitive advantage by operating in less regulated countries; and (2) it encouraged regulators to consider the adequacy of bank capital in a bank's asset portfolio.

While the Basle Accord provided standardized treatment of credit risk, it made no attempt to quantify interest rate risk. U.S. regulators adopted a second capital ratio, the "leverage ratio," which required banks to maintain minimum capital-asset ratios with the assets not weighted by risk. Even banks holding only U.S. government securities, which receive a risk weight of zero under the Basle Accord, still must maintain sufficient capital to satisfy the leverage ratio because of the potential interest rate risk.

In their implementation of the leverage ratio, bank regulators have added a risk component. Instead of weighting the assets of the bank, as is done under the provisions of the Basle Accord, regulators have demanded higher minimum leverage ratios for banks with low CAMEL ratings, which are ratings that reflect the level of supervisory-determined risk that the bank will fail.[1]

Unfortunately, the implementation of the CAMEL-adjusted leverage ratio has several undesirable features. First, requiring higher leverage ratio targets for banks with low CAMEL ratings causes capital regulation to be procyclical. As banks experience losses that erode their capital, their CAMEL ratings are lowered and their target leverage ratios are raised. In this way, leverage ratio targets are raised when banks have lost bets, rather than when banks take bets (take on the risk).

Second, the higher capital requirement is applied on average rather than marginal assets. As a bank's situation deteriorates, all assets must be supported by a higher level of capital, regardless of their underlying risk. Also, any additional lending, even to low-risk borrowers, must be

[1] Banks are rated on five factors: Capital, Asset quality, Management, Earnings and Liquidity, giving rise to the acronym CAMEL. Each individual component, as well as the composite rating of all five factors, is assigned a score from 1 (strongest) to 5 (likely to fail).

supported by the higher capital base. This provides a perverse incentive, since additional loans that require a higher capital base will be undertaken only if they have a high expected return, and presumably a high risk of default. Thus, the higher capital requirement discourages banks from lending to low-risk borrowers.

Third, for many institutions, the leverage ratio, adjusted for bank CAMEL ratings, is the most binding ratio, making the risk-based ratios irrelevant for now. Hence, the risk of bank failure, rather than the riskiness of bank assets, has become the primary factor associated with higher capital requirements. Furthermore, because CAMEL-adjusted capital requirements become most binding when banks are experiencing severe financial distress, the constraint is not likely to be eased by new equity issues.

Application of the Leverage Ratio

The new capital regulations have not been tested by a major downturn in banking, except in New England. Thus, it was not apparent until recently how the leverage capital requirement would be applied. The regulations require a 3 percent minimum leverage capital ratio for the most highly rated banks, with a minimum capital requirement 100 to 200 basis points higher for riskier institutions. The regulations are not specific, however, as to how these higher minimum requirements are set.

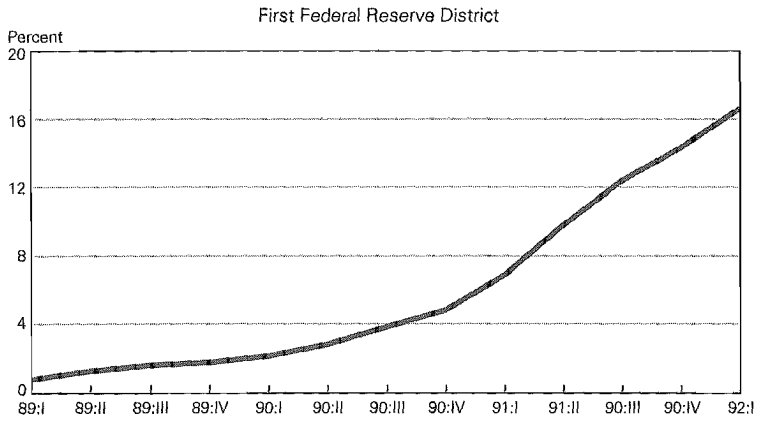
Despite the ambiguity in the regulations, regulatory actions have clarified the leverage capital guidelines. As an institution experiences financial problems, regulators usually initiate formal or informal action requiring the bank to take steps to improve its financial condition. Most CAMEL-rated institutions with overall ratings of 4 (potential of failure, performance could impair viability) or 5 (high probability of failure, critically deficient performance), and even some institutions with a CAMEL rating of 3 (remote probability of failure, flawed performance), will undergo some enforcement action.

The least serious action taken by regulators is the memorandum of understanding (MOU). This informal action, frequently taken after an examination, represents an understanding between the bank's board of directors and the regulator about deficiencies in the bank's operations and the proposed remedial action. While the agreement is not legally enforceable, failure to satisfy the MOU would likely result in a formal action being undertaken by the regulator. The MOU is generally not disclosed publicly.

For more troubled or recalcitrant banks, the regulator will normally enter a formal agreement, either a written agreement or a cease and desist order. Both actions are legally enforceable and are publicly disclosed. Cease and desist orders and written agreements are consid-

Figure 5

Banks Operating under Formal Enforcement Actions, as a Percentage of All Banks



Source: Office of the Comptroller of the Currency and the Federal Deposit Insurance Corporation.

ered more severe actions than MOUs, and often involve less negotiation with the bank. Cease and desist orders and written agreements both carry civil penalties.

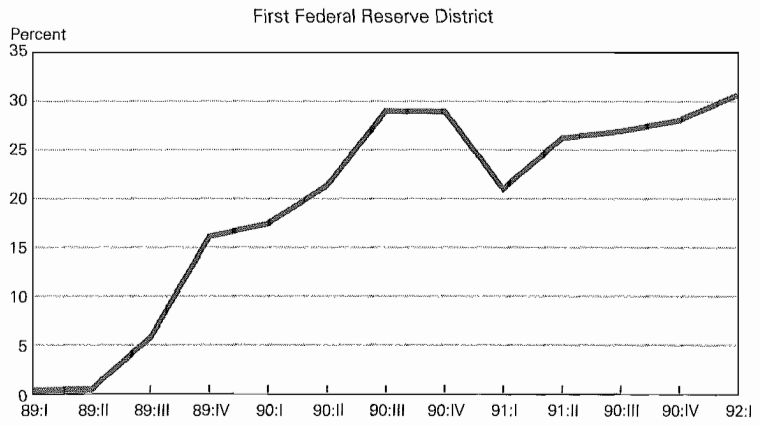
Since 1989, 106 New England banks have signed formal agreements with the FDIC and 41 New England banks have signed formal agreements with the Comptroller of the Currency. The Federal Reserve is the primary regulator for only four state member banks in New England, none of which currently is under formal agreement. However, the Federal Reserve does have formal agreements with those holding companies whose bank subsidiaries are under formal agreement with either the FDIC or the Comptroller of the Currency.

Figures 5 and 6 show how widespread the bank problems are in New England. Almost one-sixth of all banks in New England, representing 30 percent of all bank assets, are operating under a formal agreement. This group includes only the most troubled institutions, where formal agreements have been necessary. The numbers would be much larger if MOUs, about which information is not publicly available, were included. Because so many banks are under formal or informal agreements with regulators, the actions taken in these agreements are critical to the actions banks will take as they seek to recover.

Most formal agreements include sections on management and board supervision of the bank, strategic and capital plans to implement

Figure 6

Asset Value of Banks Operating under Formal Enforcement Actions, as a Percentage of Total Bank Assets



Source: Office of the Comptroller of the Currency and the Federal Deposit Insurance Corporation.

the bank's recovery, risk review, and a review of nonperforming assets and reserving procedures. While the FDIC generally requires detailed targets for capital, loan loss reserves, and classified assets, the Office of the Comptroller generally is less specific in its agreements. Table 4 details the specific capital targets, where they are included, for formal agreements signed in 1991 and the first seven months of 1992 with institutions having assets exceeding $300 million.

Table 4
Leverage Requirements Mandated in Formal Agreements Signed January 1991 to July 1992

Primary Regulator	Number of Banks[a]	Documents Available	A capital-asset ratio[b] of at least				
			4%	5%	6%	8%	10%
FDIC	26	22	1	1	16	2	1
OCC	5	4	0	4	0	0	0

[a]Banks with assets exceeding $300 million, as of 1990:IV Call Report.

[b]One bank in the FDIC group did not have a capital plan.

Source: Formal agreements (both written agreements and cease and desist orders) signed by the bank with its primary regulator.

In the sample, when specific targets have been set, they have been based on the leverage ratio, although three of the four OCC agreements did set targets for the risk-based capital ratios as well. Many institutions under formal agreement are now being required to satisfy a leverage ratio equal to or greater than 6 percent, with some agreements for leverage ratios substantially above 6 percent. The percentage of total bank assets held in banks with an actual leverage ratio of less than 6 percent has increased significantly, from 46 percent in the first quarter of 1989 to 69 percent in the first quarter of 1992; this means that a requirement of leverage ratios in excess of 6 percent makes further shrinkage of bank assets very likely.

Response by New England Banks

Table 5 shows the actual leverage ratios of the five largest banks regulated by the OCC and the five largest banks regulated by the FDIC that had not failed as of August 1992 and had signed formal agreements citing bank examinations that occurred before the end of 1990, thus enabling us to evaluate the banks' responses. Although a formal agreement does not occur only as a consequence of an exam, the major formal agreements signed recently in New England followed exams by a year or less, and those exams were mentioned in the agreements. The financial information on the 10 banks studied here dates from the quarter in which the exam was initiated. In eight of the 10 banks studied, large decreases in the leverage ratio occurred in that quarter. The banks are listed in random order.

Table 5
Leverage Ratios of 10 Large New England Banks Signing Formal Agreements

Regulator Bank	Ratio One Quarter before Exam Resulting in Formal Agreement	Ratio in Quarter Exam Initiated	Ratio Fourth Quarter after Exam Resulting in Formal Agreement
OCC			
1	5.8	4.5	5.1
2	6.9	5.5	5.8
3	5.3	5.3	4.6
4	6.6	4.5	5.4
5	6.8	6.6	6.9
FDIC			
6	6.9	4.6	2.4
7	4.9	4.4	2.3
8	5.8	4.2	4.2
9	5.4	3.9	4.0
10	11.2	9.6	4.3

Source: Call Reports.

OCC-Regulated Sample of Banks

The largest banks under agreement in New England have the OCC as their primary regulator. The five largest institutions with OCC agreements that satisfied the selection criteria represent 21 percent of total bank assets in New England as of the first quarter of 1990. The size of this share is particularly significant because it does not include the failed Bank of New England and its subsidiaries, which held 10 percent of total bank assets at that time.

The OCC's formal agreements are generally less specific than those of the FDIC. Three of the OCC-supervised banks were required to initiate capital plans, although no specific targets were specified in the agreement. The other two banks were required to maintain leverage ratios above 5 percent. Table 5 shows that three of the OCC-regulated institutions had substantial decreases in their leverage ratio in the quarter of the exam. But in all three instances, the leverage ratio increased from the exam level within one year. The leverage ratio of Bank 3 did not decrease initially, although it declined somewhat within one year after the exam. Bank 5 had only a small initial decrease in its leverage ratio, and within one year its level exceeded that of the quarter preceding the exam.

Table 6 shows how these banks achieved the changes in their capital-asset ratios. The first two columns provide the percentage change in equity capital and total assets in the year following the initiation of the exam that resulted in a formal agreement. The remaining columns show the shares of the one-year asset decline accounted for by different asset categories. A negative share indicates that the asset category grew over the one-year period.

Among the OCC-regulated institutions, three of the five actually increased their capital, and only one did not shrink its assets (Bank 5). Because Bank 5 had leverage ratios well in excess of 6 percent, the leverage ratio was not a constraint to its growth. Since Bank 3 did not initiate changes in the first year of the agreement but did initiate substantial shrinkage in the second year, we report its data for the two-year period following the exam.

The shrinkage primarily came from reductions in loans. Three of the four institutions that shrank significantly increased their holdings of securities, and all four had substantial decreases in their loan portfolios. For the credit crunch hypothesis, the loan categories that shrink are also important. Credit card loans and home mortgages can generally be obtained, either directly or indirectly, from institutions outside the region. Thus, decreases in these loan categories do not have as much significance for credit availability, since the borrowers are not dependent on local banks. Borrowers needing construction loans, commercial real estate loans, and commercial and industrial (C&I) loans are more

Table 6
One-Year Percentage Change in Assets and Capital in 10 Large New England Banks under Formal Agreement

Regulator Bank	Percentage Change in Equity Capital	Percentage Change in Total Assets	Share of Asset Decline[a] Accounted for by: Securities	Total Loans	Construction Loans	Commercial Real Estate Loans	C&I Loans
OCC							
1	−9.5	−19.7	5.1	66.3	7.2	−22.4	29.1
2	5.5	−12.8	−33.5	107.9	7.5	−5.4	19.8
3[b]	−18.1	−4.6	−48.3	155.8	102.7	52.7	−73.9
4	14.1	−9.5	−28.3	160.3	15.2	21.1	54.1
5	6.6	.0	n.a.	n.a.	n.a.	n.a.	n.a.
FDIC							
6	−61.5	−25.9	57.2	46.3	15.8	12.8	5.1
7	−51.7	−12.4	−41.7	147.1	2.9	10.5	30.6
8	−12.9	−16.6	66.1	24.0	16.2	.0	21.5
9	−10.6	−10.0	−22.9	199.2	31.1	7.1	33.1
10	−58.7	−10.7	65.6	82.6	50.9	−133.9	37.6

[a]Increases appear as negative numbers.

[b]Because no decline occurred in the first year of the agreement, these data are based on the two-year period following the exam.

Source: Call Reports.

likely to be dependent on local banks. Construction loans declined in all four OCC-regulated banks that shrank, although much of the decline was undoubtedly related to loan demand. Two of the four banks shrank their commercial real estate loans, and three of the four shrank C&I loans. These changes may in part reflect accounting rather than behavioral changes, insofar as many banks at this time were reclassifying C&I loans as commercial real estate loans, thus overstating the actual shrinkage in C&I loans and understating (overstating) the shrinkage (growth) in commercial real estate loans.

FDIC-Regulated Sample of Banks

The FDIC institutions shown in Tables 5 and 6 represent the five largest FDIC-regulated New England banks that met our criteria. These five institutions represent only 2.4 percent of the total assets of New England banks, however. While FDIC institutions are generally smaller than those regulated by the OCC, they are still important because of their large numbers in New England.

The five FDIC banks all had substantial decreases in their leverage ratios at the time of the exam. While two banks stabilized their leverage

ratios, the other three continued to experience declines, in contrast to the four OCC banks that were able to stabilize their leverage ratios at a level exceeding 5 percent in the year following the examination.

All five of the FDIC institutions shrank both their capital and their assets. Banks 8 and 9 maintained their leverage ratio at the exam date level by shrinking assets in roughly the same proportion as their capital. The other three institutions, with capital declines of over 50 percent, could not easily maintain their leverage ratios. Three of the five shrank their securities portfolios and all five shrank their loan portfolios, with a substantial portion of the loan shrinkage in categories most likely to have bank-dependent borrowers.

Bank 10 is particularly striking because of the dramatic decline in its leverage ratio, from 11.2 percent in the quarter before the exam to 4.3 percent one year after the exam. Such a decline raises the question of whether the losses were unanticipated or the bank had been systematically underreserving. In fact, the sharp declines in the leverage ratio when exams occurred would indicate that banks had been underreserved. Unfortunately, a system that focuses on capital ratios encourages institutions to manipulate reserves and charge-offs to avoid further decreases in their capital.

These 10 institutions with formal agreements have significantly reduced their assets. And because of increases in the securities holdings of many institutions, the shrinkage in loans has exceeded the shrinkage of assets. Much of the shrinkage has occurred in lending categories likely to include bank-dependent borrowers. These categories would have declined somewhat because of the recession, however, even in the absence of binding capital regulations.

The Credit Crunch

A regulatory credit crunch requires first that a capital crunch occur. Earlier research has shown that the recent decline in real estate values has caused widespread declines in bank capital, and that poorly capitalized institutions have reduced their assets and liabilities more than well-capitalized institutions. The previous section documents that this behavior is being reinforced by regulatory agreements that require banks to satisfy leverage ratios much greater than the minimum requirements.

Given that a capital crunch has occurred, a credit crunch requires that the decline in local bank lending reduce credit availability to local firms. Losses in bank capital must be widespread and bank-dependent borrowers a significant segment of the local economy. Most small and medium-sized businesses do find banks the only economical source of debt financing (Elliehausen and Wolken 1990; Gertler and Gilchrist

1991). Not only do other financial intermediaries such as insurance firms generally avoid these strata of the market, but their own financial difficulties are likely to preclude them from filling the financing gap left by local banks. A survey of small and medium-sized firms currently being completed at the Federal Reserve Bank of Boston will provide further evidence on their sources of financing and their degree of dependence on banks.

Conclusion

Unfortunately, the two conditions necessary for a capital crunch are present today: widespread losses in bank capital and the stringent application of capital regulation. The New England real estate bust led to large and widespread declines in bank capital just when capital requirements took on greater significance, as bank regulators began to enforce both risk-based capital ratios, adopted to satisfy the international Basle Accord, and the leverage ratio, adopted domestically. Rigorous enforcement of capital requirements was inevitable after the widespread criticism of regulators and politicians that followed the large deposit insurance losses in the savings and loan industry and the commercial bank losses in Texas. This capital crunch has impaired the ability of banks to satisfy the credit demands of the economy during the economic recovery, limiting the access to credit of legitimate borrowers who happen to be bank-dependent.

The capital crunch–credit crunch hypothesis has the potential to explain several of the anomalies described in the first section of this paper. In contrast to the situation under disintermediation, the capital squeeze can persist for as long as it takes to recapitalize the banking system, and cannot be remedied quickly by a decline in interest rates. Thus, it is consistent with a sustained period of unusually slow growth. Furthermore, during a period of shrinkage in bank assets, bank credit growth would be weak, as has been observed in the current situation. On the other side of the balance sheet, the shrinkage of bank liabilities would account for the unusually slow growth of the broader monetary aggregates, also observed recently. Bank asset shrinkage would be most severe in regions of the country that experienced substantial losses of bank capital, such as New England and the Mid Atlantic states. Because bank capital, unlike bank reserves, cannot be traded between nonaffiliated banks across geographic regions, geographic differences in performance can persist until the capital squeeze is resolved. Thus, the capital crunch hypothesis does have the potential to explain, at least in part, the current economic problems.

Unfortunately, a capital crunch is less responsive to the traditional monetary policy prescription of lower interest rates, which was effective

during previous periods of disintermediation. Although bank capital cannot easily be restored, several policies could ease the regulatory burden. First, the flow of bank capital across geographic regions could be made easier by eliminating restrictions on interstate branching and encouraging interstate mergers in order to restore capital in regions with few well-capitalized banks. Second, the procyclical policy of adjusting leverage ratios according to CAMEL ratings could be stopped. Third, greater attention could be given to improving bank capital as bets are taken, rather than penalizing banks once bets are lost.

While none of these policies will provide immediate relief to "crunched" borrowers, they will be positive first steps. Banking problems generated over a decade will require a substantial time for resolution.

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Discussion

*William M. Crozier, Jr.**

To begin, I feel I owe a debt to authors Joe Peek and Eric Rosengren and to their leader and colleague, Dick Syron, for tackling an issue that began to bother me in the summer of 1991. At that time, it appeared that the leverage ratio was getting in the way of promoting bank earnings recovery, and hence would delay the capital rebuilding process that clearly is a necessary part of any economic recovery. I vented my frustration to Dick Syron and, at his suggestion, wrote him a letter on the topic, with copies to Federal Reserve Board Governor John LaWare and Jerry Corrigan, President of the New York Fed. Happily, Dick's views also began to come forward in the form of urgings to his colleagues, scholarly papers, and even testimony at congressional hearings. Dick directly, and I somewhat indirectly, also got Marty Feldstein's attention, which resulted in a well-cast piece in *The Wall Street Journal* in March of 1992. Thus, some thoughtful work has entered the public domain, now including Peek and Rosengren's paper. My sense is that all this effort will matter, particularly if the Fed and its fellow central banks tie up some loose ends from the Basle Accord in the area of maturity risk.

Of course, as with many other matters, the Fed is the right leader on the leverage issue. The Office of the Comptroller of the Currency was never a problem. (As a matter of fact, Comptroller Clarke felt quite comfortable with the label "Low Leverage Bob.") But, as can be seen from Peek and Rosengren's Table 4, the Federal Deposit Insurance Commission (FDIC) needs some convincing, and perhaps Peek and Rosengren's paper and this conference will help. As the message is

*Chairman of the Board and President, BayBanks, Inc.

carried forward, careful note should be taken of the authors' recommendation to avoid pro-cyclical actions. It is a sound principle indeed to throw banking weight against, instead of into, the peaking and troughing of the cycle. We need more reminders of that sound banking advice—advice so basic, yet so regularly ignored in recent times.

Now, however, I would like to address aspects of the paper where my angle on the issues may be just a bit different from the authors'. I do believe, as Peek and Rosengren have concluded, that "the capital crunch has impaired the ability of banks to satisfy the credit demands of the economy during the economic recovery." I would argue, however, that for now the only significant credit demand that banks have not had the chance to satisfy is that of the U.S. government. It seems to me that a serious disruption has occurred in private credit demand in this most atypical recession. The evidence I have—some of it obtained personally—has confirmed my long-held view that lending money is basically a passive business. A bank cannot make a customer borrow, no matter how much those in high places think banks can.

That does not mean, however, that the biggest borrower of them all is in retreat or that the inability of banks to add to their holdings of government securities is unimportant—quite the contrary. Central bankers, in particular, should realize that in the face of a serious recession, commercial banks should be stuffed with government securities in order to help earn their way out of their capital hole with safe and highly liquid assets. Instead, thanks to leverage ratios, banks have had to forgo building government securities portfolios as high as they might have and have had to shed liabilities. Furthermore, in the process of decreasing liabilities, banks have forced their depositors into direct lending to the government or, more often, into the surrogacy of mutual funds. Thus, as a result of overly rigorous leverage standards, banks have been denied more traditional balance sheet nourishment and have had to give further ground to their mutual fund competitors. These competitors not only are outside the Basle Accord, but also are outside leverage requirements and, of course, outside the Fed, the FDIC, and the Federal Deposit Insurance Corporation Improvement Act.

Of course, as one might imagine, with the handwriting clearly on the wall, banks are now expanding into mutual funds. More monetary control for the Fed in all of this? More systemic safety? I do not think so. Moreover, policies that delay the rebuilding of bank earnings raise the cost of capital to banks, require higher pricing, and delay economic recovery. Peek and Rosengren understand this clearly. I merely wish they had said something about the opportunity to build capital that has been missed by not allowing banks to lever further their purchases of U.S. government securities.

But to return to the topic of private credit demand, I doubt very much if there really is a capital crunch or credit crunch. When examining

the statistics on loan trends, for example, one would have to make allowances not only for a severe recession, but also for the off-loading to alternate markets of high-quality credit that does not meet the new bank profitability standards based on the Basle agreement. Charge-offs and movement to ISF/OREO accounts (in substance foreclosure and other real estate owned) would also play a role. In consumer credit, securitization with or without sale would also be important. All of this balance sheet "engineering" suggests that room could easily be made for the addition of profitable new relationships, if they were to exist.

If we could gather the data and analyze the corporate finance of what is going on in the marketplace, I imagine we would find that investors today are looking only at opportunities that either are riskless or have relatively large returns, which few projects do. If projects have suitable prospects, they are well financed and easily banked. On the other hand, projects lacking strong investor support cannot pass muster at banks.

Returning to our text and thinking about why projects cannot pass muster, I might salvage a little more of the Stiglitz and Weiss model than our authors would. For many transactions we have an information/reliability gap. For instance, it is hard to know what collateral is worth. A steep decline in real estate values has occurred in the Northeast, yet measured against other parts of the United States, some of our real estate markets are still very high. Moreover, given today's shaky economy, the ability to sustain current levels of income is suspect, which further erodes values based on income levels. Those borrowers who do show up want to take only limited risk and hence put as little of their own money as possible on the line. They will not guarantee, and we have lost some of our faith in guarantees—real or moral—anyway. It may take time to close the information/reliability gap, and perhaps some crunch-like stories may emerge as a result. Crunch-like stories, but not a credit crunch.

Finally, a word about interstate branching and interstate mergers, which the authors encourage in their recommendations. I happen to believe in both, and see geographic diversification as a help in strengthening the banking industry. But I do not see the phenomenon helping to restore capital quickly to distressed areas. Instead, I see the process moving resources to regions in need of funds and away from troubled areas. Why, with the bars down, are outside banks not rushing into New England? Perhaps because the prospects just are not there. Meanwhile, Fidelity is busy diverting new hoards of funds to more promising locations through bond, stock, and short-term mutual funds. That is not inherently bad, but more of the same may bring new complaints from those who perceive regional credit crunches.

Discussion

*Albert M. Wojnilower**

I begin with some quotes from a U.S. Treasury report:

> . . . there exists a genuine unsatisfied demand for credit on the part of solvent borrowers . . . one of the most serious aspects of this unsatisfied demand is the pressure for liquidation of old working-capital loans, even sound ones. . . . this pressure is partly due to a determination on the part of bankers to avoid a recurrence of errors . . . it is also due in *large* part to the attitude of bank examiners (my emphasis).

