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A quarterly report on Treasury and Federal Reserve foreign exchange operations for the period May through July 1987 begins on page 49.

Capital Requirements of Commercial and Investment Banks: Contrasts in Regulation

Banking authorities in the United States and the United Kingdom have made noteworthy progress toward converging regulatory capital standards for multinational banks. They are also seeking to include within the standards explicit treatment of capital market activities, an area in which commercial banks are in direct competition with securities firms. Within the United States, however, commercial banks and securities firms (investment banks) must adhere to very different capital requirements. As regulators address activities common to both industries, they must be mindful of the competitive effects of new requirements. Otherwise, activities will be pushed to the least restrictive environment, which may be wholly unregulated.

Stockholders' equity and other forms of capital protect a company from insolvency by absorbing losses. A strong capital base protects customers and creditors by reducing the possibility that financial problems at a firm would cause it to default on its obligations. Government authorities use regulations to encourage adequate capitalization for two reasons. First, the public cannot easily evaluate the financial strength of companies as complex as commercial and investment banks. Second, the collapse of such companies can be detrimental to the financial system and cause undue financial loss.

To provide adequate protection against potential losses, quantitative capital standards use proxies to measure business risk. Such risk measures can be simple or complex, but they can never be wholly accurate. Many capital market professionals view the different capital requirements imposed on commercial and investment banks as a source of competitive inequity.

Their calls to "level the playing field," however, are often disingenuous, focusing only on those disparities that work to their disadvantage.

This article examines how the diverse nature of commercial and investment banking has led regulators to develop quite different capital standards for the two industries. At a time when efforts are being made to bring the standards into closer conformity, it is important to emphasize that the capital requirements for these industries are rooted in the traditionally distinct activities of commercial and investment banking. The standards use very different time horizons, each reflecting how quickly managers within the industry can adapt to change and adjust their risk profiles. The standards also set the stage for differing treatment of weak and failing institutions in each industry. This article, then, seeks to clarify the logical basis of the capital requirements. The analysis suggests that the task of reconciling the two approaches to capital regulation may prove difficult.

The article begins with a brief review of the regulatory agencies responsible for overseeing the commercial and investment banking industries. The second section highlights the chief differences between the capital rules applied by the Securities and Exchange Commission (SEC) and the U.S. banking authorities. Each capital standard is then considered independently, with particular attention given to the methods used by regulators to assess the components of capital and to establish a standard of comparison.

Regulatory structure

Somewhat parallel federal oversight structures have developed in the U.S. commercial and investment

banking industries. Although the regulatory agencies have different priorities, they are motivated by the same basic concerns—protecting retail customers, safeguarding the integrity of the financial system, and advancing macroeconomic goals. Moreover, both industries face multiple government rulemakers, multiple examining authorities, and a federal insurance agency responsible for attending to failed firms.

The Securities and Exchange Commission has the broadest responsibilities among the securities rulemakers; it regulates diversified brokerage houses, underwriters and dealers in corporate securities, stock exchanges, and investment managers. The Commodities Futures Trading Commission (CFTC) and the U.S. Treasury regulate other aspects of the securities business. Supervisory responsibilities over securities firms are delegated to the various exchanges and the National Association of Securities Dealers (NASD), while retail customers are protected by the Securities Investor Protection Corporation (SIPC). This article will focus on the SEC's capital regulations for diversified broker-dealers, the principal operating units of U.S. investment houses. In this comparison of investment and commercial banking rules, the differences among SEC, Treasury and CFTC regulations are not material.

The principal federal authorities overseeing the commercial banking industry are the Federal Reserve, the Comptroller of the Currency, and the Federal Deposit Insurance Corporation (FDIC). Almost all commercial banks must join the FDIC, which provides protection for deposits of \$100,000 or less. In addition, individual states charter and examine banks. Again, for the purpose of this discussion, it is unnecessary to make distinctions among the several bank rulemakers.

The Federal Reserve regulates bank holding companies and subjects them to consolidated supervision. An important premise of bank holding company oversight has been that the health of a bank cannot, in the final analysis, be separated from that of its parent and affiliates. In contrast, the SEC statutory mandate is limited to registered broker-dealer and investment management units only; it does not reach to the holding company level or to unlicensed affiliates. The Commission must depend on the premise that a broker-dealer can be financially separated from its unregulated affiliates and parent.

Underlying differences

Traditional business: The two sets of capital requirements are logical outgrowths of the core business activities of the banking and securities industries as they were separated by the Glass-Steagall Act in 1933. Both industries function as middlemen in the credit and investment markets but traditionally specialize in dif-

ferent areas.¹

Traditional commercial banking involves intermediation in the primary credit market. Banks provide highly liquid assets to the public (mostly as deposits) to raise money that they usually lend directly rather than invest in marketable securities. Most loans are held until maturity. Asset turnover is, therefore, relatively slow.

Investment houses, in contrast, traditionally act as principals for only temporary periods, and their assets turn over extremely quickly. Their core activity in the primary credit market has been underwriting new issues of marketable securities. In this activity, investment houses assume principal risk for only as long as it takes to sell assets to final investors. Securities dealers incur significant principal risk in the secondary market, reflecting speculative trading or inventory held to accommodate customers (market making), but the risk is also temporary.

Both industries also have long established roles as agent. Investment houses "broker" securities, effecting transactions in the secondary securities markets at the behest of their customers. Although this activity has been centered on organized exchanges, direct dealer-to-dealer transactions in the over-the-counter market have become increasingly important in recent years. Banks act as "trustees," managing funds placed in their care.

Time horizon: Securities firms and banks adjust to internal and external changes over very different time horizons. Since the most basic need for capital is to protect an institution from the risk of insolvency, capital should be sufficient to absorb losses while an institution adapts to adverse developments. The time frames for adjustment, therefore, are key determinants of the structure of each capital standard.

