Fairly Priced Deposit Insurance and Bank Charter Policy

by

Roger Craine
Department of Economics
University of California, Berkeley 94720-3880
craine@econ.berkeley.edu

April 1995*
forthcoming Journal of Finance

Abstract

The thrust of current deposit insurance reform--risk-based insurance premiums and capital requirements--is an effort to price deposit insurance more fairly. Fairly pricing deposit insurance eliminates inequitable wealth transfers, but it does not lead to an efficient equilibrium. This paper shows that an alternative charter policy results in an efficient separating equilibrium.

The analysis provides support for the deposit insurance reform proposal in the recent NCFIRRE (1993) report to the President and Congress, and for Merton and Bodie's (1993) proposal.

Keywords: Deposit insurance reform, fairly priced deposit insurance, agency cost of debt

JEL Classification G21, E44, E61

Introduction

This paper analyzes the effect of alternative charter policies when deposit insurance is fairly priced. The thrust of current deposit insurance reform--risk-based capital requirements (1988) and risk-based insurance premiums (1994)--is an effort to price deposit insurance more fairly. Chan, Greenbaum, and Thakor's (1992) seminal paper dramatically illustrated that fairly pricing deposit insurance is not enough to solve the deposit insurance problem. In their model, when banks hold nontraded private-information assets, no equilibrium exists with fairly priced deposit insurance unless banks earn rent or are subsidized.

Fairly pricing deposit insurance eliminates inequitable transfers of wealth but it does not lead to an efficient equilibrium. This paper shows that an alternative charter policy results in an efficient separating equilibrium. The separating equilibrium segregates the market for insured transactions deposits from the market for private-information financial intermediation.

The analysis provides support for the deposit insurance reform proposal in the recent (1993) National Commission on Financial Institution Reform, Recovery and Enforcement (NCFIRRE) report to the President and Congress, and for Merton and Bodie's (1993) proposal. The NCFIRRE report recommendation (p11) would "Allow institutions (not just banks and S&Ls) to offer federally insured deposit accounts *solely* through separately capitalized, federally insured, money market funds authorized to invest in only short-term

debt instruments for which there is an active national market." Merton and Bodie (p5) would require "that collateral be equal to 100% of transactions deposits and that collateral should be restricted to U.S. Treasury bills or their equivalent." Both proposals call for isolating insured transactions accounts and the public-information traded assets that secure them from private-information assets in the bank's portfolio.

The model developed here is designed to demonstrate the effect of charter policy on the efficiency of market equilibrium in an uncomplicated setting. But the main result that a separating equilibrium is more efficient is extremely robust with respect to the model specification. The formal model has two types of financial intermediaries; intermediaries that hold nontraded private-information assets (essentially Chan, Greenbaum, and Thakor's intermediaries) and intermediaries that hold traded public-information assets (Merton's (1977) model). Intermediaries that choose to issue insured transactions accounts are banks. To close the model and analyze the market equilibrium, I assume there are no perfect substitutes for insured transactions accounts. This assumption provides the economic rationale for deposit insurance. If there were perfect substitutes for insured transactions accounts, then there would be no economic reason for deposit insurance. When charter policy restricts the issue of insured transactions accounts to private-information intermediaries (the Chan, Greenbaum, Thakor model) a banking equilibrium exists, but it is inefficient. Private-information banks hold excessively risky portfolios, which misallocates resources, and the demanders of insured transactions accounts pay rent on their deposits. Relaxing charter restrictions so that intermediaries that hold traded public-

information securities can issue insured transactions accounts leads to a voluntary separating equilibrium. The separating equilibrium is efficient. Intermediaries that hold traded public-information assets issue all insured transactions accounts. They earn no rent. The market for insured transactions accounts is efficient. Intermediaries that hold private-information nontraded assets are funded by private sources. Deposit insurance does not distort their incentives. The market for private-information intermediation is efficient. The separating equilibrium dominates the private-information banking equilibrium.

The dominance of the separating equilibrium depends on three features. (1) There are no perfect substitutes for insured transactions accounts; there is an economic reason for deposit insurance. (2) Private-information financial intermediation affects the allocation of resources; excessive risk-taking leads to less wealth. (3) There are no expected excess returns in the market for public information traded assets; the capital market is "efficient."

