

UC Berkeley

Fisher Center Working Papers

Title

Debt Guarantees and Inefficient Equilibria

Permalink

<https://escholarship.org/uc/item/09t7t6br>

Author

Craine, Roger

Publication Date

1996

Peer reviewed



Institute of
Business and
Economic Research

University of
California at
Berkeley

FISHER CENTER FOR REAL ESTATE AND URBAN ECONOMICS

WORKING PAPER SERIES

WORKING PAPER NO. 96-245

**DEBT GUARANTEES AND
INEFFICIENT EQUILIBRIA**

By

These papers are preliminary in nature: their purpose is to stimulate discussion and comment. Therefore, they are not to be cited or quoted in any publication without the express permission of the author.

Roger Craine

WALTER A. HAAS SCHOOL OF BUSINESS

**FISHER CENTER FOR REAL ESTATE AND URBAN ECONOMICS
UNIVERSITY OF CALIFORNIA AT BERKELEY**

**Kenneth T. Rosen, Chair
Robert H. Edelstein, Co-chair
Dwight M. Jaffee, Co-chair**

The Center was established in 1950 to examine in depth a series of major changes and issues involving urban land and real estate markets. The Center is supported by both private contributions from industry sources and by appropriations allocated from the Real Estate Education and Research Fund of the State of California.

**INSTITUTE OF BUSINESS AND ECONOMIC RESEARCH
Richard Sutch, Director**

The Institute of Business and Economic Research is an organized research unit of the University of California at Berkeley. It exists to promote research in business and economics by University faculty. These working papers are issued to disseminate research results to other scholars. The authors welcome comments; inquiries may be directed to the author in care of the Center.

DEBT GUARANTEES AND INEFFICIENT EQUILIBRIA

Roger Craine¹
Economics Department
University of California
Berkeley, CA 94720-3880
craine@econ.berkeley.edu
January 1996

Working Paper No. 96-245

Almost all governments, implicitly or explicitly, guarantee bank debt. This paper uses the Savings and Loan debacle in the US to illustrate the effect of government guarantees of bank debt on resource allocation. If the guarantee distorts incentives so that financial intermediaries choose projects whose risk-adjusted expected return is less than the risk-adjusted expected market return, then the equilibrium is inefficient. Scarce capital (savings) is misallocated so that wealth is less than potential wealth, and the economy's growth may be less than potential growth. In an inefficient equilibrium the guarantee distorts the intertemporal allocation of resources which reduces the wealth of current and future generations. The S&L debacle is an idea case study because the goal of government policy is well-defined and, in retrospect, the reasons for the policy failures and successes are clear and easy to understand.

¹Keynote address for the 10th Annual Economics Meeting sponsored by the Central Bank of Uruguay.

Introduction

Almost all governments, implicitly or explicitly, guarantee bank debt. In some countries the state runs public banks, eg, in Australia, France, and Uruguay. Other countries such as the US and Japan explicitly guarantee the debt of privately owned banks through a deposit insurance system that protects depositors up to a maximum amount. Implicit commitments often extend the guarantee to bank debt not covered by deposit insurance or an explicit commitment. In 1984 when the massive (\$US34 billion in assets) privately owned Continental of Illinois Bank teetered on the brink of insolvency the US government announced that some banks were "too large to fail" and assumed ownership. None of the bank's debtholders--including those with "uninsured" debt--suffered any losses.

When a bank fails and the government honors its guarantee the press fondly labels the transfer of taxpayer funds to private agents as a "bailout." The payouts have been large and few economies have been immune. Recently the Japanese government (December, 1995) approved \$US6.7 billion to dissolve seven housing-loan firms. Estimates of nonperforming loans at Japanese banks run as high as \$US252 billion. Credit Lyonnais received \$US10 billion from the French government (the amount of the French social security deficit) and will need more. Credit Lyonnais lost on investments in MGM (a Hollywood movie company) and commercial real estate. The State Bank of South Australia expanded into international lending and commercial real estate ventures. It required

\$US3.15 billion from the government of South Australia when the investments soured. This amounted to \$US2250 for each state resident. Cleaning up of the Savings and Loans mess in the US cost about \$US200 billion, or about \$800 per US resident.

