Regulation of Debt and Equity

*Richard W. Kopcke and Eric S. Rosengren**

At the heart of economic development and capital formation is the transfer of resources from those who would save to those who would invest. When the capacity to accomplish these transfers efficiently is lacking, growth is impaired, and less profitable investments may displace some that are more promising. In the United States, much of this transfer of resources flows through a nexus of financial markets and institutions. Banks, insurance companies, pension funds, savings and loan associations, and other financial intermediaries fill an important role in this financial system by offering savers an attractive means of accumulating claims while offering investors attractive terms for accepting claims. Without these intermediaries, each financial contract must accommodate at once the specific, often incompatible motives of savers and investors. For example, households seeking relatively liquid assets or insurance coverage might find little common ground with businesses seeking financing for factories. Consequently, the evolution of our financial system is guided, to a great degree, by the opportunity for profit which attracts enterprises that either would match savers with investors of complementary interests or would mediate the distinct interests of savers and investors, converting the primary securities issued by investors into assets valued by savers.

The features of our financial system are shaped by public controls and subsidies, as well as by the various motives of savers and investors. Financial transactions allocate the risks as well as the returns of the

*Vice President and Economist, and Assistant Vice President and Economist, Federal Reserve Bank of Boston.

underlying investments, not only among the parties to those transactions but also among others. The design of these arrangements also may either diminish or increase the total risk posed by uncertain investments to the economy. Because of agency costs, externalities, and competitive pressures, financial transactions may impose unacceptable risks on the economy without offering adequate compensation. Accordingly, the regulation of securities offerings, the conventions governing markets, and the regulation of intermediaries may control the risks created by these contracts. These regulations, by design, influence both the volume of financial transactions and the means by which funds flow from savers to investors.

The goal of policy is to foster contracts that allocate risks and returns in an acceptable fashion without arbitrarily impeding the efficient transfer of resources. In order to meet this goal, private and public regulations must change with economic conditions as well as the motives of savers and investors, so that the allocation of risks and returns remains appropriate. Otherwise, the cost of these regulations may exceed their benefits.

This paper concludes that the regulations governing financial intermediaries promote debt financing by businesses. Savers are attracted to the insured and guaranteed liabilities issued by intermediaries, who, in turn, place these funds mainly in new debt securities. Although regulations allow some intermediaries such as pension funds and insurance companies to buy stock, these intermediaries tend to acquire the existing equity of established corporations, not the newly issued equity of developing enterprises. Regulations that restrict intermediaries from holding equity may tend to make the economy less stable by dividing the interests of investors from those of intermediaries and by encouraging intermediaries to hold riskier debt in order to earn a competitive rate of return on their capital. Instead of emphasizing restrictions on assets, often favoring debt over equity, regulators should rely on capital controls by enforcing substantial minimum capital requirements, to be financed by common stock.

While equity is inherently riskier than debt, public policy does not necessarily promote financial security or economic stability by requiring intermediaries to acquire debt rather than equity interests. With such an emphasis on debt, the cost of equity financing may be relatively great and relatively volatile, especially for developing enterprises that are not well-known in capital markets. Furthermore, by dividing the interests of investors from those of their "bankers," such restrictions encourage intermediaries to supply less credit or seek premature repayment on projects whose prospects appear to dim. Financial intermediaries exist to bridge the differences between the motives of savers and those of investors. When regulations sharpen the distinctions between the

incentives of entrepreneurs and the incentives of those financing investments, economic activity and the prices of assets may become less stable as opinions change about the future returns on investment projects.

The first section of this paper describes the role of banks, pension funds, life insurance companies, and other intermediaries in transferring funds from savers to investors. During the past three decades, households essentially have been exchanging equities for deposits, insurance policies, or annuities. In this volume, Merton argues that financial intermediaries can repackage debt and equity of firms to satisfy investor demand. This may be prevented if financial intermediaries have a limited capacity for acquiring equities, especially those of developing enterprises. This change in the composition of households' financial wealth tends to diminish the supply and increase the relative cost of equity financing.

The second section describes the risks created by financial intermediation. By reshaping rather than eliminating risks and by reducing the rate of return on equity of regulated financial institutions, thereby making them less competitive with unregulated enterprises, existing regulations do not necessarily make financial intermediaries secure. Furthermore, by insuring or guaranteeing the liabilities of qualifying intermediaries or investors, the government tends to commit itself to maintaining the values of many assets, thereby constraining the options of macroeconomic policymakers.

The model in the third section describes the influence of regulations on an intermediary's behavior. Banks covered by deposit insurance are encouraged to make loans with lower expected returns and greater probabilities of default than they would otherwise. Binding capital requirements can foster this disposition. To the degree that regulators are not privy to the risks inherent in banks' loans, restricting the types of assets that banks can acquire may not reduce the risks that they bear very substantially.

The Flow of Funds from Saving to Investment

In accumulating wealth, households forgo current consumption in favor of increasing their opportunity for future consumption. This saving comprises investing directly in capital goods (homes, plants, durable equipment), acquiring the primary securities of others who invest in capital goods (loans, commercial paper, bonds, stock), or purchasing the indirect securities of intermediaries who, in turn, acquire either primary securities (deposits, annuities, insurance policies) or capital goods. While households directly control the disposition of much of their saving, some is undertaken on their behalf by businesses and

intermediaries that retain a portion of their earnings in order to finance new investments.

Most of households' saving each year is invested in capital goods. Purchases of consumer durables and residences amount to about 20 percent of disposable income, while the acquisition of financial assets has averaged just over 10 percent of income (table 1). Because those households purchasing capital goods ordinarily finance their investments partly by tapping the savings of other households, net saving amounted to just over 20 percent of disposable income during the last four years, while net financial saving was only about 4 percent of income.[1]

The Composition of Financial Saving

In principle, both the volume of households' saving and its allocation depend on the opportunities and services offered by the various financial assets. Some assets are attractive because they are safe, insured, or liquid; others appeal, despite their greater risks, because they offer some chance of extraordinary returns; the stream of payments offered by other assets coincides closely with the timing of future expenditures anticipated by savers; still other assets offer insurance against misfortunes; and, when "outsiders" do not understand fully investors' opportunities and motives, savers also value those financial arrangements that encourage investors to divulge information or to respect the interests of savers.

Although the acquisition of both primary and indirect assets has been an important means of saving throughout our history, the composition of household portfolios has been shifting to favor indirect securities over primary securities (tables 1 and 2). Banks, insurance companies, pension funds, and other intermediaries have introduced convenient products that, as surrogates for stocks and bonds, apparently remove some of the hurdles that deter savers, as outsiders, from financing investors. Altogether, the indirect securities issued by intermediaries rose from approximately 20 percent of household financial wealth earlier this century to about 50 percent today.

Since the 1950s, the subsidence of primary securities in households' financial wealth has been due entirely to savers' shifting their financial assets from equity toward other securities. Equity in corporations and partnerships formerly accounted for almost 60 percent of the portfolio;

[1] This net financial saving corresponds most closely, but is not identical to, the concept of household saving in the national income and product accounts.

Table 1
Composition of Household Saving

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Percent of Disposable Income:											
Gross Purchases of Real Assets and Financial Assets	19.4	20.6	24.1	25.6	29.6	28.9	29.5	30.9	33.9	30.9	32.9
Gross Purchases of Real Assets	10.0	10.8	15.6	15.6	20.4	18.6	18.4	18.2	19.6	17.5	19.8
Purchases of Financial Assets	9.3	9.8	8.5	9.9	9.2	10.3	11.0	12.7	14.2	13.4	13.1
Percent of Purchases of Financial Assets:											
Primary Securities	69.5	78.2	48.2	107.5	21.9	9.9	18.8	−2.0	1.0	−3.0	5.1
Equity	50.2	46.0	55.3	75.8	−1.0	−2.5	−7.4	−10.5	−20.5	−32.5	−27.5
Corporate Equity	19.7	28.4	26.3	57.9	3.9	−1.9	−5.6	−1.9	−6.7	−9.5	−23.9
Noncorporate Equity	30.5	17.6	29.0	17.8	−5.9	−1.6	−3.3	−7.0	−15.7	−25.5	−18.3
Debt Securities	19.3	32.2	−7.1	31.7	23.9	13.4	27.7	6.9	23.5	32.0	47.3
U.S. Government Securities	−3.4	.1	−45.6	−4.5	5.6	1.6	10.0	−1.9	11.2	17.5	22.6
Indirect Securities	30.5	21.8	51.8	−7.5	76.8	88.7	78.7	99.5	96.0	100.5	88.8
Deposits	21.2	16.0	39.2	−18.3	42.3	55.9	47.3	66.0	55.9	54.3	37.7
Pension Fund Reserves	0	0	.2	−1.6	23.6	23.4	23.4	27.4	35.3	43.5	46.9
Life Insurance Reserves	9.3	5.8	12.4	12.5	10.9	9.4	7.9	6.2	4.8	2.7	4.2
Percent of Disposable Income:											
Increase in Liabilities	1.7	1.4	3.1	1.9	5.5	5.7	5.2	5.9	8.6	6.6	9.2

Notes: For tables 1 and 2, real assets include residential structures, consumer durables, and nonprofit plant and equipment. Corporate equities include all corporate equities held directly by households and equities held indirectly in mutual funds. Debt securities include U.S. Government securities, tax-exempt obligations, open market paper, mortgages, corporate bonds, and securities credit held directly by households as well as credit market instruments held indirectly through mutual funds or money market mutual funds. Deposits include all checking, savings, and time deposits held directly by households as well as credit market instruments held indirectly through mutual funds or money market mutual funds.

Source: Disposable income 1900 to 1929, U.S. Department of Commerce, *Historical Statistics of the United States*, p. 139. All other data 1900 to 1929, Raymond W. Goldsmith, 1956. *A Study of Saving in the United States*, vol. I, p. 365. All data 1955 to 1988, Board of Governors of the Federal Reserve System, *Flow of Funds*.

Table 2
Composition of Household Assets

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Percent of Total Assets:											
Real Assets	48.5	41.4	40.7	36.6	31.2	30.0	29.7	33.4	37.4	36.5	34.8
Financial Assets	51.5	58.6	59.3	63.4	68.8	70.0	70.3	66.6	62.6	63.5	65.2
Percent of Financial Assets:											
Primary Securities	80.9	78.9	76.1	77.7	69.9	67.4	64.8	59.3	55.4	56.1	52.4
Equity	54.4	55.6	49.3	58.6	58.5	57.1	55.4	50.2	46.2	45.7	40.2
Corporate Equity	33.7	42.4	34.8	48.4	27.9	30.8	32.2	25.4	16.4	16.3	17.4
Noncorporate Equity	20.8	13.2	14.5	10.2	30.4	26.1	23.0	24.5	29.6	29.1	20.9
Debt Securities	26.4	23.3	26.8	19.2	11.5	10.5	9.7	9.4	9.4	10.7	14.1
U.S. Government Securities	1.8	.6	6.2	1.4	6.3	4.9	4.2	3.5	3.7	5.0	7.0
Indirect Securities	18.8	20.2	21.4	19.1	29.1	31.6	34.2	39.6	43.4	42.8	46.1
Deposits	14.4	15.0	16.3	12.9	17.0	18.4	20.3	24.0	26.1	24.1	23.8
Pension Fund Reserves	0	0	.2	.7	5.6	7.3	8.6	10.6	13.1	15.6	19.7
Life Insurance Reserves	4.3	5.2	4.9	5.6	6.5	6.0	5.3	5.0	4.2	3.1	2.6
Percent of Total Assets:											
Total Liabilities	8.6	8.1	8.3	11.3	10.3	12.1	13.2	14.0	14.5	14.6	16.8

Source and Notes: See table 1.

today its share is approximately 40 percent. Even though equities represent the single most important asset in households' financial wealth, these securities, which tend to be held by a very few of the most wealthy households, have played a relatively modest role in transferring resources from savers at large to investors. Instead, equity generally represents the cumulative value of investors' retained earnings in their own enterprises.