The empirical evidence is consistent with the assumption that there are no perfect substitutes for insured transactions accounts, ie, feature 1. Recent studies document that banks earn monopoly rent on their transactions accounts and that changes in rates on insured transactions deposits are not highly correlated with changes in market determined interest rates, eg, see Allen, Saunders and Udell (1991), Berger and Hannan (1989), Diebold and Sharpe (1990), Hannan and Berger (1991), Hutchison and Pennacchi (1992), or Pulley, Berger, and Humphrey (1993).

The Savings and Loan debacle and the commercial office space glut provide anecdotal support for feature 2; intermediation affects the allocation of resources. Excessive risk taking leads to a real loss--not just a transfer of wealth. Chan, Greenbaum, and Thakor's model formally incorporates feature 2 in a transparent and tractable form. In their model, excess risk taking leads to less potential wealth, so that a redistribution of wealth cannot restore welfare. In contrast, in traditional models that analyze deposit insurance, bank assets are perfect substitutes for public-information traded securities. The bank's choice of portfolio risk has no effect on the value of the bank's assets and aggregate wealth.

Empirical evidence is also consistent with the assumption that the capital market works well. There are documented "anomalies", but no evidence of gross excess risk adjusted expected returns, eg, see Brealey and Myers (1991).

The paper is organized as follows. Section I presents the formal behavioral model for a financial intermediary. Section II analyzes the efficiency of the market equilibrium under alternative charter policies. Section III summarizes and relates the main results from the formal model to the NCFIRRE and Merton and Bodie proposals.

Section I: The Model of an Individual Financial Intermediary

This section presents a stylized model of an individual financial intermediary. The intermediary holds either private- or public-information assets. The model of the private-information intermediary is similar to Chan, Greenbaum, and Thakor's model. If the

intermediary holds public-information assets, the model is Merton's (1977) model. *An intermediary that accepts insured transactions accounts is a bank.* All decisions are made at time zero. At time T the assets pay off and the bank (or the insurance fund) pays the depositors.

Assumptions

A1.1 Intermediary Technology

A1.1.1 Information

Each public-information intermediary holds a portfolio of traded public-information assets, *V(m)*.

Each private-information intermediary holds a portfolio of nontraded private-information assets, $A(\Omega(j))$. Private-information assets do not trade in markets because outsiders cannot accurately assess their value.

A1.1.2 Returns

All asset returns follow diffusion processes.

The return on a public-information intermediary's portfolio is:

$$dV(m)/V(m) = rv(\sigma(m))dt + \sigma(m)dz(m)$$

Arbitrage forces all traded portfolios with the same stochastic process to have the same expected return. A public-information intermediary's portfolio choice has no effect on the allocation of resources.

The return on a private-information intermediary's portfolio is,

$$dA(\sigma(j)|\Omega(j))/A(\sigma(j)|\Omega(j)) = ra(\sigma(j)|\Omega(j))dt + \sigma(j)dz(j),$$

$$\text{where, } ra(\sigma(j)|\Omega(j)) \equiv xr(\sigma(j)|\Omega(j)) + rv(\sigma(j)).$$

The expected return, $ra(\sigma(j)|\Omega(j))$, on the intermediary's private-information portfolio equals the expected return on a traded portfolio with the same stochastic process, $rv(\sigma(j))$, plus an excess expected return, $xr(\sigma(j)|\Omega(j))$. The intermediary earns rent on its private information. The excess expected return is a concave function of the portfolio's volatility with a unique maximum. Risk-taking affects the allocation of resources.

A1.2 Intermediary Size

There is a continuum of small public-information intermediaries indexed by *m* and a continuum of small private-information intermediaries indexed by *j*. The book value of an intermediary's assets is *I*. Intermediary size is exogenous.

A1.3 Insured Transactions Accounts

A bank accepts insured transactions accounts, D(.), at the market determined deposit rate, rd. The cost rate of servicing transactions accounts is k per dollar of deposits. The marginal cost per dollar of transactions accounts is e^{rd+k} per unit of time.

A1.4 Insiders supply capital, C(.) = I - D(.).

A1.5 The Exogenous Economic Environment

Market

A1.5.1 Markets for traded assets are perfect

A1.5.2 Spanning

Regulation

A1.5.3 Banks must hold a minimum level of capital, $C(.) = I - D(.) \geq \{\theta - 1\}D(.)$ and pay a deposit insurance premium, $1 >> p(.) \geq 0$, per dollar of deposits.

