

FEDERAL RESERVE BANK OF KANSAS CITY

Economic Review



March/April 1991

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By Charles S. Morris and Gordon H. Sellon, Jr.

One of the more controversial issues in banking concerns the choice of an accounting system for banks. Recent proposals would have banks abandon their traditional accounting system based on historical costs of assets and liabilities in favor of a market value system.

Critics argue the current bank accounting system does not accurately measure bank capital. They believe market value accounting would provide better information for making investment and regulatory decisions.

The banking industry argues that such a radical change is not only unnecessary, but would also have undesirable side effects. In addition, most bankers feel market value accounting would be inaccurate, costly, and difficult to implement.

Morris and Sellon examine the debate over market value accounting. They conclude that market value accounting is conceptually attractive, but that the current proposals have important practical limitations that must be balanced against their benefits.

Will Just-in-Time Inventory Techniques Dampen Recessions?

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By Donald P. Morgan

In the past, fluctuations in inventories have been an important factor in recessions. Indeed, one prominent analyst went so far as to assert that recessions *are* inventory swings.

The role of inventories in recessions may be diminishing, however, as firms increasingly adopt new inventory management techniques. With these techniques, firms reduce and control their inventories by producing just in time to sell. Many analysts claim these techniques—if prevalent and successful—may reduce the inventory swings that aggravated past recessions.

Morgan examines how just-in-time techniques are affecting inventory behavior. He concludes that just-in-time techniques can dampen recessions and may contribute to an earlier end to the current recession.

The Path to European Monetary Union

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By Paula Hildebrandt

In a period of unprecedented change in Europe, economic and monetary union (EMU) has emerged as one of the most important new developments. Europe 1992 is already creating a market with more than 320 million consumers and a productive capacity rivaling that of both the United States and Japan. European monetary union would go even further, implementing a unified European monetary policy.

The 12 member-countries of the European Community are currently debating the Delors Report, which outlines a three-step approach to EMU. The first stage includes the Europe 1992 initiative and has already been accepted. Stages two and three are still being negotiated. They would form a single European central bank and currency.

Hildebrandt outlines the historical background for EMU and the proposed stages of the Delors Report. She describes the European System of Central Banks envisioned in the Delors Report and discusses some of the important issues being debated.

Tax Increases in the Tenth District: Where Will the Money Come From?

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By Glenn H. Miller, Jr.

Strong pressures for increased spending in the 1990s are likely to force state and local governments in the Tenth District to increase taxes. Policymakers will try to hold the line on spending, make spending programs more efficient, and hope that better economic times produce more tax revenues. But these may prove to be unsatisfactory or inadequate responses to the mounting demands for public spending.

Moreover, in an era of "fend-for-yourself federalism," state and local governments must rely less on fiscal aid from the federal government and more on their own resources. It is unlikely, then, that state and local governments will be able to avoid raising taxes. In such a situation, where can state and local governments turn?

Miller describes the principal revenue sources in the district and considers some possible revenue sources. He concludes that district governments might well decide to boost revenues by increasing personal income taxes.

Market Value Accounting for Banks: Pros and Cons

By Charles S. Morris and Gordon H. Sellon, Jr.

One of the more controversial issues in banking currently concerns the choice of an accounting system for banks. Recent proposals would have banks abandon their traditional accounting system based on historical costs of assets and liabilities in favor of a market value system. Some of the more moderate proposals call for reporting selected assets at market value. More comprehensive proposals would have banks mark to market all bank assets, liabilities, and off-balance-sheet items.

The push for market value accounting is largely motivated by changes in financial markets over the past decade. In an environment of greater interest rate volatility and increased bank failures, critics argue that the current bank accounting system does not accurately measure bank capital. They believe that by overcoming the limitations of the current system, market

value accounting would give bank owners, creditors, and regulators better information for making investment and regulatory decisions.

The banking industry strongly opposes market value accounting, however. Bankers argue that such a radical change is not only unnecessary, but would also have undesirable side effects. Moreover, most bankers feel market value accounting is infeasible because it would be inaccurate, costly, and difficult to implement.

This article examines the merits of market value accounting. The article concludes that market value accounting is conceptually attractive, but that market value proposals have important practical limitations that must be balanced against their benefits. The first section examines the objectives of a bank accounting system, the principal features of the current system, and its strengths and weaknesses. The second section shows how market value accounting could improve on a book value approach. The third section discusses the pros and cons of recent market value proposals.

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What's Wrong With the Current System?

Bank owners, creditors, and regulators rely on accounting information for making investment and regulatory decisions. The current bank accounting system is based on a historical cost approach to measuring a bank's capital. A strength of the current system is that bank capital reflects changes in credit quality. One weakness of the current system, however, is that capital does not reflect changes in interest rates. Moreover, the current system can be manipulated to provide misleading estimates of bank capital.

Purpose of a bank accounting system

One of the most important pieces of information provided by a bank accounting system is a measure of a bank's net worth, or capital. Capital is the difference between the values of a bank's assets and liabilities. Capital plays a dual role in a bank. On the one hand, it represents the investment stake of bank owners. That is, it represents the amount of money bank owners would lose if unexpected losses forced the bank to be closed. On the other hand, by absorbing these losses, it acts as a buffer that protects creditors and depositors against financial loss.

The level of capital can influence the decisions made by bank owners, creditors, and regulators. Because capital represents the amount of money owners would lose if a bank fails, they are likely to choose less risky activities when the level of capital is high. Bank creditors are likely to lend more to a bank with a large capital cushion than to a bank with a small capital cushion. And, regulators may choose to increase the degree of supervision or even close a bank when capital levels become too low.

Accurate measures of capital are necessary to make correct investment and regulatory

decisions. An important criterion of a bank accounting system is that capital accurately reflects the effects of a bank's risk exposure. In addition, banks should not be able to manipulate the measure of capital to mislead outside investors, creditors, and regulators.

A good measure of capital should reflect changes in the credit quality of a bank's loans and investments. All banks are exposed to credit risk—the risk that loans or other investments will not be repaid. Since bank depositors and creditors must be paid before owners receive any profit, credit losses may reduce a bank's capital. In the extreme, these losses may eliminate capital, causing the bank to be closed.

Capital should also reflect the effects of interest rate changes. Many banks are exposed to interest rate risk—the risk that changes in interest rates will affect a bank's current and future earnings. Changes in interest rates may affect bank earnings because profits depend on the difference between the interest received on loans and securities and the interest paid out to depositors and other bank creditors. A change in interest rates that eliminates this interest spread can cause losses that will reduce the value of a bank's capital.

An accounting system also should not be subject to manipulation if it is to provide an accurate measure of capital. For example, if a fall in the value of an asset causes the true value of capital to decline, an accounting system should not have rules that allow discretion on whether or not the decline is recognized in measured capital.

Features of the current accounting system

The present bank accounting system is based on a view of banking that dates back to the 1930s. According to this view, banks make loans or acquire securities with the intention of

holding them to maturity. In the absence of credit losses, banks can expect to receive the full value of these investments at maturity. That is, the bank can generally expect to receive the original contractual interest payments plus principal. In this view, changes in the current value of an asset due to changes in market interest rates are generally ignored. Such changes are viewed as temporary and as having no effect on an asset's cash flow or a bank's ability to collect the full value of the asset at maturity (Federal Deposit Insurance Corporation).

Following this approach, the current bank accounting system requires all assets that a bank intends to hold to maturity and all bank liabilities to be recorded on the bank's books at historical cost.¹ In practice, all bank loans are reported at cost because they are expected to be held to maturity. For securities, the bank must indicate whether it plans to hold them to maturity or engage in active trading. Those securities that a bank intends to hold to maturity are held in its investment account and are reported at cost.² Other securities are held in the bank's trading account and are reported at current market values.³ As a practical matter, most banks hold very few securities in trading accounts so that the vast majority of bank assets are reported at cost.

Under the current system, the book value of capital may differ from historical cost. For example, when repayment on an asset becomes doubtful a bank must provide reserves for the impaired asset because it can no longer expect to receive the full value of the asset at maturity. This increase in reserves reduces the bank's capital below historical cost. The book value of assets will also increase or decrease due to capital gains or losses realized upon the sale of loans or investment account securities. For example, if a bank sells an investment security before maturity at a capital gain, the gain increases the book value of its capital. Finally,

since assets in the trading account are reported at market value, both realized and unrealized capital gains and losses on these securities can affect the value of capital.

Strengths and weaknesses of the current system

One test of the current bank accounting system is whether it provides an accurate measure of capital. From this perspective, the current system has one important strength but two significant weaknesses.

The strength of the current system is that capital reflects changes in credit quality. Under the current system, book values of capital are marked down for expected credit losses. Most bank failures in recent years have been caused by credit losses on energy, agriculture, real estate, and foreign loans. Thus, capital as measured in the current accounting system reflects banks' principal risk exposure.⁴

One weakness of the current system, however, is its neglect of changes in interest rates. Under the current accounting system, interest rate changes do not affect the value of bank capital because they do not affect the values of assets or liabilities recorded at cost.⁵ If a bank's earnings are exposed to interest rate risk, however, interest rate changes can cause future losses and the eventual failure of the bank. Indeed, in a world of increased interest rate volatility, failures due to changes in interest rates are more likely. Thus, the current accounting system may not accurately measure a bank's capital.

A second limitation of the current accounting system is that it allows banks to manipulate the book value of capital. This accounting abuse arises because of the asymmetrical treatment of realized and unrealized capital gains for most bank assets and liabilities. For assets and liabilities reported at cost, only *realized* capital

gains or losses affect the book value of the bank capital. Thus, a bank can boost current income and capital by selling assets that have increased in value while not recognizing losses on other assets. By selectively realizing capital gains, banks may provide potentially misleading information.⁶

The Case for Market Value Accounting

Critics of the current bank accounting system argue that changes in financial markets have undermined the reliability of this system. They believe a market value accounting system would overcome the limitations of the current system and thereby provide bank owners, creditors, and regulators with a more relevant measure of capital.

Motivation for market value accounting

In the past decade, market value accounting has grown from a largely academic issue to become the center of an active policy debate. Academic economists have long advocated a market value approach, arguing that market values, not book values, reflect the true economic values of financial instruments and institutions (Benston and others; Benston). More recently, the accounting profession, some regulatory agencies, and legislators have suggested that some form of market value accounting be implemented for banks, thrifts, and other financial institutions.⁷

The growing support for market value accounting can be explained by changes in financial markets and institutions during the 1980s. These changes accentuated the limitations of the current bank accounting system. For example, with financial deregulation and the associated increase in interest rate volatility, interest rate risk has become a greater concern for banks and other financial institutions. In

addition, the growing number of bank failures and the deposit insurance crisis have emphasized the need for more accurate and timely information on banks' capital position. Because the current bank accounting system does not reflect banks' interest rate exposure and permits accounting abuses designed to inflate reported capital, critics have increasingly supported a change to market value accounting.⁸

Features of a market value system

Under market value accounting, banks measure all assets, liabilities, and off-balance-sheet items at current market value rather than historical cost. This information is used to determine a market value measure of bank capital. The market value of bank capital reveals the impact of changes in credit quality and interest rates on bank earnings.

Measuring market value of assets and liabilities. The market value of a financial instrument can be defined as the current price at which the instrument can be bought or sold. Obtaining market values is relatively easy for some bank assets and liabilities, but more difficult for others. Market prices are readily available for assets such as government securities, which are actively traded. But for instruments that are not actively traded, including most bank loans and deposits, market values must be estimated.

For many assets and liabilities, market values can be estimated using a present value model. In general, the price an investor will pay for a financial instrument depends on the return he will receive from this investment relative to the return on competing investments. Thus, as shown in the following equation, the market value of a financial instrument (MV) with maturity of T years is equal to the future interest cash flows (C) plus principal repayment (P), discounted by a market interest rate (r), which

represents the return on alternative investments.

$$MV = \frac{C}{(1+r)} + \frac{C}{(1+r)^2} + \dots + \frac{C}{(1+r)^T} + \frac{P}{(1+r)^T}$$

This model shows how changes in credit quality and interest rates affect the market value of bank assets and liabilities. For example, a fall in the credit quality of bank assets is reflected by smaller expected interest or principal payments. Accordingly, the smaller cash flows reduce the market value of the asset.

The impact of interest rates is more complicated and depends on the types of assets and liabilities a bank holds. Assets and liabilities are generally of two kinds: fixed rate and variable rate. On a fixed-rate asset or liability, such as a Treasury security or long-term certificate of deposit, a bank receives or pays a contractually fixed interest rate for a specified period of time. In contrast, on a variable-rate instrument, such as an adjustable rate loan or deposit, the contractual interest rate varies directly in response to market interest rates.

Market values of fixed-rate instruments vary inversely with market interest rates. As shown in the market value equation, if contractual interest payments (C) and principal payment (P) are fixed, a rise in market rates (r) causes market value to fall. That is, an investor will pay less for a financial instrument when its earnings are fixed and the return on alternative investments rises.

In contrast, interest rate changes do not affect the market value of variable-rate instruments. For example, the market value of these instruments is unchanged if contractual interest payments rise in direct response to an increase in market rates. Market value does not fall when rates rise because future earnings on the variable-rate instrument also increase, leaving the return on the investor's instrument the same as on alternative investments.⁹

The market value of bank capital. With

market values for all assets, liabilities, and off-balance-sheet items, a bank can determine the market value of capital. Changes in this measure will reflect the impact of changes in credit quality and interest rates on the bank's current and future earnings.¹⁰

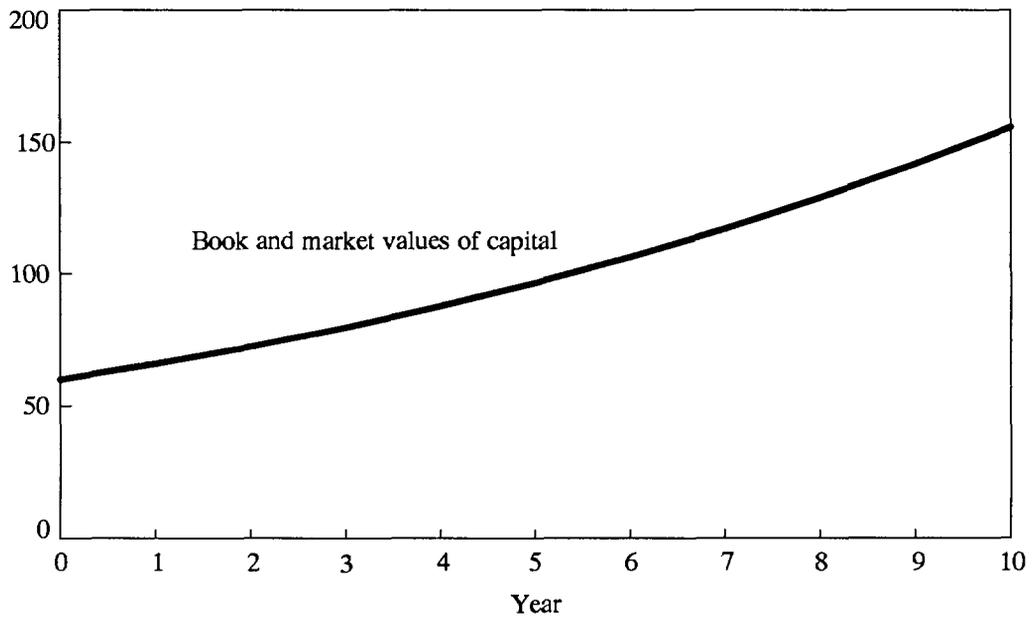
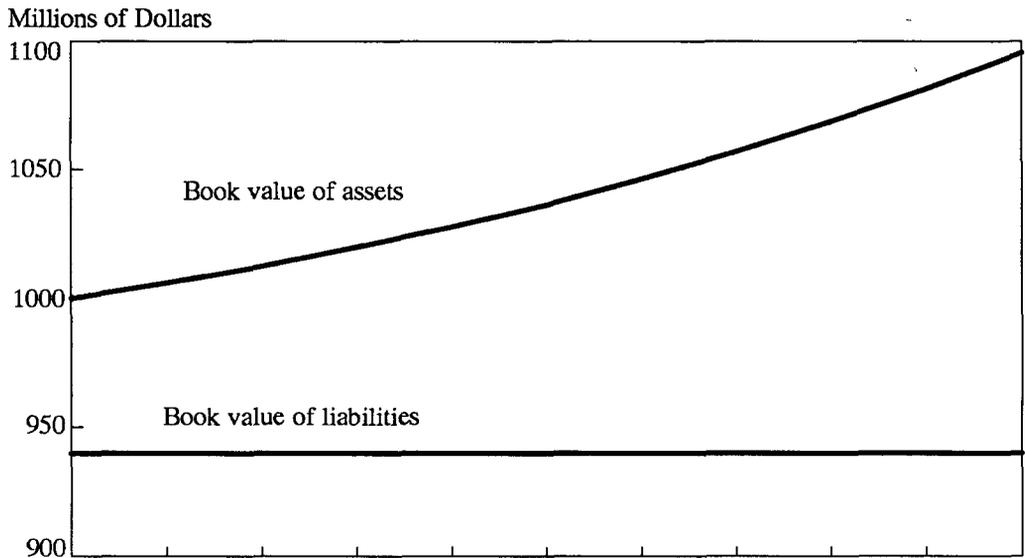
A decline in credit quality directly reduces the market value of a bank's capital. Lower credit quality causes a bank to suffer reduced current and future earnings from loans and other assets. Because smaller expected cash flows from assets lower the market value of bank assets but not liabilities, the market value of the bank's capital will fall.