Of the remaining financial assets, bank deposits, pension fund obligations, primary debt securities (mostly government debt), and the obligations of life insurance companies occupy the largest share of households' wealth. Bank deposits (comprising the accounts of commercial banks and thrift institutions) are held by most households, representing the broadest source of new funds for investors. Although these deposits have accounted for an increasing share of households' financial wealth, they are not growing as quickly as the reserves of pension funds (comprising the reserves of private pension plans and state and local government retirement funds), the third largest component of wealth. Because many employers and households participate in pension plans, these intermediaries also represent a broad source of funds for investors. Life insurance reserves today account for only 3 percent of households' financial assets, less than one-half their share of the 1950s.

The Composition of Financing for Investors

Businesses may finance their investments either with internal funds (retained earnings), which are equity, or with external funds, which may be either equity or debt. Since the 1950s, external funds have provided at least 60 percent of the financing of nonfinancial corporations (table 3), and, following a familiar historical pattern, debt accounted for more than 85 percent of this external funding.[2] After deducting capital consumption from equity, debt accounted for almost 60 percent of the financing of net investment by nonfinancial corporations from the 1950s to the 1980s.

The relative stability of corporations' ratio of debt to assets, compared to the substantial volatility in their sources of funding, suggests

---

[2] Goldsmith 1955, 1973; Navin and Sears 1955; Taggart 1986; Baskin 1988; Kopcke 1989b. Although these figures suggest that nonfinancial corporations relied on equity financing more during the first 30 years of this century than they have subsequently, these estimates probably overstate the contribution of new equity issues. Flow of funds accounts include the initial public offerings of established proprietorships and partnerships that convert to corporations. Such conversions were more significant during the early twentieth century than they have been since 1940. Furthermore, before 1930, much of the new equity was issued by one corporation to acquire the outstanding equity of another, the value of which is not subtracted from new equity issues in Goldsmith's data.

Table 3
Financing of Nonfinancial Corporate Business

	1901–12	1913–22	1923–29	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Percent of Total Sources of Funds:										
Net Equity Financing	53.7	56.7	58.1	47.7	48.9	41.6	31.7	39.7	25.3	−6.5
Debt Financing	46.3	43.3	41.9	52.3	51.1	58.4	68.3	60.3	74.7	106.5
External Financing	45.0	40.0	45.0	60.6	54.3	60.6	77.9	64.8	73.3	59.9
Percent of External Financing:										
Equity Issues	31.1	27.5	42.2	14.1	5.6	3.5	12.7	8.7	−3.4	−78.7
Debt Issues	68.9	72.5	57.8	85.9	94.4	96.5	87.3	91.3	103.4	178.7
Percent of Total Assets:										
Real Assets	63.7	63.5	58.4	73.2	71.8	71.1	71.6	74.6	74.6	72.4
Financial Assets	36.3	36.5	41.6	26.8	28.2	28.9	28.4	25.4	25.4	27.6
Equity Financing	50.0	59.2	59.4	65.9	63.1	59.5	59.9	66.5	67.3	60.3
Debt Financing	50.0	40.8	40.6	34.1	36.9	40.5	40.1	33.5	32.7	39.7
Percent of Debt Financing:										
Credit Market Instruments	63.1	49.1	54.2	62.2	64.6	64.3	66.0	69.4	64.9	68.0

Note: Balance sheet items for 1900 through 1929 are for the end year of each period rather than a period average.

Source: Data for 1900 to 1929, Raymond W. Goldsmith, 1973, *Institutional Investors and Corporate Stock—A Background Study*, p. 42. Data for 1955 to 1988, Board of Governors of the Federal Reserve System, *Flow of Funds*.

that corporations choose their financing in order to manage their degree of leverage.[3] If, at any time, one blend of debt and equity financing is preferable to others and if this optimal blend varies with the cost of obtaining debt versus equity financing, then the terms under which financial intermediaries obtain funds and the terms under which they are willing or able to advance funds will influence both the choice of leverage by businesses and their rate of investment (Gurley and Shaw 1955, 1956, 1960; Brainard and Tobin 1968; Tobin 1969, 1982).

Because intermediaries, such as banks, insurance companies, and pension funds, occupy an increasingly important role in supplying businesses with external funds, their willingness or ability to supply equity versus debt financing influences the financial structures of businesses and their cost of capital. While most intermediaries acquire considerable amounts of debt (tables 4 and 5), few hold significant amounts of equity (tables 4 and 6). Most intermediaries, including the important banking enterprises, by regulation or custom essentially hold no equity other than that of their related enterprises. Insurance companies and the rapidly growing pension funds together have obtained their equity on secondary markets from households, which have been liquidating their positions since the 1950s (table 1). Accordingly, the acquisition of equity by insurers and pension funds seldom supplies new financing directly to corporations.[4]

Because the major source of new equity financing for businesses has been retained earnings, many rapidly growing firms that are not well-known in capital markets often turn to other "nonfinancial" corporations for funds, frequently leading to mergers and acquisitions. Moreover, trade credit extended by nonfinancial corporations (not including consumer credit or loans by subsidiary finance companies) in 1988 amounted to 10 percent of their total assets or almost 40 percent of their financial assets.[5] The financial office of a business that can obtain ample financing at favorable terms is itself a potential financial intermediary.

---

[3] Although the Modigliani-Miller theorem and some of its refinements suggest that leverage may be immaterial for a corporation (Taggart 1985), when capital markets are not perfect or returns are diminishing, the choice of leverage may become important (Navin and Sears 1955; Jensen and Meckling 1976; Baskin 1988; Kopcke 1989a, 1989b).

[4] Stock markets provide shareholders a convenient means of liquidating their stakes. This opportunity may indirectly finance capital formation by encouraging entrepreneurs or venture capitalists to invest in growing enterprises. This pattern of financing depends on the motives and regulations governing investors as well as those influencing intermediaries and savers (see footnote 3).

[5] The trade credit reported as a liability of nonfinancial corporations in 1988 was about one-fifth of total liabilities (other than equity), an amount that exceeded bank loans to these corporations and which equaled six-tenths of the face value of corporate bonds.

Table 4
Composition of Assets of Financial Intermediaries
Percent of Total Assets

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Commercial Banking											
Capital-Asset Ratio	19.4	18.5	13.0	13.8	7.7	8.0	7.9	8.1	7.4	7.1	6.2
Corporate Equity	1.0	1.3	1.1	1.8	0	0	0	0	0	0	0
Debt	91.9	94.7	91.7	88.8	86.7	88.5	89.3	86.7	84.6	83.0	81.9
Thrifts											
Capital-Asset Ratio	22.7	24.8	34.4	47.1	7.7	7.5	8.1	6.6	5.9	4.6	4.8
Corporate Equity	1.5	.8	.5	.4	1.2	1.0	1.0	1.0	.7	.3	.4
Debt	93.6	97.2	97.1	96.2	93.0	92.3	92.1	92.1	91.8	89.0	87.7
Pension Funds											
Corporate Equity	0	0	20.0	20.0	24.0	33.9	41.7	47.1	40.2	39.6	43.6
Debt	0	0	80.0	80.0	73.5	63.6	54.9	47.8	50.4	52.7	51.2
Life Insurance Companies											
Capital-Asset Ratio	14.3	12.0	8.2	7.6	12.0	12.8	13.3	12.5	11.5	10.9	9.5
Corporate Equity	5.5	2.2	.6	2.4	3.8	4.8	6.2	9.3	9.6	9.4	9.4
Debt	74.5	89.2	91.5	89.8	90.2	88.6	87.0	82.9	81.8	80.0	79.7
Other Insurance Companies											
Capital-Asset Ratio	49.8	39.8	29.4	30.2	40.6	41.8	36.7	31.6	25.2	25.7	24.7
Corporate Equity	23.5	19.5	12.3	21.4	27.6	30.3	30.9	26.5	16.1	18.7	17.6
Debt	46.5	59.6	73.7	66.5	71.7	69.3	68.2	71.6	82.3	79.9	81.5
Investment Trusts											
Corporate Equity	0	0	62.7	73.3	87.3	86.2	84.0	58.2	58.1	57.1	33.4
Debt	0	0	34.5	24.0	12.7	12.4	13.6	34.8	35.3	35.3	48.8
Security Brokers and Dealers											
Capital-Asset Ratio	27.3	30.0	29.0	28.9	2.4	3.7	5.6	10.0	16.7	15.0	18.0
Corporate Equity	9.1	10.0	7.2	8.6	11.8	5.6	11.0	12.0	8.0	7.4	8.4
Debt	90.9	90.0	92.8	91.4	88.2	94.4	89.0	88.0	84.1	78.4	72.5

Distribution of Assets among Financial Institutions Percent of Total Assets of Financial Institutions											
Commercial Banking	63.6	65.4	65.5	54.0	44.2	39.8	39.9	41.6	39.8	36.9	33.4
Thrifts	18.6	14.9	13.0	14.3	16.5	19.3	19.3	19.7	21.5	19.4	18.3
Pension Funds	0	0	.1	.4	7.6	10.0	11.6	12.4	14.3	16.4	16.8
Life Insurance Companies	11.1	13.2	12.0	14.4	19.7	17.8	15.6	13.2	11.9	11.4	11.3
Investment Trusts	0	0	.2	2.5	2.1	3.1	3.9	3.4	2.0	1.9	5.7
Finance Companies	0	0	0	2.0	4.0	4.3	4.4	4.5	4.6	4.7	4.8
Other Insurance Companies	3.3	3.5	4.4	6.2	4.7	4.6	4.1	4.1	4.4	4.4	4.5
Money Market Mutual Funds	0	0	0	0	0	0	0	0	.4	3.4	3.4
Security Brokers and Dealers	3.5	3.0	4.8	6.3	1.1	1.1	1.2	1.1	1.0	1.5	1.8

Notes: In calculating capital-asset ratios, data on real assets for commercial banks from 1984 to 1988 are for FDIC-insured banks only. Thrifts includes savings and loans, mutual savings banks, and credit unions. Credit unions are included in the capital-asset ratio only from 1972 to 1988. Investment trusts includes REITs, CMOs, and mutual funds. All data for 1900 to 1929 are from Raymond W. Goldsmith, 1958, *Financial Intermediaries in the American Economy Since 1900*. Data on total assets for banks are from the Federal Deposit Insurance Corporation, *Annual Reports*, and *Statistics on Banking*. Data on total assets for life insurance companies are from the American Council on Life Insurance, *Life Insurance Fact Book*. Data on total assets for other insurance companies are from *Best's Aggregates and Averages for the Property-Casualty Insurance Industry*. Data on total assets for savings and loan companies are from the Federal Savings and Loan Corporation, unpublished data. Data on total assets for credit unions are from the National Credit Union Administration, unpublished data. Data on total assets for REITs are from the National Association of Real Estate Investment Trusts, unpublished data. All other data are from the Board of Governors of the Federal Reserve System, *Flow of Funds*.

Table 5
Holders of Equity
Percent

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Households	96.8	97.8	97.9	96.1	91.4	88.4	85.4	79.2	73.5	72.0	68.3
Pension Funds	0	0	0	.1	2.6	4.7	6.7	11.5	17.1	19.0	20.8
Investment Trusts	0	0	.1	1.4	2.6	3.7	4.5	4.4	3.4	3.1	5.2
Life Insurance Companies	.5	.3	.1	.2	1.1	1.2	1.3	2.5	3.4	3.1	3.0
Other Insurance Companies	1.0	.7	.6	1.0	1.7	1.7	1.6	1.8	1.8	2.2	2.1
Banking	1.2	1.0	.9	.8	.3	.3	.3	.4	.5	.2	.2

Source: Data for 1900 to 1929, Raymond W. Goldsmith, 1956, *A Study of Saving in the United States*, pp. 61–91. Data for 1955 to 1988, Board of Governors of the Federal Reserve System, *Flow of Funds*.

