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Why Banks Need Commerce Powers

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Commercial banks are important intermediaries of credit for the commercial and industrial sector. Their power to finance commercial and industrial activity, however, is limited sharply by the restrictions imposed by law and regulation. In particular, banks are limited in their ability to hold corporate equity in commercial firms. The author argues that these restrictions on banks' commerce powers likely impair the ability of banks to effectively intermediate credit, particularly to risky firms. In addition to a theoretical presentation, the paper provides empirical evidence consistent with the importance of lender equity powers.

The powers of commercial banks in the United States are circumscribed sharply by law and regulation. The main source of these restrictions is the Banking Act of 1933 ("Glass-Steagall Act"). The act's restrictions on bank underwriting powers are its best known features. These restrictions effectively separate investment banking from commercial banking and limit the ability of banks to operate mutual funds or issue other asset-backed liabilities.

In addition to the underwriting limitations, however, the act restricts a bank's ownership of securities for its own account. Specifically, most banks in the United States generally may hold only debt securities of other companies, unless otherwise authorized. This has come to mean that banks may hold only small amounts of nonfinancial firm equity, and in no case may banks exercise control over commercial companies.[1] Banks also generally may not hold the debt and equity simultaneously of a client commercial firm because of this restriction.[2] In general, therefore, the Banking Act of 1933 confines banks to the role of portfolio lender, and the ownership of shares in commercial enterprises by banks is limited severely.

The separation of banking and commerce is a seldom debated restriction on bank powers. While there has been much debate in recent years over the investment banking powers restrictions, removal of the commerce restrictions is considered to be much more difficult politically. The ownership and control of commercial enterprises by banks raises questions of concentration of economic power. In addition, in an environment of underpriced deposit insurance, it raises important questions about propagation of the safety net.

This paper argues that there are important arguments in favor of the removal of the commerce restrictions. In particular, it is argued that the ability to simultaneously hold the equity of and lend to commercial firms is important to successful intermediation of risky credits. To the extent that banks are special intermediaries whose function is not costlessly replaced by other types of firms, the commerce restrictions may have significant macroeconomic consequences.[3] In particular, costs of capital may

be higher and total investment lower than would be the case if banks were permitted to hold corporate equity.

In subsequent sections of the paper, the theoretical analysis is developed using a simple theoretical representation of the firm in the context of information asymmetry. (For exposition purposes, the analysis abstracts from problems caused by underpriced deposit insurance.) The paper goes on to look for data verifying the theoretical notions. Direct empirical verification of the effects of expanded powers hypothesized is difficult because U.S. banking exists in the context of restricted powers. However, international comparisons, and scrutiny of the contracting processes of nonbank U.S. financial intermediaries provide anecdotal evidence that is generally consistent with the hypothesized effects. The paper concludes with some broad policy observations.

I. The Theoretical Advantages of Mixed Finance

In recent years, the finance literature has come to recognize the importance of information asymmetries in financial relationships. If one party is better informed than another about events affecting the relationship, a financial relationship may be infeasible or handicapped unless the contractual agreement controls the ability of one party to exploit the other.

A primary instance of such a problem can arise in the context of a firm and its external financiers. It is probably reasonable to assume that the insider/management of the firm knows more than outside financiers about the firm's projects and prospects. This is likely because it is costly to make the firm transparent to outside investors, and because information is fungible, so that its general release would dissipate rents enjoyed by the firm in its markets. In such an atmosphere of information asymmetry, there is no assurance that the self-interested behavior of the firm will conform to that expected by its outside financiers. The result may be failure to fund socially desirable activities, or financial contracts that do not allocate resources optimally.

In the following discussion, we demonstrate formally that pure debt is not the socially desirable form of finance under many conditions. Rather, outside financiers may need to hold some form of equity claim on the firm simultaneously with the debt claim if the firm's value is to be maximized. We will call this type of financing "mixed" financing.

A Model of the Financing and Strategy Choices of the Firm

We examine the financing arrangements for a firm that faces uncertainty about its future payoffs.[4] Let P be the nonnegative payoffs ranging from 0 to m and x be a parameter representing different "strategies" that indexes various payoff distributions. Using Lucas/Breeden-type capital asset pricing, the market value (in a competitive market) of the firm can be derived from information on the distribution of payoffs.[5] As Ross (1987) has shown, a distribution function $f(P,x)$ can be derived that has the property

$$\int_0^m f(P,x)\,dP = 1.^{6}$$

Thus the discounted expected value of the firm, $MV(x)$ can be written as

$$MV(P,x) = r^{-1} \int_0^m Pf(P,x)\,dP$$

or

$$MV(x) = \frac{1}{r} \int_0^m [1 - F(P,x)]\,dP,$$

where r is the return on a certain payoff (the "risk-free" return) and $F(P,x)$ is the cumulative distribution associated with $f(P,x)$.[7] We assume that the firm has a maximum discounted expected value at some strategy x^*, and that its value function is strictly concave in x. In addition, we assume that the firm borrows in external debt markets an amount equal to D.