Interest rate changes may or may not affect the market value of capital. The response depends on the types of assets and liabilities held by the bank. For example, if a bank has variable-rate assets matched by variable-rate liabilities, interest rate changes will not affect the market values of either assets or liabilities. As a result, the market value of capital will be unchanged. The market value of a bank with long-term fixed-rate assets funded with long-term fixed-rate liabilities also would not change when interest rates change. In this case, the market value of the assets and liabilities individually would change, but the market value of their difference—capital—would not change.

In contrast, changes in interest rates will affect the market value of capital when a bank has a mismatch of assets and liabilities. For example, with fixed-rate assets and variable-rate liabilities, an increase in market rates will lower the market value of assets but not liabilities. Thus, in this situation higher interest rates will lower the market value of capital.¹¹

The response of the market value of capital to interest rates simply reflects the impact of interest rates on a bank's current and future earnings. Interest rate changes do not affect earnings when assets and liabilities are matched because changes in interest income are offset by

Chart 1
Book and Market Values
No Change in Interest Rates



changes in interest expense. When assets and liabilities are unmatched, however, interest rate changes will affect earnings. With fixed-rate assets and variable-rate liabilities, for example, a rise in interest rates reduces bank earnings because interest expense rises while interest income is unchanged.

Advantages of market value accounting

Proponents believe that a market value framework overcomes the two principal limitations of the current bank accounting system. Specifically, they argue that a market value system provides a better measure of capital when a bank is exposed to interest rate risk and eliminates accounting abuses caused by the current system.

Market value reflects changes in interest rates. As discussed earlier, one limitation of the current accounting system is its neglect of the effects of changes in interest rates on capital. In assuming that banks hold assets to maturity, the current system implicitly assumes that interest rate changes will not significantly affect a bank's earnings or its solvency.

Market value proponents believe, instead, that changes in financial markets have left banks increasingly exposed to interest rate risk. They feel that because a market value approach accounts for the effect of this risk, it is superior to a book value system.

The advantages of a market value system can be illustrated with a numerical example. Consider a bank with a severe interest rate exposure—\$1 billion of 10-year fixed-rate bonds funded with \$940 million of variable-rate deposits and \$60 million of capital. Initially, the bank is assumed to receive 10 percent interest on these bonds and to pay 10 percent on its deposits.¹² Book and market value of capital are initially equal to \$60 million, or 6 percent of assets.¹³

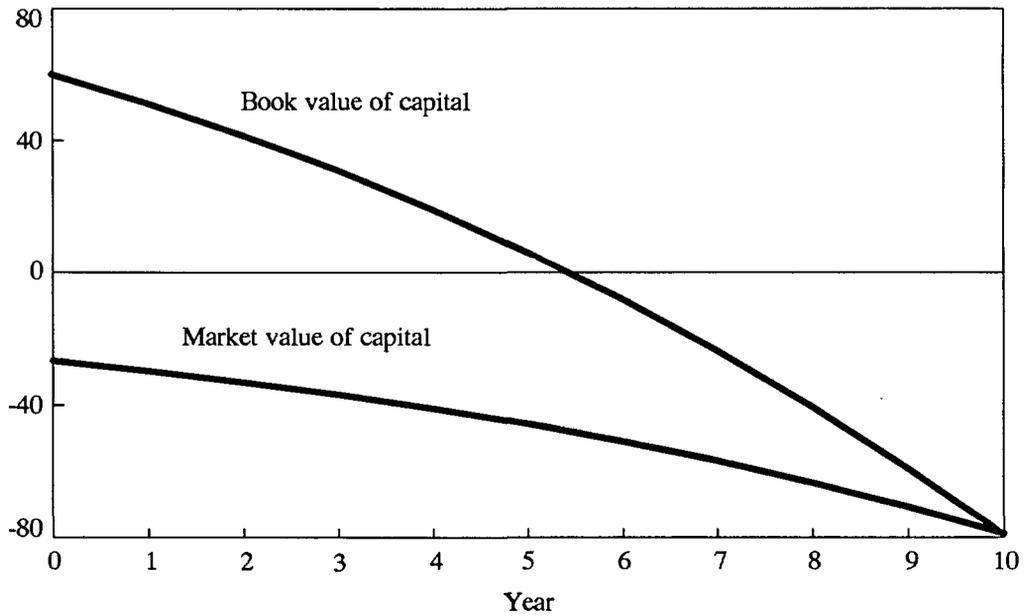
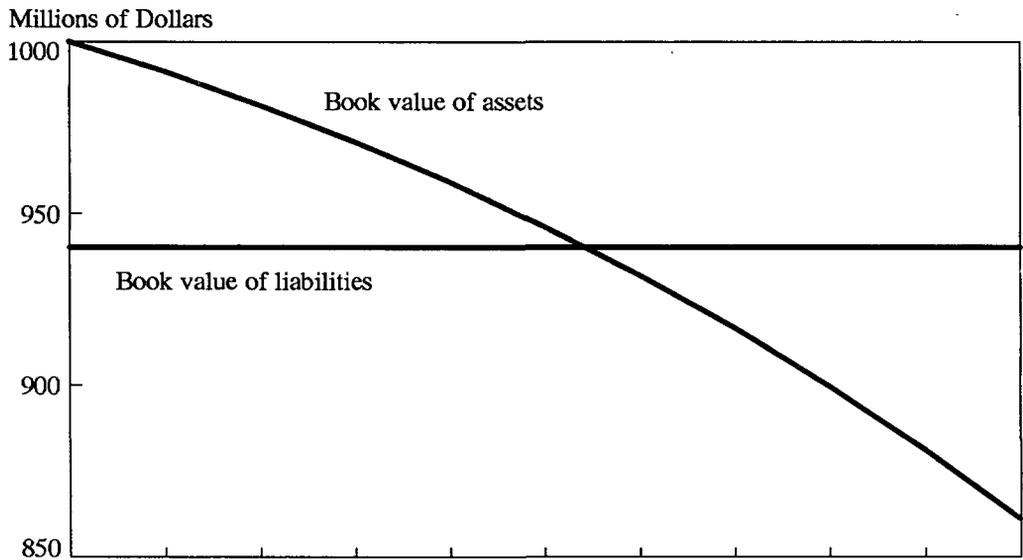
Chart 1 shows the condition of this bank over time assuming no change in credit quality or interest rates. Bank owners receive a 10 percent return on their investment and reinvest their earnings in new assets so that the book value of assets and capital increases over time. With no change in credit quality or interest rates, the book and market values of capital are always equal and provide the same information about the bank's condition.

This bank's interest rate exposure is so severe, however, that a small increase in interest rates will cause losses that lead to insolvency. Chart 2 shows the impact of a 150-basis-point rise in interest rates. The bank now pays 11.5 percent on its variable-rate deposits but continues to receive only 10 percent on its fixed-rate assets. Because interest expense rises above interest income, the bank suffers losses. These losses force the bank to sell some of its fixed-rate assets to pay depositors, causing the book value of assets and capital to decline. The bank's losses are so severe that they exhaust its capital, causing the bank to become insolvent on a book value basis long before the scheduled maturity of its assets.

In this example, the current market value of the bank's capital shows these problems, while current book value does not. Market value falls immediately from \$60 million to -\$27 million, reflecting the negative effect of higher interest rates on future earnings.¹⁴ Thus, the market value of capital not only anticipates the eventual decline in the book value of capital but also the eventual book value insolvency of the bank. In contrast, book value does not fall immediately. Instead, it declines over time only as earnings fall. Thus, book value does not anticipate the future earnings problems.

Overcoming accounting abuses. Market value accounting is also seen as a solution to accounting abuses arising under the current bank accounting system. One abuse is the

Chart 2
Book and Market Values
 Interest Rates Rise 150 Basis Points



practice of gains trading in which banks can selectively realize capital gains by selling investment account assets that have appreciated in value. These realized gains boost current income and increase the book value of a bank's capital. However, the bank can continue to value assets with unrealized losses at book value. This practice is potentially misleading to the extent that it suggests that higher current income and capital imply higher future income and capital.¹⁵

A market value accounting system would eliminate gains trading and other similar practices. Under market value accounting, no distinction is made between realized and unrealized capital gains, since all assets and liabilities would be reported at current market values. Thus, it would not be possible for a bank to report gains on some assets without also reporting losses on other assets.

Market Value Proposals and Critiques

In light of the benefits of market value accounting, several proposals have been advanced to increase the use of market value accounting by banks. These proposals range from partial approaches that only measure certain assets at market value to more comprehensive programs in which all assets, liabilities, and off-balance-sheet items are marked to market. Despite the conceptual appeal of market value accounting, however, critics have raised a number of objections to its use by banks (American Bankers Association; Independent Bankers Association of America; and *ABA Banking Journal*). This section discusses the pros and cons of some of the principal market value proposals.¹⁶

Partial market value accounting

Proposals. Most partial market value proposals would require banks to mark some or

all of their tradeable securities to market. Loans, other nonmarketable assets, and all liabilities would continue to be measured on a book value basis. Under these proposals, many securities currently reported at cost in the investment account would be reported at market value. Because unrealized capital gains and losses would affect a larger share of bank assets, measured capital would become more volatile.

The stimulus for partial market value approaches comes from two sources. One motivation is cost or feasibility. Market values for tradeable securities are easily obtained, while market values for bank loans and liabilities would have to be estimated. Thus, some proponents see a partial approach as an initial step toward a more complete market value system. Partial approaches are also viewed as a solution to current accounting abuses, such as gains trading.

One example of a partial approach is a recent proposal by the Federal Financial Institutions Examination Council directed at the gains trading problem (1990). Under current accounting rules, if banks classify assets that they do not intend to hold to maturity as investments, they can pursue a gains trading strategy to boost the book value of equity. The FFIEC proposal would tighten restrictions on assets held in the investment account, effectively forcing banks to reduce the amount of securities held in the investment account.¹⁷ As a result, banks would be expected to value more of their security portfolio at market prices.

Critiques. Most criticism of partial market value proposals focuses on the increased volatility of bank earnings and capital. Some critics argue that any increase in volatility is bad because it will discourage investors from buying bank stock and will lead creditors to demand higher risk premiums for holding bank debt. Other critics attack the asymmetrical nature of the partial approach—assets are marked to

market but liabilities are not. According to these critics, marking assets but not liabilities to market will produce an increase in volatility that may misrepresent a bank's true condition.

Critics also charge that banks may be led to make undesirable changes in the structure of their balance sheets. For example, banks might be led to reduce their holdings of long-term Treasury securities in favor of less volatile shorter term assets. Banks might also be inclined to shift from marketable securities to non-marketable assets, such as loans, to reduce the volatility of earnings and capital.

Evaluation. Whether the increased volatility of earnings and capital resulting from partial market value accounting is good or bad depends largely on whether a bank is exposed to interest rate risk. For banks exposed to interest rate risk, the volatility of market values reflects its true exposure to changes in interest rates. This volatility, therefore, provides useful information.¹⁸

However, if a bank is not exposed to interest rate risk, a partial market value approach may do more harm than good. Suppose, for example, that a bank has long-term fixed-rate assets matched by long-term fixed-rate liabilities. Both the book value and true market value of this bank's capital are unaffected by interest rate changes. Under a partial approach that marked assets but not liabilities to market, however, measured capital would change. This increased volatility would be artificial, providing a misleading signal of the bank's true interest rate exposure.¹⁹

Changes in bank portfolios due to partial market value accounting may also be beneficial or harmful. A shift from long-term securities to short-term securities is desirable if a bank is funding the securities with short-term liabilities because this shift would also reduce the bank's interest rate exposure. However, if the bank is funding the long-term securities with long-term

liabilities, such a shift would increase the bank's exposure to changes in interest rates. Moreover, a shift in the bank's portfolio from marketable securities to non-marketable assets could be detrimental. Such a shift could reduce the overall liquidity of the bank's asset portfolio and, at the same time, increase the bank's exposure to credit risk.

Full market value accounting

Proposals. More comprehensive market value proposals go beyond partial approaches in requiring banks to provide market values for most, if not all, assets, liabilities, and off-balance-sheet items. These proposals fall into two categories. Some merely require banks to disclose market values as footnotes on financial statements. Other proposals go further in requiring banks to use market values instead of book values as the basis for financial reporting.

Currently, the most comprehensive market value approach is a recent proposal for increased disclosure advanced by the Financial Accounting Standards Board (1990). Existing accounting rules require market value disclosures only for selected financial instruments. The FASB proposal would extend disclosure to virtually all financial instruments that are on or off the balance sheet. This proposal recognizes, however, that it may be too costly to estimate the market value of some instruments. As a result, the FASB proposal falls short of being a complete market value system.²⁰

Critiques. Bankers and other critics have raised many objections to comprehensive market value accounting. These critiques generally fall into three categories: market value accounting is unnecessary, potentially harmful, or infeasible.

The argument that market value accounting is unnecessary reflects the traditional view that banks hold loans and most other assets to

maturity. In this view, changes in the current market values of assets caused by interest rate changes do not affect a bank's ability to collect the full value of an asset at its scheduled maturity.

Other opponents argue that market value accounting is unnecessary because interest rate risk is not a large problem for banks. According to this view, most problems at banks are related to changes in credit quality rather than to changes in interest rates. Because the current system already reflects changes in credit quality, a change to a market value system would provide few, if any, benefits.

Many bankers believe that full market value accounting would lead to increased volatility of earnings and capital. As in the case of partial market value accounting, this increased volatility is seen as harmful to banks because it would become more difficult and costly to raise funds from investors and creditors.

Most arguments against comprehensive market value accounting, however, focus on the cost and difficulty of implementing such a system. Many bankers would argue that partial approaches are at least feasible, even if not desirable, because they rely on tradeable securities for which market values are readily obtained. Full market value accounting would require the estimation of market values for many financial instruments that have no established markets.²¹

Because of the need to estimate market values, critics of market value accounting argue that market values are costly to obtain and potentially inaccurate. For example, in using a present value model to calculate the market value of a loan, a bank would need to estimate the expected future cash flows from the loan, determine the appropriate period over which to discount, and choose appropriate discount rates. This process might be relatively easy for certain types of loans and deposits with contractual cash

flows and fixed maturities. Calculating market values could be considerably more difficult, however, for other items, such as highly leveraged loans, loans with prepayment options, and intangible assets. Thus, critics of market value accounting see estimated market values as more costly and less reliable than traditional book values.

Evaluation. A weakness of the "hold to maturity" objection to market value accounting is that it ignores interest rate risk. Regardless of whether a bank intends to hold its assets to maturity, if interest rates rise and the bank is exposed to interest rate risk, the value of the capital cushion protecting creditors and depositors will decline. Moreover, as was shown in Chart 2, banks exposed to interest rate risk may not be able to hold assets to maturity. Higher interest rates may lead to an increase in funding costs that cause losses, forcing banks to sell assets prior to maturity. Thus, contrary to the traditional view, changes in current interest rates can affect the ability of a bank to collect the full value of an asset at maturity.

While changes in credit quality were the primary cause of bank problems in the past, interest rate risk may be more of a problem for banks in the future. With the decline of the S&L industry, banks are becoming increasingly involved in activities exposed to high degrees of interest rate risk, such as home mortgage lending and investments in mortgage-backed securities. Banks are also increasing their exposure to interest rate risk by selling products to manage interest rate risk, such as interest rate swaps. With a market value accounting system, problems related to interest rate risk will show up in measures of capital before they become too large.

The second objection, that full market value accounting will lead to harmful volatility of earnings and capital, is also flawed. If a bank is not exposed to interest rate risk, a full market

value approach will not lead to increased volatility. While interest rate changes may affect the market values of assets and liabilities separately, they will not affect the market value of capital. In contrast, if a bank is exposed to interest rate risk, market value accounting will lead to increased volatility of earnings and capital. However, an accounting system that reflects this volatility is good, not bad, because it reveals a bank's true exposure to changes in interest rates.

In contrast to the first two objections, criticisms of full market value accounting based on feasibility have more merit. One issue is the accuracy of market value measures of bank capital. The case for market value accounting is based on the view that market values provide a more accurate measure of a bank's capital. Because market values must be estimated for many financial instruments, however, estimated market values may be inaccurate measures of true economic values.²² If so, it might be argued that market value accounting may not be an improvement over the current bank accounting system.

While important in principle, this criticism is subject to two practical qualifications. First, even recognizing inaccuracies, market value estimates may still be more accurate and relevant than book values. For banks exposed to interest rate risk, for example, imprecise estimates of market value may still provide better information than accurate, but irrelevant, book values (Mengle 1989). Second, inaccuracy is most likely to be a significant problem in the early stages of using a market value framework and for instruments that require complex valuation models. As banks and regulators gain more experience and develop better valuation models, this source of inaccuracy is likely to become less important. Thus, rather than undermining the basis for market value accounting, the accuracy issue may suggest

the need for caution in the use of market value information and a gradual approach to implementation.²³

Another difficulty with full market value accounting is its potential cost. Implementing a full market value system would clearly be costly to banks that must estimate market values, particularly for smaller institutions that do not have the necessary resources and expertise to implement such a system. Banks would have to collect new information for calculating market values, develop systems to keep track of the data, and train personnel to use the systems. Market value accounting would also be costly for supervisory agencies responsible for verifying and monitoring this information. This burden could be especially large when institutions with complex operations are examined.

Although full market value accounting will certainly be more costly than the current system, these costs must be balanced against the benefits of market value accounting to individual banks and to society. Market values can provide more accurate and relevant information about a bank's capital. This information can lead to better risk management that improves the performance of bank managers and increases the investment return to bank owners. Market value information may also enable regulators to take actions that reduce the likelihood of bank failure, protecting the interests of depositors, creditors, and taxpayers.