The crucial assumption is that private-information financial intermediaries' decisions affect resource allocation. Excess risk-taking leads to a less efficient allocation and less wealth than optimal risk-taking. My specification of the excess expected return to private-information assets is equivalent to Chan, Greenbaum, and Thakor's.[1] Private-information financial intermediation is special. There is nothing special about the remaining assumptions.

IA. Bank Value

There are three sources of bank value in addition to the value of the owners' capital contribution. Private-information intermediaries earn rent on their information. Let X denote

[1] The specification is essentially a decreasing marginal productivity specification. The intermediary's information set is the fixed factor. The intermediary chooses a point on the efficient mean-variance frontier. More volatile portfolios have higher expected returns and greater private information content. As the intermediary shifts it portfolio from a low-risk, low-expected-return portfolio to more informationally intensive and volatile portfolio, the excess return initially increases and then it decreases.

the value of the rent on private-information intermediation services. If the spread between the risk-free rate and the rate on insured transactions deposits exceeds the cost of servicing insured transactions accounts, then banks earn rent on insured transactions accounts. Let Z denote the value of the rent on insured transactions accounts. In addition, underpriced deposit insurance transfers wealth from the deposit insurance agency to the bank's owners. Let Y denote the value of underpriced insurance. Then, the value of a bank in excess of the value of the owners' capital is,

$$\Delta(.) = X(.) + Y(.) + Z(.) , \qquad \textbf{(1)}$$

the value of intermediation, X, plus the value of issuing insured transactions accounts, Z, plus the benefit from underpriced insurance, Y.

I drop the index denoting an individual intermediary when there is no need to distinguish among intermediaries.

Value of Private-information Intermediation

It follows from the spanning assumption that a portfolio of traded assets, V, can be constructed that has the same state-contingent payoffs as the private-information portfolio, A. Define the excess value of the intermediary's private-information portfolio, $A(\sigma)$, over a public-information traded portfolio, $V(\sigma)$,

$$X(\sigma) \equiv A(\sigma) - V(\sigma); \quad V(\sigma,0) = I, \qquad \textbf{(2)}$$

as the value of private-information intermediation. The value of private-information intermediation,

$$X(\sigma,0) = V(0)[e^{xr(\sigma)T} - 1] \quad \textbf{(3)}$$

only depends on the excess expected return on the private-information portfolio.

A private-information intermediary maximizes the value of intermediation by increasing volatility of the return on its asset portfolio until the marginal excess expected return equals zero,

$$X_{\sigma}(\sigma*,0) = xr_{\sigma}(\sigma*)A(\sigma*,0)T = 0, \quad \textbf{(4)}$$

$$\textit{where},\ V(0)e^{xr(\sigma)T} = X(\sigma,0) + V(\sigma,0) = A(\sigma,0)$$

Define $X(\sigma^*)$ as the efficient private-information portfolio.[2]

A crucial distinction between public- and private-information intermediaries is that a private-information intermediary's volatility choice affects wealth, $A(\sigma,0) = X(\sigma,0) + I$. A public-information intermediary's volatility choice does not affect wealth, $V(\sigma,0) = I, \forall\ \sigma$.

Value of Underpriced Insurance

[2] The choice $X(\sigma^*)$ maximizes the private value of intermediation for the intermediary. In special circumstances where the intermediary and the borrower's interests are aligned, it also maximizes the social surplus from intermediation, see Chan, Greenbaum, and Thakor.

A bank borrows, *D,* from the public to finance its asset portfolio and contributes, $C = I - D$, in capital. The bank agrees to repay its depositors, De^{rdT}, at the deposit maturity. Merton (1977) showed that the private value of deposit insurance (present value of the risk premium) is formally equivalent to the value of a put option,[3]

$$\rho(\sigma,D,S) = De^{-(rf-rd)T}N(y + \sigma\sqrt{T}) - SN(y), \text{ where,}$$
$$y \equiv \frac{\ln(De^{-(rf-rd)T}/S)}{\sigma\sqrt{T}} - \frac{1}{2}\sigma\sqrt{T}, \text{ and,} \qquad \textbf{(5)}$$
$$S \in \{A, V\}, \text{ and,}$$

N(y) is the standard cumulative normal distribution.

The insurance agency charges a deposit insurance premium, p, per dollar of deposits. Then,

$$Y(\sigma,D,S) = \rho(\sigma,D,S) - pD \qquad \textbf{(6)}$$

is the value of insurance underpricing.