The value of the firm can be partitioned into those payoffs that accrue to debt holders, $B(x)$, and those that accrue to equity holders, $V(x)$. Specifically, if the coupon payment on the debt is R, the market value of the firm can be partitioned as

$$MV(x) = B(x) + V(x) = \frac{1}{r} \int_0^R [1 - F(P,x)]\,dP$$

$$+ \frac{1}{r} \int_R^m [1 - F(P,x)]\,dP.$$

That is, the discounted expected value of the payoffs between 0 and R accrues to bondholders, while the portion in excess of this accrues to equity holders.

Note that x indexes not only the firm's value, but also the "risk" of the strategy. Bankruptcy occurs if $P < R$. The strategy x' will be considered riskier than x if the probability of bankruptcy is greater. That is, if $F(R,x') > F(R,x)$. If the distribution function has a single-crossing property, then this also suggests that when x' is greater than x, x' is a riskier strategy than x.[8]

The Moral Hazard Problem

Having structured the basic valuation model, we can now model how information asymmetry can influence the viability of external finance for this firm. It is assumed that only outside financiers hold the debt of the firm, and that outside financiers are informationally handicapped relative to the insider/equity holders of the firm. This information asymmetry takes the form of uncertainty about the strategy, x, that will be chosen by the insiders.

We look first at the case when outside financiers can only hold the debt the firm (and thus the insiders hold all the equity). For a given coupon, R, on the debt, insiders have an incentive to chose a riskier strategy than the one incorporated in R. This is because for $x' > x$, for a given coupon

$$V(x') = \frac{1}{r}\int_{R}^{m}[1 - F(P,x')]dP > V(x)$$

$$= \frac{1}{r}\int_{R}^{m}[1 - F(P,x)]dP$$

and

$$B(x') = \frac{1}{r}\int_{0}^{R}[1 - F(P,x')]dP < B(x)$$

$$= \frac{1}{r}\int_{0}^{R}[1 - F(P,x)]dP,$$

by the earlier definition of a riskier strategy. In essence, riskier strategies add to the "upside" value captured by equity holders while decreasing the value of the position of the bondholders (for a given amount of outstanding debt). This implies that $\partial B(x)/\partial x < 0$.

The Effect on Risk-Taking

The equilibrium effect of the moral hazard problem on risk-taking and the value of the firm requires consideration of how the parties to the transaction will respond to these incentives. Since the value of the firm is assumed to be a concave function of the strategy x, by definition it is maximized when $\partial MV(x)/\partial x = 0$, which will occur by definition at x^*. The insider/borrower, however, will have his equity stake maximized when the first order condition for a maximum value of $V(x)$ is met. This is when

$$\frac{\partial V(x)}{\partial x} = \frac{\partial MV(x)}{\partial x} - \frac{\partial B(x)}{\partial x} = 0,$$

at a given coupon rate, R. But since $\partial B(x)/\partial x < 0$, the value of the first-order condition will be zero only for strategies for which $\partial MV(x)/\partial x < 0$. By the assumed concave nature of the firm value relationship, this requires selection of a strategy, x^+, that is greater than the value-maximizing strategy, x^*. Thus, the strategy, x^+, that would be chosen by the insider would result in a less than maximum firm value, and strategies riskier than the value-maximizing strategy.

A rational lender, of course, will anticipate the tendency for the insider to take on riskier projects, and will charge a risk-adjusted bond coupon rate that accommodates this expectation. Thus, he will charge a risk-adjusted rate $R(x^+)$ so that the value of the debt is equal to D, the given amount of outside debt financing obtained by the firm. That is, in equilibrium $R(x^+)$ will be chosen so that

$$B(x^+) = \frac{1}{r}\int_{0}^{R(x^+)}[1 - F(P,x^+)]dP = D.$$

This will be a higher coupon than at the value-maximizing strategy, since for $x^+ > x^*$, $R(x^+)$ must be greater than $R(x^*)$ in order to make

$$\frac{1}{r}\int_{0}^{R(x^+)}[1 - F(P,x^+)]dP$$

$$= \frac{1}{r}\int_{0}^{R(x^*)}[1 - F(P,x^*)]dP = D.$$

In equilibrium, therefore, lenders price debt in the above manner so that its discounted value is always equal to the amount borrowed, D. As a result, if a strategy, x, is pursued where $x^* \leq x < x^+$, it is immediately implied that

$$V(x^*) = MV(x^*) - D \geq V(x) = MV(x) - D > V(x^+)$$
$$= MV(x^+) - D.$$

That is, the value of the insider's equity would be greater if the strategy, x, which is less risky than the strategy x^+, were employed.

Mechanisms to Control Risk-Taking

Thus, the insider has an incentive to find some way to persuade outside financiers that the riskiest strategies will not be pursued. The mechanism could involve, for example, covenants in the financial agreement to bind the insiders' behavior. Covenants that restrict additional borrowing by the firm, or give borrowers seats on boards of directors (thereby giving them access to inside information) may be thought of in this light.