Summary and Conclusions

Market value accounting is conceptually attractive because it overcomes serious limitations of the current bank accounting system. To the extent that market values provide a more accurate measure of a bank's health, bank owners, creditors, and regulators would have better information for making investment and regulatory decisions.

The difficulty with market value accounting lies in its implementation. The various partial and full market value proposals all have limitations that must be balanced against their benefits. Partial proposals would reduce accounting abuses such as gains trading and would not be costly to implement. At the same time, however, partial approaches do not show an institution's full interest rate exposure and may lead to artificial and misleading volatility of capital. Full market value accounting would show a bank's interest rate exposure and would also eliminate accounting abuses. However, this

approach would be more costly to implement. Moreover, until better valuation models are developed, full market value accounting might not provide accurate measures of bank capital.

In deciding whether to require banks to adopt market value accounting, regulators will have to weigh these advantages and disadvantages. If regulators decide that the benefits of market value accounting outweigh its costs, the time and effort needed to develop accurate market value models suggest a gradual approach to implementation.

Endnotes

¹ Assets are actually reported at amortized cost. For loans and other assets that repay some principal before maturity, amortized cost is the difference between historical acquisition cost and principal payments. For securities bought at a discount, the difference between maturity value and discounted price is amortized as income over the life of the security. Throughout this article, cost should be understood to mean amortized cost.

² Prior to 1938, all securities were reported at market value. At that time, it was believed that requiring banks to report securities at market value caused excessive volatility in earnings and capital that reduced banks' ability to make business loans (Federal Deposit Insurance Corporation).

³ Securities held with the intent to sell, but which are not actively traded, are reported in the trading account at the lower of cost or market value. Because intent to sell is difficult to determine, most securities in the trading account are reported at market value.

⁴ It could be argued that capital does not accurately reflect banks' exposure to credit risk because the current system allows too much discretion in providing reserves for expected loan losses (U.S. Department of the Treasury). For example, banks have not had to fully mark down their loans to lesser developed countries.

⁵ Changes in interest rates will affect a bank's capital to the extent that trading account assets make up a large share of total assets. For most banks, the share of assets in trading accounts is very small so that interest rate changes generally have little impact on capital under the current accounting system.

⁶ Another weakness of the existing accounting system is that it does not reflect foreign exchange risk. Although

foreign exchange risk could be incorporated into a market value framework, this issue is beyond the scope of this article.

⁷ Market value proposals have recently been developed by the American Institute of Certified Public Accountants (1990), the Financial Accounting Standards Board (1990), the Federal Financial Institutions Examination Council (1990), and the Office of Thrift Supervision (1990).

⁸ Another factor motivating market value accounting is the changing role of banks in the financial system. During the 1980s many banks began to move away from traditional portfolio lending toward investment banking activities. Moreover, such assets as loans, which banks traditionally held to maturity, were increasingly securitized and sold.

⁹ Some assets and liabilities have a combination of fixed-rate and variable-rate features—for example, a variable-rate mortgage with an annual cap. The sensitivity of the market values of such instruments to interest rate changes will differ from the simple fixed-rate and variable-rate instruments described in the text.

¹⁰ For simplicity, the treatment of off-balance-sheet items is ignored throughout this article.

¹¹ Because the market value of a long-term instrument changes more than the market value of a short-term instrument in response to a change in interest rates, the same result would occur if the bank had long-term fixed-rate assets funded by shorter term fixed-rate liabilities.

¹² For simplicity, this example assumes there is no spread in the yields on assets and liabilities. This assumption does not affect the qualitative results of the example.

¹³ This example assumes the yield curve is flat. The market value of assets is calculated using the present value formula.

Because the rate on liabilities adjusts immediately to changes in interest rates, the market value of liabilities will always equal the original book value of \$940 million. The bank in this example clearly does not correspond to any real bank. Despite this lack of realism, however, this example provides a graphic illustration of the dangers of interest rate risk.

¹⁴The 150-basis-point increase in interest rates causes the market value of the 10-year bonds to fall from \$1 billion to \$913 million, while the market value of liabilities remains unchanged at \$940 million. Thus, the market value of capital falls to -\$27 million.

¹⁵Because assets sold at a capital gain have yields above current market rates, a bank is effectively trading higher current income for lower future income.

¹⁶For a more detailed discussion of the pros and cons of market value accounting, see U.S. Department of the Treasury.

¹⁷Under current supervisory reporting rules, securities held for sale are reported in the trading account at the lower of cost or market value. The FFIEC proposal adds a held-for-sale account for reporting purposes. Securities that do not meet the criteria for inclusion in the investment or trading portfolios would be reported in the held-for-sale account at the lower of cost or market value. Loans held for sale would also be included in this account. The proposal provides guidelines for banks to follow in determining which assets should be included in the three accounts.

¹⁸A partial system does not reflect an institution's complete interest rate exposure to the extent that some fixed-rate assets are not reported at market value.

¹⁹For a bank with variable-rate assets matched by variable-rate liabilities, a partial system would not have any effect since all assets and liabilities would already be recorded at market value.

²⁰Because the FASB proposal does not require complete disclosure, it may not be possible to calculate a market value measure of capital. Thus, it may not be possible to examine an institution's overall interest rate exposure.

²¹For a more complete discussion of issues involved in implementing market value accounting for banks, see Berger and others; Mengle (1989, 1990).

²²Some people argue that market values for traded instruments may also be inaccurate because their prices do not reflect fundamental economic factors. For a discussion of this issue, see U.S. Department of the Treasury.

²³Even if the level of the market value of capital is difficult to estimate, the sensitivity of market value to interest rate changes may be accurately measured. If so, closure decisions based on an estimated level of the market value of capital would require caution. However, the sensitivity of market values to hypothetical changes in interest rates could still be used to determine a bank's exposure to interest rate risk.

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Will Just-In-Time Inventory Techniques Dampen Recessions?

By Donald P. Morgan

In the past, fluctuations in inventories have been an important factor in business cycles, particularly in recessions. Indeed, one prominent analyst went so far as to assert: “Recessions *are* inventory swings” (Blinder). Recent signs, however, suggest the role of inventories in recessions may be diminishing. While recessions in the past were often foreshadowed by a rising inventory-sales ratio, the current recession was not. In fact, the inventory-sales ratio has declined noticeably since the last recession ended in 1982.

This unusual behavior in the inventory-sales ratio may be due to inventory management techniques adopted by some U.S. firms in the 1980s.

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With these techniques, firms reduce and control their inventories by producing just in time to sell. Many analysts claim these techniques—if prevalent and successful—may reduce the inventory swings that aggravated past recessions. This recession and future recessions may be milder as a result.

This article concludes that just-in-time techniques will dampen recessions. The first section of the article reviews the role of inventories in past recessions and considers signs this role may be changing. The second section discusses how firms reduce their inventories with just-in-time techniques and where such techniques are being applied. The third section presents evidence just-in-time techniques are affecting aggregate inventory behavior. The final section explores how recessions will be dampened by these techniques.

Inventories and Business Fluctuations

Inventories figure in business fluctuations in part because inventory investment—the change in the level of inventories—is a component of GNP.¹ In fact, fluctuations in inventory investment play a disproportionate role in GNP fluctuations. While the level of inventory investment represents only about 1 percent of the level of GNP, changes in inventory investment from one quarter to the next usually account for about half of the corresponding changes in GNP.

The role of inventories in recessions

Sharp drops in inventory investment have been especially important in recessions. During the 1973-75 recession, for example, inventory investment declined by \$78.1 billion from the onset of the recession—the business cycle peak—to the end of the recession—the business cycle trough. During the same period, GNP declined \$120.1 billion. Thus, about 65 percent of the decline in GNP was attributed to the decline in inventory investment. The prominent role of inventory investment in the 1973-75 recession was not unusual: on average over postwar recessions, declines in inventory investment accounted for about 80 percent of the decline in GNP.

The reason firms reduce inventories in recessions relates to the reason firms hold inventories in the first place. Businesses have historically held two or three months' worth of sales in inventory to protect against production halts or a sudden increase in sales. But of course sales decline during recessions, so firms' desired inventory stock falls proportionately. To reduce inventories, firms must then reduce inventory investment by scaling

back their production.

The sharp drop in inventory investment during recessions occurs because firms have typically failed to cut production promptly when sales decline. Instead, firms have maintained production for a time after sales declined, perhaps because firms expected sales to rebound quickly. In the meantime, however, inventories accumulated. By the time firms recognized a recession was underway and that sales would remain slow indefinitely, their warehouses were crowded with unwanted inventories. Firms were then forced to cut inventory investment dramatically to balance their inventories with the lower sales rate.

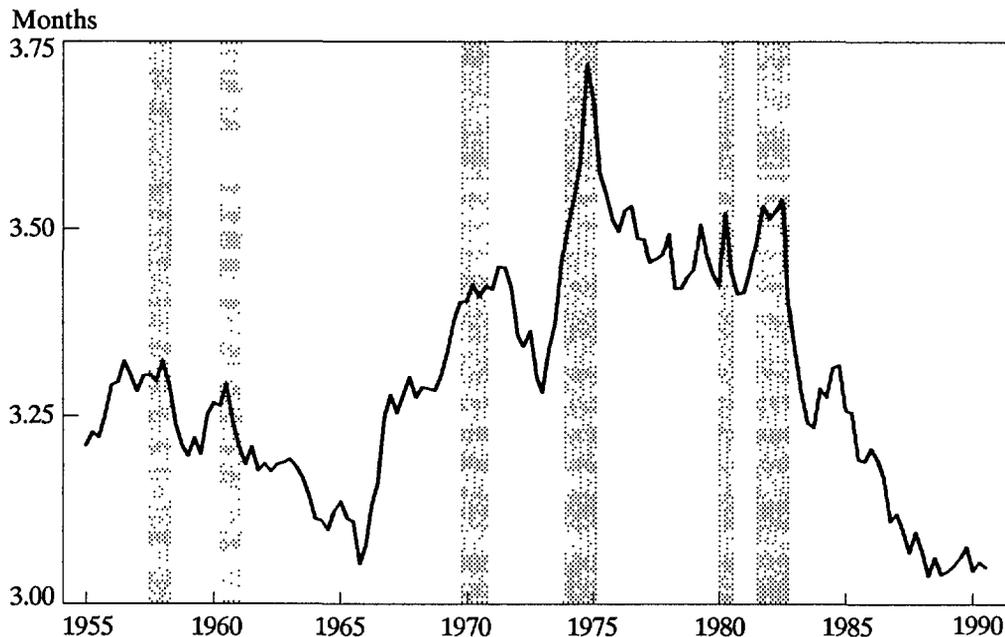
This inventory cycle of rising and then sharply falling inventory investment amplifies recessions. If firms cut production promptly when sales decline, they could prevent unwanted inventories from accumulating. In turn, firms would not need to eventually cut production so sharply, and the recession would be milder.

Evidence the inventory cycle may diminish

The onset of an inventory cycle is usually signaled by a rise in the ratio of inventory to sales. This ratio measures the number of months' worth of sales held as inventories. For example, a firm with \$3 million of inventories in stock and sales of \$1 million per month would have an inventory-sales ratio of three months (\$3 million divided by \$1 million/month).

The inventory-sales ratio typically rises late in the expansion after sales fall and firms allow inventories to accumulate.² Only after firms finally cut production during the recession does the inventory-sales ratio itself begin falling. This behavior of the inventory-sales ratio is evident in Chart 1. The vertical bands in the chart denote recessions: the first vertical line in a band

Chart 1
Aggregate Inventory-Sales Ratio



Source: Board of Governors of the Federal Reserve System.

Note: Vertical bands indicate recessions.

corresponds to a peak in business activity, and the second vertical line corresponds to a trough.³

In the 1981-82 recession, for example, the inventory-sales ratio began rising in the spring of 1981, before the peak in business activity in July. The inventory-sales ratio did not begin declining until near the trough, as firms cut production sufficiently to actually reduce their inventories.

The behavior in the inventory-sales ratio since the 1981-82 recession suggests the role of the inventory cycle may be diminishing. After beginning a sharp decline in 1982, the ratio reached an all-time low in 1988.⁴ Moreover, the ratio merely leveled off rather than rising perceptibly as the current recession began in late 1990. As a result, firms may not need to reduce inventory investment as sharply as in past

recessions. If not, the current recession will be milder. And if the inventory-sales ratio remains low, the role of inventories in recessions may be permanently diminished.

The New Inventory Techniques

Many analysts attribute the low inventory-sales ratio to inventory reduction techniques increasingly adopted by U.S. firms in the 1980s. With these techniques, firms reduce their inventories by purchasing just in time (JIT) to produce and producing just in time to sell. JIT was most widely adopted in the U.S. manufacturing sector in the 1980s, particularly in the automotive and computer industries.

Why do firms use JIT to reduce inventories?

Firms prefer to reduce inventories because holding inventories is costly. Firms incur interest costs in holding inventories because firms could have held interest-bearing assets instead. Inventories also entail costs in the form of insurance, obsolescence, depreciation, pilfering, storage, and handling. Taken together, these various costs average close to 10 percent of the value of the inventory stock per year (Blinder and Maccini). Such high costs are a powerful incentive to reduce inventories.

But inventories are also beneficial to firms. Inventories of materials and supplies used in producing finished goods protect against various problems such as late deliveries or defects. Inventories of finished goods ensure that a firm can satisfy demand in the event of a sudden increase in sales or a production halt. In addition, inventories help firms hedge against inflation. Rapid inflation in the late 1970s and early 1980s motivated firms to stock up on inventories early—before prices rose.

Firms determine their ideal level of inventories by trading off the costs and benefits of inventories. The ideal level of inventories fell after 1983 because the costs of holding inventories rose and the benefits fell. Adding to the cost side were the record-high interest rates in the early 1980s. At the same time, the declining inflation rate after 1982 reduced one of the benefits of holding inventories.

Even if interest rates were to fall or inflation to rise, firms would be expected to hold lower inventories than before adopting JIT. According to just-in-time thinking, holding inventories against such problems as late deliveries or defects is a cost of inventories—not a benefit—because the problems are never solved. Thus, the just-in-time approach is to eliminate the problem, thereby enabling firms to lower inven-

ories permanently (Hay).

Another important factor motivating U.S. firms to reduce inventories in the 1980s was fierce competition from Japanese firms. Many analysts attribute the success of Japanese firms in U.S. markets in part to JIT (Celley and others; Kim and Schniederjans). The use of JIT reduced Japanese firms' inventory costs, which in turn helped Japanese firms undersell U.S. firms. In response to this challenge, U.S. firms sent representatives to Japan to learn how to reduce inventories with just-in-time techniques.⁵

How do firms lower inventories with JIT?

Firms practicing JIT reduce inventories at all stages by purchasing just in time to produce and producing just in time to sell. These practices represent a drastic departure from traditional purchasing and production practices in the United States. Accordingly, firms adopting JIT must confront the problems the traditional practices were designed to accommodate.

To reduce inventories of materials and supplies, firms are changing their purchasing practices under JIT.⁶ Traditional practices called for infrequent orders of large lots of materials and supplies, well in advance of when needed for production. Such practices were intended to minimize ordering and transportation costs and to allow time for late deliveries and inspection of goods upon arrival.

In contrast, just-in-time purchasing calls for frequent orders of small lots of material and supplies, just in time to produce. Upon delivery, materials and supplies are whisked directly onto the assembly line. For example, Hewlett-Packard orders materials and supplies in lots of just a few hours' worth of production, several times a day (Raia 1990).

Just-in-time purchasing requires rapid delivery by suppliers. To speed delivery, suppliers

are encouraged to locate near the buyer. For example, suppliers of General Motors' Buick division are all located within one shift (eight hours) of the manufacturing plant (Raia 1987). In addition, many suppliers are switching from trains to trucks as their primary delivery mode. Trucks are more economical than are trains when delivering small lots. Trucks are also more flexible, permitting delivery on shorter notice and permitting delivery directly to the assembly line to eliminate unnecessary handling.

To reduce inventories of finished goods, manufacturing firms are also changing their production practices under JIT. Traditional manufacturing practices called for production of large batches of goods, which were then stored as inventories until inspected and sold. These practices were intended to minimize the costs of setting up for a production run and to ensure an adequate supply of the finished goods in case of defects, strikes, or a surge in demand.

JIT entails frequent production runs of small batches. Ideally, manufacturers should produce goods continuously at roughly the same rate the goods are sold. That way, if sales decline, production declines in step to prevent inventories from accumulating. To provide for an increase in sales, on the other hand, manufacturers must maintain excess production capacity to avoid missing sales.

JIT also requires firms to reduce the time needed to set up for production of a particular good, in order to respond quickly to new orders. Setup times are being reduced in several ways. Manufacturers are installing more flexible machinery that can be quickly switched between production of different goods. For example, automobile makers are installing computer-aided machinery that is quickly reprogrammed to produce a variety of different components.⁷ And instead of bolting machines to the floor, manufacturers are using quick-release clamps so machines can be moved quickly between

stations where different goods are produced.

Just-in-time purchasing and production both require improved quality control since firms hold smaller inventories against defects. To improve quality, manufacturers and their suppliers are using computer programs to control quality. These programs monitor the dimensions of goods produced and automatically halt production if the dimensions exceed the desired specification. In addition, the technique of ordering and producing in small lots improves quality because defects are detected sooner.

