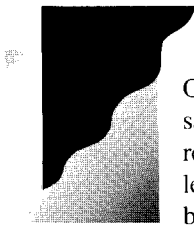


Market value accounting for commercial banks

Thomas Mondschean



One of the repercussions of the savings and loan crisis and recent capital adequacy problems among some commercial banks and insurance companies has been a debate about the system of accounting used by financial institutions. The issue is whether the current method of valuing assets and liabilities conveys information accurate enough to measure the economic net worth of financial institutions. If it does not, then is it possible to design a valuation system for which the benefits of changing exceed the costs? This issue is important to policymakers and taxpayers because better information about the economic net worth of financial institutions could give regulators an opportunity to intervene sooner and potentially reduce the cost of closing insolvent institutions. It is important to shareholders because uncertainty about the actual value of an institution makes it harder to decide whether to invest in its stocks. It is also relevant for creditors since the value of economic net worth affects a bank's ability to absorb future losses and thus is an indication of its ability to bear risk.

One proposal that has been debated in recent years is to require banks to use market value accounting (MVA) to compute the values of their portfolios. MVA would require banks to adjust the values of assets and liabilities periodically for changes in market prices and conditions. This idea is not new in financial circles. For example, futures exchanges require that all futures contracts be marked to market at the end of each trading day. For a variety of

reasons, however, marking certain portions of a bank's portfolio to market is more difficult. Opponents of MVA focus on these difficulties and the additional costs a new accounting system would require and contend that such a change is economically impractical. Proponents, on the other hand, emphasize the costs of not changing systems. Under the current historical cost accounting system (HCA), banks record the value of assets and liabilities at the time they are acquired, and these values are not subsequently adjusted until they are sold or written down. Proponents of MVA argue that the current accounting system diminishes the public's confidence in the financial system by not presenting an accurate enough picture of the current economic health of financial firms.

The purpose of this article is to examine the costs and benefits of market value accounting. I focus the discussion on the case of commercial banks; however, much of the analysis presented could be applied to other types of financial intermediaries. Many of the issues discussed here have been examined in greater detail in the chapter on market value accounting in the 1991 U.S. Treasury study on reforming the financial system. After a discussion of the purposes served by an accounting system for banks, I explain how HCA misrepresents the true economic value of financial institu-

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tions. Next, the commercial bank balance sheet is examined in detail both to explain how market value accounting would work and to evaluate the difficulty of marking to market various balance sheet items. Once it is known which balance sheet items are most difficult to value, it is then possible to assess how costly the move to MVA would be and whether the cost-benefit tradeoff for market value accounting is different for large banks than for smaller institutions. I then discuss the major criticisms raised about MVA. The issues raised by both sides imply that there may be some middle ground, so I explore possibilities for improving the system of reporting that does not require a complete move to market value accounting. The article concludes by making suggestions for improving the quality of information provided by commercial banks to both bank regulators and the public.

What should an accounting system for banks achieve?

Any bank accounting system must provide useful information to both bank regulators and the public. According to the recent U.S. Treasury study on financial reform, useful information should be: "(a) relevant, timely, and understandable to users of financial statements; (b) reliable, in the sense of being accurate, objective, and verifiable by outside parties; and (c) reported in a consistent manner to facilitate comparisons over time and across firms."¹ But for what purposes are accounting data useful? One goal is to assist in ensuring financial control. As Benston (1989) points out, the current bank accounting system is "... designed to report on the transactions that occurred between the enterprise and other market participants and among control and decision units within the enterprise and the people responsible."² Cost accounting allows banks to trace each dollar as it is acquired or spent, leaving a paper trail that assists both banks and independent auditors in detecting fraud as well as in finding and correcting mistakes. Given the volume of transactions a typical bank handles every day, whatever accounting system is in place must allow banks to monitor accurately all transactions as they take place.

Another purpose of an accounting system is to permit accurate appraisals of the value of bank net worth or capital. Net worth is defined as the difference between the value of assets and the value of liabilities. Shareholders need an

accurate measure of accounting net worth in order to make informed investment decisions. To the bank's uninsured creditors, net worth represents the amount a bank could lose and still pay its debts. From their perspective, it is more important that the value of net worth not be overstated than that it be accurate. If net worth is understated, uninsured creditors receive additional protection. Appraisals of net worth should be timely in the sense that valuations of net worth should take into account changing economic conditions, so that, for example, a decline in the value of a bank's assets, other things equal, would result in a decline in the value of its net worth. The information provided should also make it possible for users of these data to compare the relative performance of different banks.

No matter which type of accounting system is in place, a related issue is whether banks should be required to disclose more information to permit the public to reach their own conclusions about a bank's net worth. In particular, should banks be required to release the same information to the public as they do to the regulatory authorities? Some argue that greater disclosure of a bank's loan portfolio might affect the competitive position of a bank or its customers if confidential information valuable to other firms was released. Regulators must balance the public's need to learn about banks with the banks' need to protect confidential or proprietary information. Stockholders and uninsured creditors have a legitimate need to know the economic value of a bank to protect their own interests; however, it may not be in the best interest of bank managers to release such information. Some market participants contend that price-earnings ratios for bank holding company stocks might be higher if banks disclosed more and better information about their portfolios. Thus, the public policy issue is not whether banks should disclose confidential or proprietary information but whether they should be required to release more information than they currently do.³ It is worth noting that other financial services industries disclose more detailed information about their portfolios to the public than banks do. Mutual funds are required by the Securities and Exchange Commission (SEC) to disclose their complete portfolio holdings every quarter. SEC regulated broker/dealers and futures commissions merchants must report market values.