Alternatively, the outside financiers could be given a share of the equity of the firm in return for their lending the funds, D. Let us say, for example, that the insiders give

away a portion, t, of $V(x)$ so that the insider's share is now

$$(1-t)[MV(x) - B(x)]; \; 0 \leq t \leq 1.$$

The insider will now have to find a strategy, x^{++}, to maximize

$$(1-t)\frac{\partial MV(x^{++})}{\partial x} - (1-t)\frac{\partial B(x^{++})}{\partial x} = 0,$$

which will have the same optimum for a given R as before since it is just a scalar of the first order condition in the all-debt finance case. However, the reaction of the bondholders will change. Since they now hold a share of the equity of the firm, everything else being equal, they will require a lower coupon on competitively priced debt, D.[9]

It can be shown that the optimal strategy, x^{++}, in this situation will be less risky than the strategy pursued when only all-debt positions were permitted. That is, x^{++} will be less than x^{+}. This can be demonstrated by recognizing that if the new strategy, x^{++}, is in fact better for equity holders than x^{+}, then $V(x^{++}, R^{++}) > V(x^{+}, R^{++})$. It also must be the case that it was not the preferred strategy when all-debt finance was used. That is, it must be the case that $V(x^{+}, R^{+}) > V(x^{++}, R^{+})$. With the knowledge that R^{++} is less than R^{+}, these two relationships together imply that

$$\int_{R^{++}}^{R^{+}} [F(P,x^{+}) - F(P,x^{++})]dP > 0.$$

This will be the case only if x^{++} is a lower risk strategy than x^{+}.[10] Thus, if outside financiers are offered the opportunity to simultaneously hold the debt and equity of a firm, the firm will adopt less risky strategies. These strategies more nearly maximize the value of the firm.

The same result, it should be emphasized, can be obtained by directly monitoring and controlling the firm's risk-taking via restrictive covenants, participation inside the firm, and other techniques. Monitoring efforts are costly, however, because they involve expenditure of resources by the outside financier, and because they require the firm to reveal information that it might otherwise prefer not to circulate outside the firm. If the outside financiers are given some control over the firm (through seats on boards of directors, for example), there also may be a cost burden in the form of less efficient management (because the outsiders, by definition, may be less expert in the business of the firm than the firm itself). Whether monitoring and control approaches will be used with (or instead of) mixed financing depends upon the balance of the costs and benefits of each approach.

In summary, however, we have found that, for a firm with a given face value of debt, D, and a given distribution of payoffs, allowing outsiders to simultaneously hold debt and equity increases net firm value over all-debt finance. Thus, if an artificial restriction limits outside financiers to all-debt claims, net social value of the firm's activities will be enhanced if nonzero equity shares are permitted. Since the moral hazard problem is greatest in the case of a borrower who has little equity at stake, or whose risk-taking cannot be controlled or monitored accurately, the remedy of mixed financial contracts likely is of particular value in these cases.[11]

Needless to say, various forms of mixed financing besides the simple mixed finance form used here can produce this result. Convertible debt, debt plus warrants or rights, collateralized lending, and other forms of mixed debt and equity financial structures are essentially ways of sharing equity claims with lenders.

The Role of Banks in Mixed Finance

Thus far, the discussion has emphasized the importance of mixed financing generally in the relationship between a firm and its outside financiers. An obvious question, however, is whether mixed financing needs to be done by financial institutions that accept deposits. There would appear to be a simple answer to this question, one that relies again on the notion of asymmetric information.

A bank is distinguished from other intermediaries because it issues debt, redeemable on demand, that may be used in lieu of currency to effect household transactions. The depositors of a bank thus are holders of par-value, demand debt. Because depositors consist of ordinary households, they may be assumed to be informationally deprived relative to the managers of the bank. Thus they, like the outside financiers of our previous discussion, need to be able to observe behavior on the part of the bank that is consistent with control of risk-taking. In essence, this is an extension of the argument made by Diamond (1984) and Gorton and Haubrich (1987) that a bank has an incentive to structure the portfolio so as to simplify the depositors' own monitoring problem.

From our earlier analysis, a bank that holds a pure-debt position in firms has a claim that will be used to finance a riskier strategy than it would be if it employed mixed debt and equity finance. To the extent that such mixed financing improves the lender's control over the moral hazard problem, it is a superior claim to the pure-debt position. It is likely that depositors, everything else being equal, would prefer their deposits be invested in such superior claims. Thus, depositors desiring a risk-free rate of return would prefer banks with investments structured as mixed finance

for the same reason that a lender would prefer such an investment itself.

The Specialness of Banking

This line of reasoning suggests that banks with commerce powers would dominate banks restricted to all-debt financial contracting with loan clients. It does not say, however, that fully empowered banks necessarily dominate other types of financial institutions with the ability to hold the equity and debt of a firm. For this to be the case, there must be something "special" about the banking firm in the first place.

The "specialness" of a bank can be either on the assets or liabilities side of its activities. That is, depository institutions may be special because the provision of deposit services lowers the cost of accessing the savings of certain types of individuals in the economy. Households, for example, may have little in the way of resources to devote to financial management. Hence, they may seek demand debt as an investment because it offers a bankruptcy covenant that is inexpensive to exercise (they can just demand repayment of their debt, without any legal costs), and demand debt simultaneously provides liquidity and investment services.

Alternatively, banks may be special because they are superior monitors of loan credits. This is an argument that has been made by James (1987) and others. For this to be an advantage of *depository* loan monitors, however, this technological advantage must flow from some advantage of jointly providing this service and deposit services. Conceptually, this could be because holding deposit accounts provides monitoring information about loan clients, or because banks enjoy scale economies because deposit liabilities provide a large liability base.