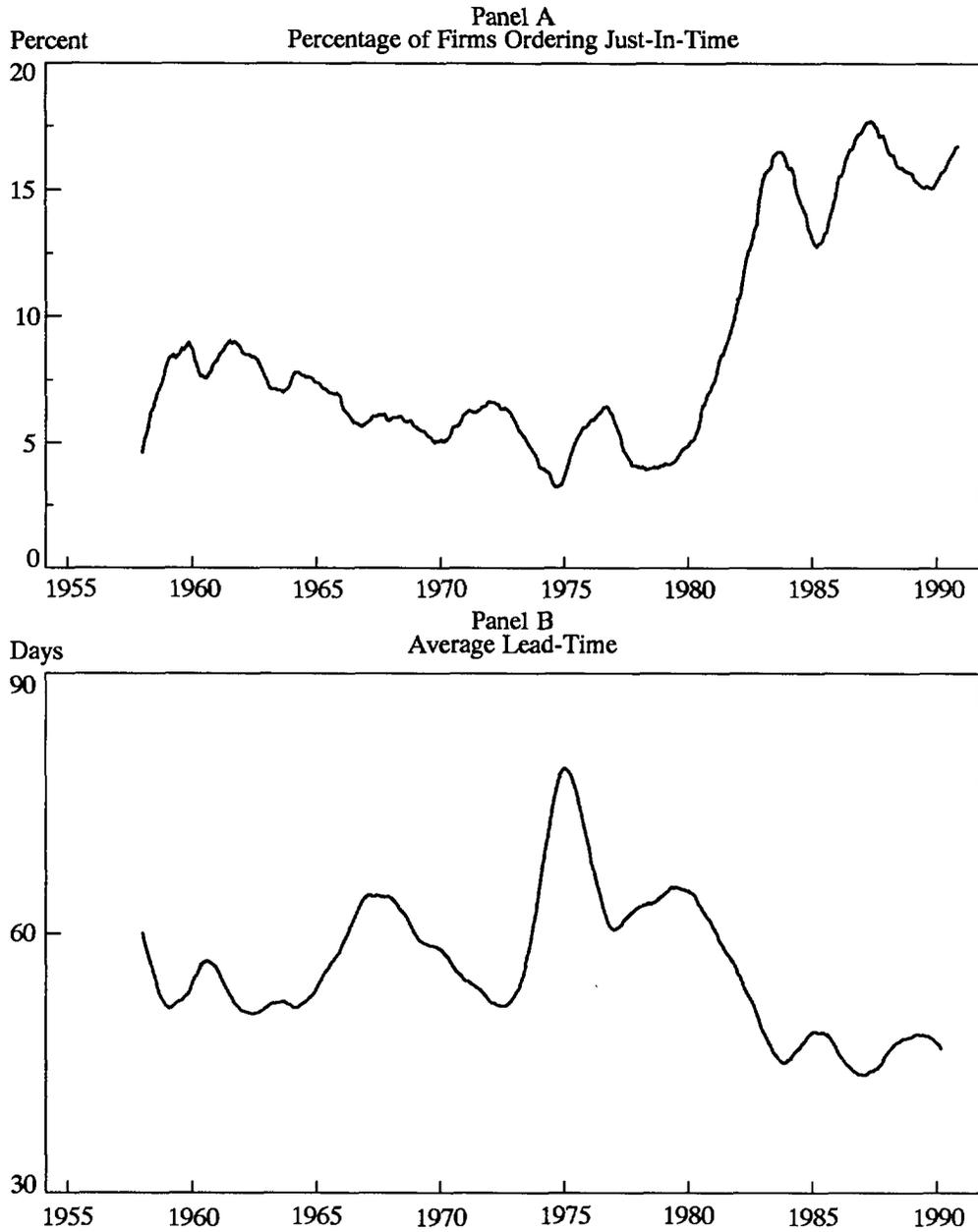
Where was JIT adopted in the 1980s?

A strategy resembling JIT was practiced in the wholesale and retail trade sectors well before 1980 (Ackerman). While this strategy went under a different name—postponement—the principle was the same: postpone ordering as long as possible in order to minimize inventories (Kim and Schniederjans). Grocery store managers, for example, have long lived by this strategy because their stock in trade is perishable. If purchased too soon, food will rot in the warehouse before it is sold.

Under intense competition from Japanese firms, U.S. manufacturing firms began adopting just-in-time techniques in the 1980s (Mecimore and Weeks).⁸ Within the manufacturing sector, adoption of JIT has been most visible at large companies in the automotive industry and the computer and office equipment industry—industries facing the fiercest competition from Japan. The Big Three of the auto industry—Ford, General Motors, and Chrysler—all began practicing JIT to some extent in the early 1980s. In the computing and office equipment industry, Hewlett-Packard, IBM, NCR, and Xerox also adopted just-in-time techniques in the early part of the decade (Zipkin; Im and Lee).

Beyond the few examples just noted, how many other manufacturing firms adopted JIT in

Chart 2
Just-In-Time Purchasing



Source: National Association of Purchasing Managers.

the 1980s? Short of asking each and every firm, this question cannot be answered with certainty. Surveys suggest, however, that a sizable number of manufacturing firms have embraced just-in-time practices.⁹ For example, the percentage of firms ordering materials and supplies just in time increased dramatically beginning around 1980 (Chart 2, Panel A).¹⁰ On average, from 1956 to 1980 only about 5 percent of manufacturing firms were ordering JIT. By 1990 about 15 percent were doing so.

While the fraction of firms ordering JIT tripled in the 1980s, 15 percent is still a small share. As a practical matter, not all firms can completely eliminate inventories of materials and supplies by ordering just in time to produce. Many firms, however, appear to be at least reducing inventories by gradually reducing the lead time between ordering and production (Chart 2, Panel B).¹¹ The average lead time across manufacturing firms has fallen substantially since 1980. After cycling upward from 1960 to 1980, the average lead time was more than 60 days in 1980. Lead times then headed down after 1980. By 1990 the average lead time was only about 45 days.¹²

JIT Reduces Aggregate Inventories

Skeptics assert that firms practicing JIT reduce their inventories by pushing them onto suppliers who may not be practicing JIT. If so, then JIT may amount to *just inventory transfers* at the aggregate level. Evidence against this possibility is the dramatic decline in inventory sales in the sector and industries where JIT was most widely applied in the 1980s.

Is JIT just redistributing inventories?

Individual firms practicing JIT typically report substantial reductions in inventories. Hewlett-Packard, for example, reduced inven-

ories by more than 50 percent after adopting just-in-time practices. General Motors used just-in-time techniques to reduce inventory costs from \$8 billion to \$2 billion (Johnson).

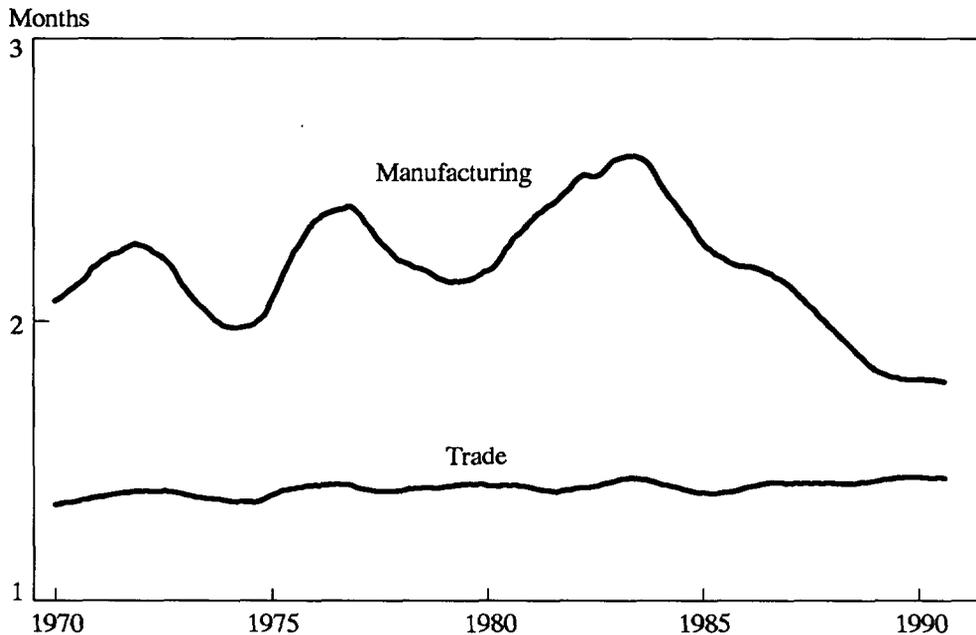
Are such firms just shunting their inventories onto their suppliers?¹³ One survey found JIT was more prevalent among large firms than among the smaller companies that supply them.¹⁴ A supplier not practicing JIT may hold larger inventories against the possibility of an unexpected, rush order from a JIT buyer. Suppliers may also inspect goods themselves and hold larger inventories against defects. If such practices are widespread, then JIT may merely be redistributing inventories from one firm to another.

Just-in-time buyers have an incentive not to force inventories onto suppliers because suppliers eventually pass their higher inventory costs back to the buyers. Suppliers can do so because they usually operate under long-term contracts that allow them to raise their prices when their costs increase (Hall).

Just-in-time buyers try to prevent shifting inventories onto suppliers with several measures. First, buyers often provide suppliers with forecasts of purchasing orders. Armed with a forecast, suppliers can time production of material and supplies so they are ready when the actual order arrives. Second, buyers can encourage suppliers to adopt genuine quality improvement programs. By improving quality, suppliers need not inspect each good before shipping and can hold smaller inventories against defects (Lorinez).

Most important, buyers can encourage suppliers to adopt just-in-time techniques themselves. Many automobile manufacturers, for example, weigh a prospective supplier's commitment to JIT before awarding a long-term contract to the supplier (Raia 1987). Suppliers practicing JIT can be relied on to purchase and produce materials and supplies just in time to fill the buyers' orders. In turn, buyers can order

Chart 3
Inventory-Sales Ratio by Sector



Source: Board of Governors of the Federal Reserve System.

just in time to produce the final good. In this manner, inventories are reduced all the way down the production chain—from the smallest producer of materials and supplies to the largest producer of the final good.

Evidence JIT is reducing inventories

Is there evidence JIT is reducing inventories? If JIT were merely redistributing inventories across companies, the aggregate inventory-sales ratio would not be expected to decline. But, as already noted, the ratio declined markedly after 1982.¹⁵ Of course, some factor other than JIT may be reducing inventories. However, two pieces of evidence link the decline in inventories to JIT. First, the decline in the aggregate inventory-sales ratio stemmed entirely from the sector where JIT was newly

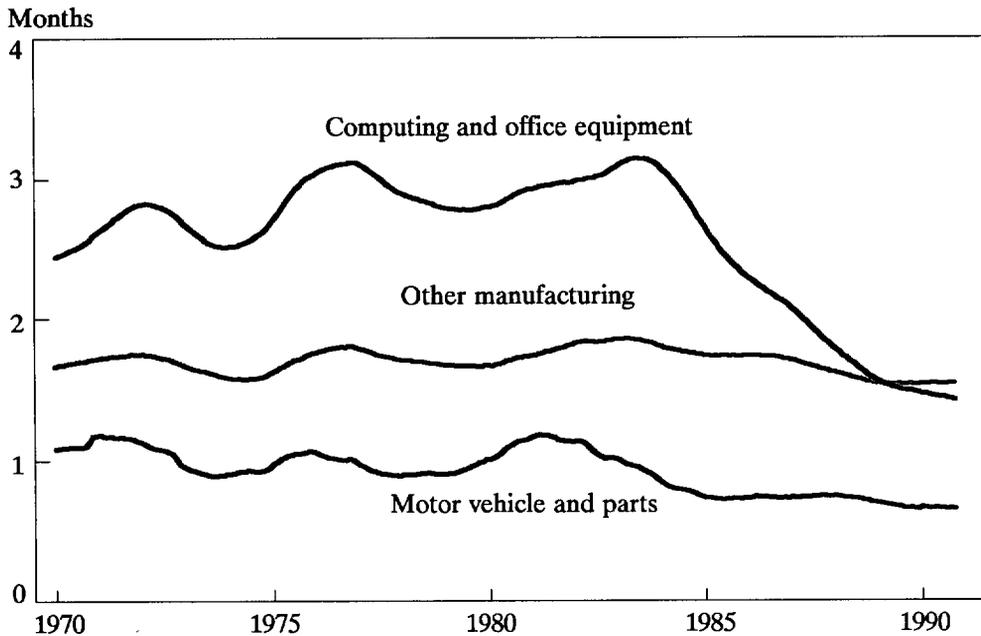
applied in the 1980s—manufacturing (Chart 3). Second, the decline in the manufacturing sector inventory-sales ratio was most dramatic in the industries where JIT was most visibly adopted—the computing and office equipment industry and the motor vehicle industry (Chart 4). This evidence suggests the adoption of just-in-time techniques by U.S. manufacturing firms in the 1980s has, in fact, reduced aggregate inventories. Smaller aggregate inventories imply lower inventory costs and a stronger competitive position for U.S. firms. From a broader perspective, the use of just-in-time techniques implies a more stable U.S. economy.

Implications of JIT for the Economy

Inventory cycles have historically played a destabilizing role in the economy. By helping

Chart 4

Inventory-Sales Ratio -- Selected Manufacturing Industries



Source: Board of Governors of the Federal Reserve System.

firms reduce and control their inventories, JIT can be expected to reduce inventory cycles. Reduced inventory cycles in turn will dampen, but not eliminate, recessions.

JIT can dampen recessions

In the past, large swings in inventories have amplified the effect of a change in business sales on output. That is, the decline in production (the recession) following a decline in sales has been both deeper and longer because of large inventory cycles. The large inventory cycles of the past resulted because firms' desired ratio of inventory to sales was high and because firms were slow to adjust production to maintain the desired ratio (Dornbusch and Fischer).

An example helps illustrate how these factors influence the characteristics of a recession.

Suppose sales decline for an indefinite period because government spending declines. The depth of the ensuing recession depends on how deeply firms cut production, which in turn depends on how much firms must reduce inventories. If firms' desired ratio of inventory to sales is high, the decline in sales causes a large decline in firms' desired inventory stock. And if firms do not cut production promptly after sales decline, inventories will increase instead of decrease. Under these conditions, firms' warehouses soon swell with undesired inventories. As a result, production must eventually decline considerably more than the original decline in sales in order to eliminate the unwanted inventories. In this way, the inventory cycle deepens the recession.

The inventory cycle may also prolong the recession. Because of the buildup of unwanted

inventories, firms may need to postpone increasing production even after sales increase. If so, the inventory cycle delays the recovery, or prolongs the recession.¹⁶

JIT diminishes inventory cycles for two reasons. First, firms' desired inventory-sales ratio is lower under JIT. Thus, a given decline in sales causes a smaller decline in desired inventories. For example, if firms' desired inventory-sales ratio declines from three months to two months under JIT, then a decline in sales of \$1 billion would reduce desired inventories by only \$2 billion instead of \$3 billion. Second, because firms reduce production sooner after sales fall under JIT, fewer unwanted inventories accumulate. Therefore, a smaller cut in inventories is needed when firms finally cut production.

By diminishing inventory cycles, JIT dampens the effect of a decline in business sales on output, making the recession shallower and shorter. Production falls by less because firms wish to reduce inventories by less after sales decline. And firms need less time to eliminate unwanted inventories because they are smaller to start with. Thus, firms can increase production sooner after sales increase.

While the above discussion is merely hypothetical, there is real-world evidence suggesting JIT stabilizes output by stabilizing inventory investment. One researcher compared the variability of production and sales from 1957 to 1986 in seven industrial countries (West).¹⁷ In the United States, production was about 30 percent more variable than sales. In general, he discovered production was more variable than sales in all but one country: Japan. In Japan—where JIT was most prevalent—production and sales were about equally variable.¹⁸

The power of JIT is limited

While JIT may dampen recession by stabilizing inventory investment, JIT cannot eliminate recessions. Indeed, there is no evidence that fluctuations in inventory investment actually cause recessions (Blinder and Maccini). Most analysts think recessions result from other types of shocks to the economy, such as higher oil prices or reduced government spending. The inventory cycle following a shock only influences the depth and length of the recession caused by the shock. JIT may dampen a recession, but the recession may occur nevertheless.

Nor can JIT be relied on to prevent deep and long recessions. These characteristics of a recession depend on both the shock and the condition of the economy when the shock occurs. Hence, a severe recession could still result from a persistent shock to a weak economy. For example, a sustained increase in the price of oil in an economy laboring under a heavy debt burden could cause a severe recession. The most one can say is that the recession might have been even worse without JIT.

Saying so, however, invites a question: Will just-in-time techniques make the current recession milder? The answer depends on how prevalent the techniques are today. Unfortunately, evidence on that point is only suggestive. One small survey suggests reason for hope. In 1988, only 25 percent of the firms surveyed had just-in-time programs in place. Fully half of the firms, however, expected to be practicing JIT by 1990.¹⁹ If the results of this survey are representative, then the new inventory techniques may be . . . just in time.

Endnotes

¹ Only inventory investment is counted because GNP is intended to measure goods produced in the current quarter. The total stock of inventories is not counted because it includes goods produced in previous quarters.

² Because inventories are increasing due to a decline in sales, the rise in the inventory-sales ratio late in the expansion reflects unintended accumulation of inventories. In contrast, the rise in the inventory-sales ratio that sometimes occurs in the middle of expansions reflects intended accumulation of inventories in anticipation of faster sales (Dornbusch and Fischer).

³ The dates of the peaks and troughs indicated in Chart 1 are determined by the National Bureau of Economic Research. These dates do not necessarily correspond to peaks and troughs in GNP.