Investment banks have very short time horizons: trading is hour by hour, arbitrage spans several days, and underwriting spans days or weeks. These firms can adjust their risk profiles quickly. In contrast, commercial bank risk profiles generally change much more slowly. Although specific transactions may have short maturities, customer exposures regularly span many years. In past years, both credit and interest rate risk varied with economic conditions and the business cycle. Changes in the local, national and international arenas developed over time and banks were expected to stand by their customers. As a result, the principal risks facing commercial banks changed slowly; some adjustments spanned several quarters while others spanned several years. Credit risk remains relatively slow to change although new financial techniques have reduced the

¹Both also provide important securities custody services for their customers, but this activity is not addressed with capital requirements.

time needed to adjust interest rate exposures.

The central difference between securities and banking capital standards reflects these differing time perspectives. Investment houses are evaluated on a liquidation basis and their accounting is mark-to-market. Commercial banks are evaluated as going concerns and their accounting is based on original cost. That is, most bank assets reflect contractual value rather than the value if offered for immediate sale (market value). The difference between these two modes of evaluation has practical significance beyond the structure of capital standards because it also reflects how failing firms are treated when the structure works properly.

The following sections discuss how differences in the capital rules derive from the liquidation and going concern approaches to evaluation as well as from differing authority over holding companies.

Broker-dealer capital requirement: a liquidation measure

The underlying logic of the SEC's capital rule² is that a broker-dealer should be able to wind down its activities and protect its customers within one month. The Commission evaluates the risk-adjusted liquidity of the firm with a conservative view of those assets that can be sold or collected in order to meet senior obligations in the very near term. The SEC's rule starts with total capital, applies a series of deductions to derive "net capital," and compares this measure to a required safety margin. Broker-dealers must operate with capital in excess of the requirement. Because a firm must cease operating if it fails the standard, the required margin is quite small. The supervisory process, however, also employs several higher "warning level" tests. Firms operating with net capital at or below warning levels are subject to special restrictions and close supervisory scrutiny. They must scale down their activities in line with their capital.

The permitted components of total capital reflect the short time frame of the capital rule. Equity and subordinated debt with more than one year to maturity are the core elements, but other subordinated debt of quite temporary duration is also allowed as capital. For example, an unusually large underwriting may be capitalized with temporary subordinated debt repayable within 45 days. Owners may also provide debt capital by pledging marketable securities instead of investing cash in the firm. Moreover, accrued liabilities for discretionary bonuses and some tax deferrals are allowable additions to capital.

The SEC requires three types of deductions from total capital. The first set addresses liquidity and includes intangible, fixed, and other illiquid assets, securities that do not meet a stringent test of marketability, and "dis-allowed" assets such as most unsecured receivables. The deduction of unsecured receivables reflects both liquidity and credit risk concerns. The next set of deductions addresses other forms of credit risk and introduces into the rule several incentives for efficient market practices.³ Capital adjusted to this point in the calculation can be viewed as "liquid capital."

The third set of deductions from the total capital, called haircuts, gauges potential trading risk, that is, how much securities might decline in value prior to being sold. Net capital, which remains after all deductions, is compared to a minimum requirement and higher warning levels. The requirement is a small fraction of a proxy for the size of the firm. Broker-dealers can choose either a proxy for the size of senior obligations (6.67 percent of aggregate indebtedness under the basic method) or a proxy for the size of "customer" business (2 percent of aggregate debit items under the alternative method).⁴ The SEC rule is briefly described in the Box.

Liquid capital, as a measure, differs significantly from total capital. Liquid capital is the excess of marketable and easily liquidated assets over senior liabilities. Liquidity, thereby, is given primary importance, and unmarketable, unsecured assets are heavily penalized with a 100 percent capital requirement. In this context, the SEC applies a definition of marketability which is quite stringent in most circumstances: the security must be exchange traded, or bid and offer quotations must be readily available and settlement of sales at such prices must be possible within a relatively short time. Marketable assets and liabilities must be valued at current prices and unrealized gains and losses reflected in net worth each day. Marketable assets are assumed to be saleable, but this is not the point of the capital charge; liquidity is. A security that does not pass the marketability test need not be deducted from total capital to the extent that a bank has already lent funds secured by the asset.

Most unsecured receivables and advances are also deducted in full, although a few routine receivables are only deducted when aged. To secure a receivable under the rule, collateral must meet the same marketability tests as inventory. This aspect of the rule helps insulate broker-dealers from their affiliates because it encourages firms to take marketable collateral to secure

³For example, there is a capital charge for securities purchased but not yet received within 30 days, while the capital charge for securities sold but not yet delivered applies after only 5 days.

⁴"Customers" are specifically defined within the SEC rules. Not all counterparties are customers; principals of the firm and other broker-dealers are excluded.

²SEC Rule 15c3-1, Net Capital Requirements for Brokers and Dealers. Treasury requirements for specialized dealers in government securities and CFTC rules for futures commission merchants are quite similar to the SEC rule at the conceptual level discussed here.

Box: Securities and Exchange Commission Uniform Net Capital Rule for Brokers and Dealers

The SEC first adopted a capital rule in 1944 to establish a standard of financial responsibility for registered brokers and dealers. The most recent comprehensive update of the rule was implemented in 1982. Firms that provide retail brokerage services and that underwrite or deal in corporate or municipal securities must abide by the rule.

The capital rule is a liquidity test in the sense that it seeks to ensure that liquid assets, adjusted for trading risk, exceed senior liabilities by a required margin of safety. A broker-dealer should be able to liquidate quickly and to satisfy the claims of its customers without recourse to formal bankruptcy proceedings. The test is a two-step procedure: first, a determination of the amount of net capital available to meet a firm's capital requirement, and second, a determination of the capital requirement (that is, the margin of safety). Net capital is total capital reduced by various charges and by haircuts that measure trading risk. A firm may choose either the basic or the alternative requirement. (See Figure 1.)

Total capital

Total capital equals net worth plus subordinated liabilities and is augmented by allowable credits. It is determined by generally accepted accounting principles on a mark-to-market basis. To be counted as capital, subordinated debt must have a minimum term of one year and may not be prepayable without the prior written approval of the broker-dealer's examining authority (New York Stock Exchange or NASD). Subordinated debt may be in the form of either borrowed cash or borrowed securities, the latter serving as collateral for "secured demand notes." The rule also allows two forms of temporarily borrowed

capital. Broker-dealers are permitted to obtain temporary subordinations not exceeding 45 days in maturity as often as three times a year to capitalize underwriting and extraordinary activities. A firm may also have a revolving subordinated loan agreement providing for prepayment within a year.