Although economists continue to debate the issue, the empirical importance of banking in virtually all financial landscapes strongly suggests that banks play special roles.[12] By extension, therefore, restricting the equity powers of commercial banks will have important consequences to the extent the powers restrictions have the adverse effects modeled above.

II. Empirical Support

The arguments made in this paper suggest a number of testable hypotheses about the use of mixed financing and the role of banks:

1. Mixed debt-equity financing will be used when the riskiness of projects is difficult for outsiders to monitor or control.
2. Preference for such financing also will be higher where the equity stake of the firm is small or collateral is not available.
3. Banks that must hold only debt will be dominated by intermediaries without such restrictions. As a corollary of this, banks will be more prominent intermediaries in financial systems that grant banks equity powers.
4. In economies where external finance is handicapped by instrumentation powers, there will be greater reliance on financing generated internally by the firm, despite the inefficiency of such finance.

Because mixed debt-equity financing by banks is not permitted in the U.S., however, it is necessary to look to other financial sectors and other financial systems to see if these hypothesized effects are observed.

Evidence from Venture Financing

Hypotheses 1 and 2 above can be tested by examining financings that clearly involve risky projects and asymmetric information. Mixed debt-equity financing should be prevalent in these types of circumstances.

The Nature of Venture Activity. An examination of U.S. venture capital activity helps test these hypotheses. The venture capital business in the United States provides financing in an environment of particularly severe information asymmetry on project risk. Venture projects, because of their novelty, are risky and difficult to evaluate externally. In addition, venture firms, by definition, are firms with low collateral and market value net worth. Thus, start-up firms offer little in the way of receivables or other sources of collateral to protect the financier's position; and the entrepreneur typically has little equity in the enterprise to moderate the moral hazard problem faced by the lender. As Table 1 demonstrates, the result is a class of investments with very high risk, relative to other types of assets in the economy.

The Type of Instrumentation. The type of financial instrumentation typically employed in the high-risk setting of venture finance as displayed in Table 2 supports the theoretical notions offered earlier.[13] As is apparent from this table, simple coupon debt instruments ("notes" in Table 2) are very uncommon in venture financing.[14] When pure debt is used, it is typically very short term, usually to provide a new firm with interim working capital or other temporary needs. Consistent with the model above, both

Table 1

Comparative Returns and Risks (1978–87)

Asset Class	Average Annual Returns (%)	Standard Deviation of Returns (%)
Venture Capital Funds > 6 years	24.4	51.2
S&P 500 stocks	15.9	12.3
Small stocks	20.4	18.9
Real estate	12.8	n.a.
Treasury bills	9.2	2.7
Long-term government bonds	10.5	16.2
Long-term corporate bonds	10.7	16.4

Source: Chiampou and Kallett (1989).

the monitoring problems and the high risk of the projects predispose against the use of pure debt.

The most common form of venture finance instrument appears to be convertible preferred stock, which is essentially a mixed debt-equity position similar to the simpler equity share modeled above. The preferred stock dimension gives the venture capitalist some debt-like returns, while the convertibility feature provides opportunities to enjoy the greater upside potential of common stock. Less commonly, straight debt with equity conversion or detachable stock warrant features are employed. These, too, have elements of a mixed financial structure.

The venture finance positions are augmented by other covenants that serve the role of direct risk-capping, that is,

Table 2

Venture Capital Financing Instruments 1990

Type of Instrument	Average Use by Venture Funds (% of fund assets)	Standard Deviation in Average Use (%)
Common Stock	26.1	25.5
Convertible Preferred Stock	62.0	37.1
Notes	2.9	3.5
Convertible Debt	2.3	4.7

Source: Sample of venture fund reports, 1990.

Table 3

Features of Venture Capital Instruments

Feature	Mean Proportion of Financings
Convertible preferred with liquidation priority	64
Convertible preferred with mandatory redemption	41
Warrants	25
Antidilution "ratchets"	71
Restrictions on sale of founder stock	66

Source: QED Survey of Venture Partnerships. Note that individual financings may employ more than one of these features, so that the total of the proportion of financings may exceed 100 percent.

permitting the financier to control his losses should he perceive a deterioration in his position. The convertible preferred positions, for example, often include liquidation priority and redemption rights. Liquidation priority, provides the venture capitalist with a worst-case downside protection; redemption rights require that the firm cash out the venture capitalist at a premium over the value of the initial investment if, by a certain time, performance has been less than anticipated. In addition, various antidilution and stock sale restrictions are frequently imposed to prevent the firm from increasing its leverage or diluting the claims of the venture capitalist. Table 3 presents the frequency of such features from a survey of venture partnerships.

In addition to embedding these control features in their outside positions, venture capitalists often obtain inside (management) rights in return for their significant outside funding. These rights may include the opportunity to appoint one or more directors or to serve as an officer of the company. In addition, financing to venture firms usually is provided in stages, to give the venture financier additional control.

Evidence from Recent Changes in Tax Law and Venture Activity

All of these contracting conventions observed in the venture capital industry lend further support to the notion that mixed debt-equity positions are useful in intermediating these types of risky credits. This observation is further supported by the effect of recent changes in tax law on the

level of venture finance activity. Recent changes in tax law have increased effective capital gains tax rates and increase the benefits of tax-deductible debt finance. Specifically, with the passage of the Tax Act of 1986, personal income tax rates were made lower than the corporate income tax rate, and the rates at which capital gains and ordinary income are taxed were equalized. Both have the effect of favoring debt over equity finance.