The popular press blames the failures and subsequent "bailout" on inadequate regulation, or deregulation, greed and corruption. But, the fact that the government honors its guarantee and pays off bank debtholders is not necessarily evidence of an inefficient outcome. A debt guarantee is insurance. Insurance pays off when there is a bad realization. Society only loses when there is an inefficient allocation of resources.

This paper uses the Savings and Loan debacle in the US to illustrate the effect of government guarantees of bank debt on resource allocation. If the guarantee distorts incentives so that financial intermediaries choose projects whose risk-adjusted expected return is less than the risk-adjusted expected market return, then the equilibrium is inefficient. Scarce capital (savings) is misallocated so that wealth is less than potential wealth, and the economy's growth may be less than potential growth. In an inefficient equilibrium the guarantee distorts the intertemporal allocation of resources which reduces the wealth of current and future generations.

The S&L debacle is an idea case study because the goal of government policy is well-defined and, in retrospect, the reasons for the policy failures and successes are clear and easy to understand. At the time the events unfolded there were no savants (economists

or politicians) that forecast the failures or the road to success.

The financial system collapsed during the Great Depression and the government took an active role in legislating boundaries and providing support for resurrected financial structure. Congress wanted to give small homebuyers the same access to funding as large corporations. So they created an industry devoted to financing housing. A well-intentioned command and control policy isolated the Savings and Loans (S&Ls) from market forces. Isolation led to regional and sectoral imbalances in the 1960s and eventually destroyed the S&L industry in the 1980s. The hasty legislative patch to rescue the system extended the deposit insurance guarantee from debt secured by mortgages to debt secured by nontraded private information assets. This opened the door to moral hazard opportunities which led to massive losses and wasted resources.

In 1960 the government also tried to create a national secondary market in mortgages to eliminate regional and sectoral imbalances. This effort ultimately led to the integration of the mortgage and capital markets. Now securities, backed by mortgages, sell directly in the capital market. The total value of mortgage-backed securities exceeds the value of corporate bonds. Small homebuyers have the same access to capital as large corporations. In the case of housing finance, integration worked--isolation failed.

The paper is organized as follows. Section 1 lays out the general framework. Section 2 applies it to the S&L policy. Section 3 offers conclusions.

Section I: Overview

This section sets out the criteria to analyze government bank debt guarantees. If resources are misallocated, then the equilibrium is inefficient.

1. GOAL. Evaluation of any policy requires an objective. What is the policy supposed to achieve and why is there a *Government* guarantee? Is there an externality?

There are two sides to a bank's balance sheet: assets and liabilities. Both have been used as a justification for government debt guarantees.

Assets: The standard justification is to channel capital to a particular sector, or particular industries.

Liabilities: The standard justification is to protect small uninformed savers and to protect the payments mechanism.²

2. IS THE GUARANTEE MISPRICED? A debt guarantee is insurance. Fairly priced insurance does not distort private decisions. Of course "fairly priced" is an abstract notion. In situations with private information it is infeasible for outsiders to determine the fair price. But in these cases it is also infeasible for the government (an outsider) to effectively regulate, ie, monitor and control actions. If there is private information a debt guarantee is probably the wrong policy to achieve the objective.

I think the only justification for economies with well-developed financial markets is to protect the payments mechanism. But my view is controversial. The point here is any policy should have a well-defined objective.

If the guarantee is underpriced, then there are two (not mutually exclusive) outcomes.

Transfer: The underpricing subsidizes the financial intermediary but does not distort its asset decisions. This is simply a transfer of wealth. Society's wealth stays the same and the policy redistributes wealth. In principle, the redistribution could be undone with taxes and transfers.

Resource Misallocation: The underpricing distorts asset decisions. This is a net loss to society. A redistribution cannot restore lost wealth.

Section 2: A Case Study

The US Congress took an active role in delineating financial intermediaries' activities and designing regulation for the financial system in the wake of the Great Depression in the 1930s. This section summarizes the rise and collapse the S&L industry and the policy failures and successes.

GOAL: Congress' objective was to provide small homebuyers with the same access to funds as large corporations.