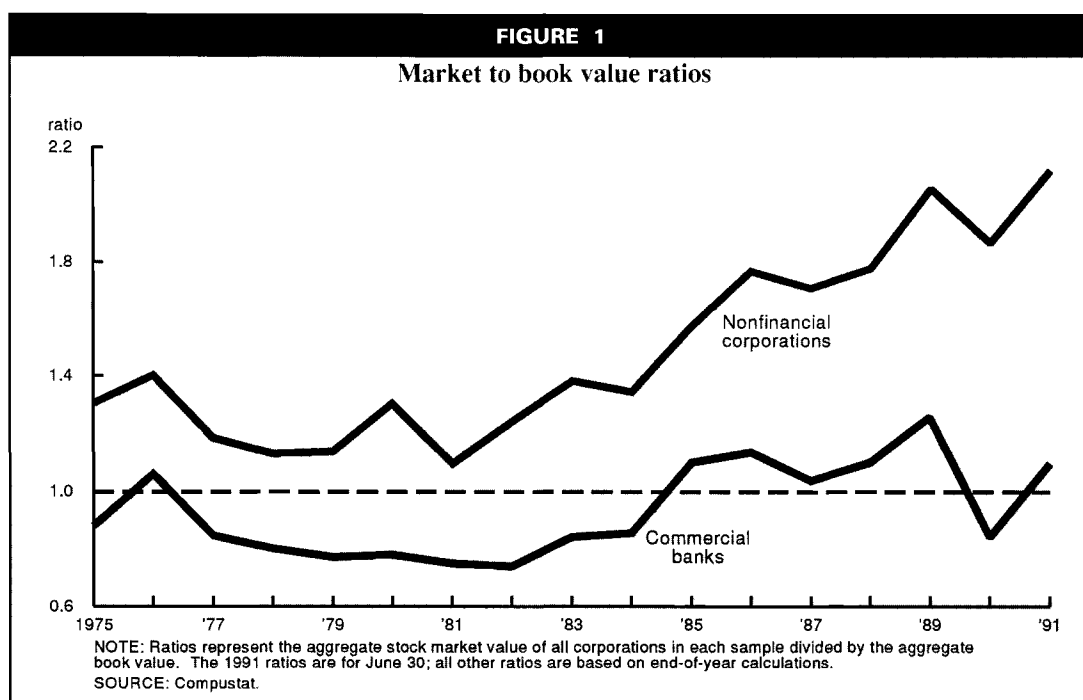
Insurance companies are required to disclose their complete stock and bond holdings as well as state-by-state breakdowns of their long term mortgage loans to regulators once a year.⁴

Problems with the current accounting system

Under HCA rules, a bank records the nominal value of the asset or liability at the time it is acquired.⁵ One justification for HCA is that banks were presumed to acquire assets and liabilities and hold them until maturity. As long as they receive repayment of interest and principal at the contracted periods, changes in market value were presumed to have no effect on the asset's cash flow. However, this motivation for HCA violates basic economic principles. First, an asset's purchase price does not represent the best estimate of what it will be worth in the future because it ignores subsequent information about changes in market interest rates, credit risk, and other variables. Second, the assumption that banks hold all of their assets to maturity is outdated. The development of securitization and other techniques means that many types of loans can be easily sold before maturity. Third, for certain assets, banks can lock in current embedded gains or limit future economic losses by hedging even if the asset is not sold before maturity.

The development and use of generally accepted accounting principles (GAAP), which are based in large part on HCA principles, are designed to give all banks a similar set of rules with which they report the value of their portfolios. However, GAAP allows banks some flexibility in determining the timing of valuation changes. For example, a bank with an unrealized gain on a particular asset may choose a particular time to sell the asset, realize the gain, and use it to offset other losses. Alternatively, a bank may prefer to increase loan loss reserves at discrete intervals rather than taking losses as they become apparent.⁶ Thus, the book value of bank capital might understate its economic value if a bank has unrealized gains in its portfolio or overstate its economic value if it has unrealized losses. Because GAAP permits such behavior, meaningful comparisons between banks are more difficult. Proponents of MVA believe the best way to solve this problem is to require banks to report changes in values when they occur, rather than allowing banks to choose when to realize them.

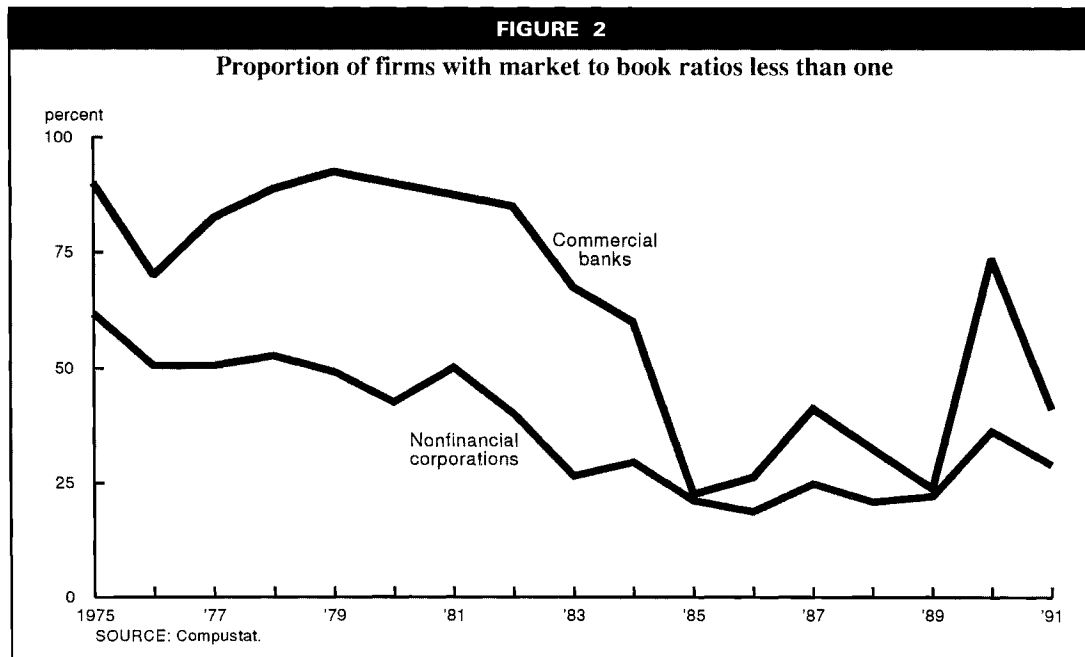
Perhaps the best evidence that the current bank accounting system needs to be improved comes from the stock market itself. Figure 1 compares the ratios of market to book values for a sample of 80 bank holding companies to those of approximately 1,400 nonfinancial