⁴ One might date the decline in the ratio back to 1975. However, this is an illusion created by the rise and fall in the inventory-sales ratio during the 1973-75 recession. Ignoring that spike, the ratio was trendless from 1976 to 1982 and began declining thereafter. The ratio declined from 3.5395 months in 1982:Q2 to 3.0379 months in 1988:Q2 and then leveled off at 3.0498 months in 1990:Q2. Before this decline, the nadir of the inventory-sales ratio was 3.0535 months in 1965:2.

⁵ The case of Harley Davidson is illustrative. As Raia (1987) tells the story, the maker of rough-running motorcycles (known affectionately as hogs) was driven to the verge of bankruptcy in the early 1980s by its JIT practicing Japanese competitors. In response, Harley Davidson did as many companies do: it lobbied for and received temporary trade barriers to protect it from foreign competition. During the respite, however, Harley Davidson adopted JIT and then asked Congress to lift the trade barriers. So rare is the latter act that President Reagan himself flew to the company's headquarters in York, Pennsylvania, to commemorate the occasion.

⁶ Unless other sources are indicated, the following comparison between traditional inventory practices and JIT practices is from Hay, and Mecimore and Weeks.

⁷ While some firms use computers in practicing JIT, computers are not essential. All that is needed is some signal that inventories are low and more should be produced or purchased. Many firms just use empty containers as a signal while others use red and green lights. On the other hand, computer production techniques do not necessarily reduce inventories unless combined with the JIT principle of ordering just in time to produce and producing just in time to purchase (Sauers; Kim and Lee).

For a description of computer production techniques, see Johnson.

⁸ Toyota developed JIT in the 1950s and 1960s, followed by other Japanese firms in the 1970s. Analysts have discussed many reasons JIT was practiced by Japanese manufacturers before their U.S. counterparts. One important reason is the closer physical and business relationship between Japanese firms and their suppliers. For example, they are physically closer (because Japan is smaller) and this fact expedites delivery. Another reason is that strikes are rarer in Japan, which reduces the need for inventories. In a pinch, however, U.S. manufacturers realized the superior highway system here might offset the greater distances suppliers must travel. And to the extent better roads were not enough, U.S. firms began relocating suppliers nearby. Finally, the decline in union membership in the United States facilitated JIT by, among other things, reducing the threat of strikes.

⁹ In a survey conducted by the accounting firm Price Waterhouse, 37 percent of 210 manufacturing executives indicated their firms had applied JIT to some extent (Moscal).

¹⁰ These data are from a monthly survey of 250 purchasing managers of manufacturing companies in all industries, across the country. They represent the percentage of managers indicating they were ordering "hand to mouth," which is interpreted here as "just in time." The data were smoothed slightly to highlight the trend.

¹¹ The data are actually a weighted average: lead-time multiplied by the percentage of firms reporting that lead time. The lead times used in the National Association of Purchasing Managers survey are 30 days, 60 days, 90 days, and 180 days or more. These data were also smoothed slightly to highlight the trend.

¹² The reduction in lead times would suggest that suppliers' delivery performance was improving. Surprisingly, the percentage of buyers reporting late deliveries was trendless in the 1980s (National Association of Purchasing Managers). Given the reduced lead times, however, the absence of deterioration can be taken as evidence of improvement. Further evidence of improvement is the fact late deliveries did not increase in the last stages of the expansion as in the past.

¹³ For example, Raia (1987) noted a newspaper item suggesting the Detroit warehouse business was being revived by auto industry suppliers needing space to store larger inventories. The alleged revival came after the warehouse district was first decimated when automakers

themselves reduced inventories after adopting JIT. While this report was speculative, the possibility that JIT may just redistribute inventories is real (Hall).

¹⁴ The survey found more than two-thirds (67 of 97) of small supplier companies were delivering to their customers on a just-in-time basis; fewer than half of the suppliers, however, had adopted JIT internally (Sheridan).

¹⁵ The monthly disaggregated data in Chart 2 are available only back to 1967. The inventory-sales ratios differ from quarterly inventory-sales ratios shown in Chart 1 because two series use different sales figures. The Commerce Department survey from which these data obtain includes a sample of smaller companies (U.S. Department of Commerce).

¹⁶ In fact, JIT can also smooth output by dampening the effect of an increase in sales. When sales increase, firms with high desired inventory-sales ratios will increase their inventory investment more than will firms with low desired inventory-sales ratios. Thus, the change in production resulting from the increase in sales will be smaller under JIT. This point is ignored here, in part, because changes in inventory investment figure less in expansions than in

recessions (Maccini).

¹⁷ The countries were Canada, France, Italy, Japan, United Kingdom, United States, and West Germany.

¹⁸ Closer to home, the 1980 recession in the United States illustrates how reduced inventory cycles dampen recessions. Inventory investment fell only \$1.8 billion during the recession itself, contributing only about 2 percent of the decline in GNP during the recession. This fact may help explain why the 1980 recession was much briefer and shallower than average (Blinder). But, of course, the small inventory cycle in 1980 was not likely due to JIT because U.S. firms were just beginning to adopt JIT at that time. Indeed, Blinder rejects the possibility that improved inventory control techniques explained the behavior of inventories in that episode and concludes instead that businesses were forewarned of recession in time to cut inventory investment early.

¹⁹ The accounting firm Touche Ross conducted this survey of 200 manufacturers and distributors (*Traffic Management*).

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The Path to European Monetary Union

By Paula Hildebrandt

In a period of unprecedented change in Europe, European monetary union has emerged as one of the most important new developments. Europe 1992 is already creating a market with more than 320 million consumers and a productive capacity rivaling that of both the United States and Japan. European monetary union would go even further, implementing a unified European monetary policy.

The 12 member-countries of the European Community are currently debating the Delors Report, which outlines a three-step approach to economic and monetary union (EMU) in Europe. The first stage includes the Europe 1992 initiative and has already been accepted. Stages two and three are still being negotiated. They would form a single European central bank and currency.

This article discusses the movement toward monetary union in Europe. The first two sections

lay the historical background for EMU and describe the proposed stages of the Delors Report. The next section provides a detailed description of the European System of Central Banks envisioned in the Delors Report. The article then discusses some of the important issues being debated. A glossary of frequently used terms is included at the end of the article.

Historical Developments Leading to EMU

EMU is not the first attempt to unite Europe. For nearly 40 years, Europeans have sought greater economic and monetary cooperation. From the first "common market" in 1952 to current plans for Europe 1992 and EMU, the Europeans have strived to create a "Europe without barriers."

Foundations of economic union

Economic cooperation in Europe dates back to 1952. France, Italy, West Germany, Belgium,

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the Netherlands, and Luxembourg banded together to form the European Coal and Steel Community. This “common market” for coal, steel, and iron ore made trade between members easier by eliminating costly tariffs normally placed on these imported goods.

The success of the European Coal and Steel Community prompted members to create the European Economic Community (EEC), formalized by the Treaty of Rome in 1957. The EEC extended the common market to include all goods. By eliminating tariffs, the EEC moved a step closer to economic union.

The European Community (EC), as the EEC was later called, decided in 1969 to pursue complete monetary union.¹ Plans to achieve union were drawn up in the Werner Plan, commissioned by the EC Council of Ministers and adopted in 1971. The Werner Plan established that within ten years exchange rates between EC countries would become fixed and the members would follow a common monetary policy. As an initial step, members were required to keep exchange rate fluctuations limited to designated ranges, called margins. The plan was discarded, however, when the 1973-74 oil price shocks caused many members to abandon the exchange rate margins. The oil price shocks had led to higher and more divergent inflation rates, making the exchange rate margins difficult to maintain (International Monetary Fund).

Momentum for monetary coordination returned in 1978 with the development of the European Monetary System (EMS). The EMS established the Exchange Rate Mechanism (ERM), which bound members to maintain exchange rates within narrow margins. The EMS remains in place today. EMS members include the 12 current EC members: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and the United Kingdom. Currencies for most members currently fluctuate within a 2 $\frac{1}{2}$

percent band. Two members of the EMS—Portugal and Greece—still do not participate in the ERM. Two other members—the United Kingdom and Spain—only recently joined the ERM and allow their currencies to fluctuate in 6 percent margins. Although realignments occurred often in the early days of the ERM, exchange rates within the ERM have become increasingly stable (Ungerer).

Europe 1992

Trade barriers still existed in the 1980s, although tariffs were gone and exchange rates had become increasingly stable in the EC. Safety and environmental standards in many EC countries, for example, continued to restrict foreign competition. Similarly, subsidies to inefficient industries combined with capital and border controls to impede cross-country trade. These barriers reduced the efficiency of European markets, lowering the potential for economic growth.

Slower economic growth in the Community and strong international competition from the United States and Japan renewed interest in further integration. This renewed interest led to the Single European Act in 1985. Commonly known as Europe 1992, this act was designed to eliminate all barriers to the movement of persons, goods, services, and capital between member-countries by the end of 1992.

Once Europe 1992 is fully implemented, Europeans will enjoy a variety of economic benefits. Both people and firms will benefit from lower costs in transactions. For example, people will be able to travel throughout the EC without being detained at borders. Firms will be allowed to ship goods anywhere in the EC without facing a myriad of safety and environmental standards. Laws will be standardized in many industries, including the telecommunications and automobile industries. Such laws will

make it possible for firms to expand and be more efficient in the larger, single market. And Europe 1992 will create a single financial area. A single financial area will allow money to flow freely throughout the Community and allow banks to locate branches anywhere they choose. In short, Europe 1992 will substantially increase economic integration, while providing EC countries with a greater potential for economic growth and a higher standard of living (Bennett and Hakkio).

Economic and monetary union

Europe 1992 and the success of the EMS have renewed interest in greater monetary integration. EC members believe a unified monetary policy will enhance the benefits of Europe 1992 by forcing member-countries to adopt a common anti-inflationary stance and by reducing the costs of exchange rate fluctuations and uncertainty. Hence, members believe monetary union will further increase efficiency and economic growth (Directorate-General).

With momentum building toward economic and monetary union, the European Council formed a committee to develop concrete stages for complete monetary union. In April 1989, the committee presented to the Council the "Report on Economic and Monetary Union in the European Community," commonly referred to as the Delors Report. In June of the same year, the member-states approved both stage one of the Delors Report and the goal of economic and monetary union. Stages two and three have not yet been approved by EC members and are currently being discussed at the inter-governmental conferences on EMU.²

The Delors Report on Economic and Monetary Union

The Delors Report offers a concrete, step-

by-step approach to economic and monetary union in Europe. According to the Delors Report, *economic union* will occur with the completion of Europe 1992 and the coordination of macroeconomic policies, including policies concerning the size and financing of government budget deficits. *Monetary union* will occur when EC members come to share a common European monetary policy set by a unified central banking system called the European System of Central Banks (ESCB), and when a single currency replaces the 12 member-nation currencies.

The Delors Report outlines three stages to reach unification. Stage one promotes greater economic convergence. Stage two will serve as a transition period by setting up a single European central bank. Stage three will introduce a common monetary policy and a single currency.

Stage one

Stage one, launched officially on July 1, 1990, promotes greater economic convergence by increasing economic and monetary cooperation. A recurring theme throughout the Delors Report is that large differences in economic growth, inflation rates, or budget deficits among the member-states would make integration difficult. For example, the currency of a country suffering rising inflation would be under pressure to depreciate, making the move to fixed exchange rates difficult. Consequently, the EC wants member economies to "converge," or become more similar, before moving to a single currency and central bank. To foster economic convergence, stage one sets goals to encourage economic and monetary cooperation. Stage one will also revise the EC's founding treaty to accommodate new Community institutions.

Four goals of stage one are designed to

promote economic convergence. The first of these is to complete Europe 1992. By eliminating barriers to trade and finance, Europe 1992 will effectively create a single internal market in Europe.

A second goal is for EC members to trim government budget deficits. The EC believes large budget deficits hinder stable exchange rates, making the move to irreversibly fixed exchange rates difficult. To discourage continued deficit spending, the EC's Council of Finance Ministers will assess national economic conditions and policies. During stage one, the Council may only recommend policy corrections; however, national governments are supposed to consult with the Council before making any major policy changes.

A third goal is to provide additional resources for regional and structural development. Stage one allows for financing economic development in the least developed countries, such as Greece and Portugal. For example, if funds are needed to improve roads and railways or to meet new environmental and safety standards to successfully compete in a European market, the EC will offer assistance.

A fourth goal is to promote economic convergence by increasing monetary cooperation. The Delors Report plans to achieve this goal by strengthening the Exchange Rate Mechanism. One way to strengthen the ERM is to have all member-countries participate (currently Portugal and Greece do not). Another way is to create subcommittees within the Committee of Central Bank Governors to monitor foreign exchange, monetary, and bank supervision policies. During stage one the subcommittees will only offer guidelines to national governments, rather than play an active role in policy.

In addition to fostering economic convergence, stage one has another important goal: to revise the Treaty of Rome, which established the European Community in 1957. Because stages

two and three require new Communitywide institutions, the Treaty of Rome must be revised to accommodate them. Otherwise, the last two stages of the Delors Report cannot begin. Revisions to the Treaty of Rome and negotiations on stages two and three of the Delors Report are underway at intergovernmental conferences on European Economic and Monetary Union. These meetings, which began last December, are expected to continue through most of this year.

Stage two

The Delors Report identifies stage two as a brief, transitional phase to prepare the Community for collective decision making in stage three. Tentatively scheduled to begin January 1, 1994, stage two would reform existing institutions and create new Communitywide institutions, such as a central banking system. In addition, the Community would continue to promote economic integration by removing any remaining barriers to trade not already eliminated in stage one. Although Europe 1992 is scheduled for completion in stage one, the Delors Report noted that some revisions or improvements in the Europe 1992 program may be necessary in stage two. As the EC continues to integrate, economic convergence will increase, easing the move to a single monetary policy.

The details of stage two are currently being debated at the intergovernmental conferences on EMU. According to the Delors Report, a major goal of stage two would be to establish the European System of Central Banks (ESCB). The ESCB will include the European Central Bank and the 12 national central banks and will be an important step toward a common European monetary policy. With price stability as its main objective, the ESCB will be independent from both the national governments and organizations at the Community level.

During stage two, the ESCB will assume responsibility for the ERM. The exchange rate margins within the ERM will narrow from the current 2½ percent. Exchange rate realignments will be allowed only in emergency circumstances. The 12 national central banks will still be responsible, however, for their individual monetary policies during stage two.

Stage three

Like stage two, stage three of the Delors Report is currently being debated at the inter-governmental conferences. If approved, stage three of the Delors Report would complete economic and monetary union, transferring important powers from national governments to the Community.

Economic union will give the Community three new powers. First, the Community will assume a larger role in allocating funds for economic development. For instance, if a particular country has trouble adjusting to economic union, the EC will offer financial assistance to make the country more competitive. However, the EC may require policy changes before providing funds if it suspects a country's difficulties stem from misguided policies.

The second new power relates to international affairs. New Communitywide institutions will determine international policy decisions for the entire EC, representing a shift in power from national governments to the Community. On international issues, a single Community view will be expressed, instead of separate views for Germany, France, and so on. The Commission believes Europe will have more influence internationally if it speaks with a single voice.

The third new power that economic union will give the Community is the right to monitor national budget policies. While the Community will not set binding rules about budget deficits, the Delors Report proposes that "excessive"

budget deficits will have to be avoided.³ In addition, national governments will not be permitted to finance budget deficits by printing money.⁴ Finally, if a country defies the budget recommendations of the Council of Finance Ministers, the country could face sanctions or have Community financial assistance made conditional on economic policy changes.

Monetary union will give the Community two additional powers. First, the ESCB will assume sole authority for monetary policy. National central banks will no longer be able to pursue individual policies; instead, each central bank will operate under a common monetary policy set by the ESCB's governing council. Annual money supply targets, for example, will be set for each EC country by the European Central Bank.

Second, the Community will assume sole authority for exchange rate policy. In the initial phase of stage three, exchange rates of member currencies in the ERM will be irreversibly locked. This system of fixed exchange rates will continue until it is administratively feasible to introduce a single European currency, tentatively called the ECU.

This "new" ECU would be fundamentally different from the current ECU. The current ECU (pronounced ek' coo) is a basket currency used in accounting transactions. Its value reflects a weighted average of the Deutschmark, the French franc, and the rest of the EC currencies. The ECU is at present strictly a unit of account—there is no physical ECU currency.⁵ The new ECU will be a physical currency that replaces the existing individual currencies of the 12 EC members as a medium of exchange.⁶ The ESCB will issue these new ECUs in accordance with its monetary policy objectives. In addition, the ESCB will handle all foreign exchange interventions against non-EC currencies, according to policies set within the Community.

Organization and Function of the ESCB After EMU

While the Delors Report outlines the basic features and functions of the ESCB, the Committee of Central Bank Governors has worked out the details. The Committee drafted a statute outlining the specific features, objectives, and functions of the system. Presented at the inter-governmental conference on EMU in December 1990, the draft statute is currently being discussed by conference participants. Like the Delors Report, the statute is only tentative. It too must be approved by the member-states before being added to the revised Treaty of Rome.

Organization and principles of the ESCB

The statute outlines a federal system of central banking modeled after the German Bundesbank and the U.S. Federal Reserve System. The ESCB will consist of the European Central Bank and the 12 national central banks. Important in the organization of the ESCB are three principles—*independence*, *accountability*, and *subsidiarity*.