I will define equal access somewhat more abstractly and much more precisely than politicians have. A payoff distribution defines any asset. Let S denote the set of potential payoff states, s , and Π the set of probabilities, $\pi(s)$, that state s is realized. And let X denote the set of the asset's payoffs in each state $x(s)$. A payoff distribution is the set of state contingent payoffs, X , and the set of probabilities associated with the payoffs, Π . In

an efficient market two assets with the same payoff distribution, $Y = X$, are perfect substitutes and have the same price, $P(Y) = P(X)$. If the payoffs on an asset are a fraction of the payoffs another asset, $Y = \alpha X$, then the price of that asset is a fraction of the price of the other asset, $P(Y) = \alpha P(X)$. A trivial example is that the price of one share of Microsoft stock is half the price of two shares of Microsoft stock.

Equal access means that a small homebuyer in the same risk class (ie, with a proportional payoff distribution, $Y = \alpha X$) as a large corporation pays the same interest rate as the large corporation, ie, $P(Y) = \alpha P(X)$.

If markets were perfect, then a small borrower that offered a payoff sequence proportional to a large borrower would pay the same interest rate. But since markets are not perfect, a mortgage is not a perfect substitute for a corporate bond. Corporate debt is sold in the capital market, individual mortgages are not. The capital market has at least three advantages for asset holders.

(1) low transactions costs

(2) liquid market (homogeneous assets can be resold for liquidity needs, or to rebalance the portfolio.)

(3) asset holders can diversify to eliminate nonsystematic risk

Diversification is a crucial element for the story that follows.³ In the famous Capital-Asset Pricing Model investors only receive a premium for bearing systematic risk. The securities market line summarizes the relationship,

$$r(i) - rf = \beta[(rm) - rf] + \epsilon(i),$$

The excess return on the i^{th} security, $r(i) - rf$, is made up of a systematic component, $\beta[rm - rf]$, which depends on how the security's return covaries with the market return, rm (β measures the covariation) and a nonsystematic component, $\epsilon(i)$, that represents volatility that is uncorrelated with the market return. There is no reward for nonsystematic risk since it can be diversified away. The risk premium on the i^{th} security, $Er(i) - rf = \beta[Er(m) - rf]$, only covers the systematic risk. Regulatory restrictions that prevented S&Ls from diversifying exposed them to nonsystematic risk which ultimately led to their collapse.

To quantify the systematic component of interest rate risk in long maturity fixed rate debt I estimated the securities market line for 20 year US government bonds.⁴ Long term government bonds have interest rate risk similar to long term fixed rate mortgages (mortgage rates were not market determined until the 1980s.) The return is volatile because small changes in interest rates result in large capital gains or losses on long

It is important to note that debt contracts are risky. There are two types of risk: default risk and interest rate risk.

The data are from the CRSP data set. The sample is annual data from 1960-1992. I proxied the market return with the return on the S&P500 and the risk free rate with the Treasury Bill rate.

maturity debt. The standard of the return on the 20 year government bond is over 2/3 of the standard deviation of the return on the S&P500 (my proxy for the market return.) But the beta for long maturity government bonds is only 0.22. Most of the interest rate risk is diversifiable risk. Long term government bonds only have a 1% premium over the risk free rate. The S&P500 Index has a 5% premium.

THE PROBLEM: How to Give Homebuyers Equal Access

Corporate and government debt in the same risk class as a mortgage are more attractive to asset holders because they can diversify risk and resell the debt in liquid markets. To give homeowners the same access to funds as large corporations a government program must make mortgages attractive to asset holders. The question is: How?

POLICY

In the wake of the Great Depression Congress created a financial services industry devoted to financing housing.⁵ They created the Federal Home Loan Bank Board with the authority to charter, regulate and make advances to Savings and Loans. They required S&Ls to hold roughly 80% of their assets in long maturity fixed rate housing mortgages. Congress also rewarded the S&Ls for holding an inefficient portfolio. They gave them deposit insurance which allowed them to raise funds at the risk free rate (or less.) And they placed geographic restrictions on their lending--they could only lend within 100 kilometers

This is a very short summary. For an excellent accounting see *Origins and Causes of the S&L Debacle, A Blueprint for Reform* (1993.)

of their office--to limit competition. An S&L charter was a local franchise. The legislation effectively isolated S&Ls from market forces for quite a long time.