More about this later.

Joe Peek and Eric Rosengren have done a first-rate job of documenting how a sudden intensification of scrutiny and stiffening of capital requirements by bank supervisors combined with a collapse of real estate prices to bring on a disastrous credit contraction in New England. Peek and Rosengren pioneer in courageously publicizing and criticizing an evidently highly articulated and sometimes perverse set of bank supervisory codes, about which very little has previously been divulged. And as much as the authors and the Federal Reserve Bank of Boston are to be congratulated for bringing all this into the open, other supervisory authorities should be called to account for having hidden from public view a process that goes far to explain why economic growth is so depressed (and not only in New England) and may be lamed for years to come. Also at fault are the economists and policy-makers who, although they knew what was happening, were asleep at the very gates they were trained to guard, and failed to call attention to the obvious

*Senior Advisor, First Boston Asset Management.

macroeconomic consequences of tightening the rules for the whole banking system at the same time.

But despite the general excellence of the paper, Peek and Rosengren's remedial proposals do not go to the heart of the problem. Unlike them, I am not subject to the constraints of public office, and will propose a more forceful approach.

By a series of accidents of fate, I have been dealing with the subject of this paper for virtually my whole professional career of forty-plus years. Although I didn't coin the term "credit crunch," in 1980 I became the first to have the temerity to describe and analyze the phenomenon in a scholarly publication (the label "scholarly" refers to the publication, not necessarily to my article). Long before 1980, I had predicted the quintessential credit crunch of 1966 as well as subsequent ones. But even before that, in the latter 1950s while still at the Federal Reserve Bank of New York, I had been allowed as part of my doctoral research to analyze some mid-1950s samples of bank examination records. My dissertation, *The Quality of Business Loans*, was published by the National Bureau of Economic Research in 1962.

In those years hardly any defaults or bank failures occurred. The project was sponsored by older folks who remembered the Great Depression. Some of them attributed its severity and duration not so much to the initial tide of loan defaults and bank failures as to the subsequent bloodthirstiness of the supervisory authorities and bank examiners in forcing the liquidation of many intrinsically sound loans, businesses, and banks. Then as now, I wonder, were those officials egged on by vindictive politicians and public?

Rather than harp on minor quibbles with Peek and Rosengren that are largely irrelevant to the powerful and accurate thrust of their paper, let me take a brief and presumptuous try at placing their results in a broader structural and historical framework.

Not a Crunch, but Slow Strangulation

Labeling the recent and current credit strangulation as a "crunch" misapplies both the dictionary meaning and my personal definition of the term. "Crunch" implies a happening that, however painful, is sudden and brief. The crunches of the past, whether touched off by disintermediation or by other triggers, occurred at times of strong credit demand and restrictive monetary policy. A largely unexpected rupture in banks' willingness and/or ability to acquire assets crippled particular banks, borrowers, or asset markets, with little regard to the role (if any) they might have played in bringing the economy to its overheated state. One such episode "crunched" primarily the Treasury bond market; others struck mainly at the municipal bond, commercial paper, or

certificate of deposit markets; still others were embolisms in the flow of business loans, mortgages, or consumer credit.

In all cases the Federal Reserve was pleased by the contraction of credit, although alarmed at its unintended and unforeseen intensity. A combination of judicious public statements, use of the discount window, and provision of liquidity cured the crunch in short order, although the cyclical consequences were generally longer-lasting. The most permanent effect each time was to leave both public and the Fed determined never to let the problem recur, with the result that no two crunches were alike in the way they were triggered.

The current credit problem is not a sudden spasm due to restrictive monetary policy, excessive credit demand, or other transitory factors. Just as the current economic situation should not be called a "recession" because of the misleading implication that old-fashioned prosperity may be just around the corner, so the term "crunch" is unduly hopeful insofar as it implies a sudden unexpected pain that soon will subside, more or less harmlessly. In actuality, there is virtually no prospect of such relief.

The Revenge of the Supervisors

The phenomenon Peek and Rosengren are documenting is, to echo the opening quotation, "partly due" to a market reaction to the credit explosion ignited by the preceding vicious cycle of financial deregulation and inflation. But mainly, "in large part," it is due to the response by the supervisory authorities. Ideally, the supervisors might have reacted to the escalating excesses in real estate, foreign, and highly leveraged loans by compelling, however belatedly, the most egregious offenders to adopt more prudent lending and capital policies. Understandably, however, in view of the political harassment to which they were subjected, they avoided such judgment calls, choosing instead to formulate a new set of blanket statistical rules to be applied simultaneously across the board to all—leaders and followers alike, swindled as well as swindlers.

In 1988, the Federal Reserve instigated the Basle international credit risk standards, which are being implemented over the 1989–92 period. An international concord was necessary to prevent more aggressive foreign banks from filling the credit vacuum being created in the United States. The Basle Accord assigned zero risk to U.S. Treasury security holdings of any maturity and did not at all impede such purchases (another example, by the way, of how the deregulation of credit and interest rates is leading in roundabout but predictable fashion to still further governmentalization of credit flows). But the authorities were alert to this government securities "loophole." As described by Peek and Rosengren, they sharpened the application of the hitherto rather

innocent leverage ratio rules, so that any and all asset acquisition would be inhibited.

How these rules were applied, and how they interacted with the so-called CAMEL ratings, was publicly described, for the first time so far as I know, in the Federal Reserve Bank of Boston's *1991 Annual Report* (Syron and Randall 1992). Until that report and Peek and Rosengren's papers, I had been attributing the credit squeeze largely to examiner zeal in applying the Basle risk-based capital ratios; but this new information suggests that the leverage ratio may well have had the more powerful contractionary effect. Going even beyond the credit risk and leverage ratios, the authorities recently proposed, as mandated by new federal legislation, a further set of interest-rate-risk guidelines that calls for additional capital in the event an institution's asset and liability durations are not matched closely enough. While such a standard (as well as the credit and leverage standards) is desirable in principle, it is not at all clear that Congress intended the Fed to draw this new playing field so narrowly as to deliberately put 20 percent of banks out of bounds, which is what they have done (Board of Governors of the Federal Reserve System 1992a and 1992b). As a result, maturity extension in Treasuries is further inhibited. And some officials never seem to tire of warning that after all these capital hurdles have been cleared, still higher ones will be erected.

Keep in mind also that it is really the examiners, through their evaluations of individual credits, who decide how much capital a bank has. That probably is why capital-to-asset ratios fall at examination time, as Peek and Rosengren point out.

Little wonder that banks are reacting by getting out of the asset acquisition business. The soundest loans are called first, or denied renewal, because the debtors can pay. Weak loans, where the risk is that a payment demand might prompt a default or disclose a flaw not yet discovered and charged against bank capital by the examiners, are allowed to linger longer. The persistence of economic sluggishness, which augurs deterioration in the credit quality of many borrowers that are still sound, intensifies the urgency of credit liquidation from the standpoint of each individual bank. A ranking of large banks would show, I predict, a high inverse correlation between capital-to-asset and loan-to-asset ratios. The most strongly capitalized banks hold, and are adding, the fewest loans.

An earlier Peek and Rosengren paper (1992) reports that "In the first quarter of 1990 bank examiners found substantial problems in the Bank of New England's real estate portfolio. This caused other banks (and examiners) to reexamine their institutions." My reading, which is not necessarily theirs, is that the supervisors' decision to face the overlending problem at one major offender launched a process in which other lenders and supervisors were forced to question the valuation of all real

estate that served directly or indirectly as collateral or capital. Even performing loans and borrowers came under pressure, not to speak of potential new borrowers. Indeed, it would be useful to have data that distinguished between bank capital writedowns that resulted from actual default, as contrasted with anticipatory writedowns on loans that were still performing. In any event, just as distress sales of real estate were mounting, the access to credit of firms that might have leased the space was demolished. Prices would no doubt have fallen sharply in any event, but in this fashion their utter collapse became inevitable.

The Economic Repercussions

It was also rendered certain that a general decline in loan demand would soon set in and receive widespread blame for the reduction of credit. But, when the Federal Reserve tightens monetary policy, in principle only a single spending cancellation may be identifiable as due to a reduction of credit supply. Vendors, suppliers, and servicers of the canceled project now have smaller credit needs than before, and their reaction will correctly be described by bankers and by econometricians as a fall in demand. It is difficult to identify specific denials of credit even at times of drum-tight money. Nevertheless, hardly anyone doubts the ability of tight money to provoke recessions. An unexpected supervisory action that reduces the asset-acquisition potential of a sizable group of financial institutions is equivalent to a major restrictive open-market operation. When the action affects capital rather than bank reserves, it is more insidious and much harder to reverse. With capital as with bank reserves, the fact that on the micro level we observe mostly demand declines does not alter the fact that a macro supply shock initiated the surgery.

Peek and Rosengren have reminded us of the disintermediation crunches of the past. In those sudden crunches, depositors chose temporarily to withdraw their funds from helpless bank and thrift institutions. Today we have chronic rather than sudden disintermediation, at the initiative not of the depositors but the institutions. They are under competitive as well as political pressures to shrink themselves. Technological advances have cheapened the cost of securities transactions, particularly for the huge and growing panoply of government-backed instruments that compete with banks for both loan and deposit business. At the same time, through punitive increases in deposit insurance premiums, capital requirements, and the like, banks are being made the scapegoats for the financial sins of society—misbehavior that, whatever individual banking outrages may have occurred, was absolutely inevitable under the low-margin, high-volume incentive structure created by deregulation. Banks and thrifts are the only institutions being

Table 1
Depository Institutions' Managed Liabilities[a]
Annual Percent Change

Annual Averages of Monthly Data				Quarterly Averages at Seasonally Adjusted Annual Rates		
1960	7.3	1976	12.6	1989:	I.	3.7
1961	12.0	1977	13.7		II.	2.3
1962	13.1	1978	13.0		III.	.9
1963	13.6	1979	10.7		IV.	−.3
1964	12.0	1980	7.6	1990:	I.	.1
1965	11.8	1981	9.8		II.	−.8
1966	8.8	1982	8.7		III.	−.5
1967	9.6	1983	12.2		IV.	−2.1
1968	9.4	1984	11.7	1991:	I.	−.6
1969	4.7	1985	8.4		II.	−2.0
1970	4.9	1986	6.7		III.	−4.6
1971	18.8	1987	5.6		IV.	−4.2
1972	16.5	1988	6.8	1992:	I.	−3.8
1973	15.8	1989	4.1		II.	−5.2
1974	11.6	1990	−.1		III.	−5.4
1975	9.4	1991	−1.9		IV.	−4.1
		1992	−4.4	1993:	I.	−5.9

[a]Includes overnight and term repurchase agreements and Eurodollars, savings and money market deposits, and small and large time deposits.

Source: Board of Governors of the Federal Reserve System, H.6 releases.

made to pay for the public safety net, although everyone understands that as a practical matter this net extends to the major money market funds, insurance companies, securities dealers, and other competitors.

Total bank assets have expanded modestly, to be sure, thanks to huge purchases of government securities. The amounts bought merely correspond, however, to the growth of demand deposits, with respect to which banks are largely passive. When it comes to the managed liabilities of the banks, those they can modulate by adjusting the interest rates they offer, contraction has become the order of the day. The table depicts, from a somewhat different perspective than Peek and Rosengren's figures, the path of shrinkage that depository institutions are choosing as respects their non-demand-deposit liabilities. From the beginning of deposit rate deregulation in the early 1960s until late 1989, annual growth was consistently at least 4 percent or faster—usually much faster, 8 percent and more. Beginning with late 1989, all but one of 12 quarters show negative growth rates, and they are deepening. This response is particularly revealing in view of the enormous inducement to acquire both loans and securities that is provided by the steep yield curve and the wide spread between money costs and the prime lending rate.

The Treasury report quoted at the outset referred not to New

England but rather to the Seventh (Chicago) Federal Reserve District. It was written by two officials, one of them Charles Hardy, a respected Federal Reserve scholar, the other Jacob Viner, a venerated conservative economic scholar whose name even young economists still may recognize. The date of publication was 1935. By 1935, the yield spread between Treasury bills and bonds had narrowed about 1 percent from 1932 to 1934 but was still huge, with bills at ¼ percent and bonds at 2½ percent, a differential that contemporaries no doubt attributed to inflationary expectations. As at present, the true reason for the steep yield curve was the intense pressure, of course much more severe in the 1930s than today, to avoid any and all risk exposure. Bond yields had fallen a little further, and real GDP had just about recovered its 1929 level, when the Federal Reserve Board raised reserve requirements in 1936 and twice again in 1937, precipitating a fresh recession.

What Is Needed

One-half of American jobs are in small companies with fewer than 100 employees. Small companies typically spearhead employment recoveries, with the larger ones joining only late in the game. Today, employment gains are especially dependent on small, new, and indeed novel ventures, as large bureaucratic enterprises around the world—whether communist or noncommunist, public or private, military or civilian, profit or nonprofit—are shedding experienced and disciplined but nonetheless redundant employees. In the business recovery of the mid 1980s, small enterprises prospered marvelously despite sky-high real interest rates, in important part because lenders were forced by deregulation to be hungry and aggressive. Today, from the credit standpoint, such firms are homeless. The lifeblood of enterprise capitalism is literally draining away.

How can matters be improved? Peek and Rosengren suggest three ways. The first, more careful supervision as loans are made, is useful for the future, but now would be the wrong time to start. Countercyclical policy should dampen risk-taking in good times when optimism is too carefree. But in bad times, lenders must be encouraged to take more rather than fewer chances. At present, judged by the broad credit and monetary aggregates, the net result of the restrictive bank capital policy and the stimulative short-term interest rate policy is, at best, a standoff.

Secondly, Peek and Rosengren correctly urge the ending of the procyclical policy of raising required leverage ratios for weaker banks, the policy of kicking them harder, the deeper down they are—but that will not help much or soon at the macroeconomic level. Peek and Rosengren also advocate eliminating geographical restrictions in banking. While that is surely worthwhile for structural reasons, we should

keep in mind that greater integration can also promote the faster spread of infection. As with hurricanes, insurance diversification minimizes the impact of the average storm, but also guarantees that a truly big storm will injure every insurer.

The crucial remedy for which the situation calls was included in a set of proposals I first offered in a much less supportive Federal Reserve setting almost two years ago (Wojnilower 1990). Whether or not individual banks are held to tougher capital standards, they must be required to increase credit, preferably to the private sector, in harmony with the Federal Reserve's aggregate target for national credit growth. If banks, large and small, cannot or will not lend, how can the aggregate growth targets be attained? If a bank does not lend, who needs it? What is its franchise? What risks is it incurring? Why should it have the benefit of a lender of last resort or deposit insurance? And if its capital is so inadequate that no asset expansion at all is tolerable, it should be closed and will not be missed. Some will say that setting a growth standard would cause bad loans to be made. They are right. But as macroeconomists we may be just as confident that, in times like these, defaults will be fewer when banks are lending than when they are not.

Some day in the distant future, financial institutions will have become so overcapitalized that they will resume competing for earnings through growth and risk-taking. The resulting economic and eventually inflationary stimulus will alarm the Federal Reserve and they will raise interest rates. But because the lenders (and by then, probably many borrowers, too) are strongly capitalized, they will, to the surprise of the authorities and many observers, be quite oblivious to small and, later, even to large interest rate increases. Ultimately it will take an old-fashioned credit crunch to stop the inflationary spiral.

We should all live so long.

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Banks and Real Estate: Regulating the Unholy Alliance

*Robert E. Litan**

Banking and real estate have always had an uneasy relationship. It was not until early this century that national banks were even permitted to extend loans collateralized by real estate. To this day, national banks, bank holding companies, and many state-chartered banks are prohibited from owning real estate directly, except when obtained through foreclosure or if used for bank premises.[1] In addition, savings and loan institutions generally have had authority to make commercial real estate loans and to invest in real estate directly for only a little more than a decade.

The uneasy attitude toward bank involvement in real estate lending is not difficult to understand. Real estate lending has played a significant role in several of the major episodes of banking difficulties in the postwar era: in particular, in the mid 1970s through bank-established "real estate investment trusts" or REITs; in the mid 1980s among banks and savings and loans in the Southwest; and more recently among banks in the Northeast and (thus far to a lesser extent) in California.

This paper will attempt to answer four key questions that the most recent real estate troubles have provoked. First, could the problems that banks in particular have suffered have been prevented or significantly minimized in any way by reasonably prudent regulation in advance? Second, did regulators actually make the problems worse once they

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*Senior Fellow in the Economic Studies Program and Director of the new Center for Law, Economics, and Politics at The Brookings Institution. The author thanks Charles Schultze for valuable comments and Kirsten Wallenstein and Maya MacGuineas for excellent research assistance.

[1] As of 1990, some 27 states permitted their banks to make some direct investments in real estate, but generally subject to some percentage of capital, assets, or deposits.

were discovered? Third, what changes in regulatory policy toward bank involvement in real estate activities would best prevent real estate downturns from causing troubles in the banking industry in the future? And finally, how should those changes be phased in, to ease the transition out of the current difficulties?

The paper focuses principally on lending for commercial real estate, not because residential real estate lending is unimportant—to the contrary, it has been and continues to be larger in volume than commercial real estate lending—but instead because most of the real-estate-related problems that banks have experienced have been concentrated in commercial projects. In addition, the discussion concentrates heavily on *bank* lending for commercial real estate, although virtually all of the analysis and policy recommendations apply with equal force to such lending by savings and loans.

In brief, the long-run recommendations are centered on the well-known observation that commercial real estate activity and values appear to be heavily influenced by the availability of financing, or liquidity. When times are good and money is available, lenders lend and builders build. But because of the long lags between the times loans are made and projects finished, both developers and banks will eventually overexpand, leading to excess capacity and thus creating the conditions for a subsequent contraction.

A central objective for bank regulation (and for policymaking generally) is to construct a statutory and regulatory environment that minimizes the amplitude of this inherent "boom and bust" cycle in commercial real estate. During the up side of the cycle this means that, at a minimum, lenders should be held to prudent loan-to-value requirements, such as those recently proposed by federal bank regulators. Some have suggested that statutory or regulatory ceilings also be imposed on the portions of a lender's assets that can be invested in commercial real estate lending (mortgages as well as construction and development loans). This study recommends incentives to encourage banks not to concentrate so heavily in commercial real estate, rather than the imposition of arbitrary limits on participation.

Ultimately, the best protection against excessive risk-taking in commercial real estate or any other bank activity is a regulatory system that imposes effective discipline generally. The "early intervention" capital-based requirements of the 1991 banking reform legislation are a step in the right direction, but more can and should be done to introduce market discipline, with respect to larger banks in particular. Toward this end, all banks with assets over $1 billion should be required to satisfy some portion of their Tier 2 capital standard with subordinated debt, which would provide a stable source of market discipline against excessive concentration in high-risk real estate lending. Smaller banks could be penalized in a different way for excessive concentration,

preferably with lower supervisory ratings and thus higher deposit insurance premia, or alternatively through supplemental capital requirements.

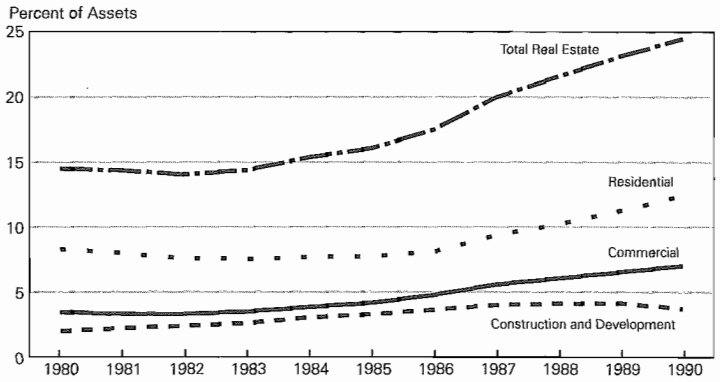
The more difficult regulatory questions arise when asset values "turn south," posing the critical issue of whether the policies desirable for the long run should be relaxed in any way in the short run. Critics of recent bank regulatory policies argue that they should, pointing to what they believe has been the contractionary effect of those policies. The discussion that follows accepts the premise of the critics, that bank regulation does appear to have worsened the 1990–91 downturn and inhibited the recovery, but it does not agree with their conclusion that bank regulation should necessarily be weakened. Instead, the contractionary effects induced by recent bank regulatory policies mean that the two traditional macroeconomic policy tools—monetary and fiscal—need to work that much harder to achieve the desired stimulative impact. Thus, at this writing, a strong case continues for further monetary easing and possibly even some short-run fiscal stimulus, provided that any fiscal package contain concrete measures to reduce the high-employment or structural federal deficit in the long run.

This study nevertheless will recommend three ways in which bank regulation might be changed to minimize the contractionary effects that have been the focus of the critics' attack and yet be consistent with desirable long-run regulatory objectives. First, and admittedly most difficult to alter given their internationally negotiated character, the risk-based bank capital standards should be reworked to remove much of their current bias against banks' making loans. At the very least, a waiver procedure could be established to permit individual countries to narrow the risk-weighting differential between government securities and conventional loans, provided the overall level of capital required of banks is not reduced. In this way the actual 4 percent and 8 percent capital standards for Tier 1 and Tier 2 capital would not be reduced or even delayed. Second, regulators should abandon the policy of requiring banks to establish loss reserves on so-called "performing nonperforming loans," those loans where the borrower continues to make payments but, in the opinion of the regulators, the short-run liquidation value of the collateral has fallen below the face amount of the loan. Instead, banks should be required to establish reserves on loans only when they become nonperforming, not when they are expected to be in that status. Third, once loans become nonperforming, regulators should be discouraged from using liquidation values to establish reserve levels, but instead should base their reserving decisions on conservative, but realistic, estimates of the present discounted value of the real estate collateral.

Some may interpret any or all of these recommendations as a "relaxation" of current standards, but all three can be justified with

Figure 1

Real Estate Loans as a Share of the Assets of Insured Commercial Banks



Source: *Banking Industry in Turmoil: A Report on the Condition of the U.S. Banking Industry and the Bank Insurance Fund*, December 1990; Federal Deposit Insurance Corporation, *Statistics on Banking*, 1990.

appeals to simple common sense. Moreover, to do otherwise in the name of regulatory purity can actually be self-defeating, encouraging a spiral downward in real estate values and bank capital that can only further weaken many of the loans banks already have on their books. Put another way, these changes are designed to be permanent features of the regulatory landscape that nevertheless take account of inevitable cyclical fluctuations in the macroeconomy. *Bank regulatory policy itself* should not be cyclical.

Finally, key to any economic recovery is the growth of residential construction. It is therefore critical that bank regulatory policies not discourage the financing of residential construction by banks and thrift institutions.

Banks and Real Estate Lending: Some Factual Background

As other papers in this volume document, commercial banks became substantially more involved in real estate lending during the 1980s. Figure 1 illustrates, however, that the major upturn did not really

begin until the middle of the decade, and then it did not really accelerate until the end of the decade. At the end of the first quarter of 1992, banks had $854 billion in real estate loans on their books, representing one-quarter of their assets and 43 percent of their total loans.

Figure 2 charts real estate lending for banks of different sizes by major loan category—construction and development, nonfarm, nonresidential mortgages (commercial mortgages), and residential mortgages (one- to four-family). The figures illustrate that banks of all sizes became more active real estate lenders during the past several years, although some distinctions are notable. In contrast to their larger brethren, the smallest banks (those with assets below $300 million) did not significantly increase their lending for construction and development, and thus did not have to cut it back significantly at the end of the decade, as did the larger banks.

It is not difficult to explain why larger banks were increasingly attracted to real estate—and especially commercial real estate lending—during the past decade. These institutions suffered a loss of their prime commercial and industrial loan customers, who found cheaper finance in the securities markets, but they did not suffer a loss in deposits. Accordingly, many large banks chased various forms of higher-risk lending, largely for commercial real estate but also for highly leveraged corporate transactions.[2]

More puzzling, however, is the fact that even banks that had never loaned money to the large companies that deserted banks for the securities markets during the 1980s plunged more heavily into commercial real estate lending. As will be argued below, this was likely a reflection of the herd mentality that gripped many investors, foreign and domestic, bank and nonbank, in the 1980s. At the same time, it is noteworthy that the very smallest banks (those below $300 million in assets), which would have been least affected by the "securitization" of commercial lending in the 1980s, moved less aggressively into commercial real estate lending than the medium-sized and larger banks.