All of the above are treated as satisfactory subordination agreements by the rule and thereby qualify for total capital. However, the rule establishes more demanding specifications that, if met, would qualify subordinated borrowings from a partner or stockholder as what can best be called "near equity." Net worth plus this near equity must equal or exceed 30 percent of the total of net worth and subordinated debt.

Allowable credits to total capital include certain deferred income tax liabilities and accrued liabilities that are payable solely at the discretion of the firm, such as bonuses and profit sharing.

Broker-dealers are prohibited from distributing equity capital (for example, through dividends or unsecured loans to owners) if doing so would reduce the firm's net capital below warning levels. Supervisory authorities set warning levels somewhat higher than the minimum requirement; for example, one is 120 percent of the basic requirement.

Capital charges: Total capital is reduced by nonallowable assets and various special charges. An asset is considered nonallowable if it cannot be immediately or quickly converted into cash. This definition applies to fixed and intangible assets, investments and unsecured receivables from affiliates and subsidiaries, most other unsecured receivables, and nonmarketable securities. Special charges include specified types of receivables from other broker-dealers not collected within 30 days and other specified receivables aged beyond 11 or 60 days. Credit exposure is also deducted for purchased securities not received within 30 days and for most sold securities not delivered within 5 days. There are also charges for giving excessive margin on repurchase transactions when a dealer borrows. (If excessive margin is taken when a dealer lends under a resale agreement, the requirement is increased.) Such charges encourage good business practices.

Haircuts: The rule recognizes that the prices of marketable assets and liabilities may move adversely during liquidation, thereby reducing net capital available to cover a firm's obligations. The deduction for price risk in the firm's proprietary positions, haircuts, are percentages of the market value of security and forward positions held by the broker-dealer. As a measure of price risk, haircut factors vary in accordance with the type and remaining maturity of securities held or sold short.

For government and high-grade corporate debt, some forms of hedging serve to reduce haircuts. Moreover,

Figure 1

SEC Net Capital Computation

Total capital:	Equity Allowable subordinated debt Allowable credits
Less deductions:	(Illiquid assets) (Unsecured receivables) (Charges for aged credit exposure) (Market risk haircuts)
→ Net capital	Compared to
Requirement:	$6\frac{2}{3}$ percent aggregate indebtedness, or 2 percent aggregate debit items
Excess capital:	Net capital less the requirement

Box: Securities and Exchange Commission Uniform Net Capital Rule for Brokers and Dealers (continued)

Figure 2

**Summary of Haircuts
Applied to Unhedged Positions**

Government and agency securities:
0 to 6 percent in 12 maturity subcategories
6 percent applies to 25 year bonds
Municipal securities:
0 to 7 percent in 16 maturity categories
7 percent applies to 20 year bonds
Commercial paper, bankers acceptances, and certificates of deposits:
0 to 0.5 percent in 5 maturity categories
0.5 percent applies to 9 month paper
Investment grade corporate debt:
2 to 9 percent in 9 maturity categories
9 percent applies to 25 year bonds
Preferred stock: 10 percent
Common stock and "all other":
30 percent under the basic method
15 percent under the alternative method

within the several maturity subcategories into which government, high-grade corporate and municipal debt securities are grouped, short positions serve to offset long positions fully. Forward contracts receive the haircuts applicable to their underlying securities. Futures and options positions are also explicitly treated. The rule specifies additional haircut charges where the broker-dealer has an undue concentration in securities of a single issuer. For broker-dealers choosing the alternative method of calculating required capital, lower haircut

percentages may be taken on certain securities positions, including undue concentration and underwriting commitments. Most important, the haircut on common stock and "all other" securities is 15 percent instead of 30 percent.

Capital requirement: Net capital must exceed a minimum absolute dollar level and one of two standards that relate to the size of a broker-dealer's business.

The basic method requires that net capital exceed $6\frac{2}{3}$ percent of aggregate indebtedness, which includes all liabilities less those specifically exempted. In essence, aggregate indebtedness is any liability not adequately collateralized, secured, or otherwise directly offset by an asset of the broker-dealer. It also includes contingent, off-balance sheet obligations. Few large investment houses choose to use the basic method because, as noted above, it requires a 30 percent haircut on common stock and "all other" securities. This method is usually chosen by smaller retail-oriented brokerage firms.

The alternative method requires that net capital exceed two percent of aggregate debit items computed in accordance with the Reserve Formula under the Customer Protection Rule. These debit items are the gross debit balances of particular asset accounts and generally represent good quality customer receivables. The rule uses these debit items as a proxy for the size of customer-related business. For small broker-dealers whose business is heavily retail-oriented, these aggregate debit items can represent a majority of a firm's assets. However, for most large broker-dealers who are not heavily retail-oriented, these debit items usually constitute less than 25 percent of total assets.

For major firms, the alternative method applies a lower percentage factor to a smaller base than does the basic method and permits a 15 percent haircut on "all other" securities rather than 30 percent. To qualify for this method, however, a firm must hold a greater reserve under the Customer Protection Rule calculation.

receivables.

The capital rule's focus on liquidity is designed to work in concert with the SEC's Customer Protection Rule.⁵ Put simply, the Customer Protection Rule seeks to compel a broker-dealer to (1) balance its liabilities to customers with receivables due from customers plus a segregated cash reserve, and (2) place all fully paid for customer securities in possession or control (a custodial obligation).⁶ Moreover, if a firm maintains a greater segregated cash reserve, it may choose the less

burdensome alternative capital requirement.

Trading risk is explicitly treated to gauge how marketable assets might decrease in value, and marketable liabilities might increase in value, if a firm must be liquidated. Risk factors (haircuts) for investment grade securities have been developed from statistical measures of price volatility.⁷ For example, three-month Treasury bills are haircut 0.5 percent and 30-year bonds are haircut 6 percent of market value. Haircuts are also applied to off-balance sheet market exposures such as futures, forwards, and options. Many forms of hedging and arbitrage are recognized as having less risk than

⁵Rule 15c3-3, the Customer Protection Rule, was established in the early 1970s in response to the back office problems suffered on Wall Street during the late 1960s.