After WWII the system worked very well. In the 50s and early 60s S&Ls funded the US housing boom. It seemed like populism at its best. Small local savers held deposits at their local S&L. Small local builders built the houses financed by the local S&L. In 1980 there were more than 4000 S&Ls with an average asset size of only \$US150 million. Although the S&Ls were small they held enough mortgages to make default risk an actuarial risk. Roughly one mortgage in 2,500 defaults due to nonsystematic risk--a divorce, job loss, etc. A portfolio of mortgages reduces default risk to systematic risk. Default risk is relatively easy to quantify and insure against. But the S&Ls were not diversified against interest rate risk. An increase in interest rates decreased the value of 80% of their portfolio.

By the middle 60s the first signs of the costs of isolation began to appear. There was a geographic imbalance and a sectoral imbalance. The west coast grew more rapidly than the east coast. There was no mechanism for savings in the east to finance housing in the west. West coast homebuyers paid higher interest rates than east coast homebuyers with the same risk profile. Local markets have local prices. When tight monetary policy increased short term interest rates, funds flowed out of the S&Ls and housing construction crashed. Small builders and homebuyers bore the brunt of monetary policy. An isolated system is slow to adapt to market pressure.

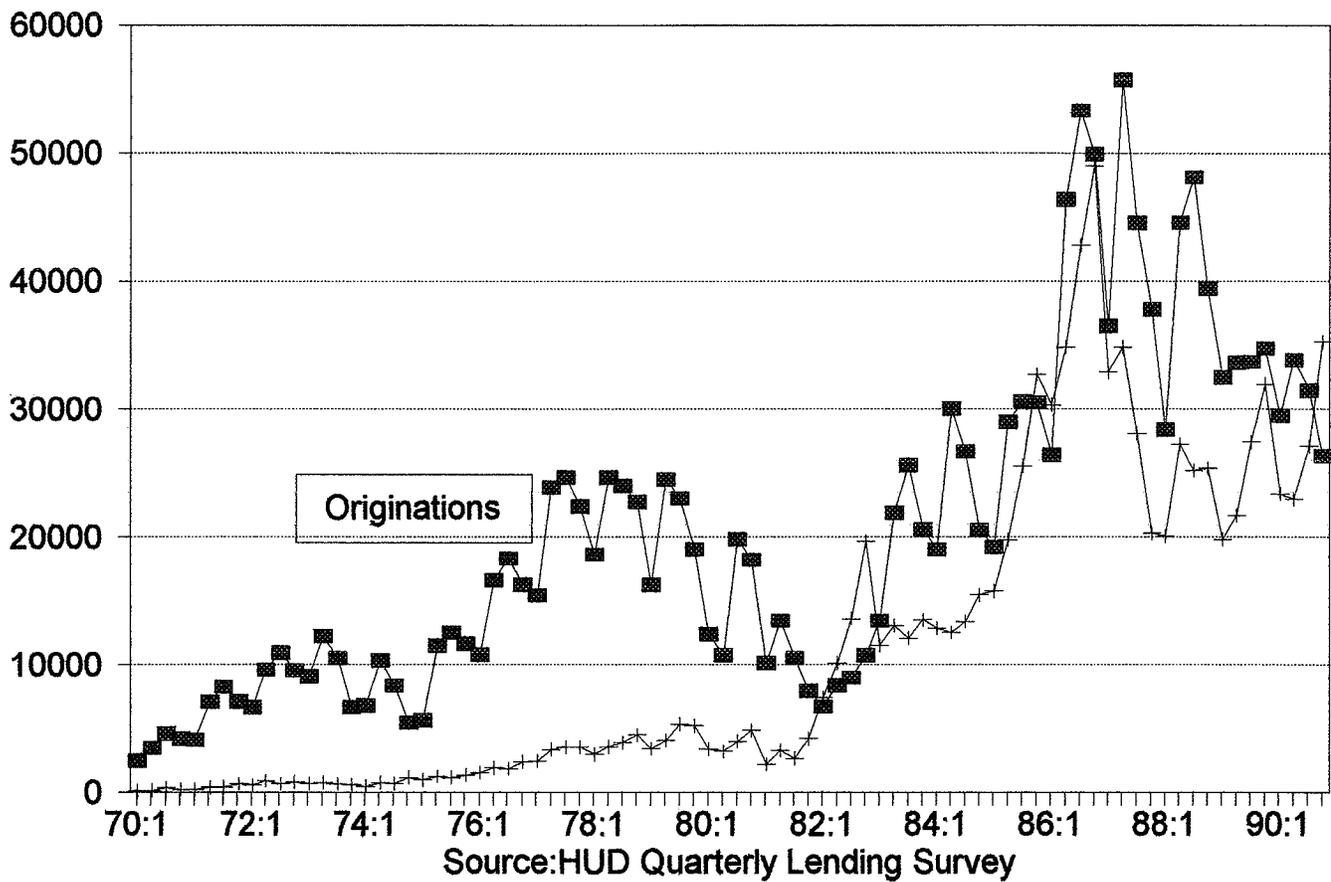
Congress responded in two ways. They set interest rate ceilings to stop the disintermediation (which provided additional isolation from market forces.) And they tried to create a national secondary market in mortgages to eliminate geographic and sectoral imbalances. They instructed the Federal National Mortgage Association (FNMA) to buy and sell home mortgages. FNMA could buy mortgages but there was no one to sell them to. And FNMA was not big enough to offset credit squeezes. FNMA could not create a secondary market.