Value of Transactions Accounts

The bank pays the market determined rate, *rd*, on its insured transactions deposits and it costs a rate of e^k, per unit of time, to service the accounts. The alternative for the bank is risk-free debt (since deposit insurance makes bank debt risk-free.) The present value of the rent on insured transactions accounts is,

---

[3] Under spanning, the option pricing formula is valid for valuation even if private-information makes replication impossible.

$$Z(\{rf - rd\} - k,\ D) = e^{-rfT}\{e^{rfT} - e^{(rd + k)T}\}D$$

$$= \{1 - e^{-(\{rf - rd\} - k)T}\}D$$

IB. Intermediary Behavior

The intermediary's objective is to maximize the excess value of the owners' contribution.

If the intermediary accepts insured transactions accounts, it is a bank.

Private-information Intermediaries

Debt is an inefficient contract in an environment with private-information. It is infeasible to condition the debt risk (deposit insurance) premium on the risk of the private-information portfolio. Therefore, the borrower has an incentive to expropriate some of the lender's wealth by increasing the riskiness of the portfolio. This is the standard moral hazard result that risk-taking transfers wealth from the lender to the borrower.

In this model (and Chan, Greenbaum, and Thakor's), excessive risk-taking also misallocates resources. Excessive risk-taking, $X(\sigma^+) < X(\sigma^*)$, reduces wealth. This is an agency cost of debt. A bank balances the marginal gain in the private value of deposit insurance (risk premium on the debt) against the marginal loss from holding an inefficient private-information portfolio,[4]

[4] Recall that $A(\sigma) = X(\sigma) + I$. So $A_\sigma = X_\sigma$. The private value of deposit insurance is increasing in volatility, $\rho_\sigma(\sigma,D,A) > 0$, and since , $-1 < \rho_A(\sigma,D,A) < 0$, then, $\rho_\sigma(\sigma,D,A)/(1-\rho_A(\sigma,D,A)) > 0 \Rightarrow X_\sigma(\sigma^+) < 0$. Cox and Rubinstein (1985) give the derivatives. I assume an

$$\Delta_\sigma(\sigma^+,\ D) = X_\sigma(\sigma^+) + \rho_\sigma(\sigma^+,\ D,\ A(\sigma^+)) + \rho_A A_\sigma(\sigma^+)$$
$$= \{1 + \rho_A\}X_\sigma(\sigma^+) + \rho_\sigma(\sigma^+,\ D,\ A(\sigma^+)) = 0. \quad \textbf{(8)}$$

An insider-financed intermediary maximizes the excess value of the owner's contribution by choosing the efficient private-information portfolio, X(σ*).

Participation

The j^{th} private-information intermediary will accept insured transactions accounts (be a bank) if,

$$\sigma^+(j),D(j),p(j),A(j)) + Z(rf-rd-k,D(j)) \geq \{X(\sigma*(j)-X(\sigma^+(j)\}\ ,\ j\in \quad \textbf{(9)}$$
where B denotes the set of banks,

the value of underpriced insurance plus the value of rent on insured transactions accounts (the value of issuing insured transactions accounts) equals or exceeds the lost value from holding an inefficient portfolio (the agency cost of debt.)

Public-information Intermediaries

Debt is an efficient contract in an environment with no private-information. It is feasible to condition the debt risk (deposit insurance) premium on the observable portfolio of traded securities. Therefore, the borrower has no opportunity to expropriate the lender's wealth

---

interior solution gives the maximum.

by increasing the riskiness of the portfolio since there is no "hidden action".[5]

Participation

The m^{th} public-information intermediary will accept insured transactions accounts (be a bank) if,

$$Y(\sigma(m),\ D(m),\ p(m)) + Z(\{rf - rd\} - k,\ D(m)) \geq 0,\ m \in B, \quad \textbf{(10)}$$

the value of issuing insured transactions accounts is nonnegative. A public-information intermediary earns no rent on its asset portfolio, $X(\sigma(m)) = 0$, since it has no private information and the market for traded securities is efficient.

Section II: Market Equilibrium with Fairly Priced Deposit Insurance

This section examines the effect of charter policies on the market equilibrium when deposit insurance is fairly priced. A policy of chartering public- and private-information intermediaries leads to a separating equilibrium that strictly dominates the equilibrium when charters are restricted to private-information intermediaries. In the dominating equilibrium, the demanders of insured transactions accounts are better off and the private-information portfolio allocation is efficient.