Table 6
Holders of Debt of Nonfinancial Sector
Percent

	1900	1912	1922	1929	1955–59	1960–64	1965–69	1970–74	1975–79	1980–84	1985–88
Banking	30.5	35.0	32.4	31.8	39.6	42.3	43.1	45.8	46.8	42.5	39.9
Households	35.6	35.6	39.2	35.8	20.0	17.8	15.1	13.0	11.9	12.0	12.5
Business	27.1	20.1	18.7	17.5	16.5	15.1	14.3	14.3	12.9	12.8	11.0
Life Insurance	4.4	6.8	5.8	7.9	13.7	13.0	11.3	9.5	8.5	8.0	8.2
Federal Government	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	4.2	4.9	6.0	7.1	7.7
Pension Funds	0	0	0	.2	4.2	5.1	5.2	4.9	5.7	6.8	6.9
Finance Companies	0	0	0	1.1	2.9	3.4	3.6	3.8	3.9	4.2	4.4
Investment Trusts	0	0	0	.1	.2	.3	.4	.8	.8	2.7	5.1
Other Insurance Companies	.9	1.2	1.6	2.5	2.2	2.2	2.0	2.1	2.7	2.8	3.1

Notes: Banking includes commercial banks, savings and loans, mutual savings banks, and credit unions. Business includes corporate and noncorporate business. Investment trusts includes CMOs, REITs, mutual funds, and money market mutual funds.

Source: Data for 1900 to 1929, Raymond W. Goldsmith, 1956, *A Study of Savings in the United States*, pp. 61–91. Data for 1955 to 1988, Board of Governors of the Federal Reserve System, *Flow of Funds*. Data on federal debt holdings, Office of Management and Budget, *Special Analysis: Budget of the U.S. Government*.

The federal government also is a financial intermediary. Aside from offering considerable health and retirement benefits to households, which pay "premiums" in the form of payroll taxes, the government and its sponsored enterprises hold almost 8 percent of the debt issued by nonfinancial sectors (table 6), while guaranteeing the outstanding balance on another 6 percent of the debt issued by households and businesses. Altogether, the government directly or indirectly insures about one-half of the debt of households and businesses through these loans, guarantees, and the insuring of bank deposits and pension plan obligations.

Risk and Regulation

A bank may offer deposits with little risk by running a "matched book": the characteristics of deposits are matched closely with those of assets. If intermediaries did little more than run matched-book mutual funds, then the economy would have advanced little beyond the stage where savers seeking liquid deposits and insurance found little in common with investors wanting to finance new factories. For most savers, the appeal of indirect securities issued by intermediaries is greater than that of primary securities, partly because intermediaries bear risks by transforming the properties of primary securities into those more attractive to savers. Financial intermediaries also serve savers and investors by evaluating investors' prospects, monitoring their performance, and providing them a relatively dependable access to funds on terms commensurate with their risk and returns.[6]

Deviating from a matched book creates risk. But, in doing so, intermediaries might increase their return on assets, the yields they offer depositors, and their profits; they also might offer funds to investors on better terms than otherwise possible. To a degree, a good reputation, a secure money market, and some ability to sell assets mitigate the risk of an unbalanced book, but the system as a whole is vulnerable should the motives of savers not match those of investors very closely (Keynes 1936; Minsky 1985). Intermediaries bear a considerable risk of insolvency or eventual illiquidity, for example, to the degree the redemption values of their liabilities do not match those of their assets.[7] Most households'

---

[6] See Gurley and Shaw (1955, 1956, 1960); Jensen and Meckling (1976): Leland and Pyle (1977); Smith and Warner (1979); Diamond and Dybvig (1983); Diamond (1984); Fama (1985); Bernanke and Gertler (1987); Gertler (1988); and Hoshi, Kashyap, and Scharfstein (1989).

[7] During the late 1970s and 1980s, savings and loan associations gradually became illiquid and insolvent, even though the book value of their assets exceeded their liabilities

financial assets are of "guaranteed" principal, while the value of capital goods is never "guaranteed."[8]

Risks Inherent in Intermediation

By bearing the risk of a mismatched book, financial intermediaries essentially reduce the difference between the price savers ask and the price investors bid for financial resources. As long as intermediaries fully recognize the consequences of this risk, their activities may facilitate efficient capital formation. But intermediaries may not bear the full risk inherent in their activities for at least three reasons. First, because of agency costs, the owners and managers of intermediaries have an incentive to acquire relatively risky assets and to finance their assets with relatively little of their own equity. Second, some of the risk created by intermediaries is borne by the economy at large. Third, intermediaries may be prone to "winner's curses."

The owners of any enterprise financed partly by "debt" (defined claims as opposed to the residual claims of equity) have an incentive to promote the value of their own interests at the expense of customers and creditors by making relatively risky investments or relying on relatively little equity financing (Jensen and Meckling 1976; Galai and Masulis 1976). This potential agency cost becomes especially great when creditors lack sufficient information about the characteristics of the enterprise's assets. Consequently, this cost may be considerable for intermediaries that exist partly because of savers' unfamiliarity with investors' offerings. To the degree intermediaries are willing to accept relatively risky assets, they, in turn, will tolerate greater leverage on the part of investors to whom they offer financing.

When intermediaries, especially depository institutions, encounter hardships, they may trigger panics, runs, or withdrawals, which can threaten customers of other intermediaries with capital losses and retard economic development (Bernanke 1983; Calomiris and Hubbard 1989; Diamond and Dybvig 1983; Gertler 1988). Each financial intermediary ordinarily considers only the risks and returns borne by the parties to its

---

for much of this time, because the characteristics of their liabilities did not match those of their assets. They borrowed short while lending long, and the value of the real estate backing their deposits collapsed. The risk of illiquidity or insolvency arises whenever changes in yields or relative prices influence assets differently from liabilities.

[8] In 1988, the tangible assets of households and nonfinancial corporations, which back their financial assets, were about $11 trillion. Land and structures represented more than one-half of this sum. Much of the remainder was durable equipment whose gross returns would "liquidate" its value only over several years. On the other hand, most of the financial assets that ultimately finance these tangible assets are deposits, short-term securities, or defined-benefit pension and insurance contracts.

contracts, instead of those borne by the entire economy. Consequently, some activities that pose high but acceptable risks for the intermediary and its customers may pose unacceptably great risks for society.

Finally, a winner's curse may tempt intermediaries to commit too many funds to the latest fad, paying relatively high prices for risky assets. As a consequence of the laws of probability and familiar waves in the pattern of economic development, at any time some assets will boast a recent record of consistently high returns with little apparent risk. Intermediaries holding these assets are more profitable than their competition. An overly optimistic assessment of the opportunities offered by these assets coupled with the desire to remain competitive and to appear in step with current opportunities can encourage many intermediaries (as well as savers and investors) to bid too aggressively for these assets, perhaps accepting too great a degree of leverage borne by investors (Keynes 1936; Thaler 1988). Ultimately, intermediaries can pay an excessive price, thereby accepting an inadequate return, given the risks inherent in these assets.

Deposit Insurance

Society may control the risk of runs by insuring bank deposits, annuities, or pension plans, but doing so increases the agency costs of intermediation. Although these agency costs are present even without insurance, such guarantees make savers less critical and reduce the cost of an intermediary's reliance on debt financing. These guarantees, for the same reasons, also may increase the degree of intermediation, reduce the cost of capital, and increase savers' acquisition of debt instruments.

Deposit insurance may be either explicit or implicit. Qualified accounts in banks and many pension plans are insured by government agencies to which these intermediaries (and their customers) may pay a fee. Because the reserves backing this insurance are modest and many of the large deposits upon which most of the more prominent banks depend are uninsured, much of the confidence in banks, pension funds, and other intermediaries derives from an implicit guarantee by the federal government to maintain a stable financial system. The importance of this implicit insurance may be so great that banks and pension funds, the only intermediaries favored with explicit insurance, may be the only intermediaries that must pay for their insurance (Wojnilower 1989).[9]

[9] The scope of explicit insurance extends beyond financial intermediaries under these circumstances. The support of "policy" extends through the money market—government securities, repurchase agreements, federal funds, commercial paper (Penn Central)—to the credit market—mortgage participations and passthroughs, small business loans, farm

Whether insurance is explicit or implicit, this guarantee creates a "put" written by the government in favor of financial intermediaries, their "depositors," and their borrowers. A commitment to financial stability for the sake of long-term economic development entails a commitment to a relatively smooth course of GNP, incomes, and therefore asset values, breeding financial contracts, institutions, and conventions that presume such stability. Unless insurance is limited or regulations can restrain financial arrangements, financial instruments, under some circumstances, may become more dependent on such stability through, for example, greater leverage, the willingness to rely on the projected values of more assets as collateral, the design of contracts, and the embedding of shrinking variances in asset pricing.

This put can harm economic development. If the government is to ratify asset prices, its policy, to a degree, must enforce investors' expectations (Keynes 1936; Minsky 1985). Whenever the government, because of social externalities or changes in circumstances, would be inclined to pursue policies that would depress the prices of assets, the commitment or need to maintain a sufficient degree of financial stability may limit the latitude of policymakers (Federal Reserve Bank of Kansas City 1986). When financial contracts are less dependent on this commitment, policymakers may have more discretion.

Capital and Credit Controls

The agency costs associated with financial intermediation may be reduced by capital and credit controls. Capital controls limit the degree to which intermediaries may reduce their reliance on equity financing. Credit controls restrict an intermediary's choice of assets in order to limit the risk they might assume. If these controls are binding, they also tend to limit intermediation and raise the overall cost of capital for investors.[10] Credit controls, to the degree they require or encourage intermediaries to acquire debt rather than equity, tend to foster investors' reliance on debt financing.

Binding credit controls expose intermediaries to competition from other enterprises (including brokers, finance companies, and nonfinancial corporations) that are not subject to the same regulations. As the yield on regulated bank assets, for example, falls relative to the returns offered by the portfolios of competitors, the rate of return on equity of

---

lending—and to businesses themselves through outright guarantees (Chrysler and Lockheed) to income support programs (import quotas, tariffs, price supports).

[10] If businesses are not indifferent about their financial structure (see footnote 3), then controls that alter the relative supplies of different types of financing essentially increase the cost of capital.

banks tends to fall relative to that of other enterprises (Gurley and Shaw 1960). Consequently, to offer a competitive return on equity, either banks must reduce their ratio of common stockholders' capital to assets, or banks must enter other lines of business. As economic conditions, computer technology, and the regulations governing underwriters and brokerage firms (such as the abolition of fixed commissions and the advent of shelf registration) during the 1960s and the 1970s bred strong competition for banks and insurance companies, the seigniorage that they received from their charters became insufficient to maintain an adequate return on common stockholders' equity. Accordingly, these intermediaries explored "financial innovations," and their ratios of capital to assets fell as they attempted to sustain a competitive return on equity (table 4).

Besides explicitly insuring their liabilities, public policy might attempt to bolster the rate of return on capital of regulated intermediaries in several ways (Gurley and Shaw 1960). The government may invest in the equities of these intermediaries, perhaps "nationalizing" them: Farm Credit System, Federal Housing Finance Board, Federal Home Loan Mortgage Corporation, Federal National Mortgage Association, Student Loan Marketing Association, College Construction Loan Insurance Association, Commodity Credit Corporation, Farmers Home Administration, Export-Import Bank, Rural Electrification Administration, Foreign Military Sales, Small Business Administration, and Veterans Administration. Through these agencies and enterprises as well as through other means such as the tax codes, the government also may guarantee or subsidize qualifying borrowers or creditors. Furthermore, small and "inefficient" intermediaries could be combined into larger enterprises, which might become more efficient, as is occurring in the banking and thrift industries.

The capital and credit controls that apply to financial institutions are numerous and often complex. Because the functions of intermediaries are not always distinct and the interactions among intermediaries and financial markets are extensive, the regulations that govern each intermediary or financial market also may influence others. With these explicit controls, tax laws and general security or trust laws also influence the financial policies of intermediaries.

Before the 1930s, many banks both held and underwrote a variety of securities, including stocks and bonds, in order to supply the capital financing required by growing industries. To the degree banks bridged savers' fundamental lack of information about investors, critics believed that allowing banks to offer securities to the public created a considerable moral hazard (Carosso 1970). During the 1930s, these long-standing concerns about conflicts of interest and insider information yielded federal legislation separating commercial and investment banking. Responding to the opportunities offered by post-World War II economic

development, many domestic banks have emerged as investment banks abroad. Many also have resumed merchant or investment banking at home through their activities as dealers in credit market instruments or in offering municipal securities, loan syndications, participations, negotiable certificates of deposit, and, recently, commercial paper or corporate bonds. Although banks generally can hold only minimal equity, creative arrangements like small business financing, yield enhancements, warrants, options, participations, and the development of venture capital affiliates allow banks somewhat more latitude (Saulsbury 1987, U.S. Congress 1987–1988). The attraction of investment banking and equity participations has only increased with the recent adoption of more stringent capital requirements for banks which, by the early 1990s, may restore their capitalization to levels resembling those of the 1950s and 1960s (table 4).