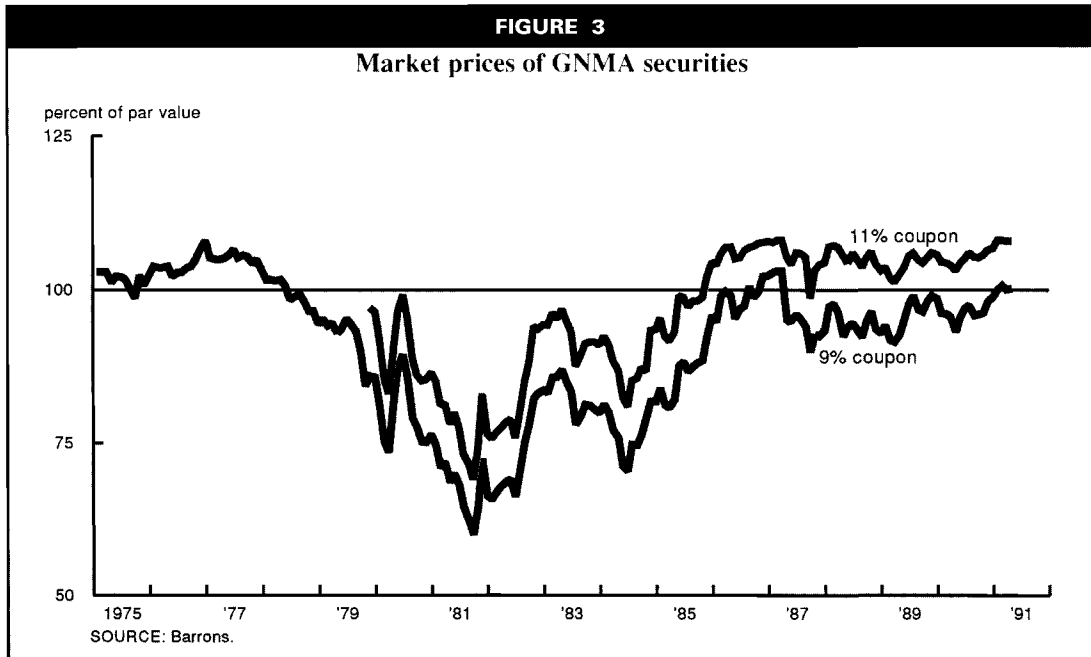


corporations from 1975 to 1991. From the perspective of bank creditors, a higher ratio of market to book value is desirable because it indicates a more conservative valuation of accounting net worth, which provides additional protection for the deposit insurer as well as uninsured creditors. Market to book ratios have been consistently higher for nonfinancial corporations than for commercial banks throughout the last fifteen years, and the difference in the ratios has been widening in recent years. This graph also demonstrates that the problems with the system of bank accounting are not a recent phenomenon: market values were below book values in 1975 and from 1977 to 1984. Figure 2 compares the proportion of banks whose market values were less than book value with nonfinancial corporations. In every year, there was a larger proportion of commercial banks than nonfinancial corporations whose market values of net worth did not exceed their accounting values. A system of accounting should produce conservative and relevant assessments of a bank's net worth, but these data show that there were several years when the market did not believe that the book value assessment of bank net worth was low enough.

Changes in market interest rates can cause the market value of bank net worth to differ from its book value. An example of this is illustrated in Figure 3. Market bid prices for

mortgage-backed GNMA (Ginnie Mae) securities with 9 and 11 percent coupons are plotted for the last Friday of each month from 1975 to 1991. These securities are backed by federally insured mortgage loans, so that, from the investor's point of view, there is zero default risk. The value of mortgage loans made by a commercial bank would be recorded on its books at the time the loan was made and would not change unless the bank sold the loan. One can observe, however, that the market values of such loans have fluctuated a great deal over the past fifteen years. For example, the market values of GNMA securities with 9 percent coupons were 100.75 percent of their par value at the end of May 1978. By September 1981, these securities were trading at 60 percent of their par value, due to a large increase in long term market interest rates during this period. Because commercial banks held fixed rate mortgage loans during this period, the ratio of market to book value of these loans decreased from 1979 to 1981. In Mondschean (1990), I examined the mortgage portfolios of 75 bank holding companies and found that, on average, the market value of their mortgage loans declined from approximately 90 percent of book value at the beginning of 1979 to approximately 60 percent by the end of 1981. Although banks could have hedged their fixed rate mortgage loans by using futures and options or by





funding the loans with long term deposits, I also found that banks with larger unrealized losses on mortgage loans experienced greater declines in their stock prices than banks with smaller losses. However, the accounting value of their mortgage loans and hence the book value of net worth did not change unless banks were forced to sell or write down these loans.⁷

Besides market interest rates, there are other factors which can affect the market value of bank net worth. The probability of default can increase unexpectedly, adversely affecting a loan's market value. The duration, a measure of the term to maturity of a financial instrument, can decrease unexpectedly, affecting the timing of payments of principal and interest, thereby altering the present value of the loan's cash flow. Changes in the exchange rate value of the U.S. dollar could affect the dollar value of assets and liabilities denominated in foreign currencies. But why should one care if market and book values diverge? Because commercial banks are highly leveraged, small changes in the market values of their assets have a significant effect on their net worth. For example, suppose a bank has a capital-to-asset ratio of 6 percent and the market value of its assets falls by 1 percent with no offsets elsewhere on or off the balance sheet. While a 1 percent decline in total assets may not seem like a large change, it is equivalent to one-sixth of the bank's total capital. Because of this, it is essential for both regulators and investors to

know when the market value of a bank's portfolio changes relative to its book value.