In 1968 Congress tried again. This time they created the Government National Mortgage Association (GNMA.) GNMA had the authority to guarantee mortgages, but not to buy mortgages. It used its authority to guarantee the payment of interest and principal on securities, backed by a pool of mortgages⁶, issued by private entities--Wall Street firms and large banks. GNMA only provides a guarantee against default risk. Pooling mortgages makes default risk an actuarial risk that is easy to quantify and insure against. GNMA charges a small insurance premium and has never been in financial difficulty. Now there are private insurers that cover nonconforming (to GNMA criteria) mortgages.

The GNMA mortgage-backed securities sold on capital markets. Buyers of mortgage-backed securities could combine them in a portfolio to eliminate unsystematic interest rate risk. And they could resell them in a liquid capital market. Now mortgages, bundled into

The mortgages must satisfy certain criteria. See Fabozzi and Modigliani (1992) for a detailed description of GNMA securities.

S&Ls: Mortgage Originations and Sales



securities, had the same attraction as government debt.

Mortgage-backed securities created the instrument to integrate the mortgage and capital markets. They gave small homebuyers the same access to capital markets as large corporations. Until 1980, however, the market in mortgage-backed securities grew very slowly, see the Figure

INSERT FIGURE: MORTGAGE ORIGINATIONS AND SALES

The Figure shows mortgage originations and sales. In the 70s most S&Ls continued with business as usual. They originated and held mortgages--sales were less than 15% of originations. S&Ls had no strong incentive to participate in the mortgage-backed security market. They could sell individual mortgages and buy a GNMA security which made them more liquid, but it did not diversify interest rate risk. And legislation still required them to hold most of their assets in mortgages, or mortgage-backed securities.

THE COLLAPSE

In late 1979 the Federal Reserve dramatically tightened monetary policy to fight inflation. Treasury bill rates jumped from 6% in 1979 to 15% in 1982. The interest rate increase was a surprise. S&Ls were no worse at forecasting interest rates than the bond market. But, legislation forced them to hold undiversified portfolios. The interest rate shock killed the S&L industry. The value of their assets plummeted. The cost of the liabilities--short maturity deposits--skyrocketed. They were losing money on a cash flow basis and the

market value of their assets was less than the value of their liabilities. Figure 3 and Table 1 from The S&L Debacle illustrate the extent of the destruction.

INSERT FIGURE & TABLE

In 1981 85% of S&Ls were unprofitable. By 1982 13% of S&Ls holding 32% of the industry's assets were insolvent on a book accounting basis. On market value basis almost all S&Ls were insolvent.

GENERAL EQUILIBRIUM: A Transfer of Wealth

The interest rate shock was a surprise. All holders of long maturity fixed interest rate debt (lenders) took a capital loss. All borrowers got a capital gain. The interest rate shock created a transfer of wealth; it did not destroy wealth. Society was not worse off.

Agents with undiversified portfolios, however, experienced large changes in their wealth. Homeowners with low fixed interest rate mortgages got a whopping gain. The nominal market value of their assets--their house--increased with inflation (which caused the tight monetary policy) and the nominal market value of their debt--their mortgage--fell dramatically as interest rates increased. S&Ls took a whopping loss. The nominal value of their assets--mortgages--fell as interest rates increased. But the nominal value of their debt--short maturity deposits--stayed constant. Estimates put the market value of S&L liabilities at roughly \$US150 billion more than the market value of their assets.