Meanwhile, the rise in the share of all bank assets devoted to less risky residential real estate mortgages can be attributed largely to two factors. Among other things, the 1986 Tax Reform Act gradually phased out deductions for consumer installment debt and thus encouraged consumers to replace what were once straight consumer loans with home equity loans, which are included in the data for residential real estate lending shown in Figure 2. In addition, in the latter part of the decade, bank regulators from the major industrialized countries agreed upon new capital standards (the so-called "Basle Accord") that gave banks incentives to originate and hold residential mortgages, by requir-

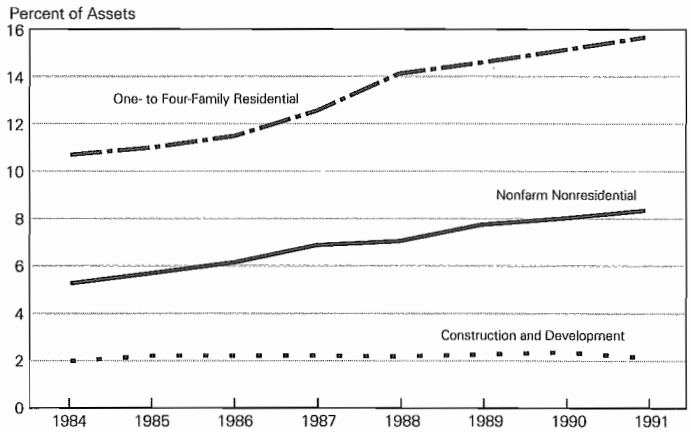
[2] This phenomenon is addressed in some detail in Litan (1991).

Figure 2

Real Estate Loans as a Share of Average Consolidated Bank Assets

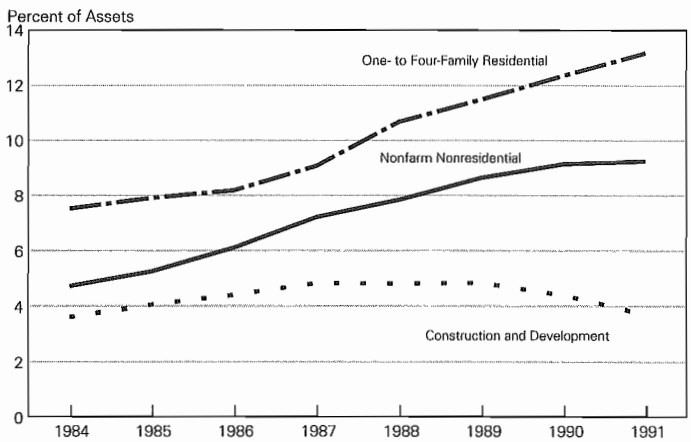
2a.

Banks with Assets below $300 Million



2b.

Banks with Assets of $300 Million to $5 Billion



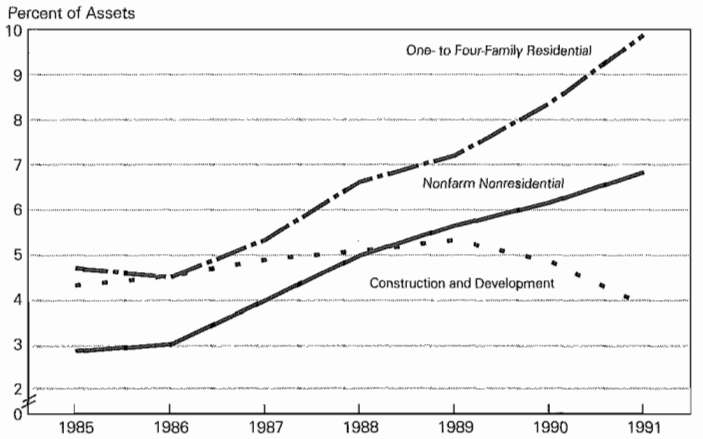
Source: *Federal Reserve Bulletin*, July 1992.

Figure 2
continued

Real Estate Loans as a Share of Average Consolidated Bank Assets

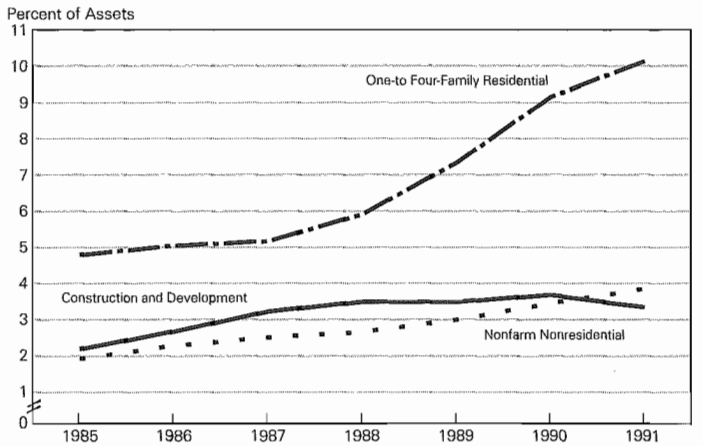
2c.

Banks with Assets over $5 Billion excluding the Ten Largest Banks



2d.

The Ten Largest Banks



Source: *Federal Reserve Bulletin,* July 1992.

Table 1
Percentage of Bank Commercial Real Estate Loans in Nonaccrual Status, First Quarter 1991 vs. First Quarter 1992

	Construction and Development Loans		Commercial Mortgages		All Loans	
Asset Size	1991:I	1992:I	1991:I	1992:I	1991:I	1992:I
All Banks	11.9	14.8	5.5	5.9	3.2	3.0
Less than $100 Million	2.8	3.2	2.1	2.5	1.8	1.6
$100 Million to $1 Billion	5.2	5.8	2.6	3.4	2.1	2.1
$1 Billion to $10 Billion	11.1	12.2	5.3	5.5	3.1	2.8
Over $10 Billion	16.7	22.4	10.0	10.5	4.2	4.0

Source: Federal Deposit Insurance Corporation, Division of Research and Statistics. *The FDIC Quarterly Banking Profile.* First Quarter 1991, p. 3; and First Quarter 1992, p. 3.

ing them to back each dollar so invested with only half the capital required for conventional loans. Although the standards did not become effective until 1991, the fact that they were announced in 1988 would have given banks incentives to build up their residential mortgage portfolios in advance.

It is now well known, of course, that in the 1990s banks have paid a heavy price for their plunge into commercial real estate during the preceding decade. As shown in Table 1, by the first quarter of 1992, nearly 15 percent of all construction and development loans made by U.S. banks were in nonaccrual status, while almost 6 percent of all banks' commercial mortgage loans were in a similar condition. Both numbers were several multiples of the nonaccrual percentages for bank loans generally, and both were higher in the first quarter of 1992 than in the same period the prior year, while bank loans generally were improving in quality. In addition, the largest banks reported the highest percentages of commercial real estate loans in nonaccrual status, consistent with the observation just made that these institutions suffered the greatest shock to their traditional lending business in the 1980s and thus took the greatest risks in an effort to compensate.

Thus far, banks' losses in commercial real estate have not exceeded their losses from LDC debt, either in absolute or relative terms. For example, from 1987 through 1991, the top 50 U.S. banks wrote off $26 billion, or approximately one-quarter of their LDC debt. In contrast, between 1989 and 1991 (the years covering the recent commercial real estate crisis) all U.S. banks wrote off $18 billion, or only about 5 percent, of their commercial real estate loans (Lipin 1992). But it is far too soon to close the books on the comparison. A Goldman Sachs study reported in mid 1992 that $93 billion in bank loans for commercial real estate had still to be "repriced"—or less euphemistically, written down—in order to reflect a projected average deterioration of 30 percent in the value of the

underlying real estate.[3] If, quite conservatively, the write-downs average 20 percent, then the banking industry as a whole is looking at total additional losses of almost $19 billion, a sum roughly equal to the entire earnings of the banking industry in 1991 (approximately $18 billion).

Bank Real Estate Lending: The Role of Public Policy

Banks clearly took a roller coaster ride in their commercial real estate investments during the 1980s and have only themselves to blame for their mistakes. Nevertheless, public policy helped in various ways to build the roller coaster.

The role played by changes in tax policy is well known. The 1981 Economic Recovery Tax Act helped launch a wave of development activity by granting generous depreciation allowances and other incentives for commercial real estate development. But then the Tax Reform Act of 1986 pulled the plug on the market by abruptly taking those incentives away. The changes in tax policy are reflected in the statistics: between 1981 and 1985, the nominal value of commercial construction put in place almost doubled, rising from $40 billion to $76 billion; it was virtually flat thereafter until mid 1990, when it began to plummet on account of the recession.[4]

Bank regulatory policy followed a similar roller coaster pattern. As part of the Garn-St Germain Act of 1982, Congress removed various statutory restrictions on permissible loan-to-value ratios governing the real estate lending of national banks, which previously ranged from 66.7 percent for unimproved land to 90 percent for improved structures.[5] In their place, Congress issued only broad instructions to the Comptroller of the Currency to regulate real estate loans in a manner consistent with the "safety and soundness" principles it applied to all bank lending. A gradual relaxation of lending standards throughout much of the banking system followed.

For example, at the beginning of the decade the typical bank did not finance unimproved land; when it financed construction it did so only when a developer had a commitment for "takeout" financing in hand; and commercial mortgages were provided only where developers put up at least 30 percent of the money. By the end of the decade, land loans

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[3] Brueggman (1992). The study also indicated that at that time thrift institutions and insurance companies faced repricing on $92 billion of commercial mortgages.

[4] Data are from the *Economic Report of the President, 1992*, pp. 354–55. For a thorough treatment of the role played by tax policy changes, see the paper by James Poterba in this volume.

[5] The previous law also specified loan-to-value limits and maturities for residential mortgage loans of 80 to 90 percent.

were common, construction loans often were provided without advance takeout commitments, and many developers put up as little as 10 percent equity. In some cases, banks put up all the money (Brimmer 1992; Downs 1992). In this respect, banks followed the thrifts, which were allowed into commercial real estate finance for the first time only at the beginning of the 1980s (with the passage of the Depository Institutions Deregulation and Monetary Control Act in 1980 and the Garn-St Germain Act in 1982). Liberal commercial real estate lending by many thrifts helped lead to the overbuilding in many markets that later came to haunt the commercial banks and the developers they funded.

The roller coaster in bank and thrift regulatory policy changed direction at the very end of the 1980s in two ways. First, lending by thrifts for both commercial real estate and residential construction was significantly cut back in August 1989 in the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA). This was not done directly, but instead was the effective result of provisions that forced thrifts to limit loans to one borrower to no more than 15 percent of capital (the standard applicable to banks), down sharply from the previous 100 percent of capital limit. As a practical matter, this change had its greatest impact on commercial real estate loans, which tended to be the largest loans in thrift portfolios. In addition, FIRREA mandated a long overdue increase in thrift capital ratios that had the effect of constraining the growth of capital-weak institutions.

Second, shortly after FIRREA became law, bank regulators became more rigorous in their valuation of loans collateralized with real estate and then of commercial loans generally. The change in attitude appears to have surfaced first with the Comptroller's examination of Bank of New England, which had a large portion (38 percent) of its loan portfolio tied up in real estate, primarily in the Northeast where real estate values had begun to drop. As a result of the exam, Bank of New England was required to make substantial additions to its reserves in the fourth quarter of 1989 and even greater additions the following year (culminating in the bank's failure in January 1991).

The regulatory posture became more formal and general in early 1990, mandating a more conservative approach toward establishing reserves for future loan losses and in particular requiring banks and their examiners to place greater emphasis on the market value of the underlying collateral, as an indicator of the likelihood of future default. For commercial real estate loans in particular, the Comptroller issued new instructions that noted, among other things, that "[m]ortgaged premises can be considered foreclosed, *in substance*, regardless of whether formal foreclosure has taken place . . . when the debtor has little to no equity in the collateral, sources of repayment depend on the operation or sale of the collateral, and the debtor has abandoned control of the collateral" (emphasis added). The new guidelines further ob-

served that while "in some cases" the debtor may continue to retain control of the collateral, as a practical matter control may be deemed abandoned "because of financial weakness or [poor] economic prospects."[6]

In effect, this language gave examiners the authority to require banks to establish reserves against loans on which borrowers were current in their payments but where the market value of the underlying real estate collateral had fallen so low as to wipe out any equity the borrower may once have had in the project. In fact, examiners had this authority before, since the *Comptroller's Handbook* had previously counseled that mortgage loans were unsound if "the amount of the loan is large relative to the fair value of the property" or if the "ability of the obligor to pay is questionable" (Section 213.1, p. 2). In this connection, the *Handbook* had also observed that real estate values could be determined by looking to the recent prices on comparable real estate or by capitalizing income that the property was expected to generate. All of this preexisting language gave examiners ample flexibility to force banks to establish reserves on what have since been labeled "in substance foreclosures." Nevertheless, by adding specific instructions to this effect, the new guidelines issued in early 1990 appeared to dictate that approach, rather than allowing banks to avoid reserving until borrowers actually began missing their loan payments.[7] It appears that the other federal bank regulatory agencies—the Federal Deposit Insurance Corporation and the Federal Reserve—adopted the Comptroller's new policy at roughly the same time.

The widely understood rationale for the tough regulatory stance toward the valuation of bank real estate loans was a desire to make provision in advance for the increased likelihood that in a depressed real estate market, borrowers would simply "hand the keys" to their property to the bank rather than continue to make loan payments, even if they had the financial resources to make those payments independent of the collateral. Such behavior apparently was common in the Southwest in the mid 1980s, when plunging oil prices caused an economic downturn in that regional economy. Regulators simply wanted to apply that experience to New England and any other part of the country where it seemed likely to be repeated. A critical question, to be addressed

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[6] Taken from the *Comptroller's Handbook for National Bank Examiners* (March 1990), Section 213.1, p. 2.

[7] Much has been made of the fact that the Comptroller's new policy urged examiners to value property based on "discounted cash flow" techniques. It is true that the new instructions specifically described discounted cash flow as an alternative real estate valuation technique, but no major conceptual difference exists between discounted cash flow and the "capitalization of income" approach that was previously identified as a method of valuation.

below, is whether in attempting to anticipate future loan losses, regulators helped make them worse.

Bank Real Estate Problems: Could They Have Been Avoided?

It is easy in retrospect to claim that regulators could have done a better job of preventing banks from taking the real estate roller coaster. At a minimum, if both bank and thrift regulators had retained in the form of regulation the loan-to-value ratios that were previously part of the bank statutory environment, both types of depository institutions would not have so freely increased their exposures to commercial real estate. The same would be true, of course, if Congress had never repealed the loan-to-value guidelines as part of Garn-St Germain.

A case can also be made that real estate concentration limits would have helped, although as will be argued below, less arbitrary ways can be found to curtail excessive real estate lending risks. In fact, even Garn-St Germain constrained federally chartered thrifts in their commercial real estate lending, although the "limit" was quite high—40 percent of assets, or more than four times the average level of the typical bank during the 1980s. No such concentration limit was set for commercial banks. Clearly, in retrospect, had both sets of institutions been subjected to significantly lower limits—say, on the order of 10 percent—commercial real estate construction would not have gone as far overboard as it did. Moreover, a 10 percent concentration limit would have constrained fewer than 10 percent of the banks.[8]

But just because different regulatory policies could have prevented overlending by banks for commercial real estate, overall bank *safety* would not necessarily have been enhanced. After all, if banks and thrifts had not made commercial real estate loans that later turned sour, they still would have had to find some other investments for the deposits they had collected. Since by making these loans in the first place these institutions had displayed an appetite for risk-taking, would they not simply have found other, perhaps even riskier, ways to gamble—for example, by extending even riskier commercial and consumer loans, engaging more heavily in trading activities (government securities and foreign exchange), or taking on more interest rate risk? Or, if their risk-taking opportunities in commercial real estate lending had been truly diminished, would they have pursued their other banking activities more prudently?

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[8] This calculation is based on data from *Bank Source*, a data base service of W.C. Ferguson & Co., for the years 1986 to 1990.

To oversimplify, the answers to these questions turn on which view of the commercial real estate lending phenomenon most accurately describes the behavior of lending institutions during the 1980s. The "moral hazard" view suggests that risk-taking was concentrated among institutions that were poorly capitalized or perhaps even economically insolvent, or those institutions that, in principle, would have had the most to gain from the "heads I win, tails the FDIC/FSLIC loses" gambles that are created by federal deposit insurance. If this view is correct, then tighter loan-to-value criteria or lending concentration limits for commercial real estate lending would have helped contain the overbuilding of commercial properties, but would not have stopped the lending institutions from taking other, potentially even riskier gambles.

An alternative view would suggest that it was a "herd" or "lemming" mentality that drove banks and thrifts into such heavy involvement in commercial real estate lending. That is, once some lenders saw how profitable such lending was for other lenders, they quickly hopped on the bandwagon, hoping either that the real estate boom would last forever or, more likely, that at least their borrowers would be the last good ones before the crash came. Moreover, what made commercial real estate lending so easy is that lenders did not have to go out chasing deals. The 1981 tax act gave developers strong incentives to cook up deals, which then came to the banks, and all the banks had to do was decide whether to take them. If the "lemming" view of bank and thrift lending for commercial real estate is correct, then presumably tighter loan-to-value ratios and/or concentration limits not only would have constrained risk-taking in commercial real estate, but also would have enhanced the overall safety of the banking system.

Which of these two views is most accurate? For thrift institutions, several pieces of evidence tilt toward the moral hazard explanation. First, between 1982 and 1985, or the three years following the enactment of Garn-St Germain, the thrift industry as a whole increased its investments in commercial mortgages from $44 billion to $98 billion, or from 6.4 percent of its assets to 9.2 percent. It was during this period that much of the asset gambling in the industry took place and quite clearly commercial mortgages were the chosen vehicle for this risk-taking, since the share of residential mortgages in thrift portfolios dropped sharply, from about 73 percent of assets to less than 60 percent (Hendershott and Kane 1992). Significantly, the thrifts that grew most rapidly—and thus were likely to have had the thinnest capital-to-asset ratios (assuming they were positive)—had higher proportions of their assets invested in commercial mortgages, suggesting that these institutions were deliberately taking risks at the expense of the deposit insurer (White 1991, pp. 102–103).

Second, between 1985 and 1988, thrifts that were insolvent according to generally accepted accounting principles (GAAP) consistently had

higher proportions of their assets invested in commercial mortgages; the same pattern was true for direct investments (Barth, Bartholomew, and Bradley 1989). In some quarters, this pattern has been interpreted as evidence that commercial mortgage investments "caused" the insolvencies. The more accurate interpretation may be that institutions that were GAAP-insolvent throughout this period abused the deposit insurance system, taking ever larger risks while they remained open, and that their vehicle of choice was commercial real estate. Indeed, GAAP-insolvent thrifts increased the share of assets devoted to commercial real estate mortgages between 1985 and 1986 from 12.7 percent to 17.2 percent, a trend consistent with this explanation.

Moral hazard behavior also helped drive some of our largest banks—namely those that had suffered significant losses on LDC debt—toward commercial real estate lending (Litan 1991, pp. 28–29). But that surely cannot explain why, as was shown in Figure 2, banks in all size groups increased the concentration of their portfolios in such investments. Nor can it explain why so many *nonbank* financial institutions, such as life insurance companies and pension funds, also became more active lenders for real estate (although primarily for the less risky takeout financing). The "lemming" hypothesis appears to be more consistent with these actions than moral hazard.

To investigate this issue further, this study analyzed banks of different capital strengths during the period from 1986 to 1989, the years when banks sharply increased their investments in commercial real estate loans, to see if the weaker banks displayed any greater tendency to increase their asset concentrations in construction and development and commercial mortgage loans. Banks were segregated for this purpose into "small" and "large" banks, or those with less and more than $1 billion in assets, respectively.

Table 2 shows the results for the larger banks in two capital-to-asset categories, above 6 percent and between 3 percent and 6 percent; too few banks of this size had capital ratios below 3 percent to provide meaningful results. The contents of the table can best be described with an example. The first line of the table lists, for all banks with capital ratios above 6 percent in 1986, the shares of their assets invested in loans for construction and development, commercial mortgages, and residential mortgages in the years from 1986 to 1989. For this group of banks, the best-capitalized institutions, the shares invested in all three types of real estate rose during the period. The same pattern was repeated for banks with capital ratios above 6 percent in 1987 and in 1988.

The critical question is whether banks that were less well capitalized, those with capital ratios between 3 and 6 percent, displayed any *greater* tendency to invest in commercial real estate loans, the behavior one would expect if moral hazard incentives were driving much of the investment in this area. The answer appears to be "no": the shares of

Table 2
Percentage of Bank Assets Vested in Real Estate in the Years 1986 to 1989
Banks with Assets Greater than $1 Billion, Grouped by Equity-to-Asset Ratio

Year-End	Equity-Asset Ratio	Construction and Development Loans				Commercial Mortgages				Residential Mortgages			
		1986	1987	1988	1989	1986	1987	1988	1989	1986	1987	1988	1989
1986	>6%	6.9	7.7	8.1	8.0	7.2	8.6	9.5	10.3	11.8	13.0	13.8	14.7
	3%–6%	6.3	6.9	6.7	6.6	4.9	5.8	6.2	6.8	7.1	8.4	10.0	12.4
1987	>6%	6.6	6.9	7.1	7.1	8.0	9.7	10.4	11.2	11.3	16.2	17.1	17.6
	3%–6%	6.2	7.1	7.4	7.4	5.1	6.7	7.2	7.7	8.9	11.7	13.2	15.4
1988	>6%	6.4	7.0	7.5	7.4	7.8	9.9	10.7	11.4	12.6	17.9	19.2	20.0
	3%–6%	5.8	6.4	6.9	6.8	4.6	5.6	6.5	7.0	7.3	9.5	10.8	12.6

Source: W.C. Ferguson & Company, *Bank Source.*

assets invested by these banks in commercial real estate loans also rose over the period, but not noticeably faster than among the better capitalized banks.

Table 3 provides the same statistics for banks with less than $1 billion in assets, with one key difference: for this group of banks, it was possible to include banks with significantly lower capital ratios, between zero and 3 percent, where one would expect to find more evidence of moral hazard behavior. This table, too, shows no strong evidence of

Table 3
Percentage of Bank Assets Vested in Real Estate in the Years 1986 to 1989
Banks with Assets Less than $1 Billion, Grouped by Equity-to-Asset Ratio

Year-End	Equity-Asset Ratio	Construction and Development Loans				Commercial Mortgages				Residential Mortgages			
		1986	1987	1988	1989	1986	1987	1988	1989	1986	1987	1988	1989
1986	>6%	4.3	4.5	4.6	4.8	12.0	13.1	13.7	14.2	20.8	22.6	23.6	24.5
	3%–6%	7.7	7.2	6.9	6.8	13.9	15.5	15.4	16.3	16.6	18.8	20.2	21.4
	1.5%–3%	7.0	5.6	5.2	4.5	12.5	11.3	12.7	13.3	11.3	12.8	12.1	13.1
	0–1.5%	17.9	18.6	13.8	5.9	8.8	15.5	17.6	17.6	14.0	14.7	18.2	19.6
1987	>6%	4.1	4.7	5.0	5.1	11.9	13.0	13.6	14.2	21.2	27.3	28.3	29.1
	3%–6%	7.9	7.4	6.2	5.9	13.3	15.2	15.8	16.4	16.7	20.4	22.6	25.2
	1.5%–3%	9.0	8.3	7.0	5.2	12.9	17.5	13.3	12.5	13.7	16.6	17.6	26.6
	0–1.5%	8.3	5.2	4.2	3.2	14.8	15.0	15.7	13.0	16.5	22.8	31.8	32.6
1988	>6%	4.0	4.6	5.0	5.1	11.9	12.9	13.7	14.3	21.5	27.6	28.7	29.4
	3%–6%	6.8	7.0	6.9	6.2	12.2	14.2	14.8	15.4	16.6	20.6	22.4	24.8
	1.5%–3%	5.3	5.8	3.4	4.1	11.1	13.1	12.9	14.4	15.2	18.8	19.0	22.0
	0–1.5%	9.6	9.4	7.1	3.9	9.5	12.6	14.5	12.4	12.1	16.5	18.4	19.8

Source: W.C. Ferguson & Company, *Bank Source.*

such behavior. Indeed, the weakest banks (those with capital-to-asset ratios below 3 percent) actually decreased the shares of their investments devoted to commercial real estate by the end of the period, although this result is strongly affected by "survivorship bias," since a large fraction of the banks in this category eventually failed.[9]

The fact that moral hazard behavior was not as evident in the banking industry as it was among thrifts should not be surprising. After all, during the mid 1980s, the thrifts that were gambling were actually *insolvent*. In contrast, while the capital ratios of many banks were weak—especially those of the larger banks that had engaged heavily in LDC debt lending—they were not *negative*. Thus the incentives for risk-taking, while present, were not as strong as those that confronted insolvent thrifts. At the same time, however, moral hazard incentives probably played some role in the tendency of a number of weak larger banks to engage more heavily in commercial real estate lending in the latter part of the decade.

In sum, to the extent that commercial real estate lending increased among thrifts and banks during the 1980s on account of moral hazard, it is unlikely that a tougher regulatory policy toward real estate lending would have improved overall bank and thrift safety, although it clearly would have resulted in fewer real estate problems. That does not mean, however, that such a policy would have been totally ineffective. Lemming behavior also appears to have played a significant role in the willingness of so many lending institutions to increase the shares of their asset portfolios invested in commercial real estate loans. A more restrictive regulatory policy toward real estate lending would have constrained the lemmings from following each other over the cliff.