When the market value of a firm goes down, other things equal, its stock price should be affected. However, when the value of bank net worth declines without a corresponding change in accounting net worth, both the regulators and the public may believe a bank has more capital than it actually has. Since many investors are aware of the fact that a bank has better information about its true economic value, they must forecast the magnitude of a bank's net unrealized gains or losses. Thus, a bank's debt and equity may be priced differently than it would be if investors had an accurate measure of net worth. For example, a bank with unrealized losses that are larger than the market believes might have a higher stock price than it would if investors had accurate information about market values; consequently, investors would not be adequately compensated for the risk of investing in that bank's stock. On the other hand, if a bank has larger unrealized gains than the market believes, then, other things equal, its stock would be underpriced, raising the cost of issuing new equity for the bank.⁸

The existence of deposit insurance exacerbates the problems that can arise if the market value of bank net worth falls below book value. As its market value gets closer to zero, the bank has a greater incentive to increase its risk expo-

sure. Since shareholders would receive nothing if the institution is closed, a market value insolvent bank acting in the best interest of shareholders has a strong incentive to increase risk in the hope of earning above normal returns. If the institution experiences greater losses, the losses are borne by the deposit insurer and not by the shareholders, thereby placing the deposit insurance fund at greater risk. This moral hazard problem underscores the importance of providing accurate market values of bank net worth to regulators. Because the current accounting system does not guarantee that this will be the case, the probability that taxpayers will be required to absorb part of the cost of future bank failures is increased.⁹

Measurement issues in a market value accounting system

Under a system of market value accounting, banks would be required to adjust all assets and liabilities for changes in the market value of those assets and liabilities. Critics of this approach argue that market value estimates of bank net worth would be unreliable due to the difficulty of measuring the value of various

balance sheet items. To evaluate this argument, it is helpful to examine a representative bank's balance sheet in greater detail. In Table 1, bank assets are separated into several categories and asset shares are reported for all banks with total assets of less than \$100 million, \$100 million to \$1 billion, and over \$1 billion, respectively, as of the end of 1990. The asset categories are divided into two groups. The first grouping lists assets for which either book and market values are equal or market values can be calculated with little additional cost. The market values of cash assets, representing currency and coin, reserve balances at Federal Reserve Banks, and cash items in the process of collection, are equal to their book values. Assets held in trading accounts are already carried at market value. The market values of overnight federal funds sold and securities purchased under agreement to resell are close to book values because of the short term nature of these financial instruments. The market value of securities held is already reported to regulators.¹⁰

Deposits due from other banks represent funds one bank may place with another bank. These funds can be interest-bearing or noninter-

TABLE 1

Asset shares of commercial banks
(December 31, 1990)

	Asset size category in millions of dollars		
	Less than 100	100-1,000	Greater than 1,000
	<i>(percent of total assets)</i>		
Easy to mark to market			
Cash and due from deposits	6.86	6.83	10.61
Federal funds sold and reverse RPs	6.70	5.28	3.65
Assets held in trading accounts	0.04	0.21	1.97
Securities (book value)	30.64	23.85	14.40
Premises and fixed assets	1.69	1.64	1.48
Other real estate owned	0.64	0.66	0.63
Subtotal	46.57	38.47	32.74
Difficult to mark to market			
Total loans and leases	51.58	59.47	62.04
Other assets	1.84	2.06	5.23
Total assets	100.00	100.00	100.00
Number of banks	9,144	2,682	363

SOURCE: Federal Reserve Report of Condition.

est-bearing. In general, smaller banks having a correspondent relationship with a larger bank deposit these funds in exchange for services provided by the larger bank. Since there is a great deal of competition for this business among large banks, it is believed that the value of services provided as implicit interest on these balances approximates a market interest rate; hence, the market values of these deposits equal their book values.

Computing market values for other real estate owned (OREO) is somewhat less precise. OREO includes all real estate owned or controlled by the bank excluding bank premises, such as direct and indirect investments in real estate ventures for investment purposes and real estate acquired through foreclosure. Currently, banks report to regulators the book value of these assets less accumulated depreciation, which cannot be greater than fair market value. Fair market values of these assets are generally calculated by independent appraisers. The accuracy of these appraisal reports depends on both the availability of comparable market information as well as the judgment of the appraisers. While they may be imprecise, these estimates would be no less exact under market value accounting than under the current system. Since banks also record bank premises and fixed assets (computers, furniture, etc.) at book value less depreciation, there is no reason why market appraisals could not be used to value these assets as well.¹¹

Taken as a group, those assets for which using MVA would entail little or no additional cost to banks represent approximately one-third of total assets for banks with over \$1 billion in total assets and just under one-half of total assets for the 9,144 banks with \$100 million or less in total assets as of the end of 1990.

Proponents of MVA recognize that certain categories of loans would be difficult to mark to market. While some loans, such as one-to-four family mortgage loans and student loans, are actively bought and sold, most types of loans are not actively traded, and so market values cannot be inferred directly from secondary markets.¹² Although financial institutions must often compute market values of nontraded assets for their own purposes, such calculations are inherently judgmental and could potentially be manipulated. Opponents of MVA point out that the cost of imposing MVA on banks would be high if every bank loan required such a valua-

tion. Proponents counter that banks already use such judgment in determining the appropriate size of their loan loss reserves.

Analyzing the effect of market interest rate changes on loan market values is a primary objective of MVA. Table 2 classifies loans at commercial banks according to the remaining time to repricing or repayment. Floating rate loans are loans whose interest rate is adjusted to reflect market interest rate changes. For banks with over \$1 billion in total assets, the majority of loans are made at floating interest rates. The market values of these loans can diverge during the period between repricing dates; however, once the loan interest rate is adjusted, market and book values are equal. Thus, the effect of changes in market interest rates on the market values of bank loans depends on the time period before either the loan is repriced or it is repaid. As Table 2 indicates, for all size classes, the percentage of loans which are repriced or repaid within one year is between 60 and 70 percent.

For loans with longer periods before repricing or repayment, assuming banks revealed accurate cash flow information, market values could be inferred using some form of discounted cash flow analysis. The market value of a loan is equated to the present value of the expected flow of payments accruing from the loan. Assuming, for simplicity, that payments are made at the end of each period, the present value of the flow of payments as of date 0 can be represented by the following:

$$PV_0 = C_0 + C_1/(1 + r_1) + C_2/(1 + r_2)^2 + \dots + C_n/(1 + r_n)^n$$

where, for example, C_1 represents the expected payment of principal and interest in period 1, r_1 is the discount rate for period 1, and n is the number of years from today to the date of the final payment. The present value of a bank's existing loans can be affected in two ways. First, the timing of interest and principal payments may be altered in the event of a rescheduling of repayments. Second, the interest rate used to discount future payments may change. Using discounted cash flows to derive market values would have several advantages. As long as banks know when expected payments of interest and principal would occur, they could combine loans and report the expected cash flow of the entire loan portfolio. Thus, they need not report the market value of each loan. As banks make new loans

TABLE 2

Loans at commercial banks by remaining time before repricing or repayment
(December 31, 1990)