---

[5] Arrow (1985) notes that all agency problems arise from asymmetric information. He labels moral hazard as an agency problem created by "hidden action" and adverse selection as an agency problem created by "hidden information." Neither problem exists for public-information traded portfolios. Deposit insurance is a put option on the portfolio. Any changes in the portfolio change the value of the put and the insurance premium.

Fairly priced deposit insurance sets the premium so that there are no subsidies, or wealth transfers, that distort the equilibrium. Fairly priced deposit insurance fairly prices the bank's debt. For a public-information bank, the insurance premium is the value of a put option on the bank's traded asset portfolio, $p(\sigma(m),D(m), I)\, D(m) = \rho(\sigma(m),D(m), I)$. This is an efficient debt contract.[6] For a private-information bank, the insurance premium is set so that the bank has no incentive to extract wealth from the deposit insurer by increasing risk, $p(j)D(j) = \rho(\sigma^{+}(j), D(j), A(\sigma^{+}(j))$. This is an incentive compatible debt contract.

Charter Policy

A charter entitles an intermediary to issue insured transactions accounts. Under the first arrangement, only private-information financial intermediaries receive charters. The alternative policy grants charters to all intermediaries.

Assumption

A2.1 The Market Demand for Insured Transactions Services

There are no perfect substitutes for insured transactions accounts. The market demand for insured transactions accounts, $\tau(rf-rd)$, is a strictly decreasing continuous function of the spread, rf - rd, between the risk-free rate, rf, and the deposit rate, rd. As the spread gets very large the quantity demanded goes to zero, ie, as $rf - rd \to \infty$, $\tau(rf-rd) \to 0$. As the spread gets very small the quantity demanded gets very large, ie, when $rf - rd \to 0$, $\tau(rf-rd) \to \infty$.

This is a crucial assumption. Insured transactions accounts are special. If there were perfect substitutes for insured transactions accounts, then there would not be any reason

[6] A fixed deposit insurance premium is an inefficient contract. A public information bank would choose the maximum risk to take advantage of a fixed (unconditional) premium, eg, see Keeley and Furlong (1989.) An efficient contract conditions the premium on the observable portfolio.

for deposit insurance.

A Private-information Banking Equilibrium

Charter Policy: Restricted Entry

Only private-information financial intermediaries receive charters.

A private-information banking equilibrium is a spread (rf-rd)* and an allocation, {D*(j), $X(\sigma^{+}(j))$}, $j \in B$, $X(\sigma^{*}(j)) \notin B$, so that no intermediary has an incentive to change its action and demand is satisfied.

Proposition 1: Given the assumptions in Sections I and II, and the charter arrangement that restricts entry to private-information financial intermediaries, an equilibrium with banks[7] exists when deposit insurance is fairly priced.

Proof:

Rewriting the participation equation when insurance is fairly priced gives,

$$D(j)[1 - e^{-(|rf-rd|-k)T}] \geq X(\sigma^{*}(j)) - X(\sigma^{+}(j)); \text{ for all banks.} \quad \textbf{(11)}$$

When the spread equals the cost of servicing transactions accounts, {rf-rd} = k, banks earn no rent on insured transactions accounts. The agency cost of debt exceeds the value of insured transactions accounts and no private-information intermediary issues insured transactions accounts. When the spread equals the cost of servicing insured transactions

[7] Intermediaries that accept transactions accounts are banks.

accounts, the excess demand for insured transactions accounts is strictly positive. When the spread gets large enough, rf >> rd, private-information intermediaries will want to issue more insured transactions accounts than agents demand. At some large spread, the excess demand is negative. The excess demand function is continuous between the positive and negative points because there is a continuum of intermediaries and demand is continuous. Therefore, a spread {rf-rd}* and an allocation D*(j) exist so that demand equals supply,

$$T(\{rf - rd\}^*) = \int_{j \in B} D^*(j)\,dj, \qquad \textbf{(12)}$$

and the participation equation is satisfied for all private-information banks and not satisfied for insider-financed private-information intermediaries. QED.

The intersection of the solid lines in the figure illustrates the transactions accounts equilibrium with private-information banks.