How then could the moral hazard dangers have been prevented? With respect to thrifts, the answer is easy: insolvent institutions should have been shut down, and if the money for that job would not have been made available (as it was not), then at the very least those institutions should not have been permitted to grow. With respect to banks, it would have been desirable to have had in place something like the capital-based early intervention system of many years ago, so that a number of the weakly capitalized banks would have been constrained from bidding for high-cost deposits and placing the proceeds in risky investments. However, as will be argued below, enhanced regulatory discipline could and should have been supplemented by *non-destabilizing* market discipline, in the form of a mandatory subordinated debt

[9] The overwhelming proportion of banks with less than $1 billion in assets actually had assets below $500 million. Of the banks with capital ratios below 3 percent, approximately one-half failed during the period from 1987 to 1989. See Barth, Brumbaugh and Litan (1992, p. 102).

requirement for larger institutions. Such a requirement would have limited the growth of some of the weaker large banks and thus inhibited their risk-taking.

Did Regulators and Congress Make the Problem Worse?

As already noted, regulatory and statutory policy related to bank and thrift financing of real estate turned sharply more restrictive at the very end of the 1980s. A growing chorus of policymakers—some in attendance at this conference—believe that regulators overreacted, creating a vicious downward cycle in real estate prices and in economic activity generally.

The stylized argument, in summary, goes something like this. By requiring banks to establish substantial reserves against currently performing loans where the market value of the collateral may have fallen below the loan amount, regulators induced a significant erosion in the capital bases of many banks, initially in the Northeast but more recently in other parts of the country. All this occurred at a time when regulators were also paying much greater attention to compliance with capital standards, initially as a result of the Basle Accord and later on account of the 1991 banking legislation. Accordingly, it is said that banks became much more reluctant to lend, not only for new real estate projects—which was appropriate, given the overbuilding in the market—but also to roll over the mini-perm and bullet loans they had previously extended. This reluctance to lend, in turn, allegedly drove real estate prices down further, which caused second and third rounds of write-downs on commercial real estate lending. At the risk of stating the obvious, the critics do not quarrel with the fact that real estate prices initially may have fallen, but with the regulatory policy driven in large part by the market's valuation (or estimates thereof, based on discounted cash flow models).

If this was the only alleged effect of the tighter regulatory policy toward commercial real estate, the critics would find few sympathetic ears beyond those on the heads of real estate developers and lending officers in the financial institutions that had extended money to them. But the alleged damage is considerably worse: it is suggested that the capital erosion induced by the market-based valuation of real estate, coinciding as it did with tougher capital enforcement generally, caused banks to contract their overall lending to other sectors of the economy, thus worsening the economic downturn that began in New England at the end of the 1980s and elsewhere in 1990. In short, the so-called "credit crunch" is said to be directly attributable to a combination of the

Table 4
Portfolio Composition of Insured Commercial Banks
Percentage of Total Assets

Asset	1985	1986	1987	1988	1989	1990	1991	4/92
Loans								
C&I	22.0	20.8	19.9	19.4	19.1	18.5	17.3	17.7
Consumer	10.9	11.2	11.1	11.3	11.4	11.2	10.8	10.5
Real Estate	15.7	16.7	18.7	20.6	22.2	23.5	24.4	25.1
Securities	15.5	16.1	16.7	16.8	16.7	17.2	18.7	19.8

Source: *Federal Reserve Bulletin*, July 1992.

regulators' policies toward real estate lending in particular and the structure and enforcement of capital standards generally.

The evidence is clear that banks have become more reluctant to lend since 1989. Table 4 shows that the share of banking assets devoted to securities investments (principally U.S. government bonds) increased by 3 percentage points between 1989 and April 1992. Indeed, the Federal Reserve reported in July 1992 that, for the first time in 27 years, total bank holdings of Treasury securities ($607 billion) had surpassed total bank commercial and industrial loans ($599 billion). The peculiar structure of the new capital standards—namely, the risk-weighting of assets that assigns a zero weight and therefore no capital requirement for U.S. government securities, as opposed to conventional loans—has only worsened this problem.[10]

In addition, strong evidence suggests that banks have purposefully curtailed their asset growth, in an effort not only to conform with capital standards but also to provide a margin of comfort in excess of those standards. It takes only a brief look at banks' real estate problems to understand why. As of the first quarter of 1992, 4.6 percent of all real estate loans made by all U.S. banks were in "noncurrent" status (past due by at least 90 days or otherwise in nonaccrual status); since real estate loans represent one-quarter of all bank assets, the real estate nonaccruals represent an estimated 1.2 percent of all bank assets. If, in a reasonable worst case, one-half of the value of the nonaccruals must be charged off, then the "hit" to bank capital ratios from problems in real estate lending alone is about 0.6 percentage points. For banks in New England, where almost 8 percent of all real estate loans were in

[10] A number of Federal Reserve officials, including the Chairman of the Federal Reserve Board himself, have stated that the "leverage ratio" was becoming more binding for many banks than the risk-based standards and that, therefore, the regulators were giving strong consideration to phasing out the leverage standard. Ironically, however, it is the Basle risk-weighted standards that have given banks especially strong incentives to invest in government securities.

nonaccrual status in the first quarter of 1992, the effects would be twice as large, or over 1 percent of assets. In New York, where real estate nonaccruals were over 16 percent of all real estate loans, the impact is potentially four times as high, or more than 2 percent of assets.[11]

Given that the minimum bank leverage ratio is 4 percent, and that banks have losses on other loans as well, it is little wonder that the potential losses on real estate loans have driven banks to shrink their assets—principally by letting their high-cost deposits "run off." For example, total bank assets grew at an annual rate of just 2.8 percent between December 1989 and April 1992, or less than half the 5.9 percent growth rate between 1983 and 1989. The sluggish growth of bank assets during the past several years is consistent, of course, with the concomitant slow growth in the monetary aggregates. It also reinforces the significance of the slowdown in the growth of bank lending.

There are two views, of course, about the source of this slowdown. Most banks, and quite a few economists, have claimed that bank assets and loans have not been growing because of a lack of demand for credit. After all, the economy has been extremely weak and both businesses and consumers have been overextended, so understandably businesses have not been eager to borrow from banks, at any price. Indeed, a recent survey by the National Federation of Independent Business reports loan demand at an all-time low among companies with 100 employees or less (Saddler 1992).

On the other hand, when customers fail to show up at a bank, that does not automatically mean that demand is absent: it only means that demand is weak *at the price suppliers are offering*. In the case of the banking industry, while it is true that the absolute level of the prime rate has fallen, it has not fallen as rapidly as the cost of funds. For example, by one measure, the difference between the prime rate and the rate on fed funds, the "spread" on bank commercial and industrial loans rose to an historic high in 1991 (Figure 3). And the spread does not include the other costs of obtaining a bank loan these days, especially the costs entailed in providing more collateral.

The higher costs in turn may be—and probably are—misperceived by many borrowers, who may believe that they are so high that they do not even bother applying for loans (the counterpart of "discouraged workers"). Too many anecdotes to be ignored, coming from smaller businesses as well as some bankers, suggest that precisely such factors have been at work, especially in the Northeast where bank capital has been hit especially hard by the real estate downturn. Perhaps the most persuasive of such anecdotal evidence occurred in May 1992, after the

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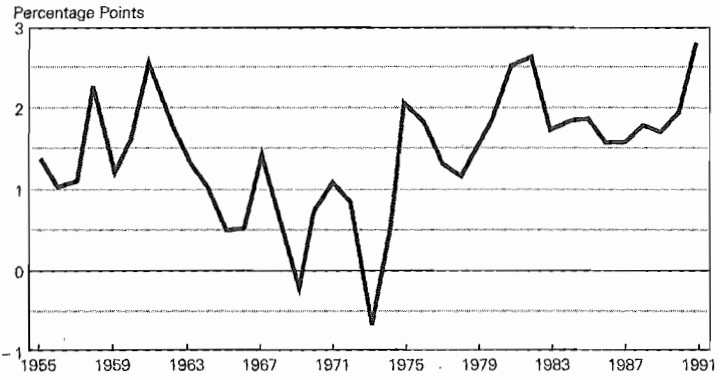
[11] Data in this paragraph are taken from *The FDIC Quarterly Banking Profile*, First Quarter, 1992.

Figure 3

The Spread between the Prime Rate and the Federal Funds Rate



Source: DRI/McGraw Hill.

Bank of Boston announced and publicly advertised the fact that it was making up to $3 billion available for commercial loans. According to a bank official, the response was literally overwhelming: over 5,000 loan applications were filed in short order, and while many were not meritorious, by August 1992 the bank had agreed to provide $1 billion in new financing to this pool of customers. The fact that other banks in the New England area do not appear to have been as aggressive as the Bank of Boston suggests that the credit crunch in that region is very real—and that it is driven by supply, rather than demand.

Critics of the supply-driven "credit crunch" hypothesis may respond by pointing to the commercial paper market, where the most creditworthy companies that do not rely on banks for credit have curtailed their borrowing. For example, after growing at an annual rate of 21 percent between the end of 1987 and the end of 1990, commercial paper issued by nonfinancial corporations actually fell by almost 10 percent in 1991. Clearly, if the most creditworthy borrowers in the United States have cut down on their borrowing, that would suggest that cries of a credit crunch are overblown and that any drop in borrowing must be demand-driven instead.

This argument now appears less convincing, in light of the disap-

pointing pace of the economic recovery and the continued spate of anecdotes about the unwillingness of banks to lend to creditworthy borrowers. For another thing, nonfinancial companies have resumed their borrowing through the commercial paper market in 1992, causing the total outstanding to increase at an annual rate of almost 20 percent in the first quarter. In contrast, during the same period, total commercial and industrial lending by commercial banks fell at an annual rate of 7.5 percent, suggesting that smaller businesses were indeed having more difficulty finding credit than larger borrowers. In any event, the most creditworthy borrowers, who can access the commercial paper market, account for only a small proportion of total employment in the economy. In 1991, for example, the Fortune 500 companies employed only a little more than 10 percent of all nonfarm workers, down from about 20 percent in the early 1970s (Hale 1992).

Moreover, the fact that corporate borrowers have reduced their commercial paper borrowings does not necessarily prove that *less* creditworthy borrowers who must rely on banks have not been discouraged from seeking bank loans by an actual or perceived unwillingness of banks to lend. What may be going on is a vicious cycle, whereby smaller companies that both supply and consume the products and services that are produced and delivered by larger companies have been hurt by the unavailability of bank financing; the larger corporate customers in turn need to borrow less because they are producing or delivering less; but all this does not mean that a credit crunch has not existed for smaller companies, especially those in hard-hit regions like New England.

The aggregate data confirm that banks have become less important providers of credit, relative to other financial institutions. Between 1989 and 1991, total credit market funds advanced by all private financial institutions fell from $536 billion to $337 billion, a 37 percent drop. Over the same period, the funds supplied by commercial banks fell even more, by 53 percent (from $177 billion to $83 billion). In contrast, insurance and pension funds actually increased their supply of funds by the small margin of 2 percent ($198 billion to $203 billion).[12] In short, a shift of credit flows has most likely occurred among borrowers, from the smaller businesses that customarily rely on banks to individuals and to larger corporations that borrow from other financial intermediaries.

Still another possible criticism of the credit crunch hypothesis, at least as it relates to New England where bank capital ratios have been reduced the most in recent years, is drawn from the experience in Texas. In the mid 1980s, banks in that state experienced a similar negative shock to their capital positions. Yet as one study has shown, economic activity there has not been correlated with the lagged values of lending

[12] Data are taken from the *Federal Reserve Bulletin*, August 1992, p. A41.

by banks in the state, suggesting that banking difficulties have not had noticeable negative real consequences (Gunther and Robinson 1991). It would be a mistake, however, to draw too much from this experience. As the authors point out, the most likely explanation of why the drop in lending by Texas banks had no perceptible effect on subsequent economic activity was that Texas-based customers who wanted credit could find it *elsewhere*, from bank and nonbank lenders based *outside* the state. In the current circumstance, bank lending has been curtailed *throughout the country*, not just in New England, suggesting that customers in New England and elsewhere would have had a tougher time finding credit than Texas-based borrowers did in the mid 1980s. While certainly not as intense as it was during the Great Depression, when thousands of banks failed and thereby interrupted the bank intermediation process for many borrowers (Bernanke 1983), the recent contraction of bank lending appears to have had some of the same effects.

In short, it appears that the tougher regulatory policy stance toward the depository industry *has* worsened the recession and inhibited the recovery, although this writer is not prepared to say by how much. Probably we will never know. *Whether the more stringent regulatory policy was wrong* is an entirely different and more complicated matter. As will be discussed in the concluding section, the answer—looking both backward and forward to the transition ahead—depends very much on one's faith in the likelihood that appropriately stimulative macroeconomic policies would have been (and will be) implemented to offset the contractionary effects of bank regulatory policies that, with a couple of exceptions, are basically in the long-term interest of promoting a safe and sound banking system.

Regulation of Bank Real Estate Activities: The Long-Run Agenda

In comparison to the first two questions, the third question—namely, the appropriate long-run strategy for regulation of bank real estate lending—is an easy one to answer, and one whose broad contours already have been suggested. The answer comes in two parts, one addressed to real estate lending directly, and the other to bank lending and other activities generally.

With respect to real estate lending, it is simply common sense that banks be held to loan-to-value ratios, requirements that were part of the statutory framework until 1982. If it is true that such requirements would have limited the severity of the overbuilding of commercial real estate in the 1980s, as is argued above, then it follows directly that such requirements represent sound long-run policy for the 1990s and beyond.

At this writing, the four federal banking and thrift regulators have

just proposed re-implementation of loan-to-value ratios that, on balance, are modestly more restrictive than those in place prior to 1982. Specifically, the proposal would require loan-to-value ratios at the low end for raw land (in the 50 to 60 percent range, below the 66.7 percent limit in the 1982 standards), and at the high end (an 80 to 95 percent range) for mortgages on residential real estate. The agencies issued their proposal in response to the 1991 banking reform legislation, which directed the agencies to adopt uniform real estate lending standards by September 19, 1992, to be effective by March 19, 1993. To allow for a transition, the proposed rules would permit lending institutions to extend loans not conforming to these restrictions in an aggregate amount of up to 15 percent of the institution's capital. This proposal seems eminently reasonable as a long-run objective.

Some analysts have suggested going even further by imposing a concentration requirement on banks; for example, limiting the proportion of a bank's assets that can be invested in real estate (or individual categories of real estate) loans. While there is little doubt that banks that concentrate excessively in real estate lending may be prone to greater risk, this writer would be reluctant to support any arbitrary asset concentration limit, and would prefer to rely on an incentive-based approach.

Larger banks—specifically those with more than $1 billion in assets, which are likely to have access to the subordinated debt market—should be required to meet some portion of their Tier 2 capital requirement by subordinated (uninsured) debt. Unlike pure equity capital, which banks can manipulate depending on the levels of loan loss reserves they establish, subordinated debt outstanding is a hard and definite number. Holders of subordinated debt also cannot "run" because they are not entitled to a return of their proceeds until the debt matures, unlike investors in certificates of deposit who can demand an immediate return of their funds, albeit with a small penalty. It is for this reason that this author has always been skeptical of proposals that would cut back the level of deposit insurance, especially with respect to the larger banks that, despite the 1991 banking reform legislation, will always be deemed "too big to fail" (or more precisely, "too big to let uninsured depositors take a loss").[13]

In any event, banks that cannot sell subordinated debt to the markets will not be able to grow, and thus will be constrained from investing more heavily in high-risk assets. And one reason the markets

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[13] Since the enactment of the 1991 reform legislation, which makes it more difficult for regulators to pay off uninsured depositors, the FDIC has increased the proportion of failures that it has resolved by not protecting uninsured deposits. The banks that have been subjected to this treatment are smaller institutions, however, none larger than $1 billion in assets, to my knowledge.

may not purchase a bank's subordinated debt is that investors may be uncomfortable with the levels of its asset concentrations, given its equity capital. In short, it would be preferable to let sophisticated investors influence a bank's asset concentration levels rather than have portfolio decisions made by regulators, or worse, by legislators.[14]

For smaller banks that do not have effective access to the subordinated debt market, excessive concentration in commercial real estate lending could be restricted in either of two ways without imposing an arbitrary ceiling. One approach would be to give banks that cross a certain concentration threshold for high-risk assets a lower supervisory rating, unless such concentrations were offset with additional capital. High-risk assets would include not just commercial real estate, but also LDC loans, loans for highly leveraged transactions, and arguably credit card loans, which historically have had high charge-off rates. Since the FDIC's new risk-based insurance system will be pegged, in part, to banks' supervisory ratings, this approach would have the effect of charging banks higher deposit insurance premia if they concentrate their investments excessively in high-risk assets. Alternatively, regulators could directly require banks that cross certain concentration thresholds to raise additional capital. Under either approach, the requisite concentration criteria would be somewhat arbitrary, but they would not act as flat limits, which could hamper otherwise useful lending by institutions with expertise in a field and in locations where such financing is in heavy demand. An incentive-based approach would be preferable, one that would encourage banks that want to concentrate in higher-risk activities to have more capital backing them.

Finally, any long-run regulatory agenda must have clear rules for loan valuation. This subject will be treated in the following section.

Managing the Transition

While it may be useful to know the direction in which we should be headed in the long run, bankers and regulators must continue to live in the short run, and unfortunately it will be painful. A number of analysts have suggested that real estate prices have hit bottom in key markets, but many banks are far from out of the woods, on their problem

[14] I am fully aware that even the most sophisticated investors can fail to forecast future bank difficulties, as Richard Randall has documented (1989). Nevertheless, not only do regulators fail to anticipate all bank problems but in recent years they also have often engaged in forbearance, allowing banks to grow more rapidly than their weakened financial conditions would otherwise permit, and which the market itself would not permit. In short, while investors may not be able to anticipate all asset quality problems, once those problems have been recognized, they can discipline weakened institutions more effectively than regulators can.

commercial real estate loans in particular. Moreover, it now seems to be conventional wisdom that in many areas of the country where commercial real estate markets have been especially hard hit in the last several years—New England, much of the Northeast, and California—the excess capacity now on the market may not be absorbed for several more years.[15] Indeed, even that forecast may be optimistic. The commercial vacancy rate in Houston exceeded 20 percent in the spring of 1992, more than five years after the collapse of the real estate market there.[16]

More broadly, the economy continues to recover from the 1990–91 recession at a very sluggish pace. Since hitting bottom in the first quarter of 1991, GDP has grown at an annual rate of less than 2 percent, a pace clearly insufficient to absorb new workers coming into the labor force. As a result, the unemployment rate at this writing (7.7 percent) stands more than 1 full percentage point above the level of the first quarter of 1991 (6.5 percent), when the recession supposedly "ended" (the last quarter when GDP actually fell).

Meanwhile, the financial system appears unwilling or unable to encourage a faster recovery. In particular, despite apparent efforts by the Federal Reserve to expand the money supply, the growth of M2 and M3 has been at the floor of the Fed's target ranges for more than two years now, surely in part because of banks' unwillingness to make loans and to bid for deposits, both in an effort to build capital ratios.[17] Even so, short-term interest rates have dropped steeply, but with little apparent stimulative effect. In the vernacular used by many economists, the Fed seems to be pushing on a string. It may be the case, of course, that the full effects of the most recent easing of rates (generated during the summer of 1992) will not show up until early 1993. Nevertheless, rates have been coming down for over 18 months at this writing, and yet annual GDP growth has continued to be disappointing and slower than the rate expected by most economic forecasters.

Against this background of slow growth, a growing chorus has been urging that bank regulators relax both their capital standards and their loan valuation methods in order to help jump-start the economy by encouraging bank lending, to smaller businesses in particular. Advo-

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[15] See, for example, the views of David Shulman of Salomon Brothers, quoted in Quint (1992).

[16] See "Still Flat On Its Back," *The Economist*, May 16, 1992, p. 103. The article reported the vacancy rate for downtown Los Angeles to be even higher, at 25.2 percent. Other major cities—including Chicago, Boston, and New York—also reported vacancy rates in the 20 percent range.

[17] In particular, the Fed's target range for the growth of M2 in 1991 and 1992 has been 2.5 percent to 6.5 percent, but in actuality, M2 grew by only 3 percent in 1991 and was advancing at a 3.5 percent pace through April 1992. Similarly, the target range for M3 growth was 1 to 5 percent in both 1991 and 1992, yet M3 grew by only 1.4 percent in 1991 and through April was climbing at an annual rate of just 0.7 percent in 1992.

cates of this position point to the limited effectiveness of easier monetary policy as well as to political and economic reasons why additional fiscal stimulus would not be appropriate. That leaves the relaxation of bank regulatory policy as perhaps the only other tool of macroeconomic stimulus left. It is little wonder, therefore, that economic officials in the Bush Administration have been pushing such an approach as the Presidential election nears.

As will be discussed shortly, a number of the criticisms that have been advanced with respect to loan valuation have merit, independent of short-run concerns about the pace of the recovery. However, this writer remains skeptical of proposals to relax or delay the effectiveness of the capital standards, which took a number of years to negotiate internationally and which are important to deter abuses of the moral hazard incentives built into deposit insurance. Indeed, the United States has about as much moral authority to urge the rest of the world to relax or defer the implementation of bank capital standards—after witnessing the highest rates of bank and thrift failures in the world—as we have to urge the rest of the world to run larger budget deficits (where we have also been "pioneers").

But all this does not mean policymakers are helpless. It simply means that the traditional tools of macroeconomic policy must be used more aggressively than otherwise, not only to offset the contractionary effect of the much needed return to capital-based discipline, but also to stimulate the recovery. For example, the reluctance of banks to bid for deposits or to lend them out has dramatically reduced the ability of the Fed to encourage economic activity by stimulating new lending through the traditional multiplier process. Instead, easier money now seems to "work" principally by lowering the interest costs of borrowers and thereby freeing up income for other purposes. But this effect, which is akin to a tax cut, has been offset by weakness elsewhere in the economy, especially in nonresidential fixed investment (which fell by more than 7 percent in 1991) and state and federal government purchases (which dropped 1.5 percent in 1991).

At this writing, short-term interest rates have fallen sharply, to the 3 percent range. Since evidence continues that banks are curtailing their lending, the Fed should continue easing. Given the larger spread between effective lending rates to small to medium-sized businesses and market interest rates, the Fed must push market rates down further than they otherwise would in order to achieve a given degree of stimulus. At one time, the main argument against further easing was that investors would view it as inflationary and bid up long rates, counteracting the effect of the intended stimulus. But the weak economy has put a lid on inflation, so this standard objection to monetary easing should not apply.

Others nevertheless may worry that even lower rates would help drive down the exchange value of the dollar, which already has been so

battered that central banks have intervened to keep it from falling further. Nothing is wrong, however, with an even lower dollar, which would help boost exports. The critical question is whether further easing would provoke a speculative run on the dollar, thus laying the groundwork for a subsequent, self-defeating increase in interest rates. Such claims are doubtful; the bogeyman of the "dollar strike" has been raised for several years running, with no evidence that such a strike is imminent. Indeed, both short and long rates have had no trouble falling even while the dollar has been falling (precisely what should be expected as rates fall).

All this does not mean, however, that policymakers should be content to rely on monetary easing alone to speed the recovery. The limited effectiveness of lower interest rates thus far suggests a need for a macroeconomic insurance policy, and specifically for some short-run fiscal stimulus. My own preference would be for the federal government to provide, for up to two years, another $30 billion or so—roughly 0.5 percent of GDP— to the states and localities (distributed on the basis of population) to help finance infrastructure spending and to minimize the need for contractionary tax increases by these governments to close their budget shortfalls. Any fiscal stimulus should be strictly temporary and coupled with concrete deficit-*reducing* measures designed to take effect automatically in the "out years" (say, beginning in 1994). This writer's personal preferences for deficit reduction include further cuts in defense expenditures and tax increases on energy, but the policy mix is not as important as getting the structural deficit down in the long run in order to bolster the nation's anemic savings rate. Moreover, unless any temporary fiscal easing is coupled with clear and definite deficit-reducing measures in the long run, policymakers run a significant risk that investors will bid up long-term interest rates, fearing that the short-run increases in the deficit represent harbingers of worse things to come.

At this writing, the prospects for a fiscal stimulus package like the one just outlined are somewhat remote. Thus, for those who remain skeptical that further monetary easing will prove beneficial, the temptation is great to turn back to easing bank regulatory policies as the only macroeconomic policy tool left. Again, for reasons already mentioned, it would not be wise to ease bank capital standards for this purpose. Several policy changes could have some of the stimulative effects the critics of recent bank regulatory policy so desire, without at the same time significantly compromising the prudent regulatory objectives of safety and soundness. Put another way, a number of regulatory changes that take account of expected cyclical difficulties are nevertheless desirable as permanent features of the bank regulatory landscape; they are not advanced with the objective of making bank regulatory policy itself an instrument of countercyclical macroeconomic policy.