Independence. Independence is a basic element in the plans for the ESCB. The statute states that the ESCB should be independent of both national and Communitywide politics and have “unequivocal commitment to maintain price stability as the primary objective of the System.” Such features have been underscored by Bundesbank President Poehl, for example, who has repeatedly stated that his approval of the European Central Bank depends on its being independent and as firmly committed to fighting inflation as is the Bundesbank (Marsh 1990b).⁷

Accountability. While independence of the ESCB is desirable, the Committee recognizes the need for democratic checks and balances. Therefore, the European Central Bank will be

required to submit an annual report to the European Council summarizing the monetary policy actions and other activities of the ESCB during the previous year. The European Central Bank will also have to distribute financial statements and other activity reports on a regular basis to interested parties. Finally, independent auditors, approved by the EC, will examine the European Central Bank and the national central banks.

Subsidiarity. Under the principle of *subsidiarity*, “functions that can be effectively carried out at a subordinate level should be performed by the subordinate rather than by a dominant central organization.” In the context of the Community, *subsidiarity* means that the European Central Bank should only assume powers that require collective decision making. All other powers or responsibilities should remain with the national central banks.

When assigning tasks in the ESCB, the draft statute adheres to the principle of *subsidiarity*. For example, a single monetary policy and currency could not be maintained if all central banks acted independently—a central decision-making body is essential. Consequently, the European Central Bank will formulate monetary policy for the Community. However, other responsibilities, like supervising banks, could be executed at the national level, provided that Community guidelines are followed.

Functions of the ESCB

The ESCB’s functions will include formulating monetary policy, managing reserves, supervising banks, maintaining the payments system, and implementing the Community’s foreign exchange rate policy. Three ESCB groups will perform these functions: the Executive Board, the 12 national central banks, and the Council.⁸ The Executive Board will consist of six members selected for their expertise in

banking or monetary matters. One member will be designated the president and another the vice president of the system. Together, the six members of the Executive Board and the 12 governors of the national central banks will form the Council.

The Council. Formulating monetary policy for the EC will be the main duty of the Council. This duty will include determining monetary targets for each member-country. The Council will also establish guidelines for implementing its policy decisions.⁹

The Executive Board. The Executive Board will be responsible for day-to-day implementation of monetary policy. The Executive Board will monitor economic developments by tracking money supplies, interest rates, and exchange rates. Additionally, by buying and selling securities in the open market, the Executive Board will be able to influence the money supplies to meet monetary objectives set by the Council.

The Executive Board will also perform other duties. For example, the Executive Board will issue the ECU, the new European currency. To obtain ECUs, all member banks will have to deposit a portion of their reserves with the ESCB. The Executive Board will implement the exchange rate policy set by the European Council of Finance Ministers. The Executive Board will also provide regulations on bank supervision and the payments mechanism and will coordinate statistical research in the ESCB. Finally, the Executive Board will delegate responsibilities to the member central banks. For example, the Executive Board may ask the 12 central banks to issue notes or help gather statistical information.

The national central banks. The 12 national central banks will assist the Executive Board in carrying out the operations of the System. The draft states that the national banks should, as much as possible, be the "operational arms of

the System." Under the Executive Board's instructions, national banks may participate in activities that include issuing ECUs, managing reserves, supervising banks, facilitating the payments mechanism, and lending to credit institutions. National central banks may even be asked to buy and sell securities in the open market or to intervene in the foreign exchange markets.

The national central banks will have additional responsibilities. For example, as members of the Council, central bank governors will help formulate monetary policy for the Community. Each central bank will conduct research and statistical analysis. And, the draft statute states that national central banks may perform other functions outside those of the System, so long as the activities do not interfere with the goals of the System.

The Delors Report: Issues Under Debate

Not all EC members believe the Delors Report represents the best approach to EMU. In the debate over the details of stages two and three at the intergovernmental conferences on EMU, three primary questions have emerged: What is the best way to implement a unified monetary policy in the EC? How quickly should EC countries proceed with EMU? And; how should national budget policies be coordinated and foreign exchange rate policies be executed?

Implementing a unified monetary policy

Since EMU discussions first began in 1989, the United Kingdom has expressed concern about moving to a single currency and central bank. The United Kingdom opposes the loss of national sovereignty involved in the Delors Report's approach to a single monetary policy, fearing it would lead to a loss of control over

U.K. economic policy. For example, after monetary union occurs, national central banks would be unable to set national goals for monetary policy, thus denying national governments a policy tool for stabilizing the economy.¹⁰

U.K. prime minister John Major has presented an alternative to stage two of the Delors Report. Commonly known as the "hard ECU" plan, Major's alternative would introduce a thirteenth currency, the hard ECU, to compete in the market with the existing 12 national currencies. The hard ECU's value would be linked to the strongest national currency and would never be devalued—features Major believes would make the hard ECU non-inflationary. The hard ECU would be issued and managed by a new Communitywide institution called the European Monetary Fund. Management of the national currencies would remain with the national governments. Because the hard ECU would never be devalued, Major believes it would be relatively attractive to businesses. If so, the hard ECU might eventually eliminate demand for national currencies.

Proponents of the hard ECU plan stress the benefits of the market-driven approach to monetary union. By gradually becoming the only currency used, the hard ECU would avoid the risk of fixing exchange rates before adequate economic convergence has developed. The hard ECU plan would also provide central bankers with experience in a common currency before moving exclusively to a single currency. Moreover, because the hard ECU would never be devalued against national currencies, proponents believe the European Monetary Fund would gain credibility as an inflation fighter (Flemming).

The hard ECU plan initially met with strong criticism. Germany was particularly critical—suspecting that adding another currency to the existing 12 would compound the difficulties of coordinating monetary policy. Bundesbank

President Poehl opposes the hard ECU, fearing it would be inflationary, despite Major's claims to the contrary (Alterman).

Other members, while less critical than Germany, have expressed additional concerns about the hard ECU plan. Some question the need to introduce a thirteenth currency when the basket ECU already exists. Others claim the hard ECU plan fails to specify conditions that would allow a move to stage three—that is, they fear the hard ECU plan would keep the EC in stage two indefinitely (Ungerer). Still other critics doubt the hard ECU will be able to eliminate other currencies since member-nations have shown no signs of abandoning their own currencies, even though they now may use the currency of their choice.

Since the intergovernmental conferences began in December, signs of compromise have developed. The United Kingdom has indicated that perhaps the ESCB, instead of the European Monetary Fund, could manage the hard ECU (Buchan and Marsh). In addition, both Spain and France have introduced draft treaties that combine features of the Delors treaty and the hard ECU plan. Both treaties plan to increase the role of the basket ECU currency (as opposed to introducing a new hard ECU), with the belief that it would eventually "harden" and become the single currency (McCune).

EMU timing

Issues have also arisen over the timing of EMU. One debate centers on whether to take a slow or fast approach to EMU. The other centers on whether all 12 EC members should proceed with EMU at the same time.

Slow track or fast track to EMU. While the United Kingdom and Germany disagree about the hard ECU plan, they agree that greater economic convergence should come before moving to complete EMU. Both feel that

monetary union before adequate economic convergence would be difficult to sustain (Ungerer). U.K. Prime Minister Major supports a slow, market-oriented approach to EMU, in contrast to the union by legislative fiat called for by the Delors Report. German Chancellor Kohl has insisted that "convergence in economic and budgetary policies" is necessary before moving to a single European currency.¹¹ To provide more time for convergence and time to prepare adequately for a single currency, Kohl also suggests delaying establishment of the ESCB until 1997—three years later than originally planned (Marsh 1991; *The Economist* 1991).

While the members that favor a slow path to EMU believe economic convergence is necessary for monetary union, other members think monetary union would itself foster economic convergence. France and Italy, for example, would like a quick move to monetary union. In France's draft treaty proposal, stage two would begin January 1, 1994. By the end of 1997, the EC would determine whether a single currency were feasible. If so, detailed plans for the introduction of a single currency would then be devised (BIS).

Two-tier plan to EMU. The "two-tier" plan (sometimes called the "two-speed" plan) raises questions as to whether all 12 EC members need to proceed with EMU at the same time. As noted earlier, the idea that full economic and monetary union requires economies to have similar inflation rates, living standards, and economic growth rates prevails throughout the Delors Report.¹² Because it may take some time to reduce the differences that currently exist between some regions, the "two-tier" plan proposes that countries already sharing similar economic performances—for example, Germany, France, Belgium, Luxembourg, and the Netherlands—proceed with monetary union. The other countries would be

left behind until their economies are in better condition for union (Nelson and Roth).

Countries with high inflation rates—like the United Kingdom and Portugal—oppose the "two-tier" approach.¹³ These countries fear they might lose power and prestige by not being part of the first group in monetary union. Once the first group experiences the benefits of monetary union, it may be even more difficult for the second group to "catch up." Opponents of the two-tier plan argue the tension it would create between countries would hinder complete economic and monetary union (Marsh 1990a).

Additional macroeconomic issues in EMU

In addition to questions about a single currency and the pace of EMU, EC members have raised other issues. In particular, how much control should the Community have over national budget deficits? And what role should the ESCB play in foreign exchange rate policy?

Budget policies. In the Delors Report, the Community would recommend budget corrections, but not set binding rules on budget deficits. However, some members believe the budget policies outlined in the Delors Report are insufficient. Germany and the Netherlands, in particular, want binding budgetary rules set by the Community. Without such rules, they argue, the stronger members would bear the financial burden of bailing out heavily indebted members (*The Economist* 1990).

Foreign exchange rate policies. The Executive Board's role in exchange rates has also caused some disagreement. In the Delors Report, the ESCB executes foreign exchange rate policy for the single European currency vis-a-vis non-EC currencies, according to guidelines set by the Community. Some committee members, however, believe the Executive Board should play a more active role. Since

foreign exchange rate policy and monetary policy affect each other, some members think the Community's exchange rate policy should at least be subject to the approval of the ESCB. Other members go further, suggesting the ESCB should formulate foreign exchange rate policy (Draft Statute).

Conclusion

Intergovernmental conferences are underway to finalize plans for EMU. At the conferences, EC members are debating the Delors Report and a draft statute on a European central banking system.

The Delors Report, the main proposal for EMU, outlines a three-stage approach to economic and monetary union in Europe. By promoting greater economic and monetary cooperation, stage one plans to increase economic convergence, easing the transition to unification. Stage two would serve as a transitional period, setting up the European Central Bank. Stage three would complete EMU. It

involves a move to a common monetary policy and a single currency.

Building on the Delors Report, the Committee of Central Bank Governors drafted a statute on the European System of Central Banks. According to the statute, the ESCB would assume sole authority for monetary policy once EMU is completed. The ESCB would be independent and pursue price stability as its main objective. The Council, the Executive Board, and the 12 national central banks would divide the ESCB's responsibilities, which include formulating monetary policy, executing foreign exchange rate policy, managing reserves, supervising banks, and maintaining the payments system.

Debates have begun over several points of the Delors Report. Issues like the introduction of a single currency, the timing of EMU, and the transfer of powers from national governments to the Community must be overcome. But Europeans are getting closer to their goal. After nearly four decades, economic and monetary union is in sight.

A Glossary of Common Terms

Bundesbank. The central bank of Germany.

Council. The decision-making group for monetary policy in the ESCB. The Council consists of the six members of the Executive Board and the 12 Governors of the national central banks.

Council of Finance Ministers. An EC group consisting of the finance ministers of each member-nation. Sometimes referred to as ECOFIN. After EMU, the Council of Finance Ministers will determine the foreign exchange policy for the Community.

Delors, Jacques. President of the European Commission and chairman of the committee that developed the Delors Report.

Delors Report. The general name for the report entitled "Report on Economic and Monetary Union in the European Community," written by Jacques Delors. The report outlines the stages in economic and monetary union.

EC. European Community. The members include: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and the United Kingdom.

ECU. European currency unit, pronounced "ek' coo." The ECU is now primarily a unit of account. The Delors Report recommends that the ECU eventually become the currency used in day-to-day transactions throughout the EC.

EEC. European Economic Community, later called the European Community. The EEC created a common market for all goods traded between members.

EMS. European Monetary System. Formed in 1979, the EMS is the name used to describe the current system of monetary cooperation.

EMU. Economic and monetary union, pronounced "ee' moo." According to the Delors Report, economic union means removing barriers to trade. Monetary union means creating a European central bank (ESCB) and a single European currency.

ERM. Exchange rate mechanism. The ERM provides the rules for setting and realigning exchange rates.

ESCB. The European System of Central Banks. The Delors Report recommends creating a European central bank that would be responsible for setting European monetary policy.

Economic and monetary union. See EMU.

Europe 1992. The EC program that abolishes all barriers to trade, commerce, and travel by December 31, 1992.

European Coal and Steel Community. A common market for coal, steel, and iron created in 1957.

European Community. See EC.

European Council. A decision-making group within the EC. All member-countries have representatives on the Council.

European Currency Unit. See ECU.

European Economic Community. See EEC.

European Monetary Fund. According to the United Kingdom's "hard ECU" plan, the European Monetary Fund would manage the hard ECU.

European Monetary System. See EMS.

European System of Central Banks. See ESCB.

Exchange rate mechanism. See ERM.

Executive Board. One of the three groups of the ESCB. Responsibilities of the Executive Board will include implementing monetary and exchange rate policies and issuing ECUs. The Executive Board will consist of six members selected for their expertise in banking or monetary matters.

Governor. The title for the executive officer of each national central bank.

Hard ECU plan. An alternative to the Delors Report, put forth by the United Kingdom. The plan recommends creating a thirteenth currency, the hard ECU, to compete with and eventually replace national currencies.

National Central Banks. The institution in each of the 12 EC countries responsible for formulating monetary policy. Once EMU occurs, the national central banks will become part of the ESCB.

Single European Act. The 1985 act commonly referred to as Europe 1992. See Europe 1992.

Stage One. The first step of EMU in the Delors Report. The goal of stage one is the

continuation of economic and monetary integration.

Stage Two. The second step in the Delors Report. Stage two is an interim stage, used to prepare the EC for moving to collective decision making.

Stage Three. The final step in the Delors Report. Stage three completes EMU with European monetary policy set by the ESCB and a single European currency.

Subsidiarity. The principle of subsidiarity states that national authorities will retain all powers except those that require collective decision making; the latter will be vested in EC-level institutions.

Treaty of Rome. The 1957 treaty establishing the European Community.

Two-tier plan. An alternative to the Delors Report, put forth by Germany and France. The plan recommends that countries with similar economic performance form their own monetary union; other countries are left behind until their performance is similar to the original group.

Werner Plan. The 1970 plan for monetary union. Oil price shocks in 1973-74 led the EC to abandon the Werner Plan.

Endnotes

¹ The EC's interest in monetary union was in part due to growing instability under the Bretton Woods system during the late 1960s.

² Since June 1989, the Delors Report has occasionally been revised. This article is based on the most recent version of the Delors Report, which was presented at the inter-governmental conferences in December 1990.

³ Not everyone agrees that national budget deficits are an impediment to EMU (Mussa).

⁴ Even before a single currency is introduced, EC members are strongly urged not to finance their budget deficits by increasing the money supply. Once a single currency is introduced, financing budget deficits by issuing money will not even be feasible. The European Central Bank will issue the currency to EC members.

⁵ For example, central banks currently use the ECU as a reserve asset and for settling accounts, while some private investors currently issue international bonds denominated in ECUs.

⁶ The new ECU will also replace the current basket ECU.

⁷ Bundesbank President Poehl is chairman of the Committee of Central Bank Governors, which drafted the statute of the ESCB. The Committee consists of the governors of the central banks of each of the 12 member-countries.

⁸ These bodies are similar to the Directorate, the Land Central Banks, and the Central Bank Council of the Bundesbank and to a lesser extent, the Board of Governors, the Federal Reserve Banks, and the Federal Open Market Committee of the Federal Reserve System.

⁹ The Council of the ESCB should not be confused with the European Council. The European Council is an existing Community organization, consisting of representatives of each EC nation. The European Council will appoint the six members of the Executive Board.

¹⁰ Margaret Thatcher was particularly critical of the loss of national sovereignty implied by the Delors Report. Her bitter opposition to EMU contributed to her resignation as U.K. prime minister.

¹¹ Germany also supports a slower approach to EMU because it is currently preoccupied with its own reunification problems (Riding).

¹² The Delors Report states that large regional differences "would pose an economic as well as political threat to the union."

¹³ Not everyone in the United Kingdom opposes the two-tier plan. Some believe a two-speed system might reduce pressure on the United Kingdom to join a complete economic and monetary union (Buchan).

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Tax Increases in the Tenth District: Where Will the Money Come From?

By Glenn H. Miller, Jr.

Strong pressures for increased spending in the 1990s are likely to force state and local governments in the Tenth District to increase taxes (Miller 1990). Policymakers will try to hold the line on spending, make spending programs more efficient, and hope that better economic times produce more tax revenues. But these may prove to be unsatisfactory or inadequate responses to the mounting demands for public spending. Moreover, in an era of “fend-for-yourself federalism,” state and local governments must rely less on fiscal aid from the federal government and more on their own resources. It is unlikely, then, that state and local governments will be able to avoid raising taxes. In such a situation, what revenue sources can state and local governments turn to?

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This article describes the principal revenue sources for state and local governments in the district and considers some possible directions the search for additional revenue might take. The first section shows the district depends more on general sales taxes and user charges, and less on property and personal income taxes, than the nation as a whole. The second section examines how heavily state and local governments in the district are tapping their available resources and shows they are underusing personal income taxes as a revenue source relative to most other states. The article concludes that district governments might boost revenues by increasing personal income taxes.

Revenues of District State and Local Governments in the 1980s

As pressures mount to increase public spending, it is important to know where state

and local governments are now getting their revenues. This section examines the sources of revenue in the district, how the sources changed during the 1980s, and how they compare with the sources used in the nation as a whole.