	Asset size category in millions of dollars		
	Less than 100	100-1,000	Greater than 1,000
	<i>(percent of total loans)</i>		
Floating rate loans with remaining time to repricing			
Within 3 months	26.51	37.25	45.07
3 months - 1 year	6.59	7.56	6.45
1 year - 5 years	1.81	2.65	1.52
Greater than 5 years	0.10	0.16	0.38
Total floating rate loans	35.01	47.62	53.42
Fixed rate loans and leases with remaining maturity			
3 months or less	12.79	8.02	10.07
3 months - 12 months	16.59	8.93	5.43
12 months - 5 years	26.87	24.70	18.66
Over 5 years	8.75	10.73	12.42
Total fixed rate loans and leases	64.99	52.38	46.58
Total loans and leases	100.00	100.00	100.00
Percent of all loans that mature or are repriced within one year	62.48	61.75	67.02

SOURCE: Federal Reserve Report of Condition.

and receive new information about the timing of expected future payments on existing loans, they could update their cash flow projections. Changes in foreign exchange rates which could affect the expected dollar values of future payments can also be incorporated into these estimates. And the present value of the loan portfolio can be adjusted for changes in market interest rates.

However, there are measurement problems inherent in the present value approach. Even for relatively simple fixed rate term loans, valuations depend on assumptions about the expected payments and appropriate discount factors. Borrowers may have trouble servicing the debt according to the terms of the loan contract because of economic difficulties, or they may choose to repay a loan faster than the bank expects. Whatever the reason, the duration of the loan may increase or decrease and the present value would be affected.¹³ In addition, many loans with interest rate caps or collars have embedded options which require more sophisticated valuation methods. These issues

aside, while adjusting the market values of loans for interest rate risk is relatively straightforward, it is more difficult to determine the effect of changes in credit risk on loan market values. One problem is that since banks possess better information about the borrower than the users of financial statements do, a moral hazard problem exists. It might be optimal for a bank not to reveal its best estimate of a loan's market value. As a bank's net worth decreases, its incentive to overstate the value of its loans increases.¹⁴

Besides loans, there are other assets for which it may be difficult to compute market values.¹⁵ An example is the value of services provided by the bank in exchange for fees. For example, when a bank sells a mortgage loan to FNMA, it often retains the right to service the loan for a fee. While in principle one could take the present value of the fees net of the bank's own cost, the possibility of prepayment or foreclosure makes such calculations problematic. Evaluating the present value of other services provided by a bank presents similar difficulties.¹⁶

There are also measurement issues which must be confronted when computing the market values of bank liabilities. When computing the value of bank liabilities, it may be inappropriate to use secondary market prices because they incorporate credit risk. While shareholders would prefer to include the value of the bank's option to default on its liabilities in the market value of net worth, debtholders and regulators would not because they would bear the cost of default. One way of protecting uninsured creditors and the deposit insurance fund would be to discount the contractual cash flows of bank liabilities at the risk free interest rate.¹⁷

Table 3 shows various liability categories expressed as a percent of total assets. Some liabilities are either easy to mark to market or are already carried at market value. The interest rate on money market deposit accounts is generally indexed to a market interest rate. Borrowed funds, such as federal funds purchased and securities sold under agreement to repurchase, are very short term financial instruments, so market and book values are extremely close. Total time deposits are relatively straightforward to mark to

market because they are seldom redeemed before maturity and over three-quarters mature or are repriced within a year. Discounted present values can be calculated for subordinated debentures and other long term bonds.

Demand deposits, savings deposits, and NOW accounts are potentially the most difficult items on bank balance sheets to mark to market.¹⁸ Because of the cost a depositor may incur in transferring accounts from one bank to another, banks often pay below market interest rates on their core deposits; hence, these deposits add market value to a bank's net worth. In theory, the additional value of core deposits can be represented by the present discounted value of future cost savings net of servicing costs over the next best alternative funding source. However, calculating these present values is difficult for two reasons. First, when market interest rates increase, the future cost savings per dollar of deposits may also rise, but the deposit quantities may decrease. Since the value of the cost savings each period equals the cost savings per dollar of deposits times the amount of deposits, there is no precise measure

TABLE 3

Liability and net worth shares of commercial banks

(December 31, 1990)

Asset size category in millions of dollars

Less than 100 100-1,000 Greater than 1,000

(percent of total assets)

Easy to mark to market

Money market deposit accounts	9.71	12.13	11.21
Time deposits	47.95	42.64	27.28
Borrowed funds	0.99	4.78	14.45
Subordinated notes and debentures	0.03	0.12	0.94

Subtotal

58.69 59.67 53.89

Difficult to mark to market

Total demand deposits	12.34	13.47	14.26
Other transactions deposits	11.40	9.50	5.17
Other savings deposits	7.49	7.97	5.29
Deposits in foreign offices	0.04	0.53	11.45
Other liabilities	1.08	1.20	4.18

Total book value capital 8.96 7.67 5.76

Total liabilities and net worth 100.00 100.00 100.00

SOURCE: Federal Reserve Report of Condition.

of the magnitude of these cost savings over time. Second, because core deposits have no stated maturity, there is no objective method to determine the duration of these deposits. Thus, any calculation using present values must be based on assumptions which are difficult to verify. On the other hand, imprecise though they may be, estimated valuations of core deposits are routinely done by depository institutions interested in purchasing core deposit accounts from insolvent institutions or when analyzing the value of a bank for a prospective merger or acquisition.

Deposits in foreign offices, which fund over 10 percent of total assets for banks with \$1 billion or more in total assets, present similar conceptual difficulties for MVA. Time deposits would be relatively easy to mark to market, but other types of foreign deposits may be more difficult. While banks are currently not required to break down their deposits in foreign offices by type of deposit, we do know that over 95 percent of these deposits pay explicit interest. Thus, if foreign deposits were reported in the same detail as domestic deposits are, accurate market valuations could be made for the vast majority of these deposits. Requiring foreign deposit holdings to be reported in greater detail would impose little additional cost since these deposits are concentrated in the largest banks who need these data for internal purposes.