Early in this century, most life insurance companies were prohibited by the State of New York from holding common stocks or underwriting securities (Carosso 1970, Jones 1968). During the early 1960s, new regulations permitted the creation of separate accounts in which life insurance companies could hold modest amounts of equity in order to better compete with other institutional investors for the rapidly growing pension and annuity business. Insurers also acquired some real estate, securities with "equity kickers," and other assets that offered some of the characteristics of an equity interest. Recognizing that a portfolio comprising risky assets need not be very risky itself, the most recent revisions of insurance regulations give insurers much more latitude to acquire equity. Due partly to competitive pressures, the ratio of capital to assets for insurers, like that of banks, fell during the past three decades. Moreover, for mutual insurance companies especially, regulations often specified ceilings for surplus accounts in order to prevent these companies from withholding an excessive proportion of their earnings from their owners (policyholders).

Pension plans comprise a variety of financial arrangements, which include annuities, employer-sponsored thrift accounts, deferred compensation plans, and individual retirement plans, funded with assets managed by investment advisors, trust companies, insurance companies, or banks (McGill and Grubbs 1989). Pension fund sponsors have placed a significant proportion of their assets in equities, a proportion that increased greatly during the 1960s and early 1970s (table 4).[11] To the extent this allocation of assets depends on the relative yields of debt and

[11] Since 1974, equity's share of private pension assets has fallen more than 10 percentage points; over the same interval, its share of state and local retirement funds has risen by nearly the same amount.

equity, the comparatively attractive real interest rates now available to untaxed pension funds may diminish equity's appeal (Black and Dewhurst 1981; Tepper 1981; Friedman 1985). The potential appeal of debt may be even greater if federal regulations, accounting standards, and the interests of sponsors tend to foster immunization strategies—running a matched book wherein the duration of accumulated liabilities essentially equals that of assets (Bodie 1989; Black 1989).

Financial intermediaries may not fulfill their potential for efficiently transferring resources from savers to investors when they hold negligible equity in enterprises that are unfamiliar to savers. Not all information about an investment project receives the same attention from a creditor who has no equity interest. Furthermore, "bankers" who are no more than creditors are less likely to enjoy the full confidence of investors whenever the interests of owners conflict with those of creditors. The efficient transfer of resources also is promoted relatively little by intermediaries that acquire the equities of large, familiar corporations (as prudence, contractual responsibilities, and practical management seem to require of many pension funds or trusts). In place of financial intermediaries, the nonfinancial corporations that enjoy a relatively low cost of capital become a source of equity financing for those investors who are less familiar to savers.

Market Discipline

One tactic for reducing the risks inherent in intermediation would shift some of these risks onto the customers or creditors of financial intermediaries. An extreme version of this tactic would tie the returns on indirect securities more closely to those on the assets held by intermediaries. Insured deposits and annuities, for example, might be offered only by intermediaries that acquire securities either written or guaranteed by the federal government.[12] Another version would require intermediaries to finance some proportion of their assets with short-term subordinated debt. Accordingly, the fear of losing customers or paying creditors penalty rates would discipline intermediaries. A more promising approach, however, would mandate relatively high mini-

[12] With such insured institutions, the government essentially becomes the financial intermediary by bearing the responsibility for the making of loans financed either with government securities or its guarantees. If insured banks, for example, also may acquire some assets other than those bearing the explicit guarantee of the government, then a "social contract" (featuring a "put" written by the government to these banks as designated agents) tends to bestow an implicit guarantee on the value of these qualifying assets, unless perhaps they are of small consequence in the portfolios of these banks.

mum capital requirements to be financed entirely by the holders of common stock.

Intermediaries, like other enterprises, exist because they represent the most economical means of bridging differences between savers and investors (Coase 1937). Accordingly, outsiders may not be capable of accurately auditing intermediaries at a reasonable cost (Randall 1989, pp. 10–13; Avery, Belton, and Goldberg 1988; Berger, Kuester, and O'Brien 1989). In the extreme version of this approach, establishing mutual funds, savers might find little common ground with investors. The less extreme version, mandating subordinated debt, may only reshape agency costs rather than reduce them. When an intermediary is under duress, the interests of subordinated creditors may coincide with those of equityholders; witness the behavior of the Federal Savings and Loan Insurance Corporation, the Federal Home Loan Bank System, and the government during the 1970s and 1980s with regard to failing savings and loan associations. When the assessment of outside creditors is more pessimistic than that of the better informed managers of intermediaries, the process of intermediation can become less efficient; the reduction in agency costs may not offset the greater cost of capital imposed by outside creditors.

In any case, market discipline need not reduce the costs imposed by the threat of runs or by winner's curses. To the degree outsiders are more susceptible to fads than insiders, oversight by outsiders could increase these risks. For example, pension fund managers subject to quarterly reviews by their plans' sponsors are criticized for their undue attention to short-run performance, their "herd instincts," and their inclinations toward "window dressing." Similar criticisms are applied to banks that also seek favorable ratings from the securities community. "Worldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally" (Keynes 1936, p. 158). Though checks and balances are a cornerstone of our society, perhaps the hand of public opinion already rests sufficiently heavily on many of our intermediaries.

Instead of asking outsiders to discipline intermediaries, regulations may encourage insiders to do so. Relatively high minimum capital requirements to be financed entirely by common stockholders (residual claimants) rather than creditors (including preferred stockholders) may diminish agency costs. If the intermediary is to be "sold" to others when its capital requirements are not satisfied, then the owners and managers of the intermediary bear more of the burden of risk-taking. Accordingly, intermediaries tend to make a more balanced assessment of the prospective returns on their assets.

Regulation and Economic Stability

We have described the way in which regulations influence the flow of funds from savers to investors. But, do these regulations make financial intermediation more secure? Do more secure intermediaries promote a more stable economy? Do these goals conflict? Our current regulatory structure reflects how these goals were weighed in the aftermath of the Great Depression. FDIC Chairman Seidman described the rationale for the Glass-Steagall Act which restricts banking activities as follows:[13]

> First and foremost, it [the Glass-Steagall Act] would help protect and maintain the financial stability of the commercial banking system, and would strengthen public confidence in commercial banks . . . Finally, the assumed potential for bank securities operations to exaggerate financial and business fluctuations and undermine the economic stability of the country by channeling bank deposits into "speculative" securities activities would be eliminated.

Both the domestic and international financial market conditions have changed substantially since 1933, raising questions as to whether current regulations, not only Glass-Steagall but also deposit insurance and capital requirements, appropriately weigh the goal of making intermediaries more secure against the goal of fostering a more stable economy.

The Model

To understand the role of regulation in promoting secure intermediation, we start with a simplified model of an intermediary in the absence of regulation. The model can be summarized in three equations that describe the intermediary's return on assets, the return to stockholders, and the utility of stockholders.[14]

---

[13] This quote is part of the testimony that L. William Seidman, chairman of the Federal Deposit Insurance Corporation, presented to the House Committee on Energy and Commerce. Chairman Seidman, as well as the Comptroller of the Currency, the chairman of the Federal Reserve, and the chairman of the Securities and Exchange Commission, all argued that banking activities needed to be extended beyond what was permitted in the Glass-Steagall Act (U.S. Congress 1987-1988).

[14] This model does not take into account the opportunity cost (in terms of risk or returns) of stockholders' investment in the intermediary. Consequently, it is not a "general equilibrium" model. Nevertheless, for the experiments considered in this paper (the changing of regulations) the model's qualitative conclusions, in most circumstances, coincide with those of more complete models.

$$R(A) \sim N(u_R(A),\ v_R(A)) \quad \frac{du_R}{dA} < 0,\ \frac{dv_R}{dA} > 0 \tag{1}$$

A—asset size
R—return on assets
v—variance of return
u—mean of return

$$r = \frac{(R - iL)}{(1 - L)} \qquad r \sim N\left(\frac{(u_R - iL)}{(1 - 0\,L)},\ \frac{v_R}{(1 - L)}\right) \tag{2}$$

L—debt/assets
i—interest rate on debt
r—return on equity

$$U(u_r,\ v_r,\ [1 - L]A) \quad U_1 > 0,\quad U_2 < 0,\quad U_3 > 0 \tag{3}$$

The first equation describes the return on assets, which declines as assets increase. This equation models a declining marginal efficiency of capital. For example, a bank wishing to substantially increase its loan portfolio will have difficulty maintaining the same quality of loans, resulting in loans with a lower expected return or a higher variance. The current problem loans to developing countries partly reflect the difficulty banks had maintaining their loan opportunities during their rapid growth in the 1970s.

The second equation describes the return to shareholders due to leveraging. Because of leverage, the mean return to shareholders, u_r, and the variance of the return to shareholders, v_r, are greater than the mean and variance of the return on assets. The relationship between the interest rate on debt (i) and leverage is shown in figure 1 and described more fully in the appendix. Even at very low levels of leverage, the interest rate on debt is above the risk-free rate, i_f, since the probability that losses will be so great that the debt cannot be paid off is low, but positive. As leverage increases, so do the probability of default and the interest rate. For any given leverage, increases in A or v_R, or decreases in u_R increase the rate of interest because the probability of default increases.

Shareholders choose A and L to maximize their utility, as described in equation (3). Shareholders are risk averse; they prefer higher returns but lower risks. The utility of shareholders increases with their wealth [(1 − L)A].

Equilibrium levels of risk and return are shown in figure 2 where the shareholders' marginal utility equals the marginal return. For a given asset size, the return line is concave. Initially the increased return

Figure 1

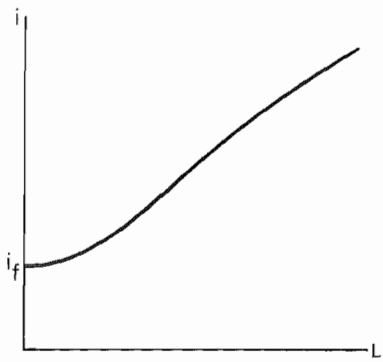
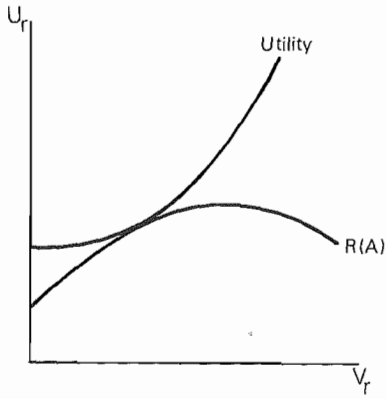


Figure 2



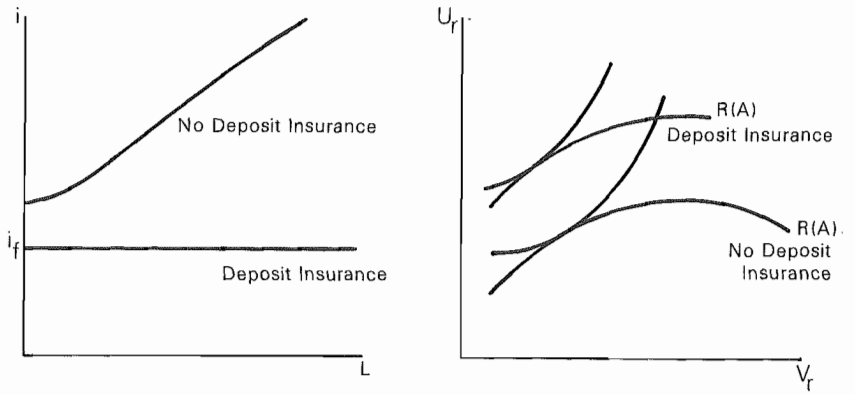
from greater leverage exceeds the increase in the interest rate. Eventually debt holders require such a large premium that any further increase in leverage decreases the expected return. If shareholders only maximized return, leverage would increase until the advantages of debt-financed investment ($u_R - i$) just equaled the cost of the additional debt ($i'L[1 - L]$). With risk-averse shareholders, leverage will be lower than for risk-neutral stockholders because v_r increases with leverage.