[INSERT FIGURE HERE]

Remark

Chan, Greenbaum, and Thakor showed that no (private-information) banking equilibrium

exists with fairly priced deposit insurance unless banks earn rent.[8] This is true here as well. An equilibrium exists here, however, since a demand for insured transactions accounts provides a source of rent and the economic rationale for deposit insurance. But the equilibrium is inefficient. No private-information intermediary will enter banking unless the value of the rent on insured transactions accounts equals or exceeds the agency cost of debt. Banks extract some of the consumer surplus through the rent on insured transactions accounts. And private-information banks hold inefficient portfolios, $X(\sigma^{+}(j))$. Fairly pricing the debt does not alter the incentive for risk taking.

A Dominating Separating Equilibrium

Charter Policy: Free Entry

Public- and private-information intermediaries receive charters that entitle them to issue insured transactions accounts.

A separating equilibrium is a spread, $\{rf\text{-}rd\}^{*}=k$, and an allocation $\{D^{*}(m), V(m)\}$, $m \in B$, $X(\sigma^{*}(j))$, $j \notin B \; \forall \; j$, so that no intermediary (private or public-information) has an incentive to change its action and demand is satisfied.

Proposition 2: Given the assumptions in Sections I and II and free entry, a separating equilibrium exists that strictly dominates the private-information banking equilibrium.

---

[8] The inequality in the participation equation is never satisfied so the supply of insured transactions accounts by private-information intermediaries is zero.

Proof: When the equilibrium spread equals the cost of servicing transactions accounts, {rf-rd}* = k, banks earn no rent on insured transactions accounts. The agency cost of debt exceeds the value of insured transactions accounts so no private-information intermediary issues insured transactions accounts.[9] Owner-financed private-information intermediaries choose the efficient portfolios, $X(\sigma^*(j)) \; \forall \; j$.

When the equilibrium spread equals the cost of servicing transactions accounts, {rf-rd}* = k, public-information intermediaries are indifferent between issuing and not issuing insured transactions accounts. An allocation, D*(m), exists so that demand equals supply. The supply of insured transactions accounts is efficient. Banks extract no consumer surplus from rent on insured transactions accounts. The equilibrium with free entry dominates the private-information banking equilibrium. QED.

The intersection of the dashed line and the solid line in the figure illustrates the transactions accounts equilibrium with public-information banks.

Section III: Summary and Conclusions

This paper starts with an economic role for deposit insurance,[10] and identifies two types of distortion created by deposit insurance. Mispriced deposit insurance leads to an

---

[9] This is the Chan, Greenbaum, Thakor no-banking equilibrium.

[10] I assume there are no perfect substitutes for insured transactions accounts. If there were perfect substitutes, then there would be no economic reason to supply deposit insurance.

inequitable transfer of wealth and financing private-information assets with insured transactions deposits leads to an inefficient allocation. Fairly pricing deposit insurance eliminates the wealth transfer, but it does not produce an efficient allocation. A charter policy which separates the market for insured transactions deposits from private-information financial intermediation results in an efficient equilibrium in the model.

The NCFIRRE report and Merton and Bodie's paper specify a reason for Federal Deposit Insurance, identify the same two distortions created by deposit insurance, and propose a policy that would lead to a more efficient market equilibrium. They informally contend that deposit insurance creates a positive externality by increasing the efficiency of the payments mechanism. They argue that the true cost to society under the current deposit insurance system is the misallocation of investment and the unintended redistribution of wealth. Resources are misallocated because financing private-information bank loans[11] with insured transactions deposits creates an incentive for excessive risk taking. Mispricing deposit insurance transfers wealth. The NCFIRRE recommendation or Merton and Bodie's proposal would eliminate the distortion created by financing private-information assets with insured transactions deposits by imposing a separating equilibrium. NCFIRRE would only allow separately capitalized institutions (subsidiaries) that held low-risk traded securities to issue insured transactions accounts. Merton and Bodie would require institutions to post 100% reserves in the form of Treasury bills (or their equivalent) with the Federal Reserve to collateralize insured transactions accounts. In the separating equilibrium, fairly pricing

[11] Merton and Bodie label private-information assets as "opaque."

deposit insurance is feasible and straightforward. The proposals are practical and would lead to a more efficient market equilibrium under fairly general conditions.