Another set of measurement issues arises when accounting for off balance sheet contingencies under MVA. Examples of such contingencies include interest rate and foreign currency swaps, forward and futures contracts, loan commitments, letters of credit, and guarantees. Since banks are already required to estimate the market value of interest rate and futures positions for regulators, these pose no additional problems under MVA. However, evaluating the market value of loan commitments is complicated by the possibility that they would become loans. The values of loan guarantees depend on the probability that they will be exercised, which implies some estimate of credit risk is necessary.¹⁹

In summary, while computing accurate market values for some bank balance sheet items is difficult, many proponents of MVA believe the extent of the problems is exaggerated since the majority of bank assets and liabili-

ties can be marked to market with little additional cost. Many of the problems are inherent in any accounting system, but others are the result of assumptions or subjective judgments which must be made in order to provide estimates of market values. Proponents of MVA contend that if banks start valuing their portfolios using MVA, the experience will spur accounting innovations that can improve the quality of information and reduce measurement errors. Also, they argue that the question should not be whether market value accounting is perfectly accurate, but whether MVA is an improvement over historical cost accounting. If MVA can reduce the bias (the difference between economic and accounting values) and the variance of the bias (the tendency for the bias to fluctuate over time) relative to HCA, it would be an improvement over the current accounting system.

Costs imposed by a market value accounting system

The banking industry maintains that the cost of implementing a new system designed to report market values as a basis for GAAP and regulatory reports would be prohibitively expensive. According to this view, MVA requires costly marking to market of all assets, liabilities, and contingent claims it holds using whatever method—observation of secondary market prices, appraisals, or discounted cash flow analysis—is deemed most appropriate. Many depository institutions claim that MVA would require additional developmental and other costs to obtain necessary data, modify or purchase computer software, perform complex calculations, and train personnel. Because many of these costs are fixed, smaller banks would experience even greater burdens on a unit cost basis. Moreover, because many assumptions required to compute market values are subjective, the cost of auditing banks may also rise as verification of a bank's methods would take longer and be more difficult.

Proponents of MVA respond that the incremental cost of adopting MVA is overstated for small banks. Smaller banks hold a larger proportion of assets which are relatively easy to mark to market, partly because they have a higher percentage of their assets in securities but also because of the nature of their loan portfolios. Table 4 shows how the average loan

TABLE 4

Total loans at commercial banks by type of loan
(December 31, 1990)

	Asset size category in millions of dollars		
	Less than 100	100-1,000	Greater than 1,000
	<i>(percent of total loans)</i>		
Loans secured by real estate	50.07	51.10	35.12
Construction and land development	3.50	5.41	6.47
Secured by farmland	4.93	1.26	0.21
Revolving, open-end loans secured by one-to-four family properties	1.55	3.34	3.00
Mortgage loans—one-to-four family dwellings	26.22	3.26	12.72
Mortgage loans—multifamily dwellings	0.94	1.41	0.88
Nonfarm nonresidential real estate loans	12.93	16.41	10.12
Loans to depository institutions	0.25	0.94	3.06
Agricultural loans	9.68	1.81	0.56
Commercial and industrial loans	19.33	22.45	32.53
Consumer loans—credit cards	1.00	3.78	6.76
Consumer loans—other	17.88	17.10	11.33
Loans to foreign governments and official institutions	0.01	0.06	1.65
Other loans	3.61	4.71	10.03
Total loans and leases, net of unearned income	100.00	100.00	100.00

SOURCE: Federal Reserve Report of Condition.

portfolio for smaller banks differs from their larger counterparts. The data show that, for banks with less than \$100 million in total assets at the end of 1990, the proportion of relatively easy to value one-to-four family mortgage loans and non-credit-card consumer loans was significantly larger than for banks with over \$1 billion in total assets, and small banks held a smaller proportion of commercial and industrial loans. They also have a larger proportion of loans secured by farmland, for which there is a great deal of price data. With few exceptions, smaller banks also do not have any foreign deposits. In other words, because smaller banks have portfolios which are easier to value, the costs of adopting MVA per dollar of earnings may actually be less than for larger banks.

Another point is that it is not necessary to mark individual assets and liabilities to market in order to obtain the majority of the benefits of MVA. One could aggregate loans and deposits

into pools with similar characteristics and estimate market values for each pool. An advantage of such a method is that idiosyncratic differences among assets within a pool would not have as great an effect on its overall value, so measurement error may be reduced. In addition, while implementation and operating costs may be high initially, they would most likely decline over time. New products would be created and marketed to make it easier to collect and process the additional information required for MVA. Economic incentives to lower these costs would lead to the development of standardized databases and software to compute market values of complex financial instruments. The movement toward standardization would also make it easier for users of bank financial statements to compare relative bank performance.

Even if adopting MVA proves to be costly, proponents believe that any incremental cost of

MVA to the banking industry should be compared with the gains society derives by having better information. Regulators and taxpayers would especially benefit by having better and more timely information about a bank's economic value. Bank managers could use the information derived from MVA to improve their management of risk exposure. Investors would have a better measure of the economic value of banks which would allow investors to make more informed choices about which bank investments to hold. Thus, while it may be in an individual bank's interest to oppose MVA because its cost of implementation may not exceed the benefits for the bank itself, MVA may be worthwhile if the total benefit to society exceeds the total cost to society. Indeed, the difference between private and social net benefits is one of the principal justifications given for imposing regulations in general.

Possible economic effects of market value accounting

In assessing the feasibility of changing the accounting system for banks, it is necessary to evaluate the likely economic effects of such a change. Many researchers have studied the impact of changes in accounting regulations on market values of firms.²⁰ The general conclusion of these studies is that changes in accounting and reporting rules do affect stock market values. While it seems likely that changes in bank accounting rules may affect market values of bank securities, this is hardly a reason for not making needed reforms since firms must often adjust to changes in accounting methods and standards. Thus, a key question is whether the use of MVA will improve the safety and soundness of the banking system. Also, will banks become more or less competitive relative to other firms under MVA? A third question is how will bank portfolio behavior change under MVA.

Whether market participants perceive banks to be safer under MVA than under current accounting practices depends in part on how serious the measurement problems are. Opponents of market value accounting argue that estimates based on subjective and difficult to verify assumptions will increase uncertainty about the true economic value of banks. This will undermine public confidence in the banks, raising their costs of capital and borrowed

funds. Also, MVA opponents argue that current bank earnings will be even more sensitive to fluctuations in interest and exchange rates because they would have to realize capital gains and losses sooner. As a result, investors will demand greater risk premia. Banks may then be induced to focus more on short run profits and avoid long term loans that may be more profitable but also more risky if they must be marked to market.