The objective of regulators is to ensure a secure intermediary, either by providing guarantees to customers (for example, deposit insurance) or by minimizing the probability of default by reducing v_r (for example, by capital requirements and asset restrictions). Since regulators and shareholders have different goals, conflicts will occur when shareholders wish to assume more risk than regulators are willing to accept.

Deposit Insurance

The conflict between shareholder utility maximization and the goal of achieving secure intermediaries is most apparent with deposit insurance. By eliminating the risks of financial loss for customers, the cost of borrowed funds does not depend on the risk borne by the institutions. Figure 3 shows that the interest rate is now a horizontal line at the

Figure 3



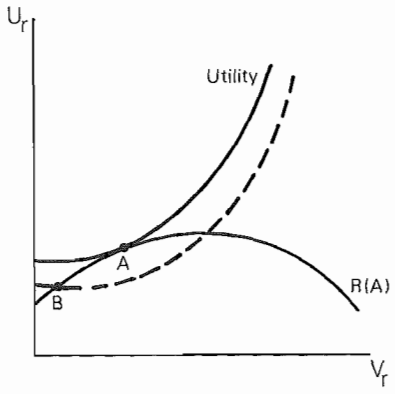
risk-free rate, since in the event of a default, the insurer rather than the intermediary's assets pays the customer. With the interest rate penalty for taking additional risk eliminated, shareholders can increase their return by increasing leverage.

The right panel of figure 3 shows that deposit insurance results in a higher return for any given stock of assets, because no risk premium is required on the borrowed funds. Shareholders are better off, since they are on a higher indifference curve. If shareholders only maximized return, the firm would take full advantage of debt financing and increase its assets until u_R = i. Insurance does not foster higher leverage if the insurance premiums are fully risk-adjusted. With appropriately priced insurance, the insurer behaves as a creditor in an unregulated market. Thus, while depositors would require no premium, the risk premium on the insurance would cause the intermediary to assume the same leverage as it would without deposit insurance.

Capital Requirements

Deposit insurance encourages intermediaries to take greater risks, which regulators try to offset with capital regulations and asset restrictions. By raising capital requirements, regulators may increase the

Figure 4

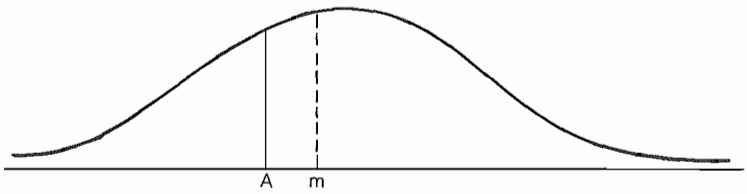


amount of equity at risk before creditors (or the insurer) lose money, and reduce the variance of shareholder returns. Once leverage is set by the regulator, the only choice remaining for shareholders is to pick the optimal size of the intermediary. Figure 4 shows that imposition of capital requirements causes the firm to move down its return line from A to B. The lower expected return to shareholders as a result of higher leverage can be partially offset by reducing assets.

Greater capital requirements reduce the variance of shareholders' returns along with their average returns. Consequently, shareholders would prefer to acquire riskier assets if they promised shareholders a higher return.[15] If we adjusted the model to allow shareholders to choose the risk and return of assets, u_R becomes a function of v_R. In response to higher capital requirements, which lower u_r and v_r, shareholders could choose riskier assets with higher expected returns. Depending on how sensitive u_R is to v_R, the variance of equity may be greater with capital requirements than without.

[15] It is possible that rational shareholders will invest in a project with higher v_R and lower u_R, if the value of equity is very low or negative. This will occur because with negative net worth all the potential loss is paid by the debtholder or insurer, while shareholders receive much of the potential gain.

Figure 5



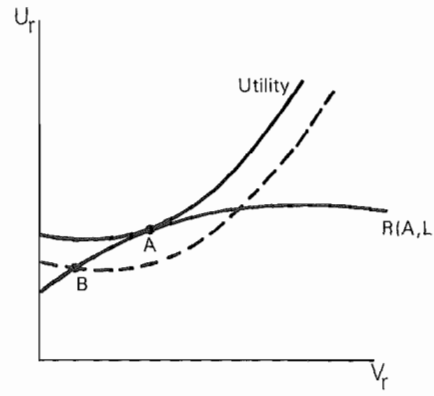
Asset Restrictions

Asset restrictions require intermediaries to invest in assets viewed as "safe" by regulators. Banks, for example, generally cannot hold equity.[16] Figure 5 shows the possible returns accruing to an investment. The upper tail represents the returns to equity holders. If the project pays less than A, creditors get partial payment and shareholders receive nothing. The expected return of the project, m, includes the whole distribution. While the probability that the stake is valueless is much lower for debt holders than for shareholders, by not participating in the upper tail, creditors must receive a return less than m. The requirement that banks hold only debt reduces their expected rate of return. The lower u_R increases the probability of default, causing shareholders to reduce leverage and asset size.

Asset restrictions ideally would reduce v_R; however, this result is virtually impossible to achieve. Undertaking credit or interest rate risk does not require exotic financial instruments. Interest rate risk can be achieved with government bonds, and the worst credit risks may be local business loans. Even these sources of risk cannot be effectively monitored by examiners, since interest risks can change in a few

[16] In countries such as Germany, banks are allowed to hold equity. McCauley and Zimmer (1989) find that close relations between banks and corporations can reduce the costs and the probability of bankruptcy.

Figure 6



minutes and some credit risks are difficult to determine even after extensive interviews and documentation.

If asset restrictions could sucessfully reduce v_R, they still might not reduce v_r. Figure 6 illustrates the effect of asset restrictions when u_R is a function of v_R. Unlike the previous figures, the slope of the return line is determined by increasing v_R rather than leverage. The return line increases at an increasing rate as shareholders must make increasingly risky investments to increase the average return. Any change in assets or leverage shifts the return line. If regulators required less risky assets, movement from A to B, both the mean and the variance of shareholder returns would drop. In response, shareholders could increase assets or leverage.

Regulatory Choices

Table 7 summarizes the effects of different regulatory choices. Deposit insurance unaccompanied by other regulation eliminates risk for depositors but makes the intermediary less secure, since shareholders have an incentive to expand and to increase leverage. The costs of regulation by insurance fall upon the government. The government subsidizes the insurance by $i - i_F$ – the deposit insurance premium. Increases in risk, caused by greater leverage and expansion of assets, increase the size of the subsidy. If capital regulation is not enforced, the

Table 7
Effects of Regulatory Choices

Regulation	Effect on			
	Leverage	Asset Size	Shareholder Utility	Cost to Government
Insurance	+	+	+	+
Capital Requirements	−	−	−	0
Equity Restrictions	−	−	−	+
Asset Restrictions	+	+	−	0

probability of default can rise rapidly, as it did for the savings and loan industry during the early 1980s, and if other intermediaries are covered by implicit insurance, the government subsidy to these intermediaries is greater than that to the banking industry.

Unlike deposit insurance, capital requirements decrease leverage, the growth of assets, and the utility of the shareholder. Capital requirements are used frequently to regulate intermediaries because they reduce leverage without any cost to the government, other than administrative expenses. While intermediaries can substitute asset risk for leverage risk, substantial equity stakes avoid the incentive for risk-taking that occurs when only debtholders or insurers bear the cost of unsuccessful investments.

Equity restrictions require no expenditure of government funds but do little to reduce the assumption of risk by intermediaries. Such restrictions do not increase the stability of the intermediary since equity positions in well-capitalized stable enterprises may be less risky than loans to highly leveraged risky enterprises. Furthermore, restrictions may increase the risk of corporate failure, both because intermediaries may too quickly abandon potentially profitable projects and because intermediaries encourage debt as a source of funds for firms whose financing needs might be better accommodated with equity.

By not changing regulations with changing economic conditions, the regulator is, in effect, choosing a different regulatory mix. Higher and more variable interest rates in an unchanged regulatory environment diminish the influence of asset restrictions and capital requirements while increasing the deposit insurance subsidy. Asset restrictions are less confining because the variance of returns on assets often exceeds that which was anticipated when asset restrictions were adopted. Capital requirements based on book values of assets and liabilities become less binding because the market value of equity falls even if its book value is unchanged. In contrast, insurance is more valuable to

shareholders because the greater risk from higher leverage and more variable asset returns is not reflected in the cost of funds.

In summary, while deposit insurance makes depositors more secure, it may at the same time make intermediaries less secure and the economy less stable. Insurance encourages intermediaries to take greater risks, both by assuming greater leverage and by making riskier loans (greater V_R). To the degree savers are attracted to insured depository institutions that are prevented from holding equity, current regulations can make the economy less stable.

Conclusions

Financial intermediaries provide services to savers and investors by bearing risks. By transforming the primary securities issued by investors into assets that are attractive to savers, intermediaries reduce the difference between the price savers ask for funds and the price investors bid for funds. As long as intermediaries recognize the consequences of the risks inherent in this mismatched book, their activities facilitate the efficient flow of resources from savers to investors. But intermediaries may impose unacceptable risks on the economy because of externalities, agency costs, and competitive pressures.

Although government regulations attempt to manage the risks inherent in financial intermediation, these regulations, by reshaping our financial system, may increase the risks inherent in saving and investing. Deposit insurance combined with capital and credit controls, as currently designed, fosters intermediation and the use of debt instead of equity financing of investment. Savers have found insured indirect securities more attractive than bonds and stocks. In turn, the assets of financial intermediaries comprise loans, bonds, and, to a degree, the stock of corporations already familiar to savers. Accordingly, the cost of equity financing can be relatively great and volatile for less familiar enterprises that must appeal directly to savers.

Deposit insurance without appropriate safeguards can be expensive for the government. Although agency costs are present for any enterprise that finances its assets with debt, deposit insurance increases the incentives for both intermediaries and firms to assume greater risk and leverage. Risk-based insurance premiums would eliminate many of these incentives; however, the difficulties in setting these premiums are formidable. Instead, regulators impose asset restrictions and capital requirements on financial intermediaries in order to control their assumption of risk.

The reliance on debt financing promoted by existing asset restrictions divides the interests of investors from those of intermediaries,

thereby impeding an efficient flow of information to those financing investments and encouraging intermediaries, as creditors, to "foreclose" prematurely on "disappointing" projects. Asset restrictions also discourage intermediaries from investing in risky but potentially profitable projects that are not suited to debt financing. In this way, regulation may increase economic instability. If banks could assume an equity interest, a less partial assessment of the future value of investments could make the supply of funds to investors more ample and more dependable.

Aside from imparting a creditor's bias to intermediation, tending to make the economy less stable, capital and credit controls do not necessarily make intermediaries more secure. If intermediaries exist because of their ability to process information and evaluate prospective returns, outside regulators may increase rather than reduce risk to the degree they influence intermediaries' asset allocations. Binding capital and credit controls, which diminish an intermediary's return on equity, encourage regulated institutions to assume risks that regulators neither observe nor control. Furthermore, controls that limit the diversification of an intermediary's portfolio may make it less secure. In this respect, regulations governing life insurance companies, which weigh the risk of entire portfolios, are preferable to banking regulations which weigh the risk of specific assets. Regulators also may enhance risk unintentionally by comparing individual intermediaries to industry averages and encouraging greater conformity among institutions. From a social point of view, diversity among as well as within intermediaries may promise the greatest security.

Although intermediaries play an important role in economic development, regulations that might make these institutions more secure do not necessarily make the economy more stable. For example, deposit insurance coupled with capital and credit controls increases savers' reliance on the implicit guarantee of investors' cash flows. A presumption of financial stability by savers commits the government to ratify asset prices and enforce investors' expectations. During the past thirty years, this "put" written by the government has been expanding. It is not coincidental that the largest and fastest-growing intermediaries (including the government and its sponsored enterprises) have been those with explicit "deposit" insurance. Whenever prudent macroeconomic policies cannot sustain the value of international, oil patch, real estate, or farm loans, the subsequent financial collapse may be more severe to the degree that savers, intermediaries, and investors have come to rely on this presumed commitment.