⁶That is, customer securities are those for which the broker has already received full payment and exclude securities purchased on margin.

⁷The haircuts reflect price volatility measured over several years and cover relatively large price changes. The factors do not, however, cover the extraordinary price movements that occurred in October 1987.

uncovered positions. "All other" securities, such as common stock and low-rated bonds, require 15 percent capitalization.⁸

Credit risk is subsumed into this structure at several points. The credit risk on marketable debt securities is covered by the market risk haircuts. Broker-dealers usually sell such assets long before a default occurs.⁹ Temporary credit exposures resulting from routine transactions are not treated consistently by the SEC because broker-dealers are presumed to avoid credit losses rather than to reserve for them. Capital charges for unsettled transactions, while based on credit risk, are designed to encourage efficient business practices. In contrast, most other unsecured receivables require 100 percent capital coverage, while secured receivables and the default risk on forward trades incur no capital charges. Finally, the 100 percent deduction for unmarketable assets to meet the liquidity intent of the rule more than sufficiently covers credit risk as well.

The structure of the SEC's rules, coupling the Net Capital Rule requirement for liquidity and the Customer Protection Rule requirement for coverage of customer payables, has practical application to the treatment of a failing firm. As a securities house weakens toward warning levels, it must constrain its business. It should not be able to double its bets and risk tripling its losses. Once a warning level is breached, the examining authority would seek further constraint. Thus, a firm's ability to compete, already weak, would be further undermined at a time when it still had positive liquid capital, that is, liquid assets in excess of senior liabilities. Facing an untenable position, management would then seek to sell or merge the company before the situation required a SIPC-managed failure. This approach has been used many times during the past two decades and, when it worked as intended, SIPC faced little or no loss. As a result, the insurance corporation operates with a low level of reserves, \$393 million (as of August 1987), and a minimal \$100 per firm annual premium. Of course, in cases of fraud neither this, nor most other structures work neatly.

Observed capital levels: Market pressures, rather than regulations, determine how much excess net capital securities firms need to compete successfully. Wall Street firms place great importance on the absolute amount of their excess net capital because it demonstrates their ability to serve large customers and handle

large transactions. Most firms have increased their capitalization in recent years. At year end 1986 sixteen diversified firms reported average net capital 7.3 times larger than minimum requirements. In absolute terms, average excess capital was \$408 million, while the average requirement was only \$65 million. In comparison, total capital averaged \$1.4 billion, with a range from under \$300 million to over \$3 billion. Equity constituted 61 percent of total capital in this sample.

The relationship between total, net and required capital is determined by the composition of a firm's business. Dealing, arbitrage and underwriting generate high haircuts that reduce net capital but change each day. Haircuts may not be particularly high on those days for which financial statements are prepared. Firms specializing in these activities tend to report more than 40 percent of their total capital as "excess." In contrast, retail brokerage causes other deductions and the final requirement to be larger. Several of the large retail houses report only 20 percent of their total capital as excess.

Although the minimum requirement is a proxy for size, it is not tied to assets. Among the sixteen firms, the minimum requirement ranged from 0.1 to 1 percent of total assets. The effective capital requirement of the SEC standard can be viewed as the difference between total and excess capital. This measure combines most aspects of the SEC rule to show how much of the firm's total capital is in use. The effective requirement reported by the sixteen firms averaged 5.1 percent of assets—a figure on par with banking standards of 5.5 percent. However, the effective requirements ranged from 1.6 to 16 percent.

Holding company implications: Because regulations extend only to the licensed subsidiaries of investment houses, the firms frequently perform in unregulated affiliates activities that would be uneconomic if held to SEC requirements. This consequence of securities industry regulation has grown in importance with recent capital market innovations. As investment houses have broadened their activity to include new products that entail nonmarketable credit exposure, the portion of their business accomplished in unregulated affiliates has grown. Swaps, whole-mortgage loan trading, and bridge loans are among the innovations handled in affiliates. In consequence, the SEC, the CFTC and the Treasury have all written their capital rules to foster financial separation of affiliates. Transactions between regulated and unregulated affiliates are treated harshly; for example, unsecured loans require a 100 percent capital charge and have the effect of transferring liquid capital. Moreover, even secured transactions are closely reviewed by examining authorities. This structure, however, does not forbid advances to or investments

⁸Most major houses choose the alternative requirement and are subject to a 15 percent haircut on "all other" securities. Under the basic requirement, this haircut is 30 percent.

⁹Defaulting debt securities usually trade at a small fraction of face value. The broker-dealer would, therefore, reflect losses day by day as the price dropped rather than wait until the asset was weak enough to warrant a write-off.

in affiliates; it merely applies a strict capital evaluation. A firm willing to move liquid capital out of its regulated unit is not constrained by regulation so long as its net capital remains above warning levels.

The investment houses usually publish consolidated holding company financial statements that display gross capital. The reports footnote the excess net capital within the firms' regulated broker-dealer subsidiaries. Competitive pressures to report impressive excess capital figures are a strong incentive to maximize the liquid capital within registered broker-dealer subsidiaries.

Banking capital requirement: a going concern measure

The capital base of a commercial bank protects the institution from the risk of insolvency by absorbing losses in times of poor performance. In so doing, capital also enhances the safety of depositors' funds, helps maintain public confidence in the bank and the industry, and supports expansion of the institution. If these purposes are to be achieved, a bank's capital must not impose financial burdens when a bank is facing difficulties (for example, dividends need not be paid in such circumstances). In order to insure that a banking institution can weather adverse conditions and unexpected losses, regulators impose capital regulations with a multiyear time horizon. In this context, capital for commercial banks must be permanent, and most subordinated debt is included only in a secondary capital measure. This structure is in sharp contrast with SEC rules that give certain subordinated debt the same weight as equity.