Proponents of MVA respond that requiring greater disclosure of market values of bank portfolios would allow investors to make better estimates of the economic or true value of bank securities. Thus, MVA comes closer than historical cost accounting to disclosing the true value, and the true risk, of a bank to investors and regulators. In particular, banks' cost of capital will rise under MVA only if banks had been underpaying for capital, deposits, or borrowed funds previously by undercompensating investors or depositors for the risk of investing in or lending to banks. Hence, MVA will benefit investors and lenders because it insures that investors and lenders will be fairly compensated for the risk of investing in or lending to banks. Moreover, since MVA would make it more difficult for banks to overstate their net worth, MVA will benefit regulators by allowing banks that are having capital adequacy problems to be identified more quickly. This would improve the safety and soundness of the banking industry.

The likely consequences of MVA for future bank behavior are difficult to determine. One concern is that banks may reduce credit availability during periods of declining asset prices. Since declining market values would quickly affect capital positions, banks might curtail lending to increase capital-asset ratios. It is also conceivable that if MVA increases the volatility of reported net worth it may also increase the volatility of credit availability. Due to the growth of commercial paper and other types of direct corporate borrowing, the borrowers that would be most adversely affected by increased credit rationing would be those who do not have direct access to capital markets, such as small businesses. Another issue is whether the optimal capital-asset ratio will increase under MVA. If reported earnings under MVA were more volatile and regulators and creditors based their actions on these new

earnings estimates, a bank would increase its equilibrium capital ratio and reduce hedgeable risk in order to reassure its customers that it could withstand shocks that reduced its net worth. This behavioral change could mitigate the need to restrict credit availability when market values are falling, and it may also improve safety and soundness.

Alternatives to market value accounting

Acknowledging some of the criticisms of full MVA, some have argued that most of the advantages of MVA can be obtained by modifying rather than overhauling the current accounting framework. One proposal is to require the reporting of values for those instruments for which secondary market prices exist. Such a step would not be very costly to banks because much of this information is already reported to regulators. Proponents believe that this would represent an improvement over the current system and would reduce the degree of measurement error that currently exists by using HCA. Opponents disagree, contending that many institutions use securities to offset positions taken elsewhere in the balance sheet. For example, a bank might decide to purchase some long term Treasury securities to offset long term certificates of deposit. Marking one and not the other to market would reduce the effectiveness of such a hedging position. Moreover, the difficulty of measuring the duration of core deposits implies that it may be not be easy to determine whether some banks have positive or negative gaps (a gap is the difference between the market value of assets and the market value of liabilities of equal times to repricing or repayment). In this case, it becomes unclear whether an increase in interest rates will reduce the market value of net worth. Thus, only marking a portion of the balance sheet to market for changes in interest rates would distort its meaning and lead to greater confusion about bank net worth, according to MVA opponents. Note that this argument would not hold for credit risk since it is difficult to hedge against credit risk.

Another proposal is to require banks to disclose more information about the performance of their portfolios in their financial reports but not necessarily mark their portfolios to market. An advantage of disclosure is that it avoids many of the measurement problems

discussed earlier because it would be up to the users of financial data to determine the effect of the additional disclosures on the market value of net worth. As a result, the cost of auditing the bank would be less than it would be under full MVA. Another advantage of disclosure is that investors, depositors, and bank regulators could use the information to make decisions. Investors could respond to disclosure of negative information by selling a bank's securities, thereby imposing greater market discipline on banks.

Disclosure of market value information would be a useful transitional step toward full MVA, because it would give market participants and regulatory bodies time to assess the usefulness of market value information and its likely economic effects. The Financial Accounting Standards Board (FASB) appears to agree. Statement No. 105 requires additional disclosure in financial statements with off balance sheet risk of accounting loss. It also requires greater disclosure of "... all significant concentrations of credit risk of all financial instruments, whether from an individual counterparty or groups of counterparties." A concentration of credit risk exists when the parties have common economic characteristics, such as operating in similar industries or locations, which would cause their ability to meet contractual obligations to be similarly affected by changes in these characteristics. For more details, see FASB (1990) and Carlson and Mooney (1991).

A recent statement, FASB (1991), goes even further. It requires that all entities disclose information about the market value of all financial instruments, both assets and liabilities on and off the balance sheet, for which it is practical to do so. For instruments for which it is impractical to estimate market value, the statement requires descriptive information that would assist users in estimating market values. The proposed date of implementation is for financial statements issued for fiscal years ending after December 15, 1992, for entities with \$150 million or more in total assets. For those entities with less than \$150 million in total assets, the effective starting date would be three years later.

Conclusion

The savings and loan crisis has focused attention on the accounting system used by financial institutions. Many economists and other researchers believe that the current system of accounting presents a misleading picture of the

true economic value of commercial banks. They contend this is both raising the cost of capital for banks and placing the deposit insurance fund at greater risk. Market value accounting has been proposed as a better way to measure the economic value of banks. However, MVA has conceptual and measurement difficulties which need to be addressed. Many of these problems can be mitigated, but it must be recognized that no system of accounting can eliminate the use of judgment in valuations.

Until this debate is resolved, there is still a need for better information to protect the deposit insurance fund and ultimately taxpayers from excessive risk taking by banks with low market values. Because managers of banks may not want to voluntarily improve the quality of information submitted to both regulators and the public, banks should be required to report the expected future cash flows (repayment of principal and interest) on their fixed rate loans and time deposits as a function of the time when repayment is made. Currently, banks are only required to report the value of assets and liabilities which fall into different time periods, as shown in Table 2. To compute present values, one needs the expected future cash flows as a function of time, not what is currently reported.