The risks inherent in financial intermediation might be controlled most efficiently by substantially relaxing asset restrictions and by adopting more stringent capital requirements. To the degree intermediaries

maintain a competitive return on equity despite asset restrictions, by reducing their ratios of capital to assets, the relaxation of asset restrictions can be exchanged for greater minimum capital ratios. If regulators are able to transfer the ownership of intermediaries that fail to meet their capital requirements when existing owners and managers still have a substantial stake, the incentives for risk-taking by the institution will be diminished. These capital requirements can be effective only if the capital of intermediaries can be measured accurately. Failure to reprice assets for changes in credit ratings and changes in interest rates misrepresents shareholders' stake in the intermediary. When the market value of equity is unacceptably low and the book value of equity is sufficiently great, rational shareholders should take greater risks, since losses will be borne by creditors or insurers while shareholders receive the gains.

Appendix

Figure 1 and Figure 3—The interest rate, i, compensates creditors for the risk of bankruptcy. i will always exceed i_f, since there is always a possibility that debt will not be paid off. This line is described in equation (A.1):

$$i - i_f = \int_{-00}^{L(1+i)-1} (i - R)\ \text{pdf}\ (R)\ dR \qquad \text{(A.1)}$$

$$\frac{di}{dL} > 0, \quad \frac{di}{dv_R} > 0, \quad \frac{di}{du_R} < 0.$$

Shareholders choose assets and leverage to maximize utility. When assets increase, the return line shifts up since u_R falls and v_R rises. The greater the leverage, L, the higher the probability of bankruptcy, and the more creditors must be compensated for the additional risk.

Deposit insurance eliminates creditor risk, so $i = i_f$.

Remaining figures—Shareholders choose leverage and assets to maximize utility.

$$\underset{L,A}{\text{maximize}} \left(\frac{u_R - iL}{(1-L)}, \frac{v_R}{(1-L)^2}, (1-L)A \right) \qquad \text{(A.2)}$$

$$0 = U_1 \left[\frac{u_R - i - i'L(1-L)}{(1-L)^2} \right] + U_2 \left[\frac{2v_R}{(1-L)^3} \right] - U_3[A] \qquad \text{(A.3)}$$

$$0 = U_1\left[\frac{u_{R'}}{(1-L)}\right] + U_2\left[\frac{v_{R'}}{(1-L)^2}\right] + U_3[1-L] \qquad (A.4)$$

Deposit Insurance—As described above, deposit insurance severs the link between the interest rate and leverage, so i'L = 0 and the interest rate drops to the risk-free rate. Equilibrium is restored with higher leverage and greater asset size.

Capital Requirements—L is no longer a choice variable. With binding capital requirements L drops, causing equation (A.4) to be positive. Equilibrium is restored with fewer assets.

Equity Restrictions—Firms hold only debt, causing u_R to fall. Equation (A.3) becomes negative. Equilibrium is restored with lower leverage and fewer assets.

Asset Restrictions—Firms maximize equation (A.2) with respect to v_R and the mean is a function of the variance:

$$0 = U_1\left[\frac{u_{R'}}{(1-L)}\right] + U_2\left[\frac{1}{(1-L)^2}\right] \qquad (5)$$

If regulators require v_R to drop, firms increase leverage and asset size.

References

Avery, Robert B., Terrence M. Belton, and Michael A. Goldberg. 1988. "Market Discipline in Regulating Bank Risk: New Evidence from the Capital Markets." *Journal of Money, Credit, and Banking*, vol. 20, no. 4, November, pp. 597–610.

Baskin, Jonathan Barron. 1985. "*On the Financial Policy of Large Mature Corporations.*" Harvard University, unpublished Ph.D. dissertation.

———. 1988. "The Development of Corporate Financial Markets in Britain and the United States, 1600–1914: Overcoming Asymmetric Information." *Business History Review*, vol. 62, Summer, pp. 199–237.

Berger, Allen N., Kathleen A. Kuester, and James M. O'Brien. 1989. "Some Red Flags Concerning Market Value Accounting." Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series, no. 85, August.

Bernanke, Ben S. 1983. "Nonmonetary Effects of the Financial Crisis in the Propagation of the Great Depression." *The American Economic Review*, vol. 73, June, pp. 257–76.

Bernanke, Ben S. and Mark Gertler. 1987. "Banking and Macroeconomic Equilibrium." In *New Approaches to Monetary Economics*, William A. Barnet and Kenneth Singleton, eds., pp. 89–111. New York: Cambridge University Press.

Black, Fischer. 1989. "Should You Use Stocks to Hedge Your Pension Liability?" *Financial Analysts Journal*, January/February, pp. 10–12.

Black, Fischer and M.P. Dewhurst. 1981. "A New Investment Strategy For Pension Funds." *Journal of Portfolio Management*, Spring, pp. 26–34.

Bodie, Zvi. 1989. "The Lender's View of Debt and Equity: The Case of Pension Funds." In this volume.

Brainard, William C. and James Tobin. 1968. "Pitfalls in Financial Model Building." *The American Economic Review*, vol. 58, May, pp. 99–122.

Calomiris, Charles W. and R. Glenn Hubbard. 1989. "Price Flexibility, Credit Availability, and Economic Fluctuations: Evidence from the United States, 1894–1904." *Quarterly Journal of Economics*, vol. 104, no. 3, August, pp. 429–542.

Carosso, Vincent P. 1970. *Investment Banking in America*. Cambridge, MA: Harvard University Press.

Coase, R.H. 1937. "The Nature of the Firm." *Economica*, New Series IV, pp. 386–405.

Diamond, Douglas W. 1984. "Financial Intermediation and Delegated Monitoring." *Review of Economic Studies*, vol. 51, pp. 393–414.

Diamond, Douglas W. and Philip H. Dybvig. 1983. "Bank Runs, Deposit Insurance, Liquidity." *Journal of Political Economy*, vol. 91, no. 3, pp. 401–419.

Fama, Eugene F. 1985. "What's Different About Banks?" *Journal of Monetary Economics*, vol. 15, January, pp. 29–39.

Federal Reserve Bank of Kansas City. 1986. *Debt, Financial Stability, and Public Policy*. Federal Reserve Bank of Kansas City Symposium Series.

Friedman, Benjamin M. 1985. "The Substitutability of Debt and Equity Securities." In *Corporate Capital Structures in the United States*, Benjamin M. Friedman, ed. Chicago, IL: University of Chicago Press.

Galai, Dan and Ronald W. Masulis. 1976. "The Option Pricing Model and the Risk Factor of Stock." *Journal of Financial Economics*, vol. 3, March, pp. 53–81.

Gertler, Mark. 1988. "Financial Structure and Economic Activity: An Overview." National Bureau of Economic Research, working paper no. 2559, April.

Goldsmith, Raymond W. 1955. *A Study of Saving in the United States*, vols. I and II. Princeton, NJ: Princeton University Press.

———. 1956. "National Balance Sheets and National Wealth Statements, 1896 to 1949." In Raymond W. Goldsmith and others, *A Study of Saving in the United States*, vol. III, pp. 3–138. Princeton, NJ: Princeton University Press.

———. 1958. *Financial Intermediaries in the American Economy Since 1900*. Princeton, NJ: Princeton University Press.

———. ed. 1973. *Institutional Investors and Corporate Stock—A Background Study*. New York, NY: Columbia University Press.

Gurley, John G. and Edward S. Shaw. 1955. "Financial Aspects of Economic Development." *The American Economic Review*, vol. 45, September, pp. 515–538.

———. 1956. "Financial Intermediaries in the Saving-Investment Process." *Journal of Finance*, vol. 11, March, pp. 257–76.

———. 1960. *Money in a Theory of Finance*. Washington, D.C.: The Brookings Institution.

Hannan, Timothy H. 1989. "The Impact of Bank Regulatory Requirements on Large Corporate Lending." Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series, no. 63, March.

Hoshi, Takeo, Anil Kashyap, and David Scharfstein. 1989. "Bank Monitoring and Investment: Evidence from the Changing Structure of Japanese Corporate Banking Relations." Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series, no. 110, August.

Jensen, Michael C. and William H. Meckling. 1976. "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure." *Journal of Financial Economics*, vol. 3, pp. 305–360.

Jones, Lawrence D. 1968. *Investment Policies of Life Insurance Companies*. Cambridge, MA: Harvard University Press.

Keynes, John Maynard. 1936. *The General Theory of Employment, Interest, and Money*, chapter 12. New York, NY: Harcourt Brace and World, 1965 ed.

Kopcke, Richard W. 1989a. "Stock Prices, Financial Structure, Investment Strategy, and Economic Rents." Federal Reserve Bank of Boston, photocopy, August 11.

———. 1989b. "The Roles of Debt and Equity in Financing Corporate Investments." *New England Economic Review*, July/August, pp. 25–48.

Leland, Hayne E. and David H. Pyle. 1977. "Information Asymmetries, Financial Structure, and Financial Intermediation." *Journal of Finance*, vol. 32, May, pp. 371–387.

McCauley, Robert N. and Steven A. Zimmer. 1989. "Explaining International Differences in Cost of Capital." Federal Reserve Bank of New York, *Quarterly Review*, Summer, pp. 7–28.

McGill, Dan M. and Donald S. Grubbs, Jr. 1989. *Fundamentals of Private Pensions.* Homewood, IL.: Richard D. Irwin.

Minsky, Hyman. 1985. *Stabilizing an Unstable Economy.* New Haven, CT: Yale University Press.

Navin, Thomas R. and Marian V. Sears. 1955. "The Rise of a Market for Industrial Securities, 1887–1902." *Business History Review,* vol. 30, pp. 105–38.

Randall, Richard E. 1989. "Can the Market Evaluate Asset Quality Exposure in Banks?" *New England Economic Review,* July/August, pp. 3–24.

Saulsbury, Victor L. 1987. "State Banking Powers: Where Are We Now?" Federal Deposit Insurance Corporation, *Regulatory Review,* April/March, pp. 1–16.

Smith, Clifford W. and Jerold B. Warner. 1979. "On Financial Contracting." *Journal of Financial Economics,* vol. 7, June, pp. 117–161.

Taggart, Robert A., Jr.. 1985. "Secular Patterns in the Financing of U.S. Corporations." In *Corporate Capital Structures in the United States,* Benjamin M. Friedman, ed. Chicago, IL: University of Chicago Press.

———. 1986. "Have U.S. Corporations Grown Financially Weak?" In *Financing Corporate Capital Formation,* Benjamin M. Friedman, ed. Chicago, IL: University of Chicago Press.

Tepper, Irwin. 1981. "Taxation and Corporate Pension Policy." *Journal of Finance,* vol. 36, March, pp. 1–13.

Thaler, Richard H. 1988. "Anomalies: the Winner's Curse." *Journal of Economic Perspectives,* vol. 2, no. 1, Winter, pp. 191–202.

Tobin, James. 1969. "A General Equilibrium Approach to Monetary Theory." *Journal of Money, Credit, and Banking,* vol. 1, February, pp. 15–29.

———. 1982. "Money and Finance in the Macroeconomic Process." *Journal of Money, Credit and Banking,* vol. 14, May, pp. 171–204.

U. S. Congress. House of Representatives. Subcommittee on Telecommunications and Finance of the Committee on Energy and Commerce. 1987–1988. *Role of Financial Institutions.* 100 Cong., 1 Sess. Washington, D.C.: Government Printing Office. Oct 5, 14, 1987, February 10 and April 13, 1988.

Wojnilower, Albert M. 1989. "What Profits Banking?" First Boston Corporation, expanded version of a talk before the Conference on "Profit and Instability" at the Jerome Levy Economics Institute of Bard College, March 18.

Discussion

*Ben S. Bernanke**

The title of the Kopcke-Rosengren paper fits in with the theme of the conference but is slightly misleading. Little direct regulation of debt and equity per se actually occurs; that is, few restrictions exist on the kinds of financial contracts that could in principle be written. For the most part, the effect of public policy on financial contracting is indirect, operating through the tax code, the laws pertaining to corporate governance and bankruptcy, and the regulation of financial intermediaries. It is this last channel of policy—the regulation of financial intermediaries—on which the paper actually focuses, and on which this comment will focus as well.

The paper falls naturally into two parts. The first section argues that increasing reliance of household savers on intermediated assets, plus regulations that induce intermediaries to hold mostly debt, have led to a growing pro-debt bias in the economy. This is an interesting suggestion; it affords a different perspective by looking at the behavior of suppliers of funds in order to explain trends in leverage, rather than at the behavior of demanders of funds (firms), as is more common.