In the venture capital industry, this appears to have resulted in a reduction of venture commitment flows by about 60 percent, and to have skewed venture finance activity toward lower-risk, more conventional intermediation.[15] This recent experience underscores the selective importance of equity and mixed finance positions in financing risky ventures.

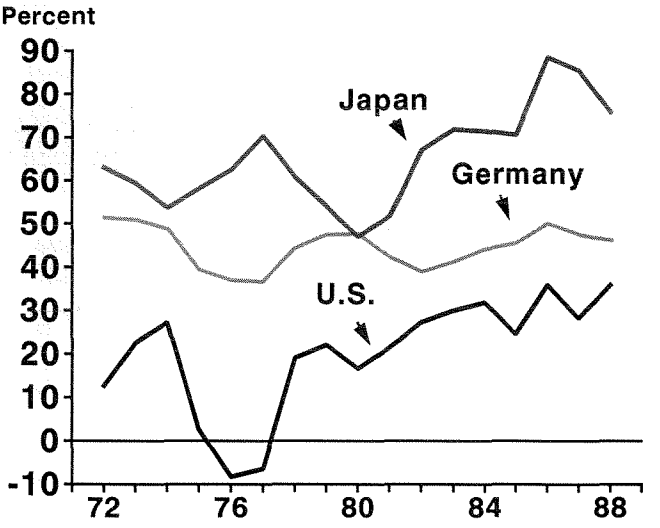
Evidence from Other Banking Systems

Hypotheses 3 and 4 state, respectively, that in economies that do not restrict bank commerce powers, banks will be the dominant form of intermediation and, by extension, that external finance thus will be facilitated. Although the commerce powers of commercial banks are limited today in the United States, banks in some other countries enjoy greater flexibility in this regard. This permits us to see whether mixed financing emerges as a common financing technique in such systems, and how banks fare versus other intermediaries when these powers are available.

German and Japanese Banking. Commerce powers are generally less restricted in most European countries and in Japan as well. Of the major European countries, Germany has the most liberal policies regarding combinations of banking and commerce. So-called universal banking is practiced, and banks enjoy virtually complete flexibility in the relationships that they may have with commercial firms.[16] These powers are of long standing in Germany, having been acquired with the introduction of joint-stock banking that occurred in 1848. These so-called Kreditbanken enjoyed both investment and commercial banking powers. In addition, historically there have been no antitrust laws or restrictions against interlocking directorates in Germany, and banks were permitted, as needed, to require representation on supervisory boards of the firms to which they lent funds.

Japanese financial regulation is nominally similar to the U.S., since restrictions similar to Glass-Steagall were imposed in the postwar period. In practice, however, as Kim (1988) has pointed out, the keiretsu industrial relationships and mochiai cross-shareholding relationships function to permit considerable exercise of mixed financing. Thus, both Germany and Japan offer interesting

Chart 1
Use of Bank Debt by Commercial Firms
(Share of Outside Financing Obtained from Banks)



opportunities to examine the effects of liberal commerce powers.

Dominance of Bank Intermediaries. In both countries, commercial banks are the dominant intermediaries. In sharp contrast to the U.S., the major share of external finance is obtained in the form of bank loans, rather than the direct placement of debt or equity securities. Chart 1 depicts the level and trend of bank loan share in the U.S., Japan and Germany.

The pattern of finance in both Germany and Japan appears to emphasize mixed debt and equity finance. Unlike banks in the U.S., banks in both Germany and Japan hold major equity positions in their corporate credit clients. In Germany, it is estimated that banks hold between 5 and 10 percent of total banking assets in the form of corporate equity, or about 10 to 20 percent of total corporate equity in Germany. Complete data are not available on the equity positions of German banks. Special antitrust studies conducted in the 1970s, however, reveal the role of German banks in large corporations. As Table 4 shows, German banks have very significant positions in these companies, with 28 percent of the largest companies having 10 percent or more of their equity capital held by financial institutions. Commercial banks appear to use this practice the most, but a wide variety of universally empowered financial institutions hold corporate equity.

In addition to significant equity positions, German banks obtain additional corporate control capability because of stock voting practices permitted in Germany. In

Table 4

German Bank Equity Positions in 74 Large Commercial Firms

	Percent of Firms Affected 1974-1975							
	Control Share: Equity Plus Proxy Votes				Control Share: Equity Only			
Bank Class	>50%	25-50%	10-25%	<10%	>50%	25-50%	10-25%	<10%
"Big Three"	0	10	17	73	0	7	3	2
Big Regional Banks	2	7	9	82	0	6	0	2
Large Commercial Banks	16	30	22	32	4	11	4	2
Savings and Giro Banks	1	1	6	92	0	3	0	4
Cooperative Banks	0	0	0	99	0	0	0	0
Other Banks	0	7	9	84	2	2	2	15
All Financial Institutions	55	22	14	10	11	12	5	10

Source: Bericht der Studienkommission, "Grundsatzfragen der Kreditwirtschaft" Table 10, p. 436.

particular, German banks also are the major provider of stock brokerage and dealing services. As a result, most shares are held on deposit by banks. German law and regulation permits the shareholder to delegate voting authority to the bank of deposit.