Disclosing this information would greatly assist regulators in examining interest rate risk of commercial banks. Second, banks should not have as much discretion to choose the time to realize gains or losses as they currently do. In particular, accounting rules for reporting nonperforming loans and for increasing loan loss reserves need to be strengthened, and changes in credit risk must be reported sooner to regulators. Third, deposits held in foreign offices should be reported in the same detail as domestic deposits. Finally, greater public disclosure is necessary to enable investors to estimate bank net worth more accurately. If investors are more accurately informed, market prices of bank stocks and subordinated debentures would better reflect the economic condition of commercial banks. Healthy banks would benefit as reduced uncertainty would raise their stock prices and lower their cost of capital. Less well-capitalized banks would be subject to greater market discipline and thus have a stronger incentive to improve their net worth positions. In the absence of requiring market value accounting, I believe these changes would improve the ability of regulators and investors to monitor the safety and soundness of the banking system and to measure bank performance.

FOOTNOTES

¹See U.S. Treasury (1991), p. XI-3.

²Benston (1989), p. 549.

³The total value of bank assets which involve truly proprietary information may be overstated. For example, many business loans are made by groups of banks in which information is shared. Currently, there are approximately \$800 billion outstanding in the shared national credits program.

⁴Insurance companies must also report a breakdown of their bond holdings by six quality classes. By contrast, commercial banks only report the aggregate amount of securities for different types (U.S. government, state and local government, corporate, foreign, etc.). They do not report which corporations' securities they are holding nor do they classify their bonds by credit quality.

⁵There are some exceptions. For example, banks report their securities holdings at par value less amortization of discount or plus accretion of premium. Other exceptions are discussed in greater detail in the measurement issues section.

⁶An example of such behavior was Citicorp's decision to increase reserves against its Latin American debt by \$3.4

billion in the second quarter of 1989. Many large banks followed Citicorp's lead with substantial increases in their own loan loss reserves.

⁷It is also worth noting that since savings and loan (S&L) associations had over three-quarters of their assets invested in mortgage loans and mortgage-backed securities, the rapid increase in market interest rates from 1978 to 1981 had an even larger negative impact on S&L net worth than it did on commercial banks. It is in part because of this experience that the Office of Thrift Supervision has developed a Market Value Model for adjusting the values of S&L portfolios for changes in market interest rates.

⁸Even if stock prices did accurately reflect unrealized gains or losses, the holders of debt contracts with covenants contingent on accounting values may be arbitrarily penalized.

⁹Since deposit insurance can be viewed as a call option, a market value insolvent bank still open for business can increase its risk exposure and thus the value of its deposit insurance. Since this option is capitalized into the price of the bank's stock, such an action can actually raise the stock's value.

¹⁰Even though market price information may be available for all these financial instruments, one must interpret these data

carefully because of the varying liquidity of the markets in which these instruments trade. For example, the municipal bond market is very heterogeneous, so one might simultaneously receive different price quotations from dealers. A bank could use the highest or lowest price quote depending on whether it is trying to overstate or understate the market value of its net worth.

¹¹Requiring banks to carry these assets at lower of cost or market value (LOCOM) reduces the likelihood that a bank could use an overestimated appraisal of its real estate holdings to increase its net worth. On the other hand, reporting real estate using LOCOM makes it more difficult for a bank to realize gains on real estate that may have appreciated in value. In any case, these two asset categories represent less than three percent of total bank assets.

¹²It is possible to get market prices for mortgage loans that conform to the standards set by the Federal Home Loan Mortgage Corporation (FHLMC) and the Federal National Mortgage Association (FNMA). However, it is not possible to get detailed pricing information for nonconforming mortgage loans, and there are problems with using FHLMC and FNMA prices. For more information, see U.S. Treasury (1991), pp. XI-14 and XI-15. In addition to mortgage loans, there are active secondary markets in loans to less developed countries (LDCs) and loans for highly leveraged transactions (HLT). The shared national credit program can be a source of market value information. Also, market values of collateral for some loans may be readily available, such as loans secured by farmland.

¹³Duration is a measure of the effective maturity of a stream of future payments, defined as the weighted average maturity of an instrument's future cash flows, with the present values of the cash flows serving as the weights. A change in the market interest rate can affect the duration of a loan. For example, a decrease in market interest rates may induce borrowers to refinance a loan or pay it off sooner, thereby altering the duration of the loan.

¹⁴In practice, matrix pricing can be used to reduce the degree of subjectivity involved in determining the risk premia of discount factors employed in the analysis [see U.S. Treasury (1991) for more details]. In addition, auditors provide a check on a bank's use of its information advantage. For a detailed discussion of the incentive problem inherent in a bank valuing its loan portfolio, see Berger, King, and O'Brien (1991). These authors stress the importance of developing some incentive compatible

mechanism for getting banks to report truthfully the market values of their loans.

¹⁵The category "other assets" in Table 1 includes: (1) investments in unconsolidated subsidiaries and associated companies, (2) customers' liability to this bank on acceptances outstanding, (3) intangible assets, which includes loan servicing rights and goodwill, and (4) other assets such as income earned but not collected on loans, net deferred income taxes, and miscellaneous items. Investments in unconsolidated subsidiaries are currently reported to regulators using the equity method of accounting, where the asset is carried at cost and adjusted for earnings and losses of the investee.

¹⁶Another intangible asset is goodwill, which arises in connection with merger and acquisitions transactions for which the purchase price exceeds the fair value of the identifiable net assets that are acquired. Calculating the market value of goodwill is difficult in any accounting system. One suggestion, contained in U.S. Treasury (1991), is "[b]ecause of the subjective nature of the determination, goodwill under MVA might be handled in much the same way as under current GAAP; that is, goodwill would be recognized only if acquired through arms-length transactions, and its historical cost would be amortized over some appropriate period of time."

¹⁷For details, see U.S. Treasury (1991), pp. XI-18-XI-19.

¹⁸The total return on demand deposits and NOW accounts equals the sum of explicit plus implicit interest. Placing noninterest-bearing demand deposit balances with banks represents partial compensation for services provided to the depositor. For corporations and depository institutions with a correspondent relationship, the size of these compensating balances is adjusted for changes in market interest rates.

¹⁹The current risk-based capital guidelines do require banks to hold additional capital based on the extent of their off balance sheet exposure.

²⁰Examples are for mandatory accounting changes in the oil and gas industry [Collins, et. al. (1981)], consolidated reporting requirements [Mian and Smith (1990)], and translation of foreign currency transactions [Salatka (1989)]. The effects of regulatory accounting changes in the savings and loan industry has been studied by Blacconiere (1991).

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