Existing standards for U.S. banks and their holding companies emphasize the permanence of the capital instrument. All common stockholders' equity and general (unallocated) loss reserves are included in primary capital. Perpetual preferred stock and subordinated debt that must be converted to or replaced with stock may provide a portion of primary capital. Certain types of perpetual debt may also provide a limited portion of holding company capital. Secondary capital includes perpetual and mandatory convertible instruments in excess of the limits allowed as primary capital. It also includes limited-life preferred stock and subordinated debt with an original maturity in excess of seven years. Unsecured senior debt with original maturities beyond seven years is recognized as secondary capital at bank holding companies but not at banks.

Bank supervisors evaluate the risk profile of an organization within the examination process. They pay careful attention to earnings, asset quality, management factors, liquidity, and off-balance sheet activities as well as capital. The quantitative measure of bank capital against a set standard is only one aspect of the eval-

uation. Moreover, the relative importance of such quantitative standards and their sophistication have varied widely over the past few decades. Since 1981, for example, the quantitative standard has been a simple primary-capital-to-total-assets ratio.

The capital-to-assets ratio is a leverage standard applied to on-balance sheet activity that can provide indirect protection against liquidity risk. In recent decades, however, liquidity risk has been addressed through other supervisory methods. During the 1960s, attention was focused on the mix of liquid assets; in the 1970s, it turned to the availability of managed liabilities. More recent supervisory methods address both factors and encourage increased use of longer-term borrowings. As a result, term debt, whether or not subordinated, is beneficial chiefly as a liquidity buffer at commercial banks and is included only in secondary capital. Although this structure is significantly different from the SEC rules, which focus on liquidity and permit large amounts of debt capital, liquidity risk is central to overall supervisory standards in the banking industry as well.

In a series of steps from 1981 through 1985, the banking authorities applied steadily tighter standards for primary-capital-to-total-asset ratios of banking institutions. Banks and bank holding companies are now subject to a minimum standard of 5.5 percent. The standard for total capital-to-total assets, which includes secondary capital, is now 6 percent. In applying these simple standards, bank regulators presume a moderate degree of credit risk and prudent levels of liquidity and off-balance sheet exposure. Banks with significant off-balance sheet exposures are expected to operate above the minimum ratios. In recent years many larger banks have raised significant amounts of new capital, reduced low-profit balance sheet investments, and expanded off-balance sheet activities. The latter two trends justified development of a risk-based proposal.

Early in 1986, U.S. banking authorities proposed a quantitative capital measure that would be more explicitly and systematically sensitive to the risk exposure of individual banks. The Bank of England joined in refining the proposal and a joint U.S.-U.K. version was published in February 1987. The new risk-based capital proposal centers on a ratio of primary capital to weighted risk assets and encompasses both on- and off-balance sheet exposures. Risk weights vary from zero for assets such as cash to 100 percent for standard risk assets such as commercial loans. The proposal as published in February 1987 is summarized in the Appendix. This risk-based capital standard is still under development, and banking authorities in several other financial centers have joined the effort to establish a consistent measure of bank capital.

Quantitative evaluations of bank capital, both estab-

lished and proposed, focus almost wholly on credit risk because such losses have been the dominant factor in most banking problems. Even when the root cause was management or macroeconomic problems, the usual result was credit losses. Because trading risks are typically quite modest relative to most banks' overall strength, the system has addressed these exposures through the examination process rather than the quantitative capital rule.

The dominance of credit risk in U.S. capital standards reflects banks' traditional economic purpose of providing credit on both a secured and unsecured basis to a broad mix of customers—some strong, some weak. A modest amount of credit loss is viewed as a normal cost of doing business, and a component of capital, the loan loss reserve, is established to absorb such losses. In this context, banks face only fractional capital requirements on standard commercial lending; under existing rules the requirement is 5.5 percent of exposure. In contrast, SEC requirements call for 100 percent capital support of unmarketable, unsecured credit exposure.

The comparison between bank and SEC standards is more complex for credit exposure in the form of marketable securities. For example, SEC haircuts on high quality corporate bonds range from 2 percent (if due in less than 1 year) to 9 percent (if due in 25 years), while low quality marketable debt requires 15 percent capital support. High grade commercial paper requires no capital support at a dealer if it matures within 30 days (and 0.25 percent if due in six months), compared to the 5.5 percent required at banks for the floating prime-based loan the commercial paper may have replaced. Of course, broker-dealers are not presumed to be in the business of holding term loans to maturity, and in fact, most paper is sold within days.

Interest rate and trading risk are not treated systematically within the current bank capital standards; rather they are addressed during on-site examinations. As banks trade actively in more sectors of the secondary capital markets, trading risk may warrant explicit treatment. Viewed in terms of securities industry haircuts, the existing 5.5 percent bank standard is, at best, a rough average requirement for unhedged positions that appear on the balance sheet. The price risk features of forward contracts such as futures and options are not captured. The proposed U.S.-U.K. calculation would generally lead to lower requirements than those of the SEC for a naked trading exposure but would be similar when applied to the mix of inventory carried by a bank dealer in government securities (see risk weights in the Appendix).

Consolidated oversight: In order to implement the Bank Holding Company Act of 1956, the Federal Reserve established consolidated oversight of banking

organizations. This approach reflects the importance of public confidence in banks and a concern that the public may be unable to distinguish a bank from its affiliates for this purpose. Holding company activities are limited by law and interaffiliate relationships are regulated. Separation of bank and nonbank subsidiaries is encouraged. Credit extended to nonbank affiliates must be collateralized and is subject to strict limits.

Bank holding company regulation also differs from securities industry rules by requiring that holding company activities be explicitly permitted. Thus, activities deemed inappropriate by regulators are usually forbidden to banks or their affiliates. The SEC, in contrast, writes its rules to make such activities uneconomic within regulated broker-dealer units. Bank capital standards are applied to both the bank and to the consolidated holding company. This constraint effectively addresses those nonbank affiliates that perform limited banking activities in states where the lead bank is not permitted to do business. Other types of affiliates, moreover, should be capitalized at levels appropriate to their lines of business. Some activities, however, are not appropriately treated by bank capital standards, leading to excessive constraint on some affiliates and little constraint on others.