First, the risk-weighting system of the current capital standards should be revamped; as already discussed, it provides an unduly strong incentive for banks to invest in government securities, which have a zero risk weight versus the 100 percent that applies to conventional business and consumer loans. Ideally, much of the risk-weighting system of the Basle Accord would be scrapped; the risk weights are highly arbitrary, they lump together a basket of conventional loans with widely different risks, and they fail to take account of portfolio, liquidity, and interest rate risks, which may be more important than the asset-specific risks the standards attempt to recognize. The only significant feature of the Basle standards that represents a real advance is the inclusion of off-balance-sheet risks in the capital scheme.

It is, of course, politically unrealistic even to attempt a major reworking of the Basle standards, which could require several more years of negotiation. Instead, the United States might ask its G-10 partners who agreed to the standards for a waiver procedure, whereby individual countries would have the freedom to change the risk weights so long as the changes do not significantly affect the overall total of bank capital being required. Thus, such a waiver could allow the U.S. regulators to narrow the current risk-weighting differential between the capital required for government securities and the capital required for conventional loans—say, by raising the risk weight on government securities to 30 percent, while lowering it on certain loans (standard consumer and commercial) to 80 percent. Note that such a procedure would not represent a weakening of the capital standards, but instead a realignment that would reduce current disincentives banks now have to make loans. To be sure, changing the risk weights would have no effects on the investment decisions of those banks whose capital is constrained by the leverage ratio (unweighted capital to assets), but most banks are not constrained in that fashion and thus would have stronger incentives to make loans if their loans were not so heavily "taxed" by the current risk weights.

Second, regulators should discontinue the practice of requiring banks to establish reserves on performing loans *before* they become nonperforming, solely on the basis of valuations of the market values of the underlying collateral. It is true that once real estate values begin to fall, the risk of nonpayment rises, but attempting to anticipate that risk with arbitrary reserving decisions can become a self-fulfilling prophecy, causing bank capital and thus lending to shrink; this in turn can negatively affect real estate values.[18] In such an environment of limited credit and only a few liquidation-induced transactions, the market prices on "comparable sales" certainly are not representative of the long-run

[18] For a persuasive discussion of this effect, see Downs (1991).

values of many properties. When regulators nevertheless automatically mark down performing loans based on such comparable values, they are injecting their own judgment—not necessarily that of the thinly traded market—about the likelihood of default. A more objective policy that requires additional reserves only once a loan truly becomes nonperforming would be preferable.

Of course, by now any alteration of the "performing nonperforming loan" rules would do little to help New England: the horse is already out of the barn. But the revision could be of some use in minimizing any further deterioration in banking markets like California, where significant real estate problems have surfaced.

Nevertheless, of far greater potential importance are the standards for valuation—and thus for establishing reserves—on loans that have become nonperforming and where real estate serves as collateral. The U.S. Department of the Treasury and other bank regulators instructed their examiners in December 1991 to use prudent but realistic assessments of the long-run economic values of these properties, based on present discounted values of the projected revenues that they should earn. As anyone who is familiar with such projection techniques knows, even minor changes in key assumptions—notably the discount rate, vacancy rates, rent inflation levels—can have dramatic effects on the outcome. The examiners in the field should be instructed to take the long view when doing these projections (or reviewing those made by the banks), but also should be firmly instructed *not* to use liquidation values in setting reserves on nonperforming loans.

Critics of such a suggestion, of course, may point to the failure of banks and their regulators to insist on larger reserves for LDC debt at a much earlier time, based on the depressed market values for such loans. That failure, in turn, allowed many of the larger banks to grow more rapidly than was prudent and to devote their incremental deposits to such high-risk assets as commercial real estate loans. Would a refusal to base reserving decisions on real estate loans not lead to a similar problem?

In brief, the answer is no, for a couple of reasons. No one is questioning the need for reserves on nonperforming real estate loans; the critical issue is whether prices on thinly traded properties should be the basis for those decisions. For real estate, which is inherently a longer-term investment, they should not. Even the market prices of LDC debt and its high-risk successor, junk bonds, have recovered substantially from their lows of several years earlier, indicating how short-term liquidation prices can provide misleading signals regarding long-term valuation.

In essence, bank regulators recognized this tendency by not requiring banks to reserve earlier and in substantial ways for LDC debt, even after the loans became nonperforming. It now appears to be

conventional wisdom in some quarters that this forbearance "worked," because all of the larger banks that were heavily extended to the LDCs, with the exception of Continental Illinois, seem to have recovered from their brush with disaster. However, the policy had its drawbacks as well, since it was not accompanied by regulatory measures designed to limit the growth of these capital-weak institutions. The absence of such regulations allowed many of the banks to gamble by investing in commercial real estate, which may yet prove to be an even bigger financial headache.

This is not a recommendation that regulators pursue the same valuation and regulatory policies with respect to commercial real estate as was done for LDC debt. First, such loans that are nonperforming should have reserves, but those reserves should not be based on liquidation values. Second, a subordinated debt requirement will ensure that the largest institutions at least will not be able to grow unless and until the market believes that their problem loans are under control, or the banks have been sufficiently recapitalized. But by not using liquidation values as a basis for reserving—which the market itself almost certainly does not use—regulators would avoid imposing an excessive degree of stringency on all depositories with significant commercial real estate exposures.

Finally, given the existing glut of commercial space, absolutely no justification can be presented for exempting new commercial real estate loans from the loan-to-value ratios recently proposed by the bank regulators. But special concern is warranted for residential construction loans, since residential housing investment traditionally has been critical to economic recovery from recession. Although gross residential investment accounts for only about 4 to 5 percent of GDP, during the recovery phases of recent recessions the *growth* in such investment has accounted for a much larger fraction of the growth in output: 22 percent from 1975 to 1977 (the first two years after the 1973–75 recession) and 19 percent from 1982 to 1984 (the first two years following the 1980–82 recession). At this writing, however, the growth of residential construction has been very weak. Regulators should therefore allow reduced risk-weightings on construction loans for residences that have been pre-sold, while putting the required loan-to-value ratio near or at the top of the proposed range of 65 to 80 percent.

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Discussion

*Robert R. Glauber**

In his comprehensive review of the real estate lending activities of banks during the 1980s, Robert Litan analyzes whether regulatory action, and bank reaction to it, have exacerbated the current economic downturn by restricting bank lending. In short, has there been a credit crunch? Litan's answer is a grudging "yes." Litan also proposes a number of regulatory changes in the treatment of real estate, which he believes could have reduced the excess of bank lending in the 1980s and for that and other reasons should be adopted. It is on these two issues in Litan's paper that these comments will be focused.

Credit Crunch

There is little question but that banks have curtailed lending activities since 1989. Litan cites numbers on the sluggish growth of bank assets since 1989, as well as the marked increase in the relative level of securities holdings. At issue is whether the slowdown in the growth of assets and loans has been driven mainly by a lack of demand for credit from creditworthy borrowers, or mainly by a reduction in the willingness of banks to lend to creditworthy borrowers at reasonable prices. The regulators can be blamed only if the pressure comes mainly from the supply side.

Litan admits that the evidence is ambiguous at best, but appears to come down on the side of supply restrictions, due at least in part to regulatory pressure. His evidence is mainly anecdotal. What hard

*Adjunct Lecturer, Kennedy School of Government, Harvard University.

evidence is available strikes me as very much on the other side; that is, that most of the reduction in loan growth is due to an easing of demand, as would be expected in a recession. While regional differences exist and, in New England particularly, bank reluctance probably explains somewhat more of the lending slowdown, it is hard to accept this as the explanation nationwide.

A principal reason for being skeptical of the argument that banks are responsible for the lending slowdown is that other nonbank, unregulated sources of short-term business lending have shown reductions in growth and even absolute declines in 1991. Finance company lending, a major source of funds to small business, after growing at a 12.6 percent annual rate during the period from 1988 to 1990, grew only 0.8 percent in 1991.[1] Funds raised by nonfinancial businesses through commercial paper actually *contracted* by 15.7 percent in 1991, after growing at a 16.6 percent annual rate over the previous three years. While commercial paper is generally not available to smaller businesses, which rely principally on bank loans, the contraction in this source is indicative of general reductions in the demand for funds throughout the economy.

Another piece of striking evidence against a credit crunch comes from surveys of small businesses, the principal victims of any bank-driven credit restrictions. The April 1992 survey by the National Federation of Independent Business, based on questionnaires completed by over 2,000 of its member firms, states unequivocally: "Financing difficulties were named by just 4% as the most important problem. Nope, no CREDIT CRUNCH" (capitalization in original). (For what it is worth, regulation and taxes tied for first at 23 percent.) For completeness, it is worth noting that this indicator has been in the 5 to 7 percent range nationally over the past two years and 7 to 11 percent in New England. By comparison, in the 1980–82 period, when most observers would agree there really was a credit crunch, the index rose to 36 percent.

In the end it is hard to read a definitive answer to the credit crunch question from the data. Obviously no one would seriously argue that the cause is wholly demand or supply-side forces. But the data strike me as hardly compatible with the conclusion that the systematic refusal of banks to lend to creditworthy customers pervasively caused the slowdown in loan growth.

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[1] These figures and those in the rest of this paragraph are derived from the Federal Reserve Board's *Flow of Funds Accounts*, Fourth Quarter, 1991.

Regulatory Changes

Litan's most interesting regulatory proposals are to reintroduce explicit loan-to-value ratios for real estate lending, to require large banks to issue subordinated debt as part of their capital, to develop standards that would focus on long-term value rather than liquidation value in appraising real estate collateral, and to reduce the current bias in the risk-based capital standards in favor of government securities and against commercial and industrial loans.

The proposals for subordinated debt and the use of long-term valuation in appraisals are eminently sensible, in my view. Any attempt to reintroduce market discipline—as would happen with subordinated debt—should be encouraged in an industry where deposit insurance has removed much of it. But I would not be too optimistic about the disciplinary effect of subordinated debt. With insured deposits still available to a bank, it will most likely simply turn to the government's balance sheet through brokered deposits when its own balance sheet becomes so weak that the cost of subordinated debt rises unacceptably. This is in fact what Citicorp did in mid 1991. Nevertheless, subordinated debt provides a market "early warning system" and should be encouraged.

While generally in sympathy with most of the remaining regulatory changes Litan proposes, I view a reinstallation of explicit loan-to-value ratios for real estate lending as both wrong policy on its own and a reflection of a misguided direction in regulatory structure. First, it is worth noting that, while the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA) mandates that the regulators adopt real estate lending guidelines and standards, it in no way requires that they promulgate explicit loan-to-value restrictions.

The fundamental issue raised by these proposals is whether the banking regulatory structure should further evolve in the direction of a centrally orchestrated system of detailed restrictions on banks, a system that would increasingly replace the presently functioning, diverse structure of standards developed by the banks themselves. Banks face complex lending decisions and develop complex, varied control systems to avoid exposing shareholders to inordinate risks. These systems by and large are sensible and effective, although their effectiveness is perhaps limited by a failure of the banks to always apply the systems consistently. I am skeptical that a centrally developed structure created by the regulators will be superior.

It likely will be argued in rebuttal that the proposed loan-to-value system is but one simple addition to the banks' own self-regulatory structures. But it is almost certain that the regulators will find it necessary to further elaborate the simple list of loan-to-value ratios in order to deal with complicated specific cases: for example, construction loans with recourse; loans subject to sale within one, two, or three

months; loans collateralized by specific kinds of real estate, like timberlands. Indeed, Litan in his paper would make a regulatory exemption to the capital standards for construction loans on pre-sold homes. I fear this path inevitably leads to the evolution of a mountain of regulations, slow to respond to innovations in the marketplace and potentially stifling of bank vitality and creativity.

Moreover, the danger exists that regulatory standards designed to constrain bank real estate risk will in fact have the opposite effect. What are developed as upper limits on aggressive lending can easily metamorphose into safe harbor protections. If, for example, 70 percent is the prescribed limit on commercial real estate construction loans, a loan at 65 percent of value is difficult for the regulators to challenge even if other aspects of the loan make it unduly risky.

Real estate lending was the bank problem of the mid and late 1980s across the board, as Litan demonstrates. But one can be pretty certain the next major banking crisis will not be caused by real estate (even if banks ever do start making real estate loans again). This obsessive attention to real estate lending has much the image of fighting the last war. The next crisis will come from another direction—energy loans, agriculture loans, swaps, or somewhere else. And after that horse is out of the barn, if we follow this trend to microregulation, we will have another rule book of detailed restrictions dealing with the most recent problem assets.

Finally, harking back to a question Litan posed in his paper, would loan-to-value ratios have significantly contributed to avoiding the bank real estate problems of the 1980s? If the real estate excesses had simply been the consequence of pervasively poor loan underwriting, perhaps loan-to-value ratios could have played an important, beneficial role, although I have concerns that the cure might be worse than the disease. But clearly the real estate problems of the eighties were much more the consequence of a rapid asset inflation, followed by an equally rapid asset deflation. (55 Water Street, New York, one of the "jewels" in Olympia & York's U.S. crown, is today worth perhaps 30 percent of its peak value.) How well would loan-to-value ratios operate to hold back the flood in such an economic environment? Surely, at least at levels that would still permit a healthy level of lending activity, loan-to-value ratios could not effectively protect against asset inflation. Loans made as prices were rising would meet the standards at the time they were made. And without some dynamic, mark-to-market process in the implementation of the standards, loan-to-value ratios are unlikely to operate as an effective impediment to the excesses Litan has documented.[2] Such

[2] Such a dynamic application of loan-to-value ratios would in fact engender the same kind of "performing nonperforming" loans that Litan rejects as a regulatory category.

restrictions might work to prevent poor evaluation of specific assets, but they cannot be very effective in a world of boom and (unforeseen) bust in real estate prices.

What is a reasonable alternative to the reimposition of loan-to-value ratios? Certainly a strong sense exists that bank regulation did not work in the eighties and that something different is needed. That is the view of Congress implicit in FDICIA. But Congress, with at least some wisdom, did not require microregulations such as loan-to-value ratios. An alternative road to more intrusive regulation would be to have regulators promulgate a set of standards, which could be used as a template by examiners in evaluating the institutions' own policies and their implementation. Regulatory standards would focus more on an institution's policies rather than on the specifics of its loans. This would surely require more judgment by examiners than the checklist approach toward which we are evolving, but it would also reduce the risk that the regulators will increasingly stifle the creativity and vitality of the banking system.

Ultimately, the path to revitalizing the banking industry lies not in more restrictive regulations to prevent bank mistakes, but in reducing the needless restrictions that limit the range of profitable opportunities open to banks. Banks have the almost unlimited ability to raise funds from the markets (using as necessary the government's guarantee), but confront limited opportunities to put this money to work profitably at acceptable risk levels. This "excess capacity" leads inevitably to banks seeking out riskier investment opportunities. Litan seems to agree with this diagnosis.

What is surely needed is the removal of the outdated restrictions that constrain where banks can conduct their activities and what types of securities activities they can engage in. Congress would have served the public interest far better if it had accepted the Bush Administration's proposals to repeal the interstate banking restrictions of the McFadden Act and the securities activity restrictions of the Glass-Steagall Act, instead of mandating the plethora of microregulatory initiatives in FDICIA as it was passed.

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Discussion

*Sherman J. Maisel**

Since I agree with a great deal of what Robert Litan says, I shall not analyze his paper in detail. Rather, I shall emphasize the areas where I disagree or where I think his ideas can be supplemented.

I believe his historical analysis is correct. The tremendous increase in bank lending for construction and development and on commercial property was primarily the result of animal spirits—lemming-like behavior. Losses would have been reduced through proper regulatory actions.

The amazing aspect of banks' rapid loan expansion is that it took place after 1985, when the large losses suffered by savings and loan institutions on such loans already were well recognized. Clearly, many bankers thought they were being cautious and making only sound loans. They were aware of dangers but failed to forecast them accurately. What they did not recognize was the great institutional bias in real estate financing toward extreme cyclical behavior.

The High Cyclical Risks in Real Estate Lending

The high risks inherent in construction, development, and commercial loans are well known. In every year's surveys of loan losses, they show up as one of the top risk categories. But the losses are multiplied many times in a recession. Numerous factors can explain real estate's amplified booms and busts.

*President, Sherman J. Maisel Associates and Professor of Business Administration (Emeritus), University of California at Berkeley.

1. The period between the time when a loan is made and the time when it is paid off is much longer in real estate than in most other fields. Values depend on future, not current, supply and demand.
2. Because properties are large, durable, and expensive, their ownership normally requires an outside source of funds. As a result, the availability and cost of financing play a major role in determining property values. When the amount of money made available by lenders expands or contracts, prices move up or down. This occurs even if construction or user costs remain constant.
3. Collateral values are based on appraisals that are notoriously poor. Appraisals reflect primarily what has happened in the market in the past. When sales have been dominated by a herd mentality, appraisals use the resulting high prices as the basis for current valuations. Any shifts in expectations cause wide variations in future values and prices.
4. While construction and development loans are made for a considerably shorter period, their dangers are even greater. In most cases, current cash flows are low or nonexistent. Interest payments are pre-funded. No one knows what prices can be achieved until the buildings or lots are completed. During the construction period, supply can expand far too fast, as competitors rush to fill the previously observed demand.
5. The risks in real estate financing are extremely hard to quantify. In normal periods, they are underestimated. The distributions, as in many financial situations, tend to be highly skewed. Extreme losses occur, but infrequently enough to be forgotten in normal times. The risk distributions shift often as a result of expectations, interest changes, or large movements in supply and demand.

Given the large risks, their skewed distributions, and the difficulties in quantifying them, I agree that special regulatory attention should be paid to real estate lending. The difficulty arises in devising the most efficient regulatory rules.

The objectives of regulating real estate, as with other lending, are:

1. To decrease the likelihood that banks will endanger their future by an overconcentration in excessively risky loans.
2. To decrease the tendency of banks to make their loans procyclically. Overexpansions of lending are expensive both for banks and for the economy. They lead first to excess and then to too little investment.
3. To allow a more efficient correction of past errors. Regulations should give banks the incentives and the time to choose the best

way out of a bad situation. Banks are often better off recasting loans rather than foreclosing. Debtors may be willing to add some funds. They may be able to manage and market the property more profitably. However, banks must be certain that they get their fair share of any cash flow. Since the debtor usually has little or no equity, problems of moral hazard are great. If a bank has to foreclose, it should not be forced to liquidate in an untimely manner.

Regulatory Relaxation

A second theme of the Litan paper is whether or not regulatory relaxation is a proper tool of antirecessionary policy. As regulators realize only too well, the demand for regulatory relaxation appears in all recessions. The shift of bank assets toward securities rather than loans also is a regular cyclical phenomenon. It certainly reflects a shift in demand for loans. It probably also reflects a reestimation by lenders of the risks and profitability of certain types of loans.

It is also clear that regulatory relaxation or forbearance can be dangerous. We know that the Federal Home Loan Bank Board, the Administration, and the Congress thought that forbearance made sense for savings and loans from 1980 to 1984. Regulations were relaxed by the introduction of regulatory accounting principles, the reduction of net worth requirements, and an increase in lending powers. The relaxation turned out to be disastrous.

Suggestions as to regulatory forbearance include both lower loss reserves and a delay in liquidating assets. It is assumed that delaying the liquidation of foreclosed properties will help the asset holder as well as the market and the economy. In contrast, many economists have argued—incorrectly, I believe—that the Federal Deposit Insurance Corporation and the Resolution Trust Corporation have been too slow in closing institutions and selling their assets. They claim that the costs of holding assets far exceed any gains that could be obtained through a delay in liquidation.

In considering this topic, one should recall one of the earliest studies of the problem—John Lintner's study of the results of the performance of Massachusetts savings banks in the Great Depression (Lintner 1948). His results have been used as another argument against forbearance. He found that book losses became larger after the worst of the Depression was over. The longer loans were held, the greater the losses. What remains ambiguous is whether losses would have been greater or smaller if they had tried to liquidate earlier. Obviously, those operating at the time thought they were taking the more profitable

action by delaying foreclosures and sales, even though they were later criticized for doing so.

Possible Forbearance Now

Litan, in contrast, argues that forbearance in general should not be adopted at the present time. But he does suggest that additional reserves should not be imposed against performing loans; that loan reserves should not be based on current or liquidation values; and that special provisions should be made for housing construction loans.

The need for such relaxations arises from the assumption that current market prices are incorrect. It is argued that the market overreacts. It fails to judge cyclical forces correctly. A lack of liquidity artificially curtails demand. As a result, both banks and the economy will gain if regulators do not penalize banks for not foreclosing or for not selling real estate owned. Not requiring larger reserves will increase bank capital and add to available credit. Holding properties off the market will help maintain prices.

As in all issues of regulatory relaxation, the question arises as to how best to solve a particular problem. Examiners require additional reserves because the situation has changed. The risks to the bank, its depositors, and the insurance fund have gone up. Is altering required loss reserves or delaying liquidation a better way to act so as to minimize additional costs?

The use of the term "performing nonperforming loans" seems to point to a contradictory and illogical policy. How can a performing loan be nonperforming? The situation might be clearer if we spoke of loans that are currently performing but whose risks have increased sufficiently to make an additional loss reserve requirement logical.

One obvious source of future problems with performing loans is found in construction and development advances, where interest has been pre-funded or where it is probable that the amounts available for current payments will not suffice to complete a project. Requiring action now will reduce future losses.

In other cases, it may be clear that a loan based primarily on the available collateral holds greater risks because the value of that collateral has dropped. Whether or not action is necessary may depend on a reanalysis of the underlying credit as well as negotiations with the debtor. The fact that loans are performing does not mean that reserves should not be held against them.

What about the idea that examiners finding nonperforming loans should not base their reserve requirements on liquidation values, but instead should use "realistic assessments of the long-run economic values of these properties, based on present discounted values of the

projected revenues that they should earn"? As a corollary, it would seem that a similar rule should be applied to real estate owned. Why should properties be liquidated at less than their values?

In attempting to follow such advice, bankers and examiners must determine whether appraisals that show the present value of future income greater than current market prices are correct. Anyone who has used many appraisals must be extremely dubious about using appraised valuations to replace those of the market. Such caution will be reinforced by reading a 1992 paper by Hendershott and Kane, which shows how far off appraisals were in recent years from values based on more realistic assumptions.

Appraisals, by their nature, can tell only what past market values have been. Even such judgments become dubious if the number of recent comparable sales is small or if many adjustments are needed to arrive at comparability. Discount (or capitalization) rates used by appraisers merely reflect the relationships between past values and future projected income. When people try to substitute discount rates other than those found in the market, they assume that their knowledge is better than that of those who are actively trading. Why should this be true? To be more accurate, the substitute values must be based on a clearer vision of future income or expenses, or of what prices would be in the current market if it were not subject to liquidation pressures.

Anyone trying to find equilibrium values for reserve or liquidity decisions would perhaps be better off using the appraisal concept of replacement cost. It would make clear the hazardous assumptions necessary in attempting to measure equilibrium values. The problems are similar to those in the use of discounted cash flow procedures.

To arrive at values through this method, we must find the current replacement cost of a property. This amount must be reduced by the loss in value due to physical or functional depreciation as well as the present value of the losses from excess vacancies and reduced rents between now and the time equilibrium is reached. Needed are projections of current costs and how they will change; the point when equilibrium will be reached; the real depreciation at that time (what the level of rents and expenses will be); how far below equilibrium income will be in the interim; plus proper discount rates for the lost income.

The main advantage of the replacement cost technique is that it is based on the more easily estimated current costs and income plus a discount rate. It still requires projections of the point when equilibrium will be reached and of income between now and then.

With respect to the view that reduced risk-weighting should be allowed on construction and development loans, I believe this also is not too logical. The determination of risk should be as accurate as possible and then should be maintained. In the past, construction and development loans have used various forms of credit enhancement from

specialists to reduce the risks to banks. Since banks have often failed in estimating the risks of such loans, this appears to be a logical division of functions. If bank regulations are altered, it becomes harder for others to perform such functions. All may be better off if the regulations are maintained.

Rather than try to make ad hoc regulatory adjustments to the cycle, as envisaged by such proposals, I believe we would be better off revising the regulations so that they include proper cyclical relationships in their basic structure.

The Long-Run Agenda

In addition to his discussion of the past and the present, Litan suggest several policies for the future. He believes that the new, stricter maximum loan-to-value ratios proposed by the regulators are sensible. He would require large banks to borrow on subordinate debt if they want to expand their assets. The objective is to require the market's scrutiny and approval of the bank's operations when it wants to grow.

For smaller banks, he would measure their concentration in a broad class of riskier loans, of which real estate loans would be a major element. If this seemed excessive, he would require either a lower examination rating, and therefore greater scrutiny and higher insurance premiums, or a higher required capital-asset ratio.

While requiring subordinated debt in order to bring about some outside scrutiny makes sense, I do not see it as a strong tool to halt the undue expansion of real estate loans. They can grow and have grown as a result of a shift in lending within a static total. They can expand even though a bank would not need to borrow additional capital.

The second proposal, to penalize but not prohibit an undue concentration of loans, seems sensible and should be applied to all banks. The penalties could increase together with the amount of concentration on riskier loans.