Resources, however, were not misallocated. S&Ls invested in assets whose expect risk-

Figure 3
Interest Rate on 3-Month Treasury Bill

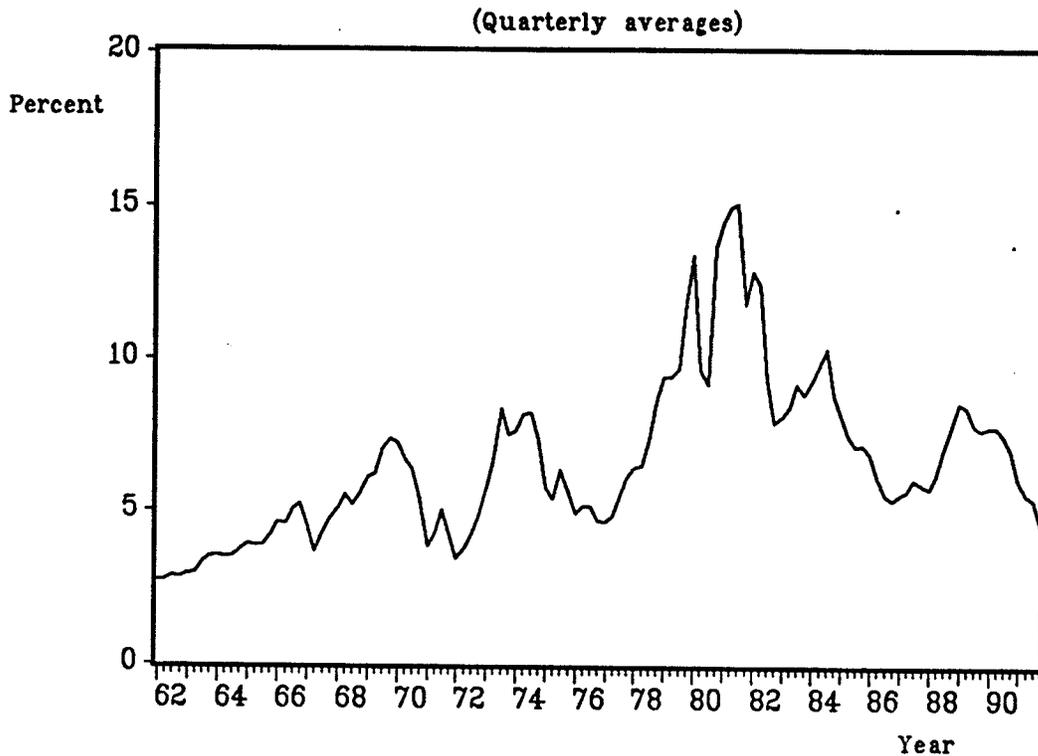


TABLE 1
Losses and Insolvencies in the S&L Industry
1979-1982

	1979	1980	1981	1982
Net income (billions)	\$0.781	(\$4.631)	(\$4.142)	\$1.945
Number of unprofitable as percentage of all S&Ls	7%	36%	85%	68%
Assets in unprofitable as percentage of total S&L assets	4%	33%	91%	61%
Number of insolvent* S&Ls	34	43	112	415
As a percentage of all S&Ls	1%	1%	3%	13%
Assets in insolvent S&Ls (billions)	-	-	\$29	\$220
As a percentage of total S&L assets	-	-	5%	32%
Tangible net worth as percentage of total assets	5.6%	5.3%	3.9%	0.6%

*Net worth calculated on a tangible net worth basis.

Source: Federal Home Loan Bank Board

adjusted return equaled the market return. Their investment decisions had not distorted the allocation of resources. The problem was that they held inefficient undiversified portfolios, so the interest rate shock wiped them out.

A "bailout" in 1982 would have taken wealth from taxpayers and redistributed it to depositors. Most S&Ls would have been liquidated. But society's wealth would have remained essentially the same. (And the mechanism--mortgage-backed securities--that ultimately gave homebuyers equal access to the capital market was in place.)