These delegated voting rights add to the ability of German banks to control risk in the corporations to which they have lent; in the parlance of our earlier model, they are able to directly limit selection of risky projects through their corporate affiliations. Referring again to Table 4, 90 percent of the large-company sample had 10 percent or more of their equity voted by banks in 1974/75. These control channels are further implemented through bank memberships on boards of directors and management committees of commercial firms. A 1979 report by the German Monopolies Commission, (Bericht der Studiet Kommission 1979) for example, found that banks had representatives on the boards of two-thirds of the top 100 corporations.

For reasons given earlier, we would expect the use of mixed financing to be less common in the financing of well-established firms with substantial net worth since they pose more modest monitoring and control challenges than new, low-net worth firms. Indeed, over time the amount of equity held by German banks in large corporations has declined (Bericht der Studiet Kommission 1979).

Similar patterns of significant stock ownership and control have been found in Japan in recent decades. As Table 5 indicates, for example, the six major industrial *keiretsu* all have had significant ownership by financial institutions. Although banks are nominally limited to 5 percent equity positions in nonbank corporations, through cross-shareholdings with insurance companies and securities firms, the effective position of the main banks of keiretsu is enlarged considerably.

Alternative Explanations. It could be argued that the dominance of banks in these two countries results not from more efficient bank intermediation, but from less efficient direct placement markets. Indeed, German stock and bond markets in particular are notoriously undeveloped. (The German stock exchange, for example, is open only 2 hours

Table 5

Ownership of Japanese Commercial Firms by Financial Institutions

(1974-1982 average)

Industrial Group	Percent of Shares Held by Financial Institutions
Mitsui	37.0
Mitsubishi	39.6
Sumitomo	34.8
Fuji	37.1
DKB	41.2
Sanwa	40.2

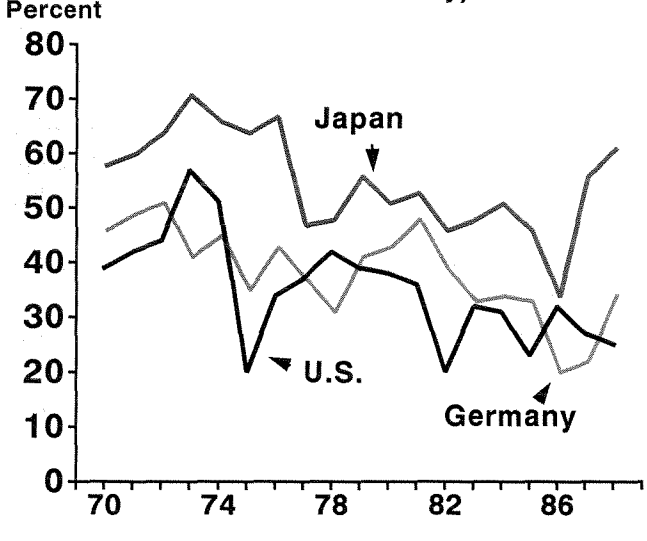
Source: Nakatani (1984)

a day for public trading.) Similarly, corporate debt markets in Japan are said to be poorly developed.

Poorly developed external financial markets however, would lead us to expect to see relatively greater reliance on internal financing. (As Myers and Majluf 1984 have suggested, firms rely on internal finance when information asymmetries cannot be managed by outside intermediation processes.) Yet in both Germany and Japan, there is less reliance on internal financing than in the United States, as illustrated by Chart 2. The comparative reliance of U.S. firms on internal finance is consistent with the notion that bank intermediaries are handicapped in their ability to manage risk in an information-asymmetric environment.

The relatively heavy reliance in the U.S. on a distinct venture capital industry also suggests that banks may be handicapped in financing certain types of credits. In essence, in the United States, the venture capital industry or some institution like it is necessary because of constraints on mixed financing by banks. With no such constraints, we would hypothesize greater bank involvement in venture capital. Indeed, this appears to be the case in Germany, where banks provide between 45 and 55 percent of all venture capital. In fact, similar high percentages are observed by Oohge, et al. (1989) in all other European nations with liberal bank equity powers, such as France (35 percent) and Italy (70 percent). The fact that U.S.-style venture capitalism has had difficulty operating in Japan also may be consistent with this view.

Chart 2
The Use of External Financing by Commercial Firms
(Percent of Financing Obtained Externally)



Evidence from U.S. Bank Portfolio Behavior

The evidence above suggests that the presence or lack of bank equity powers can have a significant effect on the structure of financial intermediation. In particular, banks' role in financial intermediation of risky credits is likely to be less without equity powers. At issue, however, is not just the specific institutional form of financial intermediation, but rather the efficiency of its provision in the economy.

Portfolio Effects. To the extent that strip finance by deposit-taking intermediaries is the most efficient form of intermediation, of course, the market share implications of powers restrictions have direct efficiency effects. Moreover, restricting the type of financial contracting that a bank may use will result in a self-selection of the types of credits able to be served by a bank. This reduces the diversification opportunities that banks may enjoy, and with it, the ability to attract (uninsured) depositors.