Some evidence can be found that this change in the composition of household wealth may have influenced very long-run trends in leverage. It is less clear, however, that savers' preferences have played an important role in the leverage trends of the past twenty years. Table 2 in the Kopcke-Rosengren paper shows that, as a share of financial assets, deposits have been stable since 1970–74; all of the growth among

*Professor of Economics and Public Affairs, Princeton University. Visiting Professor, Department of Economics, Massachusetts Institute of Technology and Visiting Scholar, Federal Reserve Bank of Boston, 1989–90.

indirect securities since that time has been concentrated in pension fund reserves. Unlike banks, of course, pension funds do not face direct restrictions on holding equity and indeed hold a larger share of assets as equity than do households.[1] This observation, plus the fact that greater amounts of government debt are competing with corporate debt for a place in wealth-holders' portfolios, makes it hard to argue that the relative supplies to corporations of debt and equity finance have recently shifted toward debt. Further, as Kopcke and Rosengren themselves point out, historically the composition of firms' external finance has not been sensitive to changes in the sources of funds. Thus it still seems likely that leverage trends in the 1980s have more to do with the decisions of firms than with the decisions of savers.

On the other hand, the failure of households to hold a larger share of wealth as equities, despite the stock market boom of the past seven years, is surprising. The decline in the relative share of noncorporate equities could be explained as a data problem, reflecting the difficulty of measuring the market values of non-traded stock, but of course this does not apply to corporate equities.

The second main part of the paper, comprised of the second and third sections, discusses the economics of financial intermediary regulation. Any serious discussion of this issue immediately raises two basic questions: (1) Why are intermediaries regulated in the first place? (2) If we accept that regulation of intermediaries is desirable, what are the optimal regulatory instruments? The paper emphasizes the strengths and weaknesses of specific regulatory instruments but does not, I think, give enough attention to the first, logically prior question.

The intellectual basis for intermediary regulation is in fact somewhat shaky. Kopcke and Rosengren write, "Because of agency costs, externalities, and competitive pressures, financial transactions may impose unacceptable risks on the economy without offering adequate compensation." This statement is not wrong, as I will discuss, but it glosses over some difficult issues. As a theoretical matter, the existence of agency costs, which are endemic to many parts of the economy besides financial markets, does not in general justify government intervention; and in practice, attempts to regulate industries with high agency costs can be counterproductive, as anyone who buys auto insurance knows. "Competitive pressures" is a strange argument for regulation; usually we think that markets work better when there is competition. Probably what the authors are thinking of here is the interaction of competitive pressures with existing perverse regulations,

[1] This is true despite the incentive, noted by Bodie at this conference, for defined benefit plans to hold debt to hedge their obligations.

such as asset restrictions. What is meant by "externalities" is not specified, but I think there is something to this, as I will discuss in a moment.

Historically, of course, much of our current financial regulatory structure arose as a response to the collapse of banking and financial markets in the Great Depression. The measures taken in the New Deal did help to end the crisis and to prevent major financial problems over the ensuing half-century. Thus the 1930s-era regulations, particularly deposit insurance, have long been hailed as a major policy success. Nevertheless, the historical record does not unambiguously support regulatory intervention in financial markets, and a revisionist view has lately become popular among some financial historians. These historians have argued that, prior to the Great Depression, largely unregulated financial systems in both the United States and other countries performed well and contributed substantially to economic growth and development. True, the United States had periodic financial panics; but (the argument goes) the damage caused by these was controlled by suspension of convertibility, clearinghouse oversight, and other private mechanisms. The specific problems of the Great Depression were *caused*, in this view, by inept regulatory intervention: unit banking laws, which kept banks small and vulnerable; the suppression of the clearinghouses; and the mistakes of the Federal Reserve.

Given the lack of a well-articulated theoretical rationale for intermediary regulation and the ambiguous verdict of history, is there any basis for government intervention in financial markets? If there is one, I think it must be based on something like the following logic:

(1) The performance of financial intermediaries, like that of many firms, is strongly affected by their financial condition. Intermediaries in financial distress, that is, with low or negative net worth, have incentives to take socially undesirable actions, such as making excessively risky investments. (This seemed clearly to be the case with the S&Ls.)

(2) Because the various components of the financial system are so closely interconnected, and because finance plays a particularly central role in the organization and functioning of a capitalist economy, a widespread malfunctioning of the financial system would pose unacceptable costs not only to the institutions and those directly contracting with them, but to the economy at large. Possible sources of externalities arising from financial failure include the closing of important financial markets (which might occur if important dealers or the clearinghouse failed); loss of liquidity and market-making capacity in markets that remain open; the destruction of unique information capital, implying cutoffs of credit to third parties; and aggregate demand externalities.

(3) Because of these costs to the economy at large, ex post the government would have no alternative but to "bail out"—that is, transfer wealth to—the financial system if large institutions got into trouble. This is the "put" on the government that Kopcke and Rosengren refer to; it can also be thought of as a "time consistency" problem, arising because the government cannot effectively commit in advance not to bail out those in trouble. By the way, as Brimmer (1989) discusses, this "put" on the government now appears to be held not only by large banks but also by other financial markets and institutions, such as the commercial paper market, the exchanges, and the clearing and settlement systems.

(4) Because of the external effects and the involuntary insurance provided by the government to financial institutions, financial arrangements drawn up ex ante and the risks taken by financial decision-makers do not fully take into account downside risks. This provides a rationale for some ex ante controls and monitoring by the government.

If we accept the view that some scope exists for regulation, then we arrive at the second question, what tools should be used to regulate financial institutions. Here I agree with Kopcke and Rosengren's diagnosis: Put as succinctly as possible, "Capital requirements good, asset restrictions bad." This follows directly from a basic principle of agency theory, that in situations of pervasive asymmetric information, the principal is better off setting the agent's incentives in a way that makes him internalize the effects of his own actions, rather than trying to control the agent's actions directly. Asset restrictions are an attempt to control actions, which is usually futile or even counterproductive when the financial institution has more information about its opportunities than the regulator. As the paper notes, even when asset restrictions succeed in modifying individual institutions' behavior, they can have perverse general equilibrium effects, for example, by increasing economywide leverage or by reducing industry diversity. Capital requirements are an imperfect tool, but a well-capitalized institution is more likely to internalize the full costs and benefits of its decisions and thus make good choices (from the social point of view).

The third major element of public policy with respect to intermediaries is deposit insurance. The authors correctly point out the intrinsic problems with government insurance of risky and illiquid investments. Deposit insurance would work better with strong capital requirements, but I think the best solution is to phase out deposit insurance of risk-taking institutions. An alternative model which deserves serious consideration is Robert Litan's (1987) "narrow banking" idea. Litan's suggestion is that banks that wish to take insured deposits would have to back them only with extremely

safe assets, such as government securities. Uninsured banks would face no asset restrictions, but presumably would finance themselves mostly by equity or long-term debt rather than deposits. This would alleviate the need for government oversight of information-intensive investment, at the same time that it protects the money supply. For reasons discussed above, though, it might still be necessary to impose capital requirements on uninsured banks.

I will close with a few comments on the formal model of an intermediary included in the last section of the paper. I was not completely happy with this formalization. Here are my complaints:

(1) As specified, the only choice variable of the managers or shareholders is A, the quantity of assets. Since the choice of total assets is presumably observable by lenders, strictly speaking no agency problem exists in the model. A fully efficient financial contract can be written, that is, one that leads to the socially optimal level of assets. The contract could be thought of as a loan with an interest rate that depends on the level of assets and an expected return equal to the opportunity cost of funds in the economy.

(2) The expression for the return to shareholders is not truncated at −100 percent return. Implicitly, equation (2) assumes that shareholders are always required (and able) to pay off the loan. If this were so, the loan would pay the risk-free rate.

(3) The expression for shareholder utility does not make sense to me. A (1 − L)—do the authors mean A − L?—is not the shareholders' wealth but the portion of their wealth that they contribute to bank capital. Utility should depend on the mean and variance of the shareholders' entire portfolios, not just on the part invested in the bank.

(4) How is the "bank" modelled in this section different from any corporation borrowing funds? and (even if there are deadweight losses due to agency costs) where are the external effects of the financial contract that would motivate regulation? This is an unfair question, since I am not sure, either, how to model the "special" features of intermediaries or the possible externalities associated with intermediary failure. But that is the direction in which research should go.

References

Brimmer, Andrew F. 1989. "Distinguished Lecture on Economics in Government: Central Banking and Systemic Risks in Capital Markets." *Journal of Economic Perspectives*, vol. 3, Spring, pp. 3–16.

Litan, Robert E. 1987. *What Should Banks Do?* Washington, D.C.: The Brookings Institution.

Discussion

*Albert M. Wojnilower**

Richard Kopcke and Eric Rosengren have submitted a most thoughtful appraisal of the role of financial intermediaries and regulators in the corporate debt surge. Like all economists, the authors are well aware how difficult it can be to regulate effectively and how unpredictable and undesirable may be the side effects. While sympathizing with their misgivings, let me confess up front that I do not share our profession's indiscriminate objections to regulation. As the savings and loan crisis illustrates, delay in making awkward choices among regulatory alternatives can lead to even more unpleasant predicaments in which no choice is left at all as to the nature and scope of intervention.

The Shrinking of Corporate Equity: What's Good for Each Is Not Good for All

The hybridization of debt and equity that has been the theme of this conference performs a most useful economic function. The financial changes taking place in many companies are the proper response to the prevailing global winds. The problem is that, from the standpoint of the economy as a whole, the process is bound to be overdone. The incentives are so overpowering that issuers and investors alike are driven to make ever more optimistic assumptions as to the government's ability to cope with shocks and to avert interest rate increases

*Managing Director and Senior Advisor, The First Boston Corporation.

and/or recessions. Competition is forcing corporate officials increasingly to take for granted that a free insurance policy written by the political process must indemnify them for industrywide or economywide problems. A serious systemic risk is being embedded, from which the economy urgently needs protection. With what I believe to be the authors' permission, I will comment only briefly on their paper and use the rest of my time to argue a rather nonintrusive form of capital requirements for nonfinancial corporations that avoids throwing out the baby with the bathwater.

Before tackling that subject, let me enter a few reservations as to the authors' treatment of the financial intermediary sector. They might have sharpened their discussion by drawing a clearer line between depository and other intermediaries. Mutual funds, pension funds, and insurance companies can and do acquire equity positions in various forms. To the extent the public seeks the risks and rewards of equity ownership, it has ample opportunity to do so directly or through these intermediaries. No need exists for additional conduits. Whether banks are to have separately capitalized mutual fund subsidiaries, which is what the authors seem to suggest, is a peripheral issue. So, too, is whether the equity investments in question happen to be new or are acquired in the secondary market. The phenomenon that has spawned this conference is not lack of capital for new ventures, but rather the extinguishment of old equity and its replacement by new instruments that have debt characteristics. Equity securities are being retired at upwards of $75 billion per year, largely using the proceeds of new debt.

The reason that banks and thrifts, in contrast to the other intermediaries, are severely restricted with respect to equity investment is that they are entangled with the national monetary and payments machinery and their deposits are federally insured. Do we really want banks to own more equity securities? Would that have been helpful in avoiding or coping with October 19, 1987? And would we have wanted banks and other intermediaries marked to market and held to account that night? That is what we did in the 1930s with respect to loan valuations, thereby gravely deepening the Great Depression. From this, we learned not to close down the whole banking system during the 1950s, even though most banks sank under water because of the depreciation of the low-coupon Treasury obligations bought to finance World War II. No, there are some investments that "nice" banks, those with insured deposits, simply cannot be permitted to make. For that abstinence, however, they deserve to be esteemed, protected, and —modestly— rewarded.

Kopcke and Rosengren's discussion has the flavor that we might be better off sharply limiting or even withdrawing deposit insurance and the other aspects of the financial safety net. In the remote eventuality

this actually became feasible, what would be the practical consequence? Most of us would then invest much more heavily in government securities, the only "insured" instrument left. This would so reduce the government's cost of funds compared with the private sector that the socialization of investment would become politically irresistible. No solace here for libertarians.