RESPONSE AND FAILURE: An Inefficient Equilibrium

Of course, the thought of liquidating the entire S&L industry in 1982 never occurred to any serious policymaker. The industry took a terrible beating because regulation and legislation put them in a straight-jacket which forced them to hold a nondiversified portfolio that was vulnerable to interest rate shocks. The owners of S&Ls were not to blame.⁷ Congress removed the straight-jacket in 1982. Congress allowed the S&Ls to invest in almost anything--from junk bonds to direct participation in real estate development.

But when Congress removed the straight-jacket on asset choices they also (unintentionally) extended the guarantee to debt secured by whatever assets the S&L choose--eg, real estate development. This was not Congress' objective--they wanted to

In fact, they were not exactly blameless. The S&L industry lobbied hard and effectively to keep the restrictions that isolated them from the market. They enjoyed the protection.

give homebuyers, not real estate developers, equal access to funding.

THE FAILURE: AN INEFFICIENT EQUILIBRIUM

Extending the guarantee led to an inefficient equilibrium. The debt guarantee was badly underpriced for S&Ls that took advantage of the opportunity. A Florida S&L invested in junk bonds that carried a 7% risk premium. The deposit insurance premium was less than 0.1%. It was almost arbitrage--borrow at 6% invest at 13%. If the bonds pay off, then the S&L wins, if they default then the insurance fund loses. The risk premium on junk bonds is easy to measure. But most S&Ls invested in nontraded private information assets that were impossible for outsiders to value. And the owners could quickly increase the risk of the portfolio without detection. The extension of the guarantee opened the door to agency problems. S&L regulators were not sophisticated, but even if they were they couldn't have monitored and controlled some of these operations. Moral hazard opportunities blossomed. There were opportunities for private gains and social losses. Resources were misallocated and wealth was lost. Society was worse off.

I'll illustrate an inefficient equilibrium with the saga of Vernon Savings and Loan of Vernon Texas. In 1982 Don Dixon, a moderately successful Texas real estate developer, returned to his birthplace--the little town of Vernon--to buy the local S&L. The S&L was small. It only had \$US82 million in assets, mostly in mortgages. Dixon offered almost \$US6 million--over 1.4 times the book value of the S&L's net worth. And in 1982 S&Ls were not doing well. R.B. Tanner, the owner and founder of Vernon, quickly accepted Dixon's "generous" offer.

Dixon recognized an opportunity when he saw one. He transformed the sleepy S&L that held mortgages into a money machine. Immediately he began investing in very risky ventures—commercial investment and real estate development—all financed with insured savings deposits. Dixon knew that everything he made was his and everything he lost was the government's. He frontloaded the investments so they would have a positive initial payoff even if they eventually defaulted.

Vernon S&L grew sixteen fold from \$US82 million to \$US1.6 billion in just four years. And Dixon generously rewarded himself for his work. He took out \$US22 million in dividends. He had the S&L buy a \$US1 million house in Southern California, and \$US2 million ski lodge in Colorado, and a \$US2.6 million yacht in Florida. Vernon spent another \$US5.5 million on airplane leases fees to fly Dixon and his friends between the homes and yacht.

In 1987 regulators closed and liquidated Vernon Savings and Loan. The assets only bought \$US300 million. This was not just a bad realization. It was an inefficient equilibrium. Dixon invested in projects whose risk adjusted expected return was far less than the risk adjusted expected market return.

THE SUCCESS: Integration of the Mortgage and Capital Markets

In 1982 the market for mortgage-backed securities began to grow rapidly. Soon most mortgages (that satisfied the criteria) were sold and held in pools that backed securities sold in the capital markets. New instruments were created tailored to asset holders'

preferences. By 1993 40% of all mortgages on 1-4 family homes in the US had been securitized. The market value of outstanding mortgage-backed securities was greater than the market value of outstanding corporate bonds. The Wall Street Journal lists the yield on the Solomon mortgage-backed index on the front of the Investment Section grouped with the yield on long Treasury bonds and the Merrill Lynch corporate bond index.

The mortgage and capital markets are integrated. Small homebuyers in the same risk class as large borrowers pay the same interest rate as the large borrower. Rates on new mortgages move in (almost) locked step with long maturity Treasury rates. Regressing the change in the new mortgage rate (for mortgages that meet the criteria) on the contemporaneous change in the 10 year Treasury bond rate and lagged levels of the 10 year rate over a sample of monthly data from 1987 through 1992 gives an R^2 of 0.71. The contemporaneous change the Treasury bond rate is the most important explanatory variable. The same regression run over a sample from 1979-1986 gives an R^2 of only 0.41 and the contemporaneous change in the Treasury bond rate is insignificant.