In the U.S. context, it seems clear that firms with significant equity and relatively transparent portfolios are increasingly able to go to investors directly to raise new funds. Underwriting and information systems clearly have improved in the computer age. Yet these are precisely the types of credits that banks, under their current restrictions, are best suited to serve. Without the ability to hold corporate equity, banks cannot reasonably expect to serve efficiently firms with low net worth, low collateral, or novel and risky projects. There seems no doubt that, in the United States, the portfolios of commercial banks have become less diversified, and more dependent upon "middle market" credits and remaining high collateral credits.

Having lost the short-term corporate debt market to the commercial paper market in the 1970s, U.S. commercial banks began losing other lines of industrial finance in the 1980s. Call report data reveal that the result has been a decline in the share of commercial and industrial loans relative to total assets. In 1984, for example, C&I loans were 17.5 percent of total assets; as of the first half of 1990, this had declined to less than 15 percent. In absolute, inflation-adjusted terms, lending by U.S. banks to nonfinancial corporations has declined by two-thirds since 1978.

In place of C&I lending, banks have increased substantially their holding of real estate credits. The share of real estate-collateralized loans in U.S. bank portfolios has increased from 14 percent in 1984 to about 23 percent today. In contrast, U.S. Flow of Funds data show that the flow of directly placed corporate debt has increased 500 percent since 1978, and the real value of venture capital commitments by a similar amount since 1980. In sharp contrast to this experience of U.S. banks, real bank lending

to business, in absolute terms has increased in the same period in both Germany and Japan, according to flow of funds data from those countries.

Mixed Financing and Corporate Discipline

An additional source of efficiency effects is the possibility that mixed financing provides a superior mechanism for resolving intracorporate conflicts. In a financial structure composed of separate debt or equity positions, conflicts arise during times of financial stress between equity holders and debt holders. No such conflicts arise, by definition, in a mixed finance position. Workouts thus may not need to result in bankruptcy, takeover, or other costly external control mechanisms.

The data on the incidence of corporate takeovers in Germany and Japan are consistent with the view that mixed financing affords an opportunity to effect significant corporate change without formal bankruptcy or takeover and the deadweight costs associated with such processes. In Germany, for example, where this phenomenon has been studied in detail, there has been only one hostile takeover (the takeover of Feldmuehle Nobel in 1989 by Flick), and other types of takeovers have been similarly rare, when compared to the U.S. and the U.K. Rather, the banks have used their strip financier position to press for management changes in advance of serious deterioration of the firm's condition. Similar practices are reported for Japan by Kim (1988).

III. Concluding Observations

This paper has argued that restrictions on the instrumentation powers of commercial banks is a potential handicap to both the U.S banking industry and to financial intermediation processes in our economy generally. The theory presented in the paper argues that mixed debt-equity finance is a potentially important means of resolving the moral hazard problem that all outside financiers face. Only casual data were presented in this paper, but the pattern of instrumentation is consistent with that implied by the model presented.

The more difficult issue is whether the lack of instrumentation powers of U.S. banks has any important macroeconomic consequences. For this to be so, one must first accept the notion that the handicap of limited commerce powers is significant and, second, that banks have special capabilities not easily provided by other intermediaries. If both of these observations are true, then the lack of universal bank-like powers may result in a handicap to the overall economy.

In concluding this paper, therefore, it is interesting to offer additional, casual observations. The banking systems in at least two major economies, Germany and Japan, follow some variant of mixed finance. In both of these economies, the introduction of bank equity powers is associated with their rapid subsequent development.

In the case of Germany, the introduction of universal banking in 1848 was followed by rapid growth through the turn of the century and the advent of the First World War. Historians and economists such as Riesser, Gerschenkron, and Schumpeter have attributed the rapidity of German growth in this period in large part to the intermediation services provided by the Kreditbanken universal banking system. (See Pozdena and Alexander 1991.) The universal banking system appears to have served modern Germany equally well. The German economy has enjoyed higher average real growth rates than the U.S. in the last three postwar decades. In addition, spending on plant and equipment in Germany is roughly twice as great (as a percentage of GNP) in Germany as in the U.S. Nonmilitary research and development expenditures in Germany also exceed those in the U.S. by only a slightly smaller fraction.

In Japan, as Hodder, et al. (1985) point out, the prewar zaibatsu and direct placement markets had managed to provide a volume of external financing of only 2 to 4 percent of GNP. In contrast, the World War II and postwar intermediation by banks is associated with a rate of external finance of as much as 20 percent of GNP. Today, investment in plant and equipment in Japan exceeds that of the U.S. in absolute terms, and at 23.5 percent of GNP is approximately twice the U.S. rate. Research and development spending, at 3.1 percent in Japan, is 50 percent higher than in the U.S.[17]

Obviously, considerable additional research is needed to demonstrate more robustly the effects of restricted banking commerce powers. In addition, before banks receive additional powers of any kind, powers reform must be coordinated with the reform of the deposit insurance system.[18]

ENDNOTES

1. Section 16 of the Banking Act of 1933 prohibits national banks from purchasing corporate stock [12 USC 24], a prohibition that has been extended to state-chartered banks that are members of the Federal Reserve System [12 USC 335]. Section 4 of the Bank Holding Company Act prohibits a bank holding company (BHC) from owning or controlling, directly or indirectly, the shares of any company that is not a bank [12 USC 1843]. The act exempts investments by BHCs that involve less than 5 percent of the voting shares of another company [12 USC 1843 (c) (6)]. In addition, Congress at various times has made exceptions that permit share ownership in selected organizations, such as Small Business Investment Corporations, which provide a limited form of debt financing to new business ventures [15 USC 682(b)] and state housing corporations [87 Stat. 269].