As banks have become more active in capital markets, they have adapted their organizational structures. In some cases, these changes alter the nature of their capital requirements. For example, a recent ruling by the Federal Reserve Board would permit bank affiliates to underwrite municipal revenue bonds provided the volume of such underwriting is only a small portion of the affiliate's business. Implementation of this new power has been temporarily delayed by Congress, but several banks have reorganized in anticipation of the end of the moratorium. To meet the volume test, many banks are transferring their existing securities trading and municipal bond underwriting departments into a holding company affiliate. Before these affiliates can engage in new activities, they must be licensed by the SEC and subject to its capital rule. Thus, a degree of functional and overlapping regulation is evolving.

Observed capitalization: The ten largest bank holding companies in the United States reported year-end 1986 ratios of primary capital to total assets averaging 7.0 percent. The lead banks in these organizations reported slightly lower ratios, averaging 6.8 percent. Capital ratios have been improving in recent years; in 1982 when the standard was first used, the average was only 4.8 percent. Capital ratios for holding companies now range from roughly 6 to 8 percent, and the spread is even narrower for the lead banks. Their capital is far greater than that of the investment houses in absolute terms; primary capital of this sample averaged \$5.8 billion.

Conclusion

The regulatory capital requirements imposed on commercial and investment banks are designed to address the traditional business activities of each industry. Direct competition between these industries within the capital markets, however, is not traditional. It involves products which introduce risk elements from both arenas. Securities firms are assuming more term, nonmarketable credit exposure, particularly for performance on complex new instruments. In addition, investment banks have begun to provide merchant banking services, investing directly in their own deals either temporarily (bridge loans) or permanently. Concommitantly, banks have begun to deal in options and other difference contracts in addition to their established trading presence in the foreign exchange and public securities markets. The turnover of bank assets has also been increased by securitization of previously unmarketable assets. These activities generate significant noncredit risk.

Although supervisors of both banking and securities firms attempt to assess the credit and price risk of new activities, they differ in the capital burden they now require. It is not clear how the common risks could be

best included within both industries' quantitative capital calculations so as to place similar requirements on banks and securities houses. Two approaches come to mind. First, segments of one standard could be grafted to the other, even though the resulting structure might not be internally logical. For example, the SEC haircut measure of trading risk could be included within the bank calculation despite its shorter time horizon. Alternatively, activities could be segmented among separately capitalized affiliates, with each affiliate subject to either a bank or a securities style standard.

Authorities in the United Kingdom have perceived a need to achieve greater consistency in the capital requirements placed upon banks and securities firms. As a result, the Bank of England and the Securities and Investment Board have coordinated efforts while implementing the Financial Services Act of 1986. Similar coordination also would be beneficial within the United States.

Gary Haberman

Appendix: Joint United States-United Kingdom Proposed Risk-Based Capital Standard February 1987

In February 1987, the Federal Reserve published for comment a proposed framework for evaluating the adequacy of commercial bank and holding company capital with regard to both on- and off-balance sheet risk.* It was jointly developed with the Bank of England, the Office of the Comptroller of the Currency and the FDIC. This summary is presented because the framework is a more informative structure than the simpler standard now in use by U.S. bank regulators that uses a ratio of primary capital to total assets. The proposal is still under development as part of a multinational effort to bring consistency to the evaluation of capital at major banks in all international financial centers.†

Capital-to-risk ratio

The proposal would create a capital-to-risk ratio to relate a banking institution's adjusted primary capital to its weighted risk assets. Primary capital should be freely available to absorb current losses while permitting an organization to function as a going concern. Under the proposal, it would consist of two classes of capital funds: base primary capital and limited primary capital. The latter would be limited to a specified percentage of base primary capital.

*Federal Register, vol. 52, no. 33, p. 5119, February 19, 1987.

†On December 10, 1987, banking authorities released the next version of this capital proposal.

Primary capital

The February 1987 proposal defined base primary capital funds to include common stockholders' equity, general reserves for unidentified losses, and minority interests in the equity accounts of consolidated subsidiaries. Other capital instruments would be qualified as limited primary capital to the extent the total does not

Proposed Capital Standard

Risk ratio is compared to a requirement

$$\text{Risk ratio} = \frac{\text{Adjusted primary capital}}{\text{Weighted risk assets}}$$

$$\begin{aligned} \text{Adjusted primary capital} &= \text{Base primary capital} \\ &+ \text{Limited primary capital} \\ &- \text{Deductions} \end{aligned}$$

$$\begin{aligned} \text{Weighted risk assets} &= \text{Sum (risk weights} \times \text{assets)} \\ &+ \text{Sum (risk weights} \times \text{conversion factors} \times \text{off-balance sheet exposures)} \end{aligned}$$

Appendix: Joint United States-United Kingdom Proposed Risk-Based Capital Standard (continued)

exceed 50 percent of tangible base primary capital, that is, base primary capital reduced by intangible assets. Limited primary capital funds would include perpetual preferred stock, limited-life preferred stock with an original maturity of at least 25 years, and certain debt that is subordinated to deposits. To qualify, subordinated debt must be unsecured, repayable only with equity or similar debt, and convertible to equity if other capital is depleted. It must also permit deferral of interest payments during periods of financial distress.

Deductions from primary capital

The February 1987 proposal would calculate adjusted primary capital by adding base and limited primary capital and deducting intangible assets and equity investments in unconsolidated affiliates. When deducted from capital, an equity investment in an affiliate would also be deducted from the risk-weighted asset base.

Proposed risk weights

Each of a banking organization's assets would be assigned to one of five risk categories and weighted

according to the relative risk of that category. The determination of asset groupings and the assignment of weights primarily would reflect credit risk considerations, with some sensitivity to liquidity and interest rate risk. The categories would distinguish among broad classes of obligors and, to a lesser extent, among maturities and types of collateralization. A credit equivalent approach would be used in weighting the risks of off-balance sheet activities. Under this approach, the face amount of an off-balance sheet exposure would be multiplied by a credit conversion factor, and the resulting credit equivalent amount would be assigned to the appropriate risk category as if it were a balance sheet item. Assets collateralized by cash or U.S. government securities would be accorded a lower risk weight, but the proposal would not explicitly recognize other forms of collateral or guarantees in weighting asset risk. However, examiners would continue to consider all forms of collateral and guarantees in evaluating asset quality and making an overall assessment of capital adequacy.