To Litan's suggested changes, I would propose two additions:

1. Regulations could require an early warning system to guard against too rapid growth of any appreciable asset category. Many bank failures result from expanding particular types of loans too fast. Such growth often reflects the herd instinct. When bankers rush to make one type of loan that seems especially profitable, a catch probably exists. The potential excess profitability is likely to mean that something has been left out of the analysis. Other problems arise. A sudden rapid growth usually requires the use of loan officers who lack required skills. In addition, experience shows that diversification over time, as well as in other dimensions, is a requirement of a sound portfolio policy. A sharp increase in one type of loan means that such diversification is missing.

In the warning system, a flag might be raised any time a quarterly regulatory report showed an annual growth rate in any appreciable asset class (including major industries) of more than some selected rate, such as over 15 percent. Alternatively, a flag might also go up if the growth exceeded some percentage of the bank's capital—say 10 or 20 percent.

Such a warning would require both management and the regulators to examine the rapidly growing class of assets in greater detail. An underwriting review independent of the loan officers might be required. The examiners would have to comment specifically on the reasons for and quality of the growth. The analysis would be incorporated into the bank's rating.

2. A second approach to the problems raised by the cyclical action of real estate and other types of lending would be to allow the capital-asset ratio of banks to vary with the business and lending cycle. Instead of assuming that the minimum level of capital should be the same at all times, perhaps minimum capital asset ratios should rise as the economy expands and decline in recessions.

While the average ratios might be higher than now contemplated, the lowest minimums would still give the necessary protection. The increase in capital requirements as the economy expanded would require that greater attention be paid to the long-run profitability of any rapidly growing lending sphere. The lower minimums in a recession would remove some of the pressure toward cumulative liquidations.

Such a cyclical change in reserve requirements would mean that the pressure for regulatory relaxation could be met, but not at the potential expense of depositors and the insurance fund. The desired flexibility would be gained through higher requirements during expansions rather than too slack regulation during recessions.

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Tax Reform and the Housing Market in the Late 1980s: Who Knew What, and When Did They Know It?

*James M. Poterba**

The construction industry in the United States has experienced a remarkable downturn in the past five years. In the mid 1980s, new housing starts averaged nearly 1.8 million per year, slightly below the record pace of 2 million per year in the late 1970s. By 1991, however, the number of new housing starts was just above 1 million. The share of GNP devoted to residential investment fell to 3.3 percent in 1991, the second lowest level in the last three decades. Many factors contributed to the recent decline in new construction, including changes in real and nominal interest rates, a recession, and a sequence of tax reforms.

The Tax Reform Act of 1986 is frequently cited as a key contributor to the recent construction decline, particularly the decline in multifamily housing. One of the Act's objectives was to reduce investment in tax shelters, and rental housing had been one of the most active shelter vehicles in the early 1980s. "Leveling the playing field," the mantra of 1986 tax reformers, required raising the tax burden on rental housing relative to that on corporate capital. The view that the Tax Reform Act of 1986 is the source of the post-1986 real estate malaise underlies the recent political pressure to repeal passive loss restrictions and several other provisions in the Act and to provide new incentives for real estate investment.

It is widely agreed that recent tax reforms have affected incentives for housing consumption and for investment in rental properties. Reductions in marginal tax rates have lowered the value of tax-exempt imputed income for homeowners, with particularly large changes for

*Professor of Economics, Massachusetts Institute of Technology, and Director of the Public Economics Research Program, National Bureau of Economic Research.

high-income individuals, whose tax rates were 70 percent at the beginning of the 1980s but are 28 percent today. Changes in the tax incentives for investment in rental property have been even more dramatic. The Economic Recovery Tax Act of 1981 liberalized depreciation provisions for rental property, while the Deficit Reduction Act of 1984 and the Tax Reform Act of 1986 reversed these changes. The net effect of all these reforms has been a reduction in the tax incentives to rental construction.

This paper considers the link between recent tax changes and the fortunes of the real estate industry. It investigates the extent to which the effects of the various reforms were predicted, and the dimensions along which actual events were a surprise. The paper is divided into five sections. The first presents summary information on developments in the real estate market in the past decade, placing the fluctuations in housing starts and real estate prices into a broader historical context. The next two sections describe the major provisions of the Economic Recovery Tax Act of 1981 (ERTA) and the Tax Reform Act of 1986 that affected real estate. The fourth section surveys analyses of the tax reform bills when they were enacted, as a guide to the expected effects of each policy. The final section asks whether policy advisors can draw general lessons about either the strengths or the weaknesses of economic analysis of tax proposals from the recent experience.

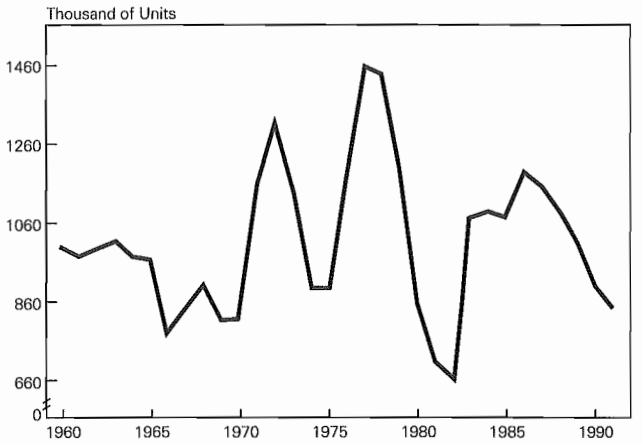
New Construction in the 1980s

Housing has historically been one of the most volatile sectors of the U.S. economy. The 1980s were unusually variable, however, particularly for multifamily construction. Figure 1 plots the number of single-family housing starts in each year since 1960, and it shows the well-known volatility of the construction sector. Single-family starts peaked at more than 1.4 million per year in 1977 and 1978, and averaged less than 0.9 million per year for the 1990–91 period. The figure demonstrates that while the decline in single-family starts since 1986 has been substantial, it is not unprecedented. Even larger declines occurred between 1972 and 1974 and between 1978 and 1981.

Figure 2 displays the time series for multifamily housing starts. The strongest growth in multifamily construction took place in the early 1970s, largely as a result of major public housing initiatives. Multi-unit starts declined sharply in the mid 1970s, tracked the overall economic cycle of the late 1970s, and then surged in the early 1980s, arguably as a result of important tax incentives in the 1981 law. Total multifamily starts rose from 390,000 in 1981 to 670,000 in 1985, with virtually all of the increase in large buildings (five or more units). The decline in construction of rental housing, from more than 650,000 units per year in 1985 and 1986 to an average of 175,000 per year in 1991 and 1992 to date,

Figure 1

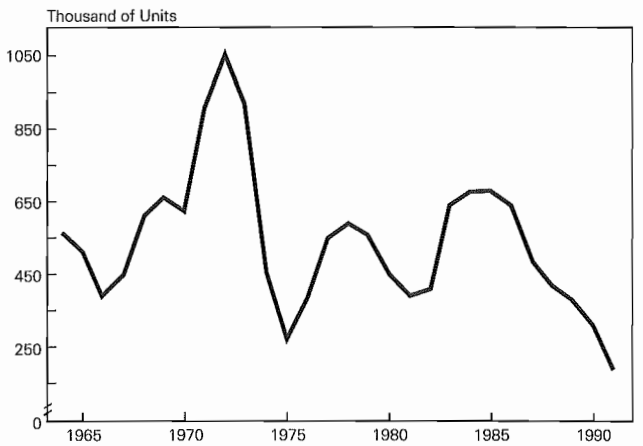
Single-Family Housing Starts, 1960 to 1991



Source: U.S. Bureau of the Census.

Figure 2

Multifamily Housing Starts, 1964 to 1991



Source: U.S. Bureau of the Census.

is much sharper than the drop in single-family starts. Excluding the unusual period at the end of the public housing expansion, it is also the largest contraction in multifamily construction during the past three decades.

Figure 3 shows an alternative measure of the level of housing activity, the share of residential investment in gross national product. Residential investment includes some expenditures on additions and alterations, as well as new construction outlays. The figure shows that the share of GNP devoted to residential investment has declined by more than one-third since 1986. Even with the residential investment boom of the mid 1980s, residential investment as a share of GNP was lower in the 1980s (4.5 percent) than in either of the previous decades (4.7 percent in the 1960s, 5.0 percent in the 1970s).

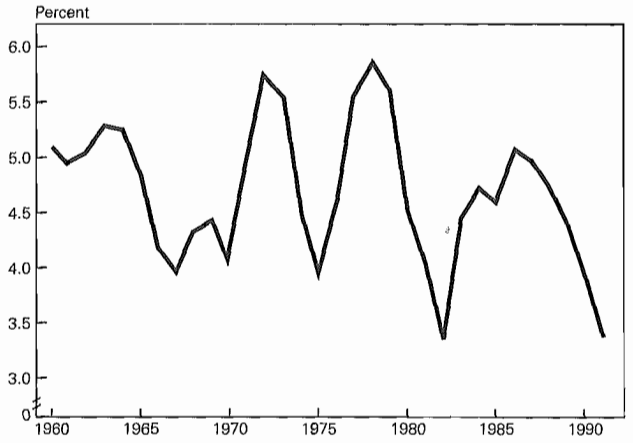
While construction activity has declined, the frequent claim that the United States has experienced a housing "bust" in the past five years, with sharply declining prices, is exaggerated. Real house prices in some regions have fallen by substantial amounts (Poterba 1991), but real house prices for the nation as a whole have declined relatively little. Figure 4 displays the real price of a constant-quality single-family home, deflated to constant 1987 dollars using the personal consumption deflator. Since 1986, real prices have declined by almost 7 percent, or at the rate of approximately 1 percent per year. This experience is striking only when contrasted with the pattern of real prices in the mid and late 1970s. Real single-family house prices rose by 30 percent between 1971 and 1979, in stark contrast to either the previous or the subsequent decade. For households that extrapolated the experience of the 1970s, however, the real decline in house prices during the last decade may have *seemed* like a housing market "bust."

Data on prices of multifamily residential structures comparable to the data on single-family homes are not available, unfortunately. Two time series, however, do provide important information on the rental housing market. The first is the vacancy rate for rental units, shown in Figure 5. Important changes have occurred over time in the vacancy rate. While it declined from the early 1960s through 1981, the rental vacancy rate *increased* from 1981 through 1988. The change between 1984 and 1986, when the aggregate vacancy rate rose by 1.5 percentage points, was the largest uptick in the vacancy rate during the past two decades.

The vacancy rate for large rental properties, those with five or more units, increased even more sharply than the average for all rental units, from 6.5 percent in 1982 to 10.4 percent in 1986. This increase in vacancy rates suggests an important degree of "overbuilding" in the early 1980s, and represents an alternative to the tax-based explanation of the collapse of rental housing construction in the late 1980s. It suggests instead that

Figure 3

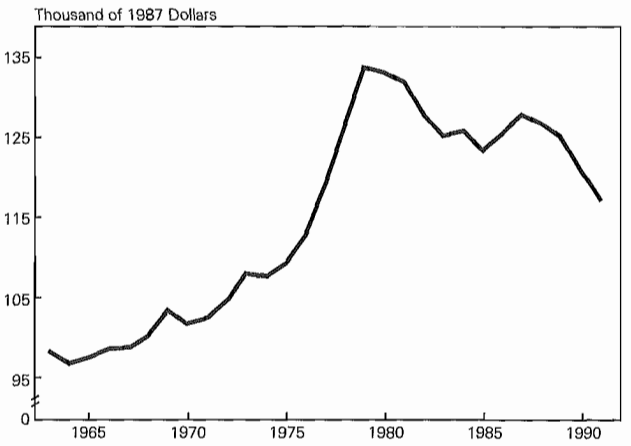
Residential Investment as a Share of GNP, 1960 to 1991



Source: National Income and Product Accounts.

Figure 4

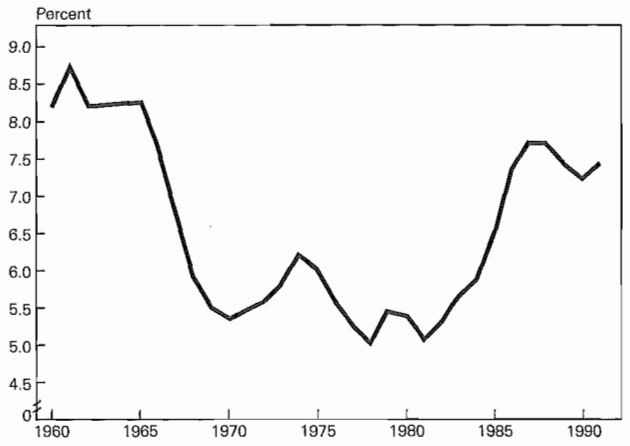
Real Price of Constant-Quality Single-Family Houses, 1963 to 1991



Source: U.S. Bureau of the Census.

Figure 5

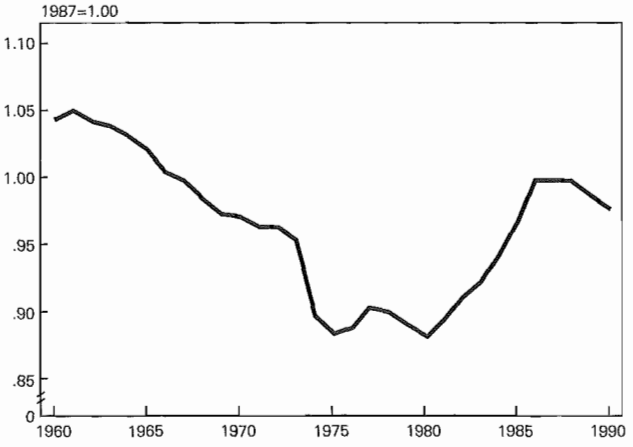
Vacancy Rate for Rental Housing Units, 1960 to 1991



Source: U.S. Bureau of the Census.

Figure 6

Index of Real Rents, 1960 to 1991



Source: U.S. Bureau of Labor Statistics.

the large expansion of the rental housing stock in the early 1980s, possibly the result of tax incentives built into ERTA, could have depressed new construction in the second half of the decade.

A second indicator of conditions in the rental housing market, and one that calls the overbuilding hypothesis into question, is the level of real rents. Figure 6 plots the real value of the implicit price deflator for consumption of rental housing services, a price index drawn from the National Income and Product Accounts, for the last three decades. This index attempts to control for quality change in the rental housing stock. The time series shows an *increase* in real rents during the first half of the 1980s, the period when the rental market was allegedly overbuilt, and a slight decline in real rents during the period since 1987.[1] This pattern is inconsistent with the first-order prediction of most analyses of the two major tax reforms in the 1980s, which suggested that the 1981 reform would expand the supply of rental housing and reduce rents while the 1986 reform would constrict the supply and lead to rising real rents.

The Central Provisions of the Recent Tax Reforms

This section focuses on five of the most important elements of the 1981 and 1986 tax reforms.[2]

Marginal Tax Rates

Both tax reforms lowered personal income tax rates. Holding constant the pretax interest rate at which households borrow and lend, this *raises* the after-tax cost of homeownership. In 1980, the weighted-average marginal federal tax rate on mortgage interest deductions for those who claimed these deductions was 32 percent. By 1984, when the rate reductions of 1981 had taken full effect, this average tax rate was 28 percent, and by 1988, the value had declined still further to 23 percent.[3]

Lower tax rates reduce the value of homeowners' deductions for mortgage interest payments and property taxes. Both tax reforms should therefore have lowered the quantity of housing demanded by some homeowners and, holding other factors constant, reduced home

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[1] Quality adjustment is a perennial issue of debate in constructing measures of real rents. If the national income accounts deflator is replaced by the time series on real rents from U.S. Bureau of the Census, *Current Housing Reports* Series H-130, which makes no correction for quality change, the pattern of rising real rents in the early 1980s remains. For this time series, the peak in real rents occurs in 1988, and real rents decline between 1988 and 1991.

[2] This section and the following section draw heavily on the analysis in Poterba (1990).

[3] These estimates were computed using the TAXSIM data base of the National Bureau of Economic Research.

prices. The downward price pressure should have been greatest for high-priced homes, whose owners received the largest marginal rate reductions. Some of these households also received higher after-tax income as a result of the tax reform; this could have blunted the adverse effects of higher user costs.

Standard Deductions

The 1986 reform also reduced the proportion of homeowners who itemized their deductions, because it raised the value of the standard deduction. This further reduced the effective tax subsidy to mortgage interest (Poterba 1992). For a joint filer, the standard deduction rose from $3670 to $5000. The average tax benefit to homeownership, and the tax incentive to own rather than rent, depend on the *total* difference between a household's itemized deductions and its standard deduction.[4] This difference falls when the standard deduction rises, further reducing the incentive for lower- and middle-income households to own their homes.

Depreciation Provisions

The 1981, 1984, and 1986 reforms affected tax depreciation benefits for rental property and thereby changed the incentives for households to own rather than rent their accommodations. Table 1 shows the recent history of depreciation policy for rental property. ERTA shortened the tax lifetime for residential rental property from 32 to 15 years (Hender-

Table 1
Depreciation Provisons for Residential Structures, 1969 to 1988

	Lifetime	Depreciation Schedule
1969–1981	32 Years	150% Declining Balance
1981–1984	15 Years	175% Declining Balance
1984–1985	18 Years	175% Declining Balance
1985–1986	19 Years	175% Declining Balance
1986–	27.5 Years	Straight Line

Source: Author's compilation based on U.S. Internal Revenue Code.

[4] The *marginal* incentive to consume additional housing services depends on the marginal tax rate at which the household can deduct further housing-related costs. This is the focus of the traditional user cost analysis of housing demand, as in Poterba (1984) or Rosen (1984).

shott 1987). The 1986 Tax Reform Act reversed this policy, extending the lifetime to 27.5 years and requiring straight-line depreciation rather than the more accelerated 175 percent declining balance. The reduction in marginal tax rates in 1981 partly counteracted the expanded depreciation benefits in ERTA, but in 1986 less generous depreciation rules combined with lower marginal tax rates to significantly reduce the value of depreciation benefits. Since the present value of depreciation tax benefits is a key consideration in rental investment decisions, these changes should affect rental markets: real rents should increase because of the 1986 Tax Reform Act.

Tax depreciation rules cannot be evaluated without some reference to prevailing economic conditions. When inflation rates are high and nominal interest rates are above 10 percent, even relatively short depreciation lives may yield net tax benefits that are smaller than those of longer lifetimes in a lower-inflation environment. Hendershott (1987) and Follain, Hendershott, and Ling (1992) emphasize that much of the impetus for the tax changes in 1981 was the erosion in the value of depreciation allowances that had resulted from the rapid inflation of the late 1970s.

Capital Gains Tax Rates

Both major tax reforms affected capital gains tax rates, although in opposite directions. ERTA reduced the marginal tax rate on long-term capital gains for top-bracket investors from 28 percent to 20 percent, while the Tax Reform Act of 1986 eliminated the distinction between capital gains and other types of income and *raised* the top tax rate to 28 percent. The capital gains tax may have little effect on most homeowners since the current $125,000 lifetime exclusion on taxation of housing gains makes these gains untaxed except for households in top income brackets, but the capital gains tax rate is potentially important in the rental market. No tax exemption exists for capital gains on rental property, and a substantial fraction of the returns to property investment often accrues as capital gains.

The capital gains tax also has important effects on the incentive to "churn" real property such as investments in rental units. When capital gains taxes are low, the tax burden on the initial owner of the asset is reduced and the incentives for churning are greater (Hendershott and Ling 1984; Gordon, Hines, and Summers 1987). The capital gains tax reduction in ERTA therefore enhanced the depreciation benefits provided by that tax reform, encouraging rapid growth in rental construction. The higher capital gains tax rates in 1986 similarly augmented the changes in depreciation rules to reduce the incentives for investing in rental properties.

Anti-Shelter Provisions

The Tax Reform Act of 1986 included several provisions designed to restrict tax shelter investments, including rental properties. The most important restrictions were passive loss limitations. Prior to 1986, investors in rental properties that generated tax losses could use these losses to shelter other income from taxation. The 1986 Act restricted this practice, allowing only other passive income to be offset by passive losses.[5] This provision limited the loss offset available on unprofitable rental projects, and it also discouraged high-leverage rental projects that were canonical "tax shelter" investments. These investments typically generated losses in their first few years of operations, as rental income failed to cover the high interest payouts and tax depreciation associated with the project. The income from these shelter investments would accrue as capital gains in later years. Prior to the passive loss limitations, investors could shelter current ordinary income with accruing tax losses, deferring realization of income until the sale of the property and obtaining preferential capital gains tax treatment. The Tax Reform Act of 1986 reduced the appeal of these investments along several dimensions by changing capital gains tax rates, loss-offset provisions, and the flow of depreciation allowances.

The anti-shelter provisions in the 1986 Act worked. Real estate partnership sales declined 37 percent between 1985 and 1988, and *more than 90 percent* between 1985 and 1991. Real-estate-related partnerships accounted for over 55 percent of new partnership sales before the 1986 Tax Reform Act, but only 44 percent in 1988 and 37 percent in 1991.[6]

Other Provisions

Many other tax provisions in both ERTA and the 1986 Act affected housing markets. The removal of amortization of interest on "builder bonds" and limits on tax-exempt financing for housing projects in the 1986 Tax Reform Act raised the costs of building new rental properties. Changes in the minimum tax affected the marginal cost of additional housing services for high-income households, and could also have altered their incentives for investing in rental properties.

Other tax provisions affected particular types of housing, for example, rental properties for low-income households. The 1986 change in depreciation benefits for such housing was even more dramatic than

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[5] Special provisions apply to passive losses of landlords with adjusted gross incomes below $100,000. These landlords may deduct $25,000 in passive losses against other income.

[6] Information on sales of real estate and other partnerships was provided by Robert A. Stanger and Company.

that for other rental housing, with a switch from double-declining balance depreciation on a 15-year lifetime to straight-line depreciation on a 27.5-year life. Most of the discussion at the time of the tax reforms, however, focused on general purpose rental housing.[7]

Estimating the Effects of Tax Changes on Housing Markets

The net effect of the tax code on incentives for owning a home rather than renting and for housing consumption can be formalized by computing the after-tax user costs of owner-occupied and rental housing under various tax regimes. The user cost of homeownership measures the marginal cost of an incremental unit (say another 100 square feet of living space) of owner-occupied housing, including the forgone return on the owner's equity. The user cost for rental property reflects the landlord's cost of investing in the property; in equilibrium, the landlord must earn rents equal to his user cost. A brief Appendix describes the specification of the user costs and the choice of various parameters for evaluating these costs.

Table 2 shows estimates of the user cost of homeownership for three households at various times during the past decade. The first panel considers the user cost for fixed rates of interest and expected inflation, thereby highlighting the effect of tax changes. The second panel evaluates the tax code of each year using interest and expected inflation rates that prevailed at that time, thus indicating the net change in incentives for homeownership.

The results illustrate that recent reforms had their most pronounced effect on the cost of homeownership for high-income households. For a family with adjusted gross income (AGI) of $250,000 in 1988, the Tax Reform Act of 1986 lowered the marginal tax rate from 50 percent to 28 percent and raised the user cost of homeownership from 0.094 to 0.114, assuming an interest rate of 7 percent and a 3 percent expected inflation rate. The 1986 tax reform would have needed to reduce the real interest rate by nearly 300 basis points to offset this effect. The actual change in the user cost of homeownership since 1986, recognizing variations in interest rates and inflationary expectations, was an increase from 0.074 to 0.095 for this household. Assuming a price elasticity of demand of

[7] One of the potential lessons of the 1980s tax reform experience is that specialized tax provisions that affect relatively few *taxpayers* can actually have important effects on aggregate investment activity. The tax returns of high-income households are complex and are often affected by changes in relatively obscure tax rules. High-income taxpayers may, however, account for an important share of the investment flow to some activities.

Table 2
Estimated User Costs of Owner-Occupied and Rental Property, 1980 to 1988

	1980	1982	1984	1986	1988
Case 1: Fixed Parameters: Interest Rate = 7 percent, Expected Inflation Rate = 3 percent					
User Cost of Homeownership					
1988 AGI = $ 25,000	.120	.122	.125	.125	.126
1988 AGI = $ 45,000	.110	.113	.117	.117	.114
1988 AGI = $250,000	.081	.094	.094	.094	.114
Rental User Cost	.126[a]	.116	.117	.118	.132
Case 2: Prevailing Interest and Inflation Rates					
User Cost of Homeownership					
1988 AGI = $ 25,000	.080	.094	.098	.115	.109
1988 AGI = $ 45,000	.064	.077	.089	.104	.095
1988 AGI = $250,000	.017	.042	.049	.074	.095
Rental User Cost	.096	.096	.104	.137	.149
Parameter Values					
Nominal Interest Rate	.127	.151	.124	.103	.091
Expected Inflation Rate	.085	.093	.072	.037	.034

Notes: AGI = adjusted gross income. Calculations for both cases assume $\tau_p = .02$, $\delta = .014$, $\alpha = .04$, and $m = .025$. Rental user costs assume no churning, with marginal tax rates for the rental landlord of 50 percent in 1980–1986 and 28 percent in 1988.

[a]This entry for 1980 is notable because it does *not* assume the highest possible marginal tax rate for the rental landlord; it assumes a 50 percent rather than a 70 percent marginal rate. At the 70 percent rate, this value would be 0.117. See the Appendix, or Poterba (1990), for a more detailed discussion.