What is revenue?

This article defines revenue as general revenue received by state and local governments from their own sources. In order to focus on revenue sources under the control of state and local governments, the definition excludes fiscal aid received from the federal government, such as shared revenues and grants-in-aid. The definition also excludes some classes of receipts not closely tied to public purposes served by general government activities—utility revenue, liquor store revenue, and insurance trust revenue.¹

Revenue data from both state and local governments are consolidated in this article. Consolidation facilitates interstate comparisons because functions performed and financed by one level of government in some states may be the responsibility of another level of government in other states. In order to adjust for population size differences among jurisdictions, comparisons across states are made in terms of revenue per capita.

District revenue growth in the 1980s

Overall, growth in aggregate state and local government revenues in the district was not much different from growth in the nation in the 1980s.² Allowing for both population growth and inflation from 1978 to 1988, real per capita revenue of state and local governments in the district grew at an average rate of 3 percent per year (Table 1).³

Revenue from taxes grew more slowly than total revenue in the district, while revenue from

miscellaneous revenue and current charges, or user fees, grew faster than total revenue.⁴ Revenues from individual income taxes and general sales taxes grew faster than receipts from other tax sources.

District per capita taxes trail the national average

Per capita revenue grew in the 1980s at the same pace in both the district and the nation. Despite solid growth in the 1980s, per capita revenue in the district trailed the national average at decade's end. State and local government revenue in the district averaged \$2,262 per capita in 1988, compared with a national average of \$2,480 (Table 2). But per capita revenue varied considerably across district states, ranging from \$1,873 in Missouri to \$3,738 in Wyoming. Put another way, per capita revenue in district states ranged from 76 percent of the national average in Missouri to 151 percent in Wyoming. Per capita revenue was above the national average in the district's three westernmost states, Colorado, New Mexico, and Wyoming, and below the national average in Kansas, Missouri, Nebraska, and Oklahoma.

Per capita revenue from taxes in the district fell short of the national average in 1988. Overall, district tax receipts per person were just 86 percent of the national average. Wyoming was the only district state with state and local government per capita tax receipts larger than the national average.

For most classes of taxes in 1988, per capita revenue in the district was below the national average. Among major tax sources, only revenues from motor fuels taxes and motor vehicle license taxes exceeded the national average. (This comparison parallels the fact that transportation was the only major function where district spending exceeded the national average in 1988.) Motor fuels taxes in the

Table 1

Real Per Capita State and Local Revenue, 1978-88

(Average annual growth in 1982 dollars)

	Tenth District	United States
Total*	3.0	2.9
Taxes	2.0	1.9
Property	.5	.7
General sales	2.9	3.1
Motor fuels	.2	—
Motor vehicle license	—	.6
Individual income	5.7	3.6
Corporate income	-1.9	1.7
Other	1.2	1.4
Current charges	3.6	3.9
Miscellaneous revenue	8.6	9.0

* General revenue from own sources.
Source: Bureau of the Census, *Census of Governments*.

district were 114 percent of the national average, and Missouri and Kansas were the only district states with motor fuels tax revenues below the national average.

Per capita revenue from user charges in 1988 was larger in the district than in the nation. Four district states exceeded the national average—Colorado, Nebraska, Oklahoma, and Wyoming. District revenue was larger than the national average for both education charges and hospital charges. All district states had revenue from education charges above the national average. Revenue from hospital charges was higher in Kansas, Nebraska, Oklahoma, and Wyoming than the national average.

District revenue sources

The way total revenue is distributed across various sources shows how state and local governments choose to finance public services. Choices may vary from state to state, depending on differences in economic structure, policy objectives, and preferences of citizens and public officials.

Not surprisingly, taxes are the major source of state and local government revenue in the district (Table 3). Still, district governments depend less on taxes than governments elsewhere in the nation. In 1988, taxes provided 67 percent of district revenue, compared with the

Table 2

Per Capita State and Local Government Revenue, 1988

(Amounts in dollars)

	US	District	Colo.	Kans.	Mo.	Nebr.	N. Mex.	Okla.	Wyo.
Total revenue*	2,480	2,262	2,543	2,384	1,873	2,331	2,587	2,096	3,738
Taxes	1,773	1,522	1,686	1,676	1,372	1,557	1,469	1,406	2,042
Property	538	425	604	583	296	644	163	266	914
General sales	428	421	435	397	437	326	581	376	394
Motor fuels	72	82	91	68	66	103	92	96	77
Motor vehicle license	39	46	29	32	39	37	65	76	86
Individual income	360	296	352	331	330	270	201	258	0
Corporate income	97	44	45	78	44	46	33	26	0
Other	240	209	131	186	161	131	335	309	572
Current charges	385	393	454	377	306	504	353	417	589
Education	110	137	180	135	111	160	128	131	134
Hospitals	106	126	96	118	98	220	102	143	333
Miscellaneous revenue	323	347	402	332	195	271	765	273	1,107
Interest earnings	193	237	219	227	135	199	520	207	938

* General revenue from own sources.
Source: Bureau of the Census, *Census of Governments*.

national average of 72 percent.

In both the district and the nation, the leading producers of tax revenue are property taxes, general sales taxes, and individual income taxes. Property taxes and general sales taxes each produced about 19 percent of state and local government revenue in the district in 1988; individual income taxes produced about 13 percent. The revenue share produced in the district by general sales taxes is larger than the national average, whereas the shares produced by property taxes and individual income taxes are smaller.

Among district states, the revenue shares produced by different taxes vary widely, especially for the three largest revenue producers. In 1988, the property tax share ranged from 6 percent of total revenue in New Mexico to 28 percent in Nebraska. The general sales tax share ranged from 11 percent in Wyoming to 23 percent in Missouri. For states with income taxes, the individual income tax share of total revenue ranged from 8 percent in New Mexico to 18 percent in Missouri; Wyoming has no income tax.

Another difference among district states in revenue shares appears in the "other taxes"

Table 3

Percentage of State and Local Government Revenue by Source, 1988

	US	District	Colo.	Kans.	Mo.	Nebr.	N. Mex.	Okla.	Wyo.
Total revenue *	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Taxes	71.5	67.3	66.3	70.3	73.2	66.8	56.8	67.1	54.6
Property	21.7	18.8	23.8	24.5	15.8	27.6	6.3	12.7	24.4
General sales	17.3	18.6	17.1	16.6	23.3	14.0	22.4	17.9	10.5
Motor fuels	2.9	3.6	3.6	2.9	3.5	4.4	3.6	4.6	2.0
Motor vehicle license	1.6	2.0	1.1	1.4	2.1	1.6	2.5	3.6	2.3
Individual income	14.5	13.1	13.8	13.9	17.6	11.6	7.8	12.3	.0
Corporate income	3.9	.0	1.7	3.3	2.3	2.0	1.3	1.2	.0
Other	9.7	9.2	5.2	7.8	8.6	5.6	12.9	14.7	15.3
Current charges	15.5	17.4	17.9	15.8	16.4	21.6	13.6	19.9	15.8
Education	4.4	6.1	7.1	5.6	5.9	6.9	5.0	6.3	3.6
Hospitals	4.3	5.6	3.8	5.0	5.2	9.4	3.9	6.8	8.9
Miscellaneous revenue	13.0	15.3	15.8	13.9	10.4	11.6	29.6	13.0	29.6
Interest earnings	7.8	10.5	8.6	9.5	7.2	8.5	20.1	9.9	25.1

* General revenue from own sources.
Source: Bureau of the Census, *Census of Governments*.

revenue source, which includes severance taxes and excise taxes on alcohol and tobacco. In 1988, New Mexico, Oklahoma, and Wyoming—states with significant energy sectors and other mining activity—had revenue shares for “other taxes” in double-digit percentages, while the four other district states had smaller shares for this category.

Tax mixes thus differ considerably from state to state in the district. For example, New Mexico had the lowest revenue shares for property and individual income taxes in 1988, but the next-to-highest share for general sales taxes.

Nebraska had the highest share for property taxes but the next-to-lowest shares for general sales and individual income taxes. Such variations reflect differences in how states choose to finance their government activities and what resources are available to them for taxation.

While the 1988 data in Tables 2 and 3 are the most recent available, district governments have made several tax changes since then. District states made few major tax changes in fiscal years 1988 and 1989, but three states made major tax changes in 1990.⁵ Both Nebraska and Oklahoma increased their personal income,

corporate income, and sales taxes. New Mexico increased its sales tax and made several changes in its personal income tax code. Nebraska and Oklahoma rank among the top ten states according to projected percent increases in state tax collections resulting from 1990 enactments (National Conference of State Legislatures).

Current charges, or user fees, are a more important revenue source in the district than in the nation as a whole. Current charges produced 17.4 percent of district total revenue in 1988, compared with a national average of 15.5 percent. In every district state except New Mexico, the share of total revenue from current charges was larger than the national average.

Miscellaneous revenue was also a larger share of revenue in the district than in the nation in 1988. New Mexico and Wyoming both had a 30 percent share of total revenue in the miscellaneous category. These large shares for miscellaneous revenue were due primarily to substantial interest earnings of state and local governments in both states.

Summary

After a decade of solid growth, per capita revenue of state and local governments in the Tenth District remained below national average per capita revenue in 1988. Among revenue sources, taxes are less important in the district than in the nation, while current charges are more important.

Among tax revenue sources, state and local governments in both the district and the nation as a whole rely principally on the same three taxes—general sales taxes, property taxes, and individual income taxes. State and local governments in the district depend more heavily on general sales taxes as a revenue source, and less heavily on property taxes and individual income taxes, than the nation as a whole.

Fiscal Effort and the Search for More Revenue

State and local governments have limited options in meeting the mounting demands for spending, especially in an environment of “fend-for-yourself federalism.” One possible tactic would be simply to hold the line on spending increases, but this may be unsatisfactory because deteriorating public services could harm both citizens’ well-being and economic growth. Governments could also try to make spending programs more efficient. While this goal is worth pursuing, savings might be inadequate to meet pressures for spending increases. Governments might also depend on economic growth spurring enough revenue growth to cover spending increases. But district economic growth has lagged behind U.S. growth in recent years, and the U.S. Department of Commerce projects income growth in district states to trail growth in the nation during the 1990s. State and local governments thus may be left with tax increases as a last resort.

If increasing taxes is necessary, where can policymakers turn? Are there sources where district state and local governments might have room to raise revenue without overreaching in comparison with other states?

Choosing a revenue source: capacity and effort

For state and local governments that decide to raise taxes to pay for increased public services, is there some framework that might help in evaluating revenue sources? One such framework is the Representative Revenue System (RRS), developed by the Advisory Commission on Intergovernmental Relations (ACIR). The RRS is built around two key measures. Revenue capacity measures a

government's ability to raise revenue from both tax and nontax sources.⁶ *Revenue effort* measures the extent to which governments are using the revenue sources available to them.⁷

The RRS is formulated in comparative terms, so that a jurisdiction's revenue capacity and revenue effort are expressed relative to those of other jurisdictions and a national average benchmark. Both capacity and effort are expressed in per capita terms and as indexes, where the national average equals 100. Thus, a state with a capacity index of 106 has the capacity to produce per capita revenue 6 percent greater than the national average. Similarly, a state with a revenue effort of 91 is using less than average effort to draw revenue from its overall revenue potential.

The RRS has two important features that add to its usefulness to state and local government officials. First, it is comprehensive. It provides a measure of revenue capacity that reflects all the sources of revenue used in the real world. In this way, the RRS is superior to personal income, long used as a measure of revenue capacity. Personal income, unlike the RRS, excludes a number of important revenue sources, such as corporate income and wages paid to nonresident commuters. Second, the RRS (but not personal income) takes account of the ability of governments to "export taxes."⁸ A state or local government exports taxes when it successfully moves the burden of part of its total tax bill to nonresidents. A hotel tax that falls on convention or tourist trade is one example; a severance tax is another. The RRS includes all taxes, even if they affect nonresidents.⁹

Comparisons across states using the RRS provide information on the relative strengths of state-local fiscal systems by revealing the relative revenue-raising abilities and revenue efforts of each state. The aggregate capacity and effort indexes compare the overall fiscal strengths of states relative to each other and to

the national average. Disaggregated capacity and effort indexes help analyze a state's revenue system in terms of its relative strengths or weaknesses in particular tax bases.

Measures of revenue capacity and effort and their uses focus on the relative fiscal well-being of taxing jurisdictions. That is, most comparisons of state-local fiscal systems using the RRS relate to the well-being of the governments involved rather than to their residents or their private sectors. In interpreting effort indexes, for example, care should be taken not to confuse tax effort with tax burden. Effort relates to governments while burden relates to taxpayers—not at all the same thing when much of the burden of some state and local taxes falls on nonresidents.

District revenue capacity

With a few notable exceptions, the revenue capacity of state and local governments in the district is generally below the national average. Table 4 shows estimates of 1988 RRS capacity indexes for the seven Tenth District states, both overall and for five important revenue sources. Estimates are shown on a relative per capita basis with the national average equal to 100. Apart from the state of Colorado and the severance tax source, in virtually all instances Table 4 shows revenue capacities in district states falling below the national averages in 1988. In terms of overall capacity, Wyoming and Colorado both had revenue-producing potential above the national average. Wyoming ranked ninth and Colorado fourteenth among the 50 states plus the District of Columbia in overall capacity to generate revenue. The other five district states had overall revenue capacity below the national average and ranked in the lower half of all states in terms of overall revenue capacity.

Colorado and Wyoming ranked high in

Table 4
Revenue Capacity, Tenth District States, 1988*

	Revenue Sources											
	Overall		Sales		Personal income		Property		Severance		User charges	
	Index	Rank	Index	Rank	Index	Rank	Index	Rank	Index	Rank	Index	Rank
Colorado	106	14	100	20	98	19	126	8	110	13	100	19
Kansas	91	30	87	40	86	26	87	31	253	10	96	22
Missouri	89	32	94	29	91	23	78	41	9	29	94	25
Nebraska	89	34	91	33	77	35	94	23	22	27	90	32
New Mexico	88	35	82	46	63	43	76	44	669	3	76	46
Oklahoma	87	37	86	42	69	38	88	30	610	4	81	38
Wyoming	118	9	87	39	81	33	115	10	2,324	2	82	37

* Relative per capita capacity, Representative Revenue System, U.S. = 100.
 Source: Advisory Commission on Intergovernmental Relations.

revenue capacity for different reasons. Colorado's overall revenue capacity was greater than the national average due to capacity measures of 100 or more for five of the six major revenue sources and an index only slightly less than 100 for the sixth. Wyoming, on the other hand, had an overall revenue capacity substantially above the national average because of the exceptionally large size of its severance tax capacity.

Indeed, the existence of significant resources available for severance taxation stands out among the five individual revenue sources. The relative importance of those resources is substantial in Wyoming, New Mexico, Oklahoma, and Kansas. Those four states—rich in minerals, especially energy products—ranked in the top ten in severance tax capacity among all states in the nation. Colorado's severance tax capacity was also greater

than the national average, ranking thirteenth among all the states.

District revenue effort

While the revenue capacity of state-local fiscal systems in the district is generally below the national average, revenue effort in district states is generally above the national average. Table 5 shows estimates of 1988 revenue effort for Tenth District states, overall and for individual revenue sources. In terms of overall effort, Nebraska, Wyoming, Kansas, and New Mexico all used their tax bases more intensively than the national average. These four states ranked in the top one-third of all states with regard to overall revenue effort. Oklahoma and Colorado had overall revenue efforts only slightly below the national average, ranking

Table 5
Revenue Effort, Tenth District States, 1988*

	Revenue Sources											
	Overall		Sales		Personal income		Property		Severance		User charges	
	Index	Rank	Index	Rank	Index	Rank	Index	Rank	Index	Rank	Index	Rank
Colorado	94	36	99	25	100	33	89	26	23	25	120	19
Kansas	104	15	104	21	107	28	125	17	71	19	107	28
Missouri	86	47	105	18	101	32	71	39	0	0	84	41
Nebraska	106	12	82	36	98	34	127	16	40	22	147	6
New Mexico	103	17	170	2	89	35	40	49	158	7	124	16
Oklahoma	95	33	108	15	104	29	56	45	107	13	131	13
Wyoming	105	14	103	23	0	47 [†]	147	7	113	12	185	3

* Relative per capita effort, Representative Revenue System, U.S. = 100.
[†] Five states without a personal income tax tied for forty-seventh place in the ranking.
 Source: Advisory Commission on Intergovernmental Relations.

thirty-third and thirty-sixth, respectively. Missouri's overall revenue effort ranked forty-seventh.

Disaggregated effort data can be useful in analyzing a particular state's revenue system and evaluating its tax practices and opportunities. A state's mix of revenue sources and its reliance on certain sources as shown by the RRS can easily be compared with those of other states and with the national average. "Policymakers can see at a glance how, relative to other revenue sources and other state-local systems, a state is 'underutilizing' or 'overworking' particular revenue sources *relative to the national average*" (Advisory Commission on Intergovernmental Relations, p. 16). Such information may be especially useful at a time of regional economic change and interstate competition for economic development, when awareness of what other

states are doing is desirable.

Considerable diversity exists among district states in their efforts to tap the individual revenue sources shown in Table 5. Those sources include the severance tax base, especially significant in the mineral-rich Tenth District, and user charges, for which district states have shown a strong predilection. Most district states with large severance tax capacities exert substantial effort in taxing those resources. And with regard to user charges, all district states except Missouri have revenue effort greater than the national average. Five district states are among the top 20 states in user charge effort.