Section 3: Summary and Conclusions

This paper uses the US S&L industry and regulation of that industry to analyze debt guarantees and inefficient equilibria. In an inefficient equilibrium resources are misallocated. The guarantee distorts incentives so that financial intermediaries benefit from investing in projects whose risk adjusted expected return is less than the risk adjusted expected market return.

US S&Ls make a particularly good case study because--with perfect hindsight--the lessons are clear. Congress' goal was to give small homebuyers the same access as large corporations to capital. The policy to create a national secondary market in home mortgages ultimately led to the integration of the mortgage and capital markets. Mortgage-backed securities gave homebuyers the same access to capital as the government. The government guaranteed the mortgages against default risk--essentially an actuarial risk that can be insured. The buyers of mortgage-backed securities could diversify the non-systematic interest risk.

The policy to create an isolated industry devoted to financing housing failed. The resource allocation was relatively efficient. Deposit insurance protected S&L debt which was secured by mortgages. But isolation caused S&Ls to hold undiversified portfolios vulnerable to an interest rate shock. A shock in the 1980s destroyed the industry. Resource misallocation occurred because Congress in an attempt to undo the damage allowed S&Ls to diversify, but did not change the terms of the debt guarantee. This put the government in the untenable position of guaranteeing debt secured by private information assets--commercial real estate and real estate development. Resources were misallocated and the system failed.

References

Barth, James R. , 1991. The Great Savings and Loan Debacle, The AEI Press, Washington, D.C.

Carron, Andrew S and R Dan Brumbaugh, 1989. The Future of Thrifts and the Mortgage Market, Conference on Bank Structure and Competition, Federal Reserve Bank of Chicago.

Craine, Roger, 1995. Fairly Priced Deposit Insurance and Bank Charter Policy, Journal of Finance, 50, 1735-47.

Database, various issues. Secondary Mortgage Markets, Federal Home Loan Mortgage Corporation, Washington, DC.

Fabozzi, Frank J. ,editor,. 1985, Handbook of Mortgage-Backed Securities, Probus Publishing, Chicago IL.

1987, Mortgage-Backed Securites, Probus Publishing, Chicago IL.

and Franco Modigliani, 1992. Capital Markets, Prentice-Hall, Englewood Cliffs, NJ.

Flow of Funds, 1992. Board of Governors of the Federal Reserve System, Washington, DC.

Goodman, John L and S Wayne Passmore, 1992. Market Power and the Pricing of Mortgage Securitization, Finance and Economic Discussion Series No187, Board of Governors of the Federal Reserve System.

Hendershott, Patric H. and James D Shilling, 1989. The Impact of the Agencies on Conventional Fixed-Rate Mortgage Yields, Journal of Real Estate and Economics, 2: 101-115.

Jaffee, Dwight M and Kenneth T Rosen, 1991. Mortgage Securitization Trends, Journal of Housing Research, 1: 117-137.

Lewis, Michael, 1989. Liar's Poker, WW Norton and Co, New York.

National Commisssion on Financial Institution Reform, Recovery and Enforcement, 1993, Origins and Causes of the S&L Debacle: A Blueprint for Reform A Report to the President and Congress of the United States, US Government Printing Office, Washington DC.

Passmore, S Wayne, 1992. The Influence of Risk-Adjusted Capital Regulations on Asset Allocation by Savings and Loans, Finance and Economic Discussion Series No213, Board of Governors of the Federal Reserve System.

Pierce, James L, 1991. The Future of Banking, Yale University Press, New Haven.

Pizzo, Stephen, Mary Fricker and Paul Muolo, 1989. Inside Job: The Looting of America's Savings and Loans, McGraw-Hill Publishing, San Francisco.

Survey of Mortgage Lending Activity, Department of Housing and Urban Development, Electronic Bulletin Board.

Van Order, Robert, 1988-89. Getting Closer: Have we succeeded in fully integrating the markets? Secondary Mortgage Markets, Federal Home Loan Mortgage Corporation, Washington, DC.

White, Lawrence J, 1991. The S&L Debacle, Oxford University Press, New York.