Why Is Equity Being Retired?

The rise in corporate debt ratios during the 1980s reflects the confluence of many factors. First and foremost, in my judgment, is the great intensification of international industrial integration, competition, and specialization, which necessitates the profound redeployment of our capital stock. We have entered a world in which every developed country has to become more specialized in its production—and in which the market for this output is worldwide. To compete, a tradable product must be able to attract a significant share of the world market. A country can achieve this only for a limited number of products. Small countries have always known this. For the United States, however, which because of two oceans and two World Wars has been used to producing almost everything primarily at home, the narrowing of industrial focus is novel and painful. It is compelling the restructuring, or worse, of many major industries and enterprises.

Chronic losses, erosion of equity, and eventual bankruptcy would have been the traditional means of adjustment. Debt-financed takeovers and buyouts are smoother and faster. They are an effective way to "bribe" normally recalcitrant top managements and shareholders to accept prompt retrenchment, as well as to enable them to override the opposition of middle management, unions, and other workers.

Furthering the process is the tide of funds seeking investment opportunities in the United States. This partly reflects the generous monetary policies of the major powers. Just as important, however, is the fact that the world's government as well as private investors prefer, for a multitude of good reasons ranging from distrust of their governments to fear of earthquakes, to invest here. In principle the situation parallels the 1970s, when the OPEC countries flooded the world with investible funds. Then the less developed countries soaked up the overflow. Today's oversupply of funds is spurring the refinancing of the United States.

Why is the process so debt-oriented? Part of the answer is provided by the tax subsidy for debt. The typical company can save taxes by converting dividend payments into interest. Although this incentive is of long standing, the more competitive business environment and

cheaper financial technology are causing it to be exploited more intensively.

While a good deal of the new financing looks like debt, it still smells and tastes like equity. The prices of the securities vary with the fortunes of the issuing companies rather than with the general level of interest rates. The high rates that are stipulated resemble the prevailing rate of return on capital rather than the yield on high-grade debt. Sophisticated investors cannot help but be aware that such returns must be at least as uncertain and interruptible as those on stocks. (Unfortunately $40 billion or so in "junk" bonds may have been sold, mainly through mutual funds, to individuals, most of whom probably believe that consumer protection entitles them to a free lunch.) At bottom, junk bonds and loans are just equity camouflaged to deceive the Internal Revenue Service.

Why Any Equity?

Not so long ago, when the Great Depression of the 1930s was still a living memory, and when capital gains were taxed much more lightly than dividend income, some businessmen would go so far as to assert that no company could ever have "too much" equity or too little debt. The sturdier the equity and the smaller the debt, the better able the company was to withstand specific adversity or general hard times. The equity base provided reliable protection for that network of explicit and implicit contracts among shareholders, creditors, management, employees, customers, suppliers, and the community at large that defines each corporate identity. Deep equity was needed to enable a company to take substantial and long-range risks in investment and innovation.

Today, however, it is taken for granted that government can and will prevent serious recessions. Capital gains no longer enjoy strongly preferential tax treatment. Thus the justifications for hefty equity cushions have lapsed. The apparent capital need is palpably smaller. The potential is also greater for the squandering of capital that has been rendered "surplus" by the change in attitudes.

Capital is perceived as needed only for riding out specific and temporary adversity. As already indicated, however, much of the adversity lately experienced by American business and likely for the future stems from unforeseen sources of international competition that are long-lived and intractable. Traditional companies are especially at risk, particularly if their managements are strongly committed to traditional ways. The market's bias should be and is against taking long-term risks and in favor of forcing companies to shake up management and divest

unprofitable lines promptly. This is what high equity ratios delay—and precisely what high debt ratios and interest burdens speed up.

Putting it more harshly, in a world thought to be depression-proof, a fat equity cushion may foster incompetent or self-serving management. The benefits that such managerial "agents" draw at the expense of shareholders constitute another melon, in addition to the tax melon, to be carved up in debt-financed takeovers. The prices paid in such takeovers suggest that the market, probably correctly, has perceived both melons to be juicy.

Even a tightly run, profitable company must, in this environment, increase its leverage. Unless it does so, it will be "cooked in its own fat" by acquirers who can use the "victim's" own unused borrowing capacity to fund a takeover bid. The market is forcing companies to live closer to the competitive edge.

Although in accord with the current state of the world, this change is not an unmitigated social boon. It compels firms to take shorter-range and narrower views of their function. An ample equity cushion confers advantages similar to those enjoyed by a monopoly. It is what has enabled companies to sponsor pure research with no visible commercial payoff, to furnish executive talent to philanthropies, or to become prominent donors to civic enterprises and universities. As the equity cushion is jettisoned, these voluntary activities—President Bush's "thousand points of light"—fade away.

The configuration of interests and incentives that promotes the "de-equitization" is so powerful that I see no timely self-limiting aspect. Existing public and management shareholders get bought out at bonanza prices. Old management may also benefit from "golden parachutes" and the like. New management (sometimes the same individuals) obtains control of a now heavily indebted company, but usually at little financial risk to itself and with significant new equity entitlements. The new management stands to lose caste in the executive compensation market should its efforts fail, but the potential loss is much smaller than the equity rewards of success.

As for the creditors, they achieve a high-return outlet for their glut of funds in a form preferable to pure equity. Absent default, realization of the return does not depend on the debtor company's willingness or ability to declare dividends, nor on the stock market's reliability in embodying revenue growth or prospects in a higher stock price. The heavy debt intentionally pressures the company to divest sizable chunks of assets, because survival really does depend on paying off the most burdensome debt long before its stated due date. In this key respect, such loans are far superior to the notorious loans that were made in Latin America and Africa, which created incentive and opportunity for borrowing more rather than for repayment. Of course the new kinds of

loans also may sink into default, but unless this happens very early on, before any of the sizable servicing has had a chance to proceed, the lender may not suffer severely. And should, perchance, the indebted company prosper beyond expectations, many loan agreements are structured to include equity "kickers" that enable lenders to share the good fortune.

Needless to add, investment bankers, accountants, and attorneys also have strong incentives to promote the process. And, to repeat, the tax system subsidizes it. Short of some spectacular and unlikely disaster, the de-emphasis of traditional equity is likely to become virtually universal.

Why Worry?

If the social benefit is the elimination of corporate fraud, waste, and inefficiency, while the cost is only the pruning of some research laboratories, orchestras, or universities, why should we be concerned? The reason is, as our experience with depository institutions teaches, that pure equity plays a crucial macroeconomic role in preserving our economic system. It enables businesses to endure an interval of general adversity, whether stemming from shocks or restrictive policies. An adequate equity position at the individual firm level is needed to buy for the economy at large what it was originally intended to provide for individual companies: the survival time to make unavoidable adjustments.

The credit crunches that preceded the deregulation of the depository intermediaries accomplished their disinflationary intent with only minor structural damage, because the intermediaries and their clients were threatened only with insolvency, not bankruptcy. Liquidity and profitability briefly vanished, but because capital was strong the injury was not mortal. Cash was low but capital was strong.

Although equity may no longer be useful from the standpoint of the individual enterprise protected by a national safety net, it remains essential collectively. As my distant cousin, Jack Hirshleifer, pointed out in a very early work, it does not really make much sense for us individually to build nuclear shelters, possibly not even if everyone else did. But it would surely increase the society's survival probability in the event of nuclear attack if everyone had to do so.

The disappearance of equity is taking us into a potentially much deeper "moral hazard" morass than did the Latin American loans or the savings and loan excesses. Now that heavily indebted companies are becoming typical, the risk is already serious that a shock, such as higher interest rates or a recession, could threaten enough household-name

companies to form a critical political mass. As with the depository institutions, it is conceivable that bad news about some firms may infect others that are innocent. It is in any case always in the interest of weak companies, in connivance with sensationalist media, to try to make their troubles general—because that improves the odds the public safety net will be unfurled in their behalf. We should expect to see on TV students barred from college classrooms or widows evicted from their homes because of junk bond disappointments. The now familiar game of chicken between the financial institutions and the government is spreading toward the nonfinancial sector.

Let me be quick to underline that, just as for forty years or more there never has been any serious likelihood that depositors in major banks or thrifts would lose money, the danger of an actual cascade of corporate defaults also is slight or nonexistent. Just as we have seen the governmental rescue function extended to, among others, Lockheed, Chrysler, New York City, the commercial paper market, government security dealers, and most recently the stock market, so may we safely assume that public support would be invoked for any important group of corporate debtors in difficulty. The risk we run by tolerating the attrition of equity is not primarily that of economic catastrophe but rather one of massive governmental rescue operations that deeply politicize the economy.

What Is To Be Done?

We need to formally establish the prevention of systemic failure as an economic policy objective separate and distinct from other macroeconomic goals. That means recognizing that a separate and additional instrument of control is required. The combating of systemic threats cannot be accomplished through monetary or fiscal policy without compromising the other tasks we have set for those instruments.

Given current realities, the new tool has to be one that constrains the borrowers rather than the lenders. Our financial intermediaries, generally speaking, are already weakened by unhappy loans from the past, by actual and potential competition from foreign institutions, and by the rapid advance of securitization that bypasses them entirely. They need more profit opportunities rather than fewer. Credit evaluation and monitoring is probably the expertise in which they enjoy the greatest comparative advantage over their competitors. Thus they would be seriously injured by further restraints on their participation in the burgeoning sector of business finance. Moreover, restricting domestic bank and thrift participation in the financing of corporate restructuring

would hardly impede the trend, just divert it into less visible and manageable channels.

It is directly on large corporations that mandatory capital standards need to be imposed. Small firms would be exempt since they do not contribute materially to the systemic problem. I have in mind a financial ratio approach similar to that already applied by lenders and bond rating agencies. The equity requirement should be gentle—I visualize less than 1 per cent of the regulated universe in initial violation—but satisfiable only by pure equity.

The role prescribed for these requirements is emphatically collective rather than particular. The notion of capital as a form of "coinsurance" that prompts owners to take early heed of an enterprise's difficulties is useful only when a firm suffers reverses peculiar to itself. When the problems are macroeconomic and threaten many firms at the same time, each firm's effort to save itself merely worsens the general plight. The object of equity regulation is to compel a buffer such that firms will be "forced," as it were, to survive a general downturn on their own resources, notwithstanding their inclination to become public welfare cases. Of course, to avoid keeping the fire engine locked up while the city burns, the authorities must be allowed to lower the requirements when they see fit, but only across the board for macroeconomic reasons, not for individual cases.

The required ratios would have to be set at different levels for different firms, depending on their size and industry. It long has been known that debt-equity and other financial ratios differ according to industry and size of firm. (I was hardly the first to show this in my antediluvian 1960 Ph.D. dissertation, done without benefit of computer or even calculator. Kopcke has done it in sophisticated and elegant fashion in a recent article in the *New England Economic Review*.) A certain arbitrariness is unavoidable, but it would hardly be greater than that already involved in the setting of bond ratings by the private rating agencies. Accountants tell me that the IRS already applies such norms to small corporations to avoid abuse of interest deductibility. For large companies, the rating agencies routinely collect and assess the relevant data. Thus mandatory capital standards would involve no great departure from precedent or novelty in terms of reporting and enforcement.

The twofold penalty for noncompliance would be simple and automatic. The lesser penalty would be the withdrawal of the tax advantage for the excess debt—the interest would be treated as though it were dividends. This would limit the tax incentive for equity retirement without radically revising the ecology of our tax system. But in many cases this would not be an adequate deterrent. The more potent penalty to be applied would be the compulsory dismissal of senior

management, with forfeiture of equity entitlements, golden parachutes, and the like.

To Sum Up

The replacement of pure equity by instruments having prominent debt attributes is helpful in the reorganization and toughening of our economy. The incentive structure, however, is such that the process is not adequately self-disciplining. It parallels our experience with depositories and is breeding an even greater systemic risk. Monetary and fiscal policy is inhibited. Farflung and politically damaging bailouts may eventually be triggered.

An additional economic tool is needed for the separate task of protecting the economy from such systemic risk. Equity capital requirements for larger corporations are proposed as a simple, effective, and market-oriented device. Such requirements seem a rather nonintrusive way to check a trend that, unconstrained, may lead to the backdoor socialization of the economy.