The following tables provide a summary of major asset and off-balance sheet weightings contained in the February 1987 U.S.-U.K. proposal.

Table A

Summary of Risk Weights for On-Balance Sheet Assets

0 percent

Cash—domestic and foreign

10 percent

Short-term (one year or less) claims on U.S. government and its agencies.

25 percent

Cash items in process of collection
Short-term claims on domestic and foreign banks
Long-term claims on and guarantees of the U.S. government
Claims (including repurchase agreements) collateralized by cash or U.S. government or agency debt
Local currency claims on foreign governments to the extent that bank has local currency liabilities

50 percent

Claims on or collateralized by U.S. government-sponsored agencies
Municipal general obligations

100 percent

Claims on private entities and individuals
Claims on foreign governments that involve transfer risk

Table B

Conversion Factors for Off-Balance Sheet Exposures

100 Percent

Direct credit substitutes including financial guarantees and standby letters of credit
Repurchase agreements and other asset sales with recourse, if not already included on the balance sheet

50 Percent

Trade-related contingencies including commercial letters of credit and performance bonds
Other commitments with original maturity over five years, including revolving underwriting facilities

25 Percent

Other commitments with original maturity of one to five years

10 Percent

Other commitments with original maturities of one year or less

Note: Swaps, over-the-counter options, and other difference contracts would be treated separately

The Economics of Securitization

Without question, one of the most prominent recent features of the financial sector has been the very strong growth in securities markets transactions. These transactions take a wide variety of forms. Investors may hold security market claims on borrowers directly or buy shares in mutual funds that acquire most, if not all, of their assets in the financial markets. Alternatively, they may own securities representing an undivided interest in a pool of loans. Or, investors may hold either securities issued by banks or deposit claims on banks that own securities rather than loans.

All of these transactions are types of securitization. Securitization is a process hard to define generally. In its broadest sense, securitization is financial intermediation that involves at some stage the buying or selling of financial claims. That definition is wide enough to include the sale of loan participations among banks or packages of commercial mortgages among thrifts, and yet it excludes not only traditional bank lending but also similar activities at finance and insurance companies. A narrower definition refers to the packaging of generally illiquid assets of banks, thrifts, and other intermediaries for sale in securities form.

But perhaps the best definition of securitization is the matching up of borrowers and savers wholly or partly by way of the financial markets. Such a definition covers issuance of securities such as bonds and commercial

paper—a practice that entirely replaces traditional financial intermediation—and also sales of mortgage-backed and other asset-backed securities—transactions that rely on financial intermediaries to originate loans but use the financial markets to seek the final holders.

Securitization is different in kind from disintermediation and the difference provides some important clues to the economic forces behind securitization. To draw this distinction, it is necessary to define some terms used in this paper. *Financial intermediation* is defined very broadly as the bringing together of borrowers and savers. Banks, thrifts, and finance companies, among others, carry out *traditional financial intermediation*. These institutions make a large number of loans and fund them by issuing liabilities in their own name. *Disintermediation* refers to a displacement of traditional financial intermediation away from banks and thrifts primarily to arrangements that are similar to bank lending—loans by other financial intermediaries or direct lending between agents in the same sector (for example, trade credit)—rather than financial market transactions. In the United States, disintermediation usually took place when market interest rates rose above the ceilings set by the old Regulation Q.

Broadly, securitization breaks with traditional financial intermediation, while disintermediation tries to emulate it. Unlike securitization, disintermediation does not change the form of financial claims to any great extent. Rather, it shifts the holding of particular kinds of claims when the traditional holder is temporarily constrained by institutional features such as deposit interest rate

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ceilings. Securitization, by contrast, changes the form of claims, and through that change also alters the distribution of holdings among types of investors. Still, securitization and disintermediation are not entirely distinct, since both involve a shift of intermediation away from banks and thrifts.

The range of transactions that replace traditional financial intermediation today suggests that no single economic force lies behind securitization. For example, an increase in the relative cost of bank intermediation in the wholesale lending markets may explain why some firms issue more bonds and commercial paper but cannot explain why some banks are major purchasers of floating rate notes (FRNs) and Euronotes.

To identify the forces driving securitization, we break traditional financial intermediation into three key elements: (1) the agreement between borrower and intermediary, (2) the service provided by the intermediary (its value-added), and (3) the agreement between the intermediary and the investor.

In traditional bank lending, one financial claim, a loan, represents the agreement between a borrower and the bank, while a deposit represents the agreement between the bank and the investor. The service of the bank is matching up borrowers and lenders, which it can do cheaply both by reducing search costs and by realizing economies of scale in gathering and allocating funds. The bank manages risks that arise in matching up borrowers and lenders, because their preferences, and thus the instruments the bank offers them, are not identical. These risks include funding, market, and credit risk. Frequently, the bank's size gives it the capacity to pool and thus reduce risks. In addition, the bank can offer its customers payments services that enhance customers' liquidity.

The three elements of traditional financial intermediation suggest that securitization covers three separate kinds of substitutions: securities for loans, direct placement of debt claims for traditional financial intermediation, and securities for deposits. In turn, three economic forces emerge as important contributors to securitization. The first is upward pressure on the cost of bank intermediation, especially higher capital requirements not accompanied by a fall in the cost of capital at a time when transactions costs for both securities placement and risk management are falling. Second is an increase in financial risk, especially in the volatility of interest rates. Third is increased competition to relationship lenders from banks and nonbank financial institutions.

Loans versus securities

No clearcut definition distinguishes a loan from a security. The features associated with securities and not

with loans are transferability, a degree of standardization and of disclosure imposed by securities laws, and often, liquidity. But the real difference between loans and securities lies not in the explicit contracts of the loan agreement and the bond but in the existence of an implicit contract between the borrower and the bank in the case of a loan and the virtual absence of such an implicit contract between the borrower and the investor in the case of a security.

A loan is essentially a private, unpublicized agreement between lender and borrower. While the loan agreement is a legally binding document, both borrower and lender understand that they can renegotiate the agreement. The loan agreement thus offers great flexibility and considerable discretion. The flexibility, discretion and durability of these arrangements is what is termed a "banking relationship." Nor does the relationship stop at a loan agreement; it also includes deposit, payment and currency services.