−1.0 for owner-occupied housing (Rosen 1984), this tax change could have large effects on both demand and house prices. Simulation evidence, such as that in Poterba (1984), suggests that such changes could induce a 10 percent decline in real house prices for the homes typically demanded by very high-income households. The change after 1986 for these households is small, however, relative to the change from the beginning of the 1980s, when the estimated user cost was 0.017.[8]

The effect of rate reductions on homeownership incentives for those in lower income brackets is much smaller, since the decline in tax rates in the 1986 reform was less pronounced. For the household with an adjusted gross income of $25,000 in 1988, the tax reform lowered the marginal tax rate from 16 percent to 15 percent and raised the user cost (in the benchmark case) from 0.125 to 0.126. Some middle-income households, such as the $45,000 example presented here, even experienced increases in their marginal tax rates, and for them housing costs

[8] The estimates for the early 1980s probably understate the user costs that households considered in their housing decisions, because households did not expect the low user cost of 1980 to prevail forever. This would make them reluctant to pay as much for a home as this user cost would suggest, since higher future user costs would lead to capital losses.

declined. Hausman and Poterba (1987) found that only 59 percent of taxpayers would receive tax rate reductions as a result of the Tax Reform Act of 1986.

The results in the lower panel of Table 2 show that the combination of high expected inflation rates and high marginal tax rates at the beginning of the 1980s made user costs relatively low, particularly for high-income households. For the household with an adjusted gross income of $45,000 in 1988, the user cost of homeownership increased nearly 50 percent—from 0.064 to 0.095—during the eight years following 1980. This reflects rising real interest rates as well as the decline in tax incentives.

Table 2 also shows the user costs of rental housing. Assuming that the marginal supplier of rental units was an individual in the top marginal tax bracket, the rental user cost rose from 0.137 to 0.149, or 9 percent, between 1986 and 1988. The increase would have been larger if the real interest rate had not declined during this period, and in the case of constant interest and inflation rates, the rental user cost rises by 12 percent. These calculations almost certainly understate the effect of the Tax Reform Act of 1986 in raising rental user costs, because they do not incorporate the changes in passive loss rules, the at-risk regulations, or the possibility (before 1986) of depreciating the same property multiple times.

The table also provides evidence on the effect of ERTA on rental user costs. If the nominal interest rate and expected inflation rate had been at their 1980 levels in 1982, rental user costs would have declined from 0.096 (assuming a landlord tax rate of 50 percent in 1980) to 0.089, a decline of 7.3 percent. The increase in real interest rates between 1980 and 1982, however, counteracted this effect so the reported user costs in the lower panel of Table 2 show virtually no change.[9] These calculations probably understate the favorable effect of the 1981 law, however, because they do not incorporate the churning of these assets.

The calculations in Table 2 are partial-equilibrium in nature, so they ignore the changes in the tax treatment of other assets in both the 1981 and 1986 tax reforms. These changes can affect the housing market by changing the required return on all investments, that is, by altering the interest rate that enters the housing user cost. General equilibrium simulations of the type performed by Hendershott (1987) and others are needed to aggregate the different tax changes for different assets into predictions for the housing market, but they generally yield results similar to those reported here.

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[9] If the marginal investor in rental property in 1980 was in the 70 percent tax bracket, then the net change from 1980 to 1982 is an *increase* in rental user costs since the reduction in the landlord's tax rate outweighs the increasingly generous depreciation provisions.

What Did Experts Think the Tax Reforms Would Do?

This section provides some evidence on the prevailing perceptions and beliefs when the two major tax reforms of the 1980s were enacted. Because real estate provisions were debated as a central component of the 1986 reform, the discussion begins with the Tax Reform Act of 1986, and then turns briefly to beliefs in 1981, when the Economic Recovery Tax Act was enacted.

The Tax Reform Act of 1986

The majority of policy analysts who reviewed the proposals leading up to the 1986 Tax Reform Act, as well as the Act itself, viewed the reform as anti-housing. There was little doubt that the reform would reduce incentives for rental housing construction,[10] but less agreement on the implications for the owner-occupied housing market.

The reduction in rental housing incentives in the 1986 tax reform was largely by design. One of the central objectives of the advocates of tax reform was to eliminate abuses of the tax system, particularly tax shelters. The Treasury report that started the tax reform process, the President's 1985 proposals, and much of the rhetoric that supported the Act berated shelters. Investments in sheltering assets enabled high-income taxpayers to avoid paying their "fair share" of taxes, and this was considered a central problem of the existing tax code.

In part as a result of the 1981 tax reform, the volume of tax shelter activity increased sharply in the early 1980s. New public offerings of partnerships grew from $38 billion in 1979 to $64 billion in 1982, with oil and gas and real estate partnerships the two most important types from the standpoint of tax policy (Steuerle 1992).

The objective of limiting tax shelter investments was implemented in many different ways. The Joint Committee on Taxation document (1987) describing the provisions of the Tax Reform Act, which includes sections on "Reasons for Change" associated with each provision, cites the need to reduce real estate tax shelters as part of the rationale for limitations on passive loss offsets, changes in at-risk rules, and modifications of the depreciation schedule for rental property.

The notion that reducing tax shelter activity would reduce housing investment was also understood, although not emphasized, in the policy debate. The Joint Committee on Taxation (1987, p. 98) wrote in its justification for changing the Accelerated Cost Recovery System (ACRS):

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[10] One notable exception to the near consensus on the detrimental effects of tax reform on rental housing was Gravelle's (1985) analysis, which argued that corporations, not individuals, were the "marginal investors" in rental housing projects. Events since 1986 have cast doubt on this view of the rental housing market.

> . . . too much investment occurred in tax-favored sectors, and too little investment occurred in sectors that were more productive but which were tax-disadvantaged. The nation's output can be increased simply by a reallocation of investment. . . .

This general discussion of the long-run benefits of equalizing tax burdens across industries and assets was typical of the analysis surrounding the 1986 Tax Reform Act. With respect to rental housing, the most commonly debated "summary statistic" for the reform was its effect on real rents. Follain, Hendershott, and Ling (1987), for example, concluded that real rents were likely to increase by between 6 and 10 percent. Their findings are representative of the results from discounted rental project models, which were widely used in analyzing the Tax Reform Act of 1986.

Few analysts drew the link, however, between reduced incentives for housing investment, rising real rents in the long run, and the *short-run* decline in construction and asset values. A notable exception is the National Association of Home Builders (1986) assessment of the consequences of the Tax Reform Act, which claimed (pp. 4 & 5):

> The decline in multifamily starts may be as large as one-third from the already reduced levels of 1986, or about 200,000 units. The decline in resale values may also be significant. . . . Even if rents for a building are expected to rise soon, current resale value could fall by 10 to 20%.

Relatively few studies called attention to this consequence of the Tax Reform Act of 1986, but the basic result was implicit in virtually all of them. Raising rents requires a reduction in the rental housing stock, which in turn requires a reduction in construction relative to what it otherwise would have been.

Analyses of the effects of the Act on owner-occupied housing were less consistent than studies of the rental housing provisions. This reflected both the conflicting incentive effects in the reform legislation and the importance of general equilibrium effects in determining how the tax bill would affect homeowners. *If* the tax reform significantly reduced real interest rates, as some studies suggested it would, then the increase in after-tax homeowner costs from marginal rate reductions could be offset by lower borrowing costs.[11] If the reform did not change interest rates, however, it would reduce the demand for owner-occu-

[11] One of the central features of the Tax Reform Act of 1986 was an increase in effective tax burdens on new investment, financed in part by a reduction in taxes on existing assets. When the tax rate on corporate capital rises, some of this tax can be "shifted back" to investors in the form of lower real returns. This effect is a subject of empirical controversy because its magnitude depends on the degree of integration of world capital markets, the substitutability of corporate and other capital, and many other parameter values.

pied housing at high incomes and have varied effects at lower incomes depending on a household's particular circumstances.

The Economic Recovery Tax Act of 1981

Housing was not a central focus of the reform debate leading up to the Economic Recovery Tax Act of 1981. There was general concern that the high inflation rates of the late 1970s had eroded the real value of depreciation allowances on physical investments, but most of the attention focused on business investment, not real estate.[12] The generous real estate provisions of the 1981 law actually generated backlash in subsequent years, even before the watershed changes of 1986. The depreciation lives for rental real estate were extended in the Tax Equity and Financial Responsibility Act (1982) and in the 1984 tax bill, suggesting that the generous treatment of real estate in 1981 may have been partly an accident.

The effects of the 1981 reforms on owner-occupied housing also received relatively little discussion in the policy debate. Lowering marginal tax rates substantially increased the real cost of homeownership for many households. As in the analysis of the 1986 Act, however, the precise magnitude of these effects was sensitive to assumptions about how the overall reform would affect interest rates.[13]

Lessons for Policymaking

The discussion in the previous section suggests that the adverse effect of the 1986 Tax Reform Act on rental housing construction should come as no surprise to those who followed the commentary leading up to the tax change. In fact, shifting investment from real estate to corporate capital was one of the *objectives* of the reform. The magnitude of the multifamily housing collapse may, however, have surprised some analysts. This section identifies several systematic features of the policy process that did not emphasize, or understated, the potential adverse effects of the 1986 reform on the level of construction activity.[14]

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[12] See Steuerle (1992) for a summary of the policy debate.

[13] One issue of controversy, at least after the 1981 tax law was enacted, was how this bill affected the incentives for owning rather than renting housing. The 1981 act reduced the marginal tax rate applicable to top-bracket rental landlords, which would raise the required rent on new rental projects, other things equal. It also provided more accelerated depreciation and, if investors "churned" their properties, this effect could overwhelm the tax rate changes. Gordon, Hines, and Summers (1987) discuss these issues in detail.

[14] This section does not address the analytic inputs to the 1981 tax reform in any detail, since I have argued above that the generous provisions toward real estate seemed more accidental than intended.

Short-Run Construction Levels Not a Focus of Policy Studies

The central objectives of the 1986 reform movement were reducing tax rates on individuals and equalizing effective tax rates across different industries and asset classes. The disparities between the effective tax rates on general industrial machinery and on buildings, for example, were widely cited as an inefficiency of the post-ERTA tax system that could induce misallocation of capital. Most of the academic and policy research leading up to the Tax Reform Act of 1986 therefore focused on measuring effective tax rates. Armed with a set of effective tax rates, a few simple assumptions, and a production function, it is a straightforward exercise to compute the long-run change in the composition of the capital stock following a tax policy change. The estimated changes in capital stock can be used to compute the efficiency gains relative to a more distorted economy. Many studies did just that, and pointed out that the long-run stock of rental housing would decline as a consequence of the tax reform.

The focus on effective tax rates and efficiency gains drew attention away from analysis of the short-run investment response to tax reform. Policy analysts may not have dwelt on the short-run dynamics in part because most of the models used to analyze the tax reform and its efficiency effects lack a well-calibrated model of new construction. Steady states can be described more easily than transition paths, and as a result, the vocabulary of the policy debate largely omitted short-run adjustment issues.

A number of examples illustrate the lack of information on short-run adjustments. Follain, Hendershott, and Ling (1987) argued that their predicted rise in real rents could occur over horizons of between three and 10 years, depending on the conditions in the local housing market. Goulder and Summers (1987) developed a computational general equilibrium model in which the behavioral equation for the supply of multifamily housing was based on the single-family investment supply equation in Poterba (1984). Their model reflects the lack of systematic empirical evidence on the links between public policies, rental market conditions, and the level of new construction. Even the short-run dynamics of the single-family housing market are controversial, as Topel and Rosen (1988) emphasize in their study of how capital can flow into and out of the construction sector.

Most studies of how the 1986 tax changes would affect the housing market implied a substantial rise in rents (say 10 percent) and an associated decline in rental construction. Assuming a price elasticity of demand for rental housing of -1.0, a 10 percent rent increase would require a 10 percent decline in the real stock of rental housing. If effective demand grows at about 2 percent per year because of population and real income growth, and depreciation on the existing housing

stock is 1 percent each year, the required adjustment could be achieved with just over three years of *no* new building. With some new building taking place, the depression in new construction could last significantly longer. The models were typically calibrated for the nation, and they were consistent with much sharper declines in new construction in some regions, where the rate of demand growth was below the national average.

Anti-Tax-Shelter Fever

A second factor that made it difficult to predict the effect of the Tax Reform Act, in this case for both the long and the short run, was the presence of overlapping and often complex provisions that reduced the incentives for rental housing construction. These resulted from a desire to make sure the reform succeeded in reducing the amount of tax shelter investment.

The rental project analyses that evaluated the legislative proposals leading up to the 1986 tax changes, like those of user costs described above, incorporated changes in depreciation lifetimes, tax rates on rental landlords, and in some cases changes in capital gains taxes.[15] They often ignored the effects of limits on passive losses, at-risk regulations, and most of the tax changes affecting builders. These omissions were largely due to the difficulty of incorporating these reforms in the standard framework for analyzing tax policies. In this case, a sequence of different reforms operated in the same direction to reduce the attraction of investing in rental projects.

Some studies of effective tax rates may not have captured the full effect of these changes because the models did not reflect the peculiarities of residential real estate investments. Gordon, Hines, and Summers (1987) and Scholes and Wolfson (1991) argue, for example, that "churning," the process of depreciating a property several times by reselling it, was potentially very important in increasing the present discounted value of depreciation deductions on rental properties under ERTA. Yet many analyses did not consider churning, focusing instead on the case in which properties are depreciated a single time.

Other issues of specification in effective tax rate calculations masked the effects on real estate. For example, real estate assets can usually bear more debt than other assets. In some computational general-equilibrium models, the mix of debt and equity does not vary across industries or

[15] Capital gains taxes are difficult to incorporate in the standard rental project analysis, because realization decisions are endogenous. Rental project investors may pursue various tax-minimizing strategies that reduce their effective capital gains tax burden below the statutory tax rate.

asset types. Such models could substantially misstate the increase in tax burdens from the Tax Reform Act for high-debt activities, since the value of interest deductions fell along with changes in investor marginal tax rates.

Hitting a Market When It Is Down

The depth of the contraction in rental housing construction in the late 1980s is difficult to blame entirely on the 1986 Tax Reform Act.[16] Signs were clear *even before the legislation was enacted* that the rental real estate market for both apartments and office buildings was weakening. Yet little discussion took place about the short-run distributional or adjustment effects associated with the reduction in tax benefits for real estate.[17]

The signs of trouble in real estate were easy to see. In February 1986, for example, *The Stanger Report,* a newsletter on limited partnership activities, reported (p.1):

> Problems in real estate syndications are on the rise. This year, you'll see some big name syndicators . . . begin to bleed from overbuilding in office markets, depressed economies in energy-industry cities, and the challenge of spending wisely the huge increase in partnership funding since 1980.

The vacancy rate for rental units in large rental buildings, those with five or more units, increased from 7.1 percent to 10.4 percent between the second quarter of 1984 and the second quarter of 1986. Vacancy rates above 10 percent were virtually unprecedented in this market, and a savvy analyst would have predicted in early 1986 that new construction would decline even *without* changes in tax provisions.[18]

The vocabulary of the tax reform debate did not encourage analysts to consider the current state of the real estate market. Instead, much of the discussion centered on comparisons of steady states, where calibration was often based on aggregate national data averaged over periods of several decades. While they included numerous descriptions of the winners and losers from tax reform, these discussions were rarely

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[16] Hendershott and Kane (1992) provide a careful analysis of the factors leading to the collapse in both rents and new construction in the office market. They identify tax changes, high real interest rates, and the recent recession as contributory factors in the office market decline. Similar arguments can be applied to the rental housing market.

[17] This is not to suggest that the efficiency objectives of the reform were not laudable, or that they did not outweigh the potential short-run costs of reductions in rental construction.

[18] These vacancy rates were occasionally noted in the tax reform discussion, usually as evidence that the post-ERTA tax rules had led to overbuilding and inefficient capital allocation.

integrated with the changes already taking place in various markets and industries.

Subtle Influences of Tax Reform on Financial Institutions

Ex post analysis of any legislation as complex as the Tax Reform Act of 1986 is bound to reveal effects that were overlooked or not considered in sufficient detail. The most prominent example in this case is the impact of tax reform on the balance sheets of financial institutions, and the resulting consequences for the supply of funds to new investment. While the Tax Reform Act of 1986 was only one of the factors contributing to the fall in property values for rental residential and commercial real estate, the late 1980s demonstrated that changes in *existing* asset values could have important effects on investment in new assets. This position runs counter to the usual public finance analysis, which views taxes that reduce the value of existing assets as a non-distorting way to raise revenue.[19]

The complexity in this case arose from the leverage of existing assets and the role of these assets in supporting loans to new projects. Tax and other factors that reduced asset values weakened the balance sheets of lending institutions. In extreme cases, thrifts and other institutions became insolvent and were reorganized as part of the federal bailout. Even in less extreme situations, however, falling property values reduced the ability of lenders to commit funds for new projects.

Calibrating the links between existing tax policies, asset values, the health of financial institutions, and the cost of funds for new investment is a major research project. The limited discussion of these links in the 1986 tax reform discussion, the potential importance of these channels for public policy influence in the subsequent years, and the increased research attention to these issues at present, provide an important example of how the art and science of public policy analysis move forward.

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[19] Kotlikoff and Summers (1987) survey tax incidence and highlight the role of taxes in affecting "old" versus "new" capital.

Appendix: The User Costs of Owner-Occupied and Rental Housing

The user cost of homeownership is defined as

$$c_o = [(1 - \Theta)(i + \tau_p) + \delta + \alpha + m - \pi_e]P_o \tag{A.1}$$

where i is the the nominal interest rate, τ_p is the property tax rate per dollar of property value, Θ is the household's marginal federal income tax rate, δ is the physical decay rate for the property, α is the risk premium for housing investments, m is the cost of home maintenance as a fraction of house value, π_e is the expected rate of house price appreciation, and P_o is the real price of owner-occupied housing.[20] Equation (A.1) applies to taxpayers who itemize. For non-itemizers, $(1 - \tau)i$ is replaced by $[(1 - \lambda)(1 - \tau) + \lambda]i$, where λ is the loan-to-value ratio for the house.

The user cost for rental property is

$$c_r = \{[(1 - \tau)i + \delta + \alpha - \pi_e](1 - \tau * z)/(1 - \tau) + \tau_p + m\}P_r \tag{A.2}$$

where the parameters not defined above are τ, the marginal income tax rate of the rental landlord, P_r, the real price of rental property, and z, the present value of tax depreciation allowances.[21] In equilibrium the rent charged must equal c_r so that the landlord is willing to hold the rental property. Poterba (1990) discusses the choice of parameters for calculating the owner and rental user costs in more detail.

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[20] This equation assumes that all capital gains on owner-occupied dwellings are untaxed. If gains are taxed, π_e would be replaced with $(1 - \tau_g)\pi_e$ where τ_g is the effective capital gains tax rate. The equation also assumes that households face identical borrowing and lending rates.

[21] If the government does not completely share the risks with private investors, as it may not if loss offsets are limited, the term in (A.2) would no longer be multiplied by $(1 - \tau * z)/(1 - \tau)$.

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Discussion

*Martin Feldstein**

James Poterba's paper is about the unexpected consequences of government actions, particularly about the effects of the tax changes of the 1980s on the housing market. Poterba has been a long-time student of the effects of taxation on real estate. He understands the complex ways in which tax rules and inflation interact to influence the prices of, and the demand for, both owner-occupied housing and multifamily rental housing. He has built on this expertise to raise important questions about the short-term macroeconomic effects of the tax changes of the 1980s.

Interaction of Inflation and Tax Rules

Since this is a Federal Reserve conference, it is particularly important to emphasize the fact that it was the decline in the rate of inflation that really caused the changes in effective tax rates on residential capital in the 1980s. The success of the Federal Reserve in reducing the rate of inflation had a much bigger effect on the real user cost of capital, for both homeowners and owners of rental property, than did the legislated changes in the tax law itself. It is because tax rules ignore inflation, and base tax obligations on nominal receipts and nominal costs, that the decline of inflation caused substantial changes in the real user cost of capital.

So taxes matter in an important way, but it was the changes in the

*Professor of Economics, Harvard University, and President of the National Bureau of Economic Research.

inflation rate in an economy with nominal tax rules that caused the important changes in the real user cost of residential capital. Lower inflation helped to reduce the bias toward excess investment in owner-occupied housing relative to nonresidential capital, but also tilted the incentives strongly away from renting and in favor of owning.

To see this more concretely, consider first the effect on the user cost of capital for middle-income homeowners (those with $45,000 adjusted gross income in 1988 dollars). Their user cost of homeownership capital rose from 6.4 percent in 1980 to 9.5 percent in 1988, an increase of 3.1 percentage points. (See Poterba's Table 2.) But if the inflation rate and interest rate had remained unchanged, the rise in the user cost of homeownership capital would have been negligible, only 0.4 percentage points.

Only for very high-income taxpayers did the changes in tax rules have any significant effect, and even for them the effect is much smaller than the effect due to the fall in inflation and nominal interest rates. The user cost of capital for high-income homeowners (those with $250,000 adjusted gross income in 1988 dollars) rose from 1.7 percent in 1980 to 9.5 percent in 1988, but less than half of this 7.8 percentage point increase was due to the tax rule changes alone. Poterba's calculations show that with fixed interest rates and inflation, the rise in the user cost of capital for those same homeowners was only 3.3 percentage points, from 8.1 percent to 11.4 percent. Thus, while the actual user cost rose nearly 500 percent, the rise due to the tax change alone was only 40 percent.

The user cost of capital for rental housing also rose in the 1980s, increasing from 9.6 percent in 1980 to 14.9 percent. For a family with a $45,000 income (adjusted gross income in 1988 dollars) that faced the choice between renting and owning, the user cost of capital for homeownership fell from about 17 percent below the user cost of capital reflected in rental housing in 1980 to nearly 40 percent below the user cost of rental capital in 1988. The distortion in the rental-ownership decision for such taxpayers in 1980 was significant, and by 1988 the bias in favor of home ownership was much greater.

These figures make it clear that the most important changes in the user cost of capital for residential real estate in the 1980s were due not to the tax legislation but to the Federal Reserve's successful policy of reducing inflation. To the extent that unexpected changes occurred in the real estate market in the 1980s, they should be attributed to the change in inflation rather than to the changes in tax rates and depreciation rules.[1]

This experience should also be a useful reminder to those macro-

[1] An exception to this was the changes in rules affecting tax shelter investments in real estate. These are not reflected in Poterba's Table 2 calculations. I will return to this below.

economists who persist in talking about the neutrality of inflation or the neutrality of changes in money growth. In every major economy in the world, tax rules interact with inflation in ways that cause changes in inflation to have powerful effects on incentives to invest and to save.[2]

Short-Run Effects on Aggregate Demand

Since the changes in tax rates and depreciation rules had very little effect on the user cost of capital for either homeowner or rental property, it should not be surprising that analysts paid relatively little attention to the short-run macroeconomic effects of the reforms. Of course, even a small change in the incentive to invest would have some effect, and these effects were in fact noted at the time.

Within a few months after the October 1986 passage of the Tax Reform Act, the Council of Economic Advisers was noting (in its 1987 *Report*, p. 93) that the "TRA will slow the growth of investment to a modest extent as the capital stock adjusts to its new long-run equilibrium growth path. Hence, unless consumption or net exports takes up the slack, aggregate demand growth will be dampened somewhat." In fact, weakness of aggregate demand was not a problem in either 1986 or the next few years. Real GDP rose at above-trend rates throughout the period, and the unemployment rate fell from 7.1 percent in 1985 to 6.9 percent in 1986, 6.1 percent in 1987, and 5.4 percent in 1988.

Despite the sharp fall in multifamily housing starts, total real residential investment remained essentially unchanged. The National Income and Product Accounts report that residential investment in 1987 dollars actually rose from $202 billion in 1985 to $226 billion in 1986 and then stabilized at that level ($225 billion in 1987 and $223 billion in 1988). Employment in construction continued to expand throughout the period, rising from 4.7 million workers on construction payrolls in 1985 to 4.8 million in 1986, 5.0 million in 1987, and 5.1 million in 1988. The average wage of construction workers remained 18 percent higher than average manufacturing wages from 1986 until at least the end of the decade.

Tax Shelter Investments in Real Estate

Although the changes in tax rates and depreciation rules had very little effect on the incentive to invest in real estate, the special changes in the Tax Reform Act of 1986 targeted at tax shelter investments in real estate did have a dramatic effect on the attractiveness of such invest-

[2] These issues are explored in a number of papers collected in Feldstein (1983).

ments. The new "passive loss" rules that stopped individuals from reducing total taxable income by offsetting the losses on such real estate investments against other income essentially stopped all such high-leverage tax shelter investments in real estate.[3]

The Treasury economists and outside academic economists who participated in the tax reform analysis were less concerned with these tax shelter changes than with the effects of the basic changes in tax rates and depreciation rules. But the potential macroeconomic effect of the change in tax shelter rules was not ignored. The *1987 Economic Report of the President* notes (p. 95): "Construction in particular will be adversely affected because the new tax rules will limit the ability of individuals to deduct net losses on investments in commercial structures and rental housing in exchange for later capital gains. These provisions of TRA have probably contributed to the recent slowdown in the construction industry. . . . Multifamily housing starts in 1986 were down 12 percent from the pace of 1985."