The five revenue sources shown in Table 5 include the three major state-local tax sources—the general sales tax, the property tax, and the personal income tax. District states generally rank high in sales tax effort, with five states

above the national average and one state virtually at that level. Moreover, all six of these states ranked in the upper half of all states in the nation with regard to sales tax effort. Property tax effort varied widely among district states. While three states showed effort above the national average, Oklahoma and New Mexico ranked forty-fifth and forty-ninth, respectively, among all states in property tax effort. In terms of personal income tax effort, four district states were at or above the national average. But the national average was strongly influenced by a significant number of states with very low effort levels, including several with no income tax. Consequently, more valid interstate comparisons of personal income tax effort may be made by examining how states rank according to that measure. When ranked according to personal income tax effort, all seven district states fell in the bottom half of the nation's states.

Personal income taxes as a source of more revenue

Using effort indexes to examine relative strengths or weaknesses in using particular revenue sources can help in evaluating what sources of additional revenue might be tapped. Every district state has relatively low personal income tax effort, suggesting personal income taxes might be a good source for increasing revenues. Most district states already make intensive use of user charges and general sales taxes, and not all states have severance tax capacity. Property tax effort varies widely from state to state, and property tax relief continues to be a major political issue. While comparative revenue effort is not the only way of approaching the question of where to find more revenue, the relatively low personal income tax effort in district states makes this revenue source a prime target for more intensive use. Advocates of this approach should assess it in

the light of a number of other factors, however.¹⁰

Several factors on the 1990s fiscal agenda for state and local governments should be considered as additional revenue is sought. Among them are balance in revenue structures, the responsiveness of tax yields to economic growth, and interstate tax competition. While full discussion of these factors is beyond the scope of this article, each will be addressed briefly in the context of the search for additional revenue and the possible use of personal income tax increases as the preferred revenue source.

Acquiring additional revenue through personal income tax increases could improve the balance in state-local revenue structures. While significant differences exist from state to state, for the district as a whole, property taxes and general sales taxes each were 19 percent of state and local government general revenue from own sources in 1988, user charges were 17 percent, and personal income taxes were 13 percent. More use of personal income taxes would generally move district tax structures toward greater balance.

While the merits of strictly balancing revenue sources are debatable, it is clear the balance should not be too far out of line (Stocker). Balancing tax structures, however, should not go so far as to overwhelm beneficial features of current district state-local fiscal systems. For example, the district's relatively heavy use of current charges is a feature likely to become more important in all states in the 1990s. User charges permit more reliance on market mechanisms in delivering government services in situations where such a method of allocation is appropriate. Nor should balance be sought at the expense of benefits arising from special characteristics of the district economy. The ability to export part of their tax burden is one such benefit to district governments. For example, heavy use of severance taxes by minerals-rich district states is a significant

means of tax exporting. Moreover, some district states like Colorado and New Mexico are important tourist destinations. This feature makes possible some tax exporting by means of retail sales taxes and other more directly traveler-oriented taxes.

The responsiveness of tax yields to economic growth is another factor to be considered when jurisdictions search for additional revenue. Total revenue or revenue from individual taxes may grow faster or slower than the economy grows, depending on a jurisdiction's tax mix and the characteristics of individual taxes. The responsiveness of various taxes to income growth has been estimated by many analysts. The yield of the personal income tax is believed to grow faster than the growth of personal income. Sales tax yields are believed to increase at about the same pace as income grows, while the yields of property taxes and excise taxes are viewed as growing slower than income growth.

A jurisdiction thus might be attracted to the personal income tax as its preferred source of additional revenue partly because of that tax's greater responsiveness to economic growth. That characteristic could make the personal income tax a good source of revenue to help meet the mounting demand for public services in the 1990s. At the same time, overall tax systems would become more responsive to changes in income growth as personal income taxes become a larger share of total revenues.

There is a downside to such an increased responsiveness of a tax system, however, because greater responsiveness makes total revenue more subject to the effects of short-run economic fluctuations. This greater instability in revenues occurs because the relationship of tax yields to changes in income growth cuts both ways. Just as revenue grows faster than income when the economy is healthy, so does revenue growth slow more than income growth if the

economy weakens. Thus, a tax system moving toward more use of the personal income tax is likely to provide more revenue growth when the economy is strong. But such a move is likely to introduce more instability into revenues over a business cycle and to weaken revenue yields in economic downturns.

While raising more revenue by increasing personal income taxes could improve the balance of revenue structures in the district, higher income taxes also might have a harmful effect on the tax competitiveness of district states. Interstate tax competition is a key part of the larger economic development competition between states for footloose industry and high-income people. In addition to providing a wide range of tax concessions, jurisdictions seek to recruit or retain businesses and their high-income owners and managers by keeping their income tax liabilities in line. Conventional wisdom holds that a jurisdiction's heavy reliance on personal income taxes discourages economic development there. But as one analyst notes: "This claim is controversial and, in any case, argues only against *heavy* reliance, not against *average* reliance" (Gold, p. 107). Tenth District state-local fiscal systems have relatively low levels of personal income tax effort and nearly all of them collect a smaller share of their total revenue from personal income taxes than the national average. These comparisons suggest that an average or lower reliance on personal income taxes gives district state and local governments room to consider them as sources of additional revenue.

Conclusion

Strong pressures for increased spending in the 1990s are likely to force district state and local governments to increase taxes. Holding the line on spending, making spending programs more efficient, and hoping that better

economic times produce more revenues may be unsatisfactory or inadequate responses to mounting demands for public spending. If state and local governments cannot avoid raising taxes, they must decide what revenue sources to turn to.

A survey of revenue structures shows district state and local governments depend more on general sales taxes and user charges, and less on property taxes and personal income taxes, than the nation as a whole. Moreover, measures of revenue effort show that district states are

underusing personal income taxes as a revenue source relative to most other states. For this reason, district state and local governments might consider turning to personal income tax increases as a source of additional revenues. At the same time, however, they should consider the effects of such a step on other items on their fiscal agendas for the 1990s, including balance in revenue structures, the responsiveness of tax yields to economic growth, and interstate tax competition.

Appendix

The Representative Revenue System: Construction and Concerns

The representative revenue system, or RRS, is widely used and is generally considered to be superior to personal income as an indicator of fiscal capacity and effort. Yet the RRS also has some shortcomings. This appendix describes how the RRS is constructed and discusses some concerns that have been raised about the measure. To simplify the discussion somewhat, the appendix focuses on describing the construction of the representative tax system (RTS)—the basic building block of the RRS. The RTS estimates yields from tax sources only, while the RRS estimates yields from both tax and nontax sources.

Construction

The RTS approach to estimating fiscal capacity requires construction of a standard system of tax rates and bases that is “representative” of actual state-local tax systems. Because standardized tax base definitions and average tax rates are used, the RTS’ estimated tax yields differ across states only due to differences in the resources available to be taxed. The approach estimates the tax yield that would result if every state-local fiscal system taxed each of 27 separate tax categories (or tax bases) at national average rates. The 27 estimated yields are then aggregated for each state to provide estimates of every state’s overall tax capacity. National average yield estimates are also calculated for the 27 individual taxes and for the overall aggregate. The yield estimates for the indi-

vidual taxes and the overall aggregates, for every state and for the nation, are divided by that jurisdiction’s population. The resulting per capita tax capacity estimates are then put into index form, with the national average equal to 100. These sets of numbers show the capacity of each state-local fiscal system to raise revenues relative to other state-local systems and to the nation, for the 27 individual taxes and for the overall aggregate.

The tax bases and tax rates used in constructing the RTS are not actual statutory bases and rates. The statutory base for any tax inevitably varies from state to state. Because the RTS requires tax yields to be estimated on a uniform basis for all states, every tax base must be defined on some standardized basis. The standardized tax bases are as closely related as possible to actual statutory bases. For example, retail sales are the base for general sales taxes and fuel consumption is the base for motor fuels taxes. In some cases, however, the standardized bases are proxies not generally used as actual state and local tax bases. For example, federal income tax liability serves as the standardized base for personal income taxes.

Standardizing tax bases is the first step toward comparing tax capacity across state-local fiscal systems using the RTS; standardizing tax rates is the second step. A national average tax rate is calculated for each of the 27 tax sources included in the RTS. No attempt is made to average all the actual statutory rates applied by state and local governments to their own bases. Rather,

the standard rates used in the RTS are calculated by dividing the total revenue collected in all states from a particular tax source by the total estimated base for that source, as defined for use in the RTS. For example, in 1988 all state and local governments together received \$108 billion in general sales tax receipts. As defined for use in the RTS, the base for this tax source (retail sales and receipts of selected service industries) was \$1,793 billion. The national average rate for general sales taxes was thus 6.02 percent.

To produce estimates of potential tax yield, or capacity, for every state, each state's RTS tax bases are multiplied by the national average tax rates. Overall capacity estimates for each state are calculated by adding its capacity estimates for all tax sources. Dividing all capacity estimates by each jurisdiction's population gives per capita capacities for each state and for the nation. To obtain indexes of tax capacity, all the state capacity estimates—overall and for each tax source—are related to the national capacity estimates, expressed as 100. An index value of 110 indicates that a state's per capita tax-raising potential, or capacity, is 10 percent above the average tax-raising capacity of all states combined.

Concerns

Many analysts believe the RRS is superior to personal income as a measure of revenue capacity. Others suggest the RRS is not an ideal measure. Concerns about the RRS involve the independence of RRS capacity estimates from actual fiscal choices, the taxability of revenue sources, and the breadth of the concept of fiscal capacity

present in the RRS measure.

Independence of a state-local fiscal system's actual revenue policies from those of a hypothetical, or representative, fiscal system is viewed as essential in estimating fiscal capacity. The measure's advocates note the RRS benefits from "being a measure of 'potential' revenues independent of actual fiscal choices" (Fastrup, p. 44). But some critics suggest that independence has not been attained—that RRS capacity estimates measure economic and fiscal choices of governments and their citizens as much as they do revenue potential, even though fiscal capacity indexes should reflect only the latter (Barro, p. 196).

Other critics hold that the RRS measure of capacity does not take adequate account of the taxability of revenue sources. Taxability relates to the behavior of businesses and persons in response to taxing and spending by governments. The likely interaction between a state's tax rate and the base for that tax may be overlooked when using the RRS measures of capacity. For example, Wyoming, with no personal income tax, is estimated by the RRS to have a substantial revenue capacity for that tax. But if Wyoming chose to tax personal income at the representative national average rate of 20 percent, businesses and households might respond in ways that prevented the state from reaching its estimated capacity. One of the most important responses affecting taxability reflects the mobility of taxable resources, or tax bases. In this example, some persons living in Wyoming, or planning to move there, might reconsider their decisions following such an increase in the personal income tax rate. On the other hand, some tax bases—natural resources such as coal fields,

for example—are immobile, and for that reason have much greater taxability. In the case of Wyoming, this characteristic helps explain the high level of revenue capacity for the state's severance tax.

Still other critics believe the RRS should not be used as a measure of state-local fiscal capacity because it lacks specific attention to jurisdictions' relative needs for public services and the relative cost of providing those services. Without such explicit attention to expenditure needs and relative costs, these critics say, RRS measures show only revenue capacity and do not warrant the broader description of measures of fiscal capacity. They argue that focusing exclusively on the ability to raise revenue without adjusting for the cost of services that jurisdictions provide gives an incomplete and distorted characterization of state-local fiscal capacities. Two states with similar revenue-raising ability may not have similar fiscal capacity if one has a much larger school-age population or many more low-income families. These critics thus find the RRS lacking as an ideal fiscal capacity measure: "A measure of revenue-raising ability alone is a seriously incomplete indicator of the overall ability of a state or local government to finance its service responsibilities. Only when revenue-raising capacity is related to the costs of the public-service responsibilities of a government can it be said that its general fiscal situation is accurately represented" (Rafuse, p. 135).

Some analysts note the presentation of RRS capacity measures in per capita terms goes a long way toward meeting the objection that expenditure needs are ignored. Dividing estimated tax capacities by resident populations does more than facilitate comparisons between jurisdictions by introducing a scaling factor. "Division by population can be seen as a method of relating the ability of a government to raise revenue to its costs of providing public services, where those costs are measured by population. In fact, population has long been regarded in the literature of state-local finance as a reasonable, simple measure of the relative costs of public services, often referred to as 'needs'" (Rafuse, p. 134).

Total population may be the most important factor in the differences between jurisdictions in expenditure needs, but it is not the only factor even though per capita estimates assume it is. Information on the age structures of populations can help in understanding differences between jurisdictions in public spending for particular services such as education. Data on differences between states in prices of public service inputs would also be useful, but are not available. In any case, measures of revenue-raising ability narrowly defined can be useful for comparisons between jurisdictions whether or not the user believes the measures to be ideal indicators of overall fiscal capacity, broadly defined to allow for differences in needs.

Endnotes

¹ Utility revenues are receipts from the sale of commodities or services by government owned and operated water, electric, gas, and transit systems. Liquor store revenues are the amounts received from sales by government liquor stores. Insurance trust revenues are receipts from contributions required of employers and employees for financing social insurance programs operated by governments and the earnings on assets held for such systems.

² This article uses 1978 as the base year in charting revenue growth. The year 1978 is a good benchmark year for state and local government finance for two reasons. First, 1978 marked the beginning of increasing citizen resistance to rising public spending and increasing taxes. This resistance was ushered in by the adoption in California of Proposition 13, which put constitutional limits on the state's spending growth. Similar measures were adopted subsequently in other states, and the threat of taxpayer revolt remains a factor in tax and spending decisions. Second, federal outlays for grants-in-aid to state and local governments peaked in 1978. Since then, state and local governments have had to make spending decisions based on greater dependence on their own resources.

³ A significant part of the increase in district own-source revenues offset a reduction in intergovernmental revenues from the federal government. Federal fiscal aid to district state and local governments declined at an average rate of 1.9 percent per year from 1978 to 1988, on a real per capita basis.

⁴ Current charges are amounts received from the public for specific services benefiting the people charged and are often called user charges. Charges for education and hospital services make up about two-thirds of all current charges. Hospital charges increased faster in the district from 1978 to 1988 than total current charges and much faster than education charges. Interest earnings—the largest share of miscellaneous revenue—increased faster than total miscellaneous revenue.

⁵ In 1988 and 1989 most district states increased their motor fuels taxes, some explicitly for underground storage tank cleanup. Personal income taxes were reduced or reformed in Kansas and Nebraska, and Kansas increased its sales tax. New Mexico permanently suspended income tax rebates made in partial reimbursement of sales taxes paid on food and medicine. Missouri increased its sales and corporate income taxes in order to make refund payments to federal pension recipients.

⁶ The revenue capacity of a state is defined in the RRS as "the revenue the state and its local governments could raise

with a set of taxes and tax rates 'representative' of actual policies prevailing, on average, throughout the nation" (Rafuse, p. 139). The RRS reflects those tax sources that state and local governments use in the real world, by estimating the dollar yield from taxing those goods, services, and factor returns that actually are taxed by all jurisdictions. The RRS estimates how much each state-local fiscal system could receive, not from its own actual tax policy, but from a hypothetical—or representative—tax policy constructed from the actual taxing practices of all state-local systems in the aggregate. "A central feature of [the RRS] is that it is designed to be representative of the overall tax system of the states. This is achieved by including all of the various taxes in the system and by weighting each tax in accordance with the extent to which it is used collectively by states and local governments. It is achieved further by a process of standardization, whereby the revenues of each state are estimated for each revenue source by applying a standard (average) tax rate to a standard (typical) tax base" (Advisory Commission on Intergovernmental Relations, p. 10).

⁷ Revenue effort compares actual revenues received with estimated potential yields under the RRS and is calculated by dividing actual revenue by estimated capacity, both overall and for individual revenue sources.

⁸ The RRS approach to measuring revenue capacity was developed in an attempt to correct some of the flaws in the personal income approach. Personal income has fallen into disfavor as a measure of revenue capacity mainly due to its lack of comprehensiveness and its failure to take account of tax exporting. Personal income measures income received by persons residing in a jurisdiction. As such, it is not a complete measure of a jurisdiction's economic resources available for taxation. Excluded, for example, are corporate income (except that paid to residents in dividends) and compensation paid to nonresidents working in the jurisdiction. Using personal income alone as a measure of revenue capacity also fails to take account of tax exporting. The ability to engage in tax exporting varies widely among tax jurisdictions, as does its practice, and tax exporting may be an important tool of tax policy. Tax exportation occurs primarily in two ways. One way is through the taxation of economic transactions or activities involving nonresidents—for example, retail sales taxes on purchases by nonresidents, hotel taxes paid by nonresident tourists or business travelers, earnings taxes on wages and salaries received by commuters into the taxing jurisdiction, or taxes on investment returns to nonresidents from invest-

ments located in the taxing jurisdiction. Another way is through the deductibility from federal taxable income of some state and local taxes. When federal tax liability is reduced by such deductions, state and local taxes are in effect shifted to taxpayers throughout the rest of the country.

⁹ The RRS automatically records receipts from taxes exported by a jurisdiction. For example, the RRS sales tax base necessarily includes retail purchases made by nonresident tourists and job commuters. However, the RRS does not incorporate the tax exporting due to the deductibility from federal taxable income of some state and local taxes.

¹⁰ For one thing, changes in tax systems due to increasing personal income taxes should be measured against the traditionally accepted objectives of a good tax structure: equity, or fairness in the distribution of the tax burden; neutrality, or minimum interference with economic decisions and behavior in otherwise efficient markets; and simplicity, or effective and understandable tax administration. Policymakers and other citizens should keep these objectives in mind as they search for sources of additional revenues for the 1990s (Miller 1989, pp. 26-30).

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