2. The Banking Act does not generate this restriction specifically. It restricts equity ownership, but generally allows incidental banking powers related to lending. The Office of the Comptroller of the Currency has interpreted this to mean that a bank may take as consideration for a loan a portion of the company's profits or earnings, but not shares of its stock [12 CFR 7.7312]. The Board of Governors of the Federal Reserve System typically has interpreted this restriction conservatively as well, and does not permit a bank to be the lead lender to a commercial firm in which it or other BHC subsidiaries hold shares, even if those shares are nonvoting and thus do not constitute controlling positions. See Taylor (1987) and Bostrom (1989) for a further discussion of these issues.

3. The macroeconomic importance of banks as intermediaries is emphasized by a number of authors studying the relationship between banking activity and business activity. See, for example, Bernanke and Gertler (1989) and Greenwald, Stiglitz, and Weiss (1989).

4. This section draws very heavily on an approach suggested by Roger Craine, and applied by Craine and Steigerwald (1989). Craine and Steigerwald's approach makes very compact a demonstration that otherwise is quite cumbersome.

5. See, for example, Lucas (1978).

6. This need not be the underlying payoff distribution; that will be the case only if agents are risk-neutral.

7. The discounted expected value of the firm is $MV(P,x) = r^{-1}\int_0^m Pf(P,x)\,dP$. However, this can be shown to be equal to $r^{-1}\int_0^b [1 - F(P,x)]\,dP$ by application of the rule of integration by parts. Specifically, suppressing the x index for simplicity, let $u = [1 - F(P)]$ and $v = P$. Then

$$r^{-1}\int_0^b [1 - F(P,x)]\,dP = r^{-1}\int_0^b u\,dv$$

$$= r^{-1}uv\,\Big|_{P=0}^{P=m} - r^{-1}\int_0^b v\,du$$

This can be written as

$$r^{-1}\{[1 - F(P)]P\}\,\Big|_{P=0}^{P=m} - r^{-1}\int_0^m P\,d[1 - F(P)]$$

$$= -r^{-1}\int_0^m -P\,dF(P) = r^{-1}\int_0^m Pf(P)\,dP$$

since

$$r^{-1}\{[1 - F(P)]P\}\,\Big|_{P=0}^{P=m} = 0.$$

8. The single crossing property is that $F(P,x^1) > F(P,x)$ for $x^1 > x$. This ensures that a shift in the distribution has an unambiguous effect on the weight in the tails of the distribution.

9. That is, the $R(x^{++})$ needed to solve

$$\frac{1}{r}\int_0^{R(x^{++})} [1 - F(P,x^{++})]dP$$

$$+ \frac{t}{r}\int_{R(x^{++})}^m [1 - F(P,x^{++})]dP$$

$$= \frac{1}{r}\int_0^{R(x^{+})} [1 - F(P,x^{+})]dP = D$$

is less than $R(x^+)$, if the expected value of the equity share is positive.

10. And the two distributions behave so that $F(P,x^+) > F(P,x^{++})$ for all P, the so-called "single crossing property" of simple cumulative distributions.

11. The model presented above can be used to show that bigger coupons (such as might arise as the firm enlarges the amount of debt, D, it wishes to borrow) induce greater risk-taking. Thus, the more leveraged a firm becomes, the greater the moral hazard problem and the potential for a significant effect of a mixed financing mechanism.

12. See, for example, Black (1985).

13. Venture firms may have other sources of finance as well, such as funds raised from family or other direct investor sources. Typically, however, the venture capitalist is the major source of the funding of start-up industrial firms. Because such firms usually are closely held, data are not publicly available to characterize accurately the liabilities of the typical venture firm.

14. For a more complete description of venture financing mechanisms, see Testa and King (1989).

15. See Pozdena and Martin (1990).

16. See Pozdena and Alexander (1991), for a more complete description of the institutional features of the German banking system. This section draws heavily on that source.

17. Restricted equity powers thus may be at the root of the often lamented high cost of capital in the U.S. Indeed, in their recent study of Japanese and U.S. costs of capital, Ando and Auerbach (1990) conclude that the measured Japanese cost-of-capital advantage may be due to the "lower risk" of comparable investments in Japan. This is, of course, simply another way of saying that Japanese financial intermediation methods better accommodate risk.

18. It is not clear, however, that expanded commercial powers necessarily translates into expanded opportunities to exploit the bank safety net. Giving banks additional tools to manage asset risk should offer them the opportunity to enhance bank profitability and net worth, which in turn quells the desire for risk-taking at the expense of the deposit insurance fund. Even for banks with very low market value net worth (and, hence, a strong preference for risk taking at the expense of the deposit insurer), a method of controlling the cost of risky credits would be used positively to enhance net worth.

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