Effects on Financial Institutions

Although aggregate demand and even construction activity continued at a healthy pace in the years after the enactment of the Tax Reform Act of 1986, the changes in the tax shelter rules probably contributed significantly to the troubles of the financial institutions in the second half of the 1980s. The high inflation rates and favorable depreciation rules had led to an overbuilding of all types of rental property in the first half of the 1980s. This was encouraged also by thrift institutions that were looking for opportunities to substantially expand their lending. They hoped to "grow their way out" of their financial problems with the help of brokered deposits, after Congress in 1980 raised the insurance coverage to $100,000 per account, the deposit size at which interest rates were no longer subject to Regulation Q restrictions.[4]

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[3] Note that the tax losses in tax shelter investments were the excess of interest payments and depreciation over rental income. Although the interest payments were actual cash outlays, the depreciation costs were not. A real estate investment could therefore have a positive cash flow even though it showed an accounting loss.

The difference between the actual value of the property and its depreciated book value would in principle be recognized as a taxable capital gain when the property was eventually sold, but there was no reason to expect the property to be sold at any time in the twentieth century. If the investor died before the property was sold, the capital gains obligation accrued through that date would be forgiven. The 1986 rise in the capital gains tax rate therefore had no material effect on the attractiveness of new tax shelter investments. The use of real estate investments as tax shelters was killed by the change in passive loss rules and by the reduction of the top marginal tax rate from 50 percent to 28 percent.

[4] On the disastrous effects of the congressional decision to raise the insurance coverage to $100,000, see Sprague (1991).

The excess building would probably have caused a glut by the late 1980s, leading to falling asset values and declining rents. To the extent that the tax changes and the decline in inflation reduced the incentive to invest, the excess supply was actually reduced somewhat, and rents fell more slowly than they otherwise would have.

But the retroactive character of the changes in the tax shelter rules reinforced the decline in real estate prices and weakened financial institutions. The Tax Reform Act of 1986 provided that passive losses on past investments would be phased out rapidly over five years. After 1986, an existing multifamily housing investment that was previously expected to generate tax losses for another 15 years would have deductible losses for only five more years, with the loss in each of those years scaled down by 20 percent. For most of the limited partners in the partnerships that owned the tax shelter real estate, the best thing to do was to sell the property at once. Dumping this property—primarily multifamily housing, hotels, office buildings—onto the property market caused a fall in their prices.

Such a retroactive change in tax rules could of course produce no gain in the efficiency of investment, since the property already existed. All of the gain in investment efficiency could have been achieved by eliminating the use of passive losses on new investments undertaken after the enactment of the tax reform legislation. The passive losses were eliminated retroactively to raise revenue, and particularly to raise revenue from the high-income taxpayers who would have the largest tax rate reductions (even though they benefited less from the tax change than high-income taxpayers who had not previously used tax shelters). The Treasury and the Congress were eager to characterize the tax reform as giving relatively greater tax cuts to those with moderate and low incomes and "closing loopholes for the rich." Although the debate about the Tax Reform Act of 1986 focused a great deal on the consequences of the legislation for individuals classified by income class, no attempt was made to take into account the capital losses that would result from this retroactive change in the tax treatment of existing real estate investments.[5]

[5] That was, of course, only one example of the improper distributional analysis that received so much attention. By ignoring the effect of the increase in the corporate tax rate, supporters of the Tax Act were able to show that a supposedly revenue-neutral reform would reduce taxes in every income bracket. Feldstein (1988) shows that imputing that tax increase to the owners of capital implied a substantial tax increase for upper-income taxpayers. Another of the great bits of chicanery in the distributional analysis of the 1986 Tax Reform Act was taking "feedback" effects of the higher capital gains tax rates into account in calculating total revenue consequences but ignoring them in calculating the distribution of tax changes by income class.

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Discussion

*Richard A. Musgrave**

Throughout the history of income taxation, tax law has favored real estate, and the playing field for investment has been tilted in its favor. This bias was increased by the 1981 tax legislation. Then, in 1986, the level of tax preference was reduced considerably, perhaps to the level that existed before 1981, but certainly not down to an even playing field.

Assessing the Tax Effect

Conventional economic analysis would tell us that the 1981 legislation should have encouraged construction activity and pushed up real estate prices, and that the 1986 legislation should have done the opposite. James Poterba concludes that this view is "arguably" accurate, and that the 1981 legislation contributed to the rise in construction of multifamily housing. That is a rather careful way of phrasing it, and I can understand his caution. Isolating the effect of the tax factor and assessing the weight of its contribution are difficult.

First, many different forces were at work during the 1980s, including declining real wages, rising real interest rates, and changes in the structure of financial markets and institutions. Many factors could be offered as explanations of the changes that occurred in real estate markets, without involving taxes. Second, to determine the true influence of the tax factor, one must attempt to specify the counter-factual. In other words, to determine the effects of the Economic Recovery Tax Act

*H. H. Burbank Professor of Political Economy, Emeritus, Harvard University and Adjunct Professor of Economics, University of California at Santa Cruz.

of 1981, one has to consider what might have been passed in its place. If nothing had been passed—if no tax reduction had been enacted in 1981—would the 1980s have been a boom period? Is it possible that a more balanced macroeconomic mix of tighter budgets and easier money would have done the job? Or do we owe the good times of the eighties, at least in part, to unintended Keynesian policy at the beginning of the decade?

The same should be asked of the Tax Reform Act of 1986. Without the 1986 legislation, how much bigger would the boom and bust have been, and where would we be now? It is important to build these counterfactual assumptions into any analysis of the effects of legislation.

From a structural point of view, the Tax Reform Act of 1986 brought considerable gains in efficiency. Poterba acknowledges these gains, but his paper is more concerned with the short-term effects of the legislation. I would point out, however, that gains were made not only in efficiency, but also in equity.

While recognizing these gains, Poterba questions whether, in sum, the 1986 legislation was wise. He speaks of "tax shelter fever," and not "beating" people when they are down. No one wants to do the latter, but I would suggest that it is an error to think that one can have tax reforms such as the 1986 legislation at will, nicely timed to avoid any upheaval. The opportunity comes rarely, perhaps once in a few decades, when major economic reform can be undertaken. And 1986 just happened to be that time.

Circumstances Leading up to the Legislation

The tax reform movement which fueled the 1986 reform really extends back to the work of Henry C. Simons in the 1940s. Over the decades from the 1940s to the 1980s, my generation of tax analysts pleaded for improvement of the income tax, to make it fairer by "leveling the playing field." The mid 1980s seemed to offer that possibility. At the end of the Carter Administration, the Treasury produced *Blueprints for Basic Tax Reform.* This was followed in the mid 1980s by two more Treasury reports advocating tax reform, the second more cautious than the first. Political support for reform grew in the Treasury, the Congress, and the White House.

Although the legislation that was passed fell short of the original vision, it accomplished a great deal—much more than most thought was conceivable or practical. The legislation brought to fruition decades of thinking about broadening the tax base. Everyone involved was so pleased that such reform could be pushed through the political establishment that the short-run effects on housing markets were not consid-

ered. The goal was to establish a level playing field and then for the next 500 years have a perfect income tax.

These events hold a lesson for tax policy. Basic tax reforms cannot always be enacted at the time when they are most convenient. Short-run effects will not always be favorable. This is true not only for tax reform. Another example is the North American Free Trade Agreement. The immediate dislocations created by free trade with Mexico will fall on those people whose wages are now down. Nevertheless, the agreement offers long-term benefits, and the appropriate response to such dislocations is to find measures to deal with the short-run inequities.

Fixing the Problems in Real Estate Markets

The current difficulties in real estate markets and financial institutions will not be remedied by a return to providing tax shelter opportunities; these would only lay the basis for a new boom and bust movement. Any remedies must maintain the more level playing field that now exists. Structural adjustments are occurring within the industry, and they are needed.

Of course, when one considers possible improvements, eliminating the deductibility of mortgage interest comes to mind. But this provision of the tax code remains almost untouchable, especially considering the current debate over family values. Nor should it be assumed that preferential treatment of housing could be avoided under an expenditure tax. The opposite may be the case.

Conclusion: Capital Formation versus Consumer Goods

To conclude, a word on the general relationship between the construction industry and capital formation. In the national income accounts, capital formation is defined as economic activity that produces something durable, something tangible. There are two difficulties with this. First, it takes in only physical assets and ignores the importance of human capital. Second, a genuine focus on economic growth requires that one distinguish between the various types of so-called capital goods. Housing is a durable good, but it is a durable consumer good. Savings directed into housing are diverted from plant and equipment. And of course it is plant and equipment that increase productivity, support innovation, and generate growth. Housing expenditures have no more effect upon the long-run growth of productivity than expenditures on short-run consumption.

If tax shelter opportunities were to be reestablished, they should be directed towards generating investment that will increase productivity. In that context, housing does not rate very highly. Affordable housing is different, not because it involves capital formation, but because it represents an in-kind transfer to low-income people. In sum, policy-makers should not attempt to resolve the productivity problem by reopening tax shelters.

About the Authors . . .

JESSE M. ABRAHAM is Principal Economist at the Federal Home Loan Mortgage Corporation (Freddie Mac). He has been the Director of Economic Forecasting at the F. W. Dodge National Information Services Division of McGraw-Hill Information Systems Company, and a Senior Economist at Data Resources, Inc. He also has taught at Princeton and at Boston University. A graduate of the Massachusetts Institute of Technology, Abraham earned his Ph.D. at Princeton. He writes extensively on the housing market; his recent article "Is It Too Late to Refinance?" appeared in the April 1992 issue of *Real Estate Today*.

PETER C. ALDRICH is President and a founder of Aldrich, Eastman & Waltch, L.P., an independent real estate investment advisor. The firm is a pioneer in the design of alternative equity investing techniques and alternative bond instruments. Aldrich is the founder of the Pension Real Estate Association and a past faculty member of both the Harvard Graduate School of Business Administration and the Yale Graduate School of Organization and Management. He is a governor of the Jerome Levy Economics Institute, and has been a member of the investment or pension advisory boards of several corporations and institutions. Aldrich received his B.A. and M.B.A. degrees from Harvard University.

WILLIAM C. APGAR, JR., is a Lecturer in Public Policy at the John F. Kennedy School of Government at Harvard and Executive Director of the Joint Center for Housing Studies. A graduate of Williams College, he received his Ph.D. in economics from Harvard University. Apgar's research focuses on housing economics and policy, regional and demographic analysis, and community development policy. He recently co-authored a report entitled *The State of the Nation's Housing: 1992*, an account of long-term national trends in housing costs and conditions. Currently Apgar is working on a study of trends in housing repair and remodeling expenditures, sponsored by the housing industry.

JAMES R. BARTH is the Lowder Eminent Scholar in Finance at Auburn University, where he specializes in financial institutions and policy as well as monetary and regulatory economics. He has also served as Chief Economist at the Office of Thrift Supervision and at the Federal Home Loan Bank Board. Barth was Professor of Economics at George Washington University from 1981 to 1987. A prolific writer, Barth is the author of *The Great Savings and Loan Debacle* and co-author of *The Future of American Banking*, as well as a contributor and referee for numerous journals. He earned his B.S. from California State University at Sacramento, his M.A. from the University of New Mexico, and his Ph.D. in economics from Ohio State University.

LYNN E. BROWNE is Vice President and Deputy Director of Research for Regional Affairs at the Federal Reserve Bank of Boston. A graduate of the University of Western Ontario, she received her Ph.D. from the Massachusetts Institute of Technology. Browne was a Program Analyst for the Massachusetts Department of Administration and Finance and an Economist at the Governor's

Office before joining the Boston Fed. She writes extensively on regional economic development and the labor market. Her recent articles include "Why New England Went the Way of Texas Rather Than California" and "The Role of Services in New England's Rise and Fall: Engine of Growth or Along for the Ride?"

KARL E. CASE is Marion Butler McLean Professor, Department of Economics at Wellesley College, and a Visiting Scholar at the Federal Reserve Bank of Boston. He lectures on economics and tax policy at Harvard Law School, and has served as an Economist and Project Officer in Indonesia with the Harvard Institute for International Development. After undergraduate training at Miami University, Case earned his M.A. and Ph.D. at Harvard. He writes extensively for economic journals and serves as a referee for many. His areas of research include the real estate cycle, patterns in mortgage lending, prices and taxes in the real estate markets, and housing policy. His books include *Principles of Economics* and *Economics and Tax Policy.*

GERARD S. CASSIDY is a Senior Vice President and Equity Analyst with Tucker Anthony, Inc., where he is responsible for providing clients with banking and economic research. He joined Tucker Anthony in 1988 as a bank equity analyst, having previously served as Senior Bank Analyst at Unum Corporation. Cassidy received his B.S. in accounting and finance from the University of Maine and his M.B.A. from St. John's University. He began his career with Gulf + Western Industries as a merger and acquisitions analyst. A member of the New York Bank and Financial Analysts Association, Cassidy is also affiliated with the Boston Bank Analysts Society.

WILLIAM M. CROZIER, JR. is Chairman of the Board and President of BayBanks, Inc. After beginning his business career at Hanover Bank in New York City, Crozier joined BayBanks, Inc. in 1964 and was named Chairman of the Board and Chief Executive Officer in 1974. He was elected President in 1977. A Director of BayBanks, Inc., BayBank Boston, N.A., and Jobs for Massachusetts, Crozier is also a member of the Association of Reserve City Bankers. He is a trustee of the Boston Symphony Orchestra and an overseer of the Boston Museum of Fine Arts. A graduate of Yale University, Crozier received his M.B.A. from the Harvard Graduate School of Business Administration.

MARTIN FELDSTEIN is the George F. Baker Professor of Economics at Harvard University and President of the National Bureau of Economic Research. From 1982 through 1984, Feldstein was Chairman of the Council of Economic Advisers and President Reagan's chief economic adviser. In 1977 he received the American Economic Association's John Bates Clark Medal, awarded every two years to the economist under the age of forty who has made the greatest contribution to economic science. His memberships include the Trilateral Commission, the Council on Foreign Relations, and the American Academy of Arts and Sciences. Feldstein is a graduate of Harvard College and Oxford University. His written work includes more than two hundred papers, several books, a monthly syndicated newspaper column, and regular contributions to *The Wall Street Journal.*

ROBERT R. GLAUBER became a Research Fellow at the Center for Business and Government of the Kennedy School at Harvard University in January 1992, after leaving the U.S. Treasury Department, where he had served as Under Secretary of the Treasury for Finance, the senior officer at Treasury responsible for domestic policy. Prior to joining the Treasury he was Professor of Finance at the Harvard Business School. While on the Harvard Business School faculty, Glauber served as the Executive Director of the presidential task force appointed to study the October 1987 stock market crash. A graduate of Harvard College, Glauber earned his doctorate in finance from Harvard Business School.

PATRIC H. HENDERSHOTT is a Professor of Finance and of Public Policy at Ohio State University, where he has held the Galbreath Chair in Real Estate since 1981. He is a consultant to the World Bank and to Price Waterhouse. He recently received the George Bloom Award for Outstanding Contributions to the Field of Real Estate from the American Real Estate and Urban Economics Association. Hendershott writes extensively on finance, public economics, and real estate, and is associate editor of several journals. He earned his doctorate in economics at Purdue University.

DONALD D. HESTER is a Professor of Economics at the University of Wisconsin at Madison and current Chairman of the Department of Economics. He teaches courses in financial intermediation, portfolio theory, and macroeconomics. Previously, Hester taught at Yale University and was a Visiting Professor at the University of Bombay (India) and the People's University of China. He has been an academic visitor at the London School of Economics, the Federal Reserve Board, and the European University Institute. Hester received his undergraduate and doctoral degrees at Yale University. He is a fellow of the Econometric Society and has been a Guggenheim Fellow.

ROBERT E. LITAN is a Senior Fellow in the Economic Studies Program of The Brookings Institution and Director of the Institution's new Center for Law, Economics, and Politics. Litan has practiced law and served as a regulatory and energy specialist for President Carter's Council of Economic Advisers. He has been a consultant to the Senate Judiciary Committee, the House Banking Committee, the World Bank, the National Academy of Sciences, and the Institute for Liberty and Democracy (Peru). Litan is currently a member of the Presidential–Congressional Commission on the Causes of the Savings and Loan Crisis. He received his law and Ph.D. degrees from Yale and his B.S. in economics from the Wharton School. His books include *The Revolution in U.S. Finance, What Should Banks Do?*, and *The Future of American Banking*.

SHERMAN J. MAISEL is President of Sherman J. Maisel Associates, Inc., economic and financial consultants, and Professor of Business Administration (Emeritus) at the University of California at Berkeley. He has also been a member of the Board of Governors of the Federal Reserve System and Co-Director of the National Bureau of Economic Research—West. Maisel is author of over one hundred articles and numerous books, including *Real Estate Finance, Macroeconomics: Theories and Policies*, and *Risk and Capital Adequacy in Commercial*

Banks. Maisel received four degrees at Harvard University: B.A., M.A., M.P.A., and Ph.D.

RICHARD A. MUSGRAVE is H.H. Burbank Professor of Political Economy (Emeritus) at Harvard University and Adjunct Professor of Economics at the University of California at Santa Cruz. He studied as an undergraduate in Germany and England and received M.A. and Ph.D. degrees from Harvard University. He has also taught at the University of Michigan, Johns Hopkins, and Princeton, and has served as an economist at the Board of Governors of the Federal Reserve System. Musgrave has written widely on public finance and tax policy. His book *The Theory of Public Finance: A Study in Public Economy*, first published in 1959, remains the classic text in the field.

JOE PEEK is Professor of Economics at Boston College and an Economist at the Federal Reserve Bank of Boston. After undergraduate work in mathematics and an M.S. in economics at Oklahoma State, Peek earned his Ph.D. in economics at Northwestern. His research topics include mortgage lending, inflation, and interest rates. His most recent journal articles include "The Measurement and Determinants of Single-Family House Prices" (with James A. Wilcox) and "Treasury Bill Rates in the 1970s and 1980s" (with Patric H. Hendershott). Peek also contributed essays on two topics to the *New Palgrave Dictionary of Money and Finance*.

JAMES M. POTERBA is a Professor of Economics at the Massachusetts Institute of Technology, where he has taught since 1982. He is also the Director of the Public Economics Research Program at the National Bureau of Economic Research, and a fellow of the Econometric Society. Poterba is an associate editor of numerous journals, including the *Journal of Finance* and the *Journal of Public Economics*. His research focuses on the economic analysis of taxation and government expenditure programs, including the effect of taxation on housing markets. A graduate of Harvard College, Poterba earned a D.Phil. in economics as a Marshall Scholar at Oxford University.

ERIC S. ROSENGREN is a Vice President and Economist at the Federal Reserve Bank of Boston and heads the banking studies section of the Research Department. He has written many articles on financial markets, mergers, junk bonds, and takeovers. After undergraduate work at Colby College, Rosengren earned his M.S. and Ph.D. degrees at the University of Wisconsin. He spent a year at the General Accounting Office in Washington on a dissertation fellowship and a year as a research fellow for the Thomas Watson Foundation in Melbourne, Australia. Rosengren was co-editor and contributor to the Federal Reserve Bank of Boston's Conference Series volumes on the merger boom and on the changing nature of corporate financing.

DAVID SHULMAN is a Managing Director and Equity Strategist at Salomon Brothers Inc., where he has been in charge of the Real Estate Research Department since 1987. Prior to joining Salomon Brothers, Shulman was Vice President and Director of Research Planning at TCW Realty Advisors in Los Angeles. He has been an Associate Professor of Management and Economics at

the University of California at Riverside, and Financial Economist at the UCLA Business Forecasting Project. In 1990, Shulman won the first annual Graaskamp Award for Excellence in Real Estate Research from the Pension Real Estate Association. Shulman received his Ph.D. with a specialization in finance from the UCLA Graduate School of Management.

JAMES A. WILCOX is an Associate Professor at the Haas School of Business, University of California at Berkeley, and is currently serving as an Economist with the Board of Governors of the Federal Reserve System in the Division of Monetary Affairs. He has also been a Senior Staff Economist with the Council of Economic Advisers, and an Advisor at the Federal Reserve Bank of San Francisco. Wilcox was an undergraduate at S.U.N.Y. Binghamton and earned his Ph.D. at Northwestern University. His memberships include the American Economic Association, the National Association of Business Economists, and the Asia Foundation Advisory Panel on the Pacific Economic Outlook Project. His research and writing focus on mortgage lending and housing prices.

ALBERT M. WOJNILOWER is Senior Advisor at First Boston Asset Management, having served for over twenty years as Chief Economist of the First Boston Corporation. Wojnilower is known in the financial community for his interest rate forecasts and in the academic community for his analyses of the consequences of financial regulation and deregulation. He has written on the subjects for both popular and scholarly publications. Prior to joining First Boston, Wojnilower spent eleven years at the Federal Reserve Bank of New York where he became Chief of the Financial Statistics and the Domestic Research Divisions. He has taught finance at New York University and has been a Director of the American Finance Association. His B.A., M.A., and Ph.D. degrees were earned at Columbia University.

Conference Participants

JESSE M. ABRAHAM, Federal Home Loan Mortgage Corporation
PETER C. ALDRICH, Aldrich, Eastman & Waltch, L.P.
WILLIAM C. APGAR, JR., Harvard University
JAMES R. BARTH, Auburn University
JOHN M. BERRY, *The Washington Post*
DAVID W. BERSON, Federal National Mortgage Association
JAMES L. BICKSLER, Rutgers University
JOAN T. BOK, New England Electric System
THOMAS BRADY, Board of Governors of the Federal Reserve System
ROGER BRINNER, Data Resources, Inc.
LYNN E. BROWNE, Federal Reserve Bank of Boston
DENNIS CAPOZZA, University of Michigan
KARL E. CASE, Wellesley College
GERARD S. CASSIDY, Tucker Anthony, Inc.
DONALD J. CHIOFARO, The Chiofaro Company
THOMAS E. CIMENO, JR., Federal Reserve Bank of Boston
TED CRONE, Federal Reserve Bank of Philadelphia
WILLIAM M. CROZIER, JR., BayBanks, Inc.
RICHARD D. DRISCOLL, Massachusetts Bankers Association
MARTIN FELDSTEIN, Harvard University
JOHN E. FLYNN, The Quality Connection
DAVID R. FRANCIS, *The Christian Science Monitor*
FRED FURLONG, Federal Reserve Bank of San Francisco
ROBERT R. GLAUBER, Harvard University
JOHN L. GOODMAN, JR., Board of Governors of the Federal Reserve System
KENNETH I. GUSCOTT, Long Bay Management Corporation
PATRIC H. HENDERSHOTT, Ohio State University
DONALD D. HESTER, University of Wisconsin at Madison
EDWARD A. HJERPE, III, Federal Home Loan Bank of Boston
RONALD A. HOMER, Boston Bank of Commerce
MICHAEL A. JESSEE, Federal Home Loan Bank of Boston
ROBERT KUTTNER, *The American Prospect*
ROBERT E. LITAN, The Brookings Institution
SHERMAN J. MAISEL, Sherman J. Maisel Associates, Inc.
ALFRED MALABRE, *The Wall Street Journal*
WILLIAM N. MCDONOUGH, Federal Reserve Bank of Boston

ALICIA H. MUNNELL, Federal Reserve Bank of Boston
PEGGY B. MUSGRAVE, University of California at Santa Cruz
RICHARD A. MUSGRAVE, University of California at Santa Cruz
STEPHEN D. OLINER, Board of Governors of the Federal Reserve System
JOE PEEK, Boston College
NICHOLAS S. PERNA, Shawmut National Corporation
JOAN T. POSKANZER, Federal Reserve Bank of Boston
JAMES M. POTERBA, Massachusetts Institute of Technology
DOUGLAS POUTASSE, Aldrich, Eastman & Waltch, Inc.
MARY P. QUINN, Keefe, Bruyette & Woods
RICHARD E. RANDALL, Federal Reserve Bank of Boston
ARTHUR J. ROLNICK, Federal Reserve Bank of Minneapolis
ERIC S. ROSENGREN, Federal Reserve Bank of Boston
GORDON H. SELLON, JR., Federal Reserve Bank of Kansas City
EUGENIE D. SHORT, Federal Reserve Bank of Dallas
DAVID SHULMAN, Salomon Brothers Inc.
EDWIN N. SIDMAN, The Beacon Companies
NEAL M. SOSS, First Boston Corporation
KATHERINE A. STADTMUELLER, University of Connecticut
RICHARD F. SYRON, Federal Reserve Bank of Boston
WATARU TAKAHASHI, Bank of Japan
AMY WEINSTOCK, Bank of Boston
JOHN WENNINGER, Federal Reserve Bank of New York
DAVID M. WESSEL, *The Wall Street Journal*
JAMES A. WILCOX, University of California at Berkeley
ALBERT M. WOJNILOWER, First Boston Asset Management Corporation

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