The proposals segregate the market for insured transactions accounts from the market for private-information intermediation. The market for insured transactions accounts is efficient under the standard conditions for a competitive equilibrium. Debt contracts (insured transactions accounts) are efficient in an environment with symmetric information and perfect markets. Conditioning the deposit insurance premium on the observable portfolio is feasible and it removes any perverse incentives for risk taking. Free entry eliminates rent on insured transactions accounts (the NCFIRRE recommendation explicitly states that entry is not restricted to existing depository institutions).

The proposals leave the financing of private-information assets to uninsured private sources. In the formal model, the unrealistic assumption that private-information intermediaries are financed by insiders eliminates agency problems and gives an efficient private-information portfolio. A more realistic specification would consider agency problems when insider financing is insufficient. But the allocation will be better, or no worse, than in the private-information banking equilibrium in Section II. Debt financed private-information financial intermediaries have no incentive to hold a riskier (less efficient) portfolio than $X(\sigma^+)$ under any debt contract. And they have an incentive to find more efficient contracts that minimize the agency cost.

References

Allen, Linda, Anthony Saunders, and Gregory F. Udell, The Pricing of Retail Deposits: Concentration and Information, *Journal of Financial Intermediation* 1-4, December 1991, 335-361.

Arrow, Kenneth J., 1985, The Economics of Agency, in John W. Pratt and Richard J. Zeckhauser, eds.: *Principals and Agents* (Harvard Business School Press, Boston, MA), 31-51.

Berger, Allen N., and Timothy H. Hannan, 1989, The Price Concentration Relationship in Banking, *Review of Economics and Statistics* 71, 291-299.

Brealey, Richard A., and Steward C. Myers, 1991, *Principles of Corporate Finance* (McGraw-Hill, New York, NY).

Chan, Yuk-Shee, Stuart L. Greenbaum, and Anan V. Thakor, 1992, Is Fairly Priced Deposit Insurance Possible?, *Journal of Finance* 47, 227-246.

Cox, John C., and Mark Rubinstein, 1985, *Options Markets* (Prentice Hall, Englewood Cliffs, NJ).

Diebold, Frank, and Steven A. Sharpe, 1990, Post-Deregulation Bank-Deposit-Rate Pricing: The Multivariate Dynamics, *Journal of Business and Economic Statistics* 8, 281-291.

Gorton, Gary, and George Pennacchi, 1990, Financial Intermediaries and Liquidity Creation, *Journal of Finance* 45, 49-71.

_____, 1992, Money Market Funds and Finance Companies: Are they the banks of the future? in M. Klauser and L White, eds, *Structural Change in Banking* (Irwin, Homewood, IL).

Hannon, Timothy H., and Allen Berger, 1991, The Rigidity of Prices: Evidence from the Banking Industry, *American Economic Review* 81, 938-945.

Hutchison, David E., and George G. Pennacchi, 1992, A Framework for Estimating the Value and Interest Rate Risk of Retail Bank Deposits, *Federal Reserve Bank of Chicago*, (WP-92-30).

Keeley, Michael C., and Frederick T. Furlong, 1989, Capital Regulation and Risk-taking: a note, *Journal of Banking and Finance* 13, 883-891.

_____, 1990, A Reexamination of the Mean-Variance Analysis of Bank Capital Regulation, *Journal of Banking and Finance* 14, 79-84.

Litan, Robert E., 1987, *What Should Banks Do?* (The Brookings Institution, Washington, DC).

Merton, Robert C. and Zvi Bodie, 1993, Deposit Insurance Reform: A Functional Approach, Carnegie-Rochester Series on Public Policy, *Journal of Monetary Economics* 38, 1-34.

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).

Pierce, James L., 1991, *The Future of Banking*, (Yale University Press, New Haven, CT).

Pulley, Lawrence B., Allen N Berger, and David B Humphrey, 1993, Do Consumers Pay for One-Stop Banking? Evidence from a Non-Standard Revenue Function, *Finance and Economics Discussion Series* 93-90, (Board of Governors of the Federal Reserve System, Washington, DC).

Figure Captions

Figure (1) (the only figure)

Title: MARKET EQUILIBRIUM

Legend: The figure shows equilibrium in the market for insured transactions accounts under alternative charter policies. The intersection of the solid lines illustrates an inefficient equilibrium with private-information banks. The banks earn rent on insured transactions accounts. The intersection of the dashed and solid line illustrates and efficient equilibrium with public-information banks.

*. I thank a referee for suggestions which substantially changed the focus of this paper. I also thank the editor, Rene Stulz, for his comments.