Consider the commercial lending relationship. There the bank can be viewed as writing options for its loan customer. Through devices such as credit lines or lending commitments, the borrower can choose the timing and the amount of a loan; the borrower can often prepay or refinance the loan with a small or even no fee. Most important, the bank makes an implicit and sometimes explicit commitment to provide funds in times when the borrower finds them difficult to obtain: when the borrower is experiencing difficulties or when liquidity has dried up. In return, the borrower may agree to allow the lender to monitor its performance over the life of the loan and agree to financial covenants restricting its behavior. While such covenants exist in bond indentures as well, they are less flexible and less meaningful.

The economics literature has tended to emphasize the importance of the bank's access to private information in distinguishing bank lending from other financial intermediation.¹ But provision of continuous access to funds in banking relationships is also crucial. In particular, the development of instruments like note issuance facilities (NIFs) and FRNs that replace bank lending underscores its importance. A NIF provides more liquidity to investors than a syndicated loan but still assures the borrower medium-term access to funds. The FRN replaces generally short-term interbank deposits with a medium-term instrument that, unlike interbank lines, cannot be cut back.

A debt security is an agreement between a borrower and lenders who are usually unspecified before the

¹See, for example, Eugene F. Fama, "What's Different about Banks?" *Journal of Monetary Economics*, vol. 15 (1985), pp. 29-39, and Joseph E. Stiglitz, "Credit Markets and the Control of Capital," *Journal of Money, Credit and Banking*, vol. 17, no. 2 (May 1985), pp. 133-52.

terms of issue are set. No agreement is negotiated by borrower and lenders. Instead, the underwriter negotiates the terms with the borrower and attempts to find investors at somewhat more favorable terms. The security holders also have no implicit contract with the borrower. They are not expected to purchase new issues of securities or hold onto securities permanently. The terms of securities issues are seldom renegotiated and the borrower's right to prepay exists only if there is an explicit call option. The debt security's documentation may obligate the borrower to provide information to its creditors or allow a third party to monitor its performance, but the security holders are under no obligation to keep such information confidential.

These conditions do not rule out the development of a relationship in the issuance of a security. Borrowers have relationships with their investment bank insofar as the borrower provides confidential information and the investment bank counsels the borrower and supports its issues in order to assure continuous and low cost access to the financial markets. But the investment bank is not itself a source of funding nor is it a credit monitor in the same sense that a bank is. To provide these services, additional parties such as banks or rating agencies must be drawn in.

Similarly, the investor has an implicit contract with the investment bank. The investment bank may be expected to make markets in its customers' securities. In addition, securities laws require underwriters to perform "due diligence" to assure that disclosures represent the truth fairly.

The distinction drawn here between loans and securities is extreme, of course. Syndicated loans are well-publicized agreements between a borrower and a large number of banks, many of which will have no other customer relationship with the borrower. Private placement securities generally require less disclosure and also lack the liquidity associated with publicly-offered securities. Since they are placed with a small number of investors, issues can be tailor-made to investor preferences. The investors may actively monitor the creditworthiness of borrowers and manage any credit problems. Moreover, the implicit contract nature of a loan is not its only distinguishing feature. The structure of transaction costs means that securities issues are much larger in size than most loans.

Erosion of the banking relationship

One determinant of the degree to which securitization can replace traditional bank lending is the relative importance of relationship to both bank and borrower. Recently many factors have reduced the value of the banking relationship. Among these are the rise in interest rate volatility, historically high nominal interest

rates in the early 1980s, asset quality problems at banks, shifts in the international flows of funds, and increased competition among banks and from other financial firms.

For banks, the sharp rise in interest-rate volatility in the late 1970s and early 1980s made the options embedded in loan agreements much more expensive. The unanticipated high level of interest rates increased both the (foregone interest) cost of reserve requirements and the effective cost of capital. As a result, the cost of holding a loan on the balance sheet in many cases exceeded the agreed lending rate, usually a base interest rate plus a spread. Thus, if the borrower exercised its right to borrow, the bank would be forced to make an unprofitable loan.

Banks responded to the higher cost of the options by withdrawing them in whole or in part where they could. In particular, they could cancel or reduce credit lines. Uncommitted lines eventually were replaced by commitments for which borrowers had to pay. These could be purchased separately from other banks that were not the traditional relationship banks. For thrifts and banks holding long-term assets that could not be called—but that exposed the institutions to much greater interest rate and prepayment risk than experienced before—selling loans grew more attractive. In extending new loans, thrifts and banks shifted from fixed-rate term lending to floating-rate loans, passing the interest rate risk to the borrower.

Interest rate volatility affected nonbank intermediaries as well. For example, life insurance companies traditionally provided implicit and explicit options in their contracts. With higher rates, however, policyholders let low-yielding policies lapse and took out low-interest policy loans in volume. The insurance companies responded by altering their liabilities to resemble those offered by depository institutions and mutual funds. To match the duration of these new liabilities more closely and to reduce their interest rate risk, life insurers have sold off part of their long-term commercial mortgage portfolio.

While banks sought to eliminate the unprofitable or risky aspects of the traditional lending relationship, the value to the bank of its other aspects has probably increased, especially as the emphasis in measuring bank performance has shifted from asset growth to rate of return on equity. Many of the nonlending services provided by banks produce fee income and are not covered by capital requirements. Customers tend to concentrate their purchases of financial services with one provider or a few. Usually the main provider is a lender. The need to offer the key service of lending pushes banks to reshape their lending activity to retain the element crucial to the borrower (access to funds)

and eliminate the element unprofitable to the bank (retention on balance sheet). Thus origination of loans for sale as participations emerges as a business line.

For the borrower, the value of the banking relationship has more clearly declined for a variety of reasons. Actions such as cutting credit lines have reduced the attractiveness of banks. Legally binding commitments have replaced credit lines; NIFs and other underwritten facilities have replaced some short-term and syndicated lending; and the FRN market has replaced part of the interbank market, as even bank borrowers have tried to ensure their medium-term access to funds. In these cases, the borrower is looking for less flexibility and more certainty in the lending arrangement than under a system of bank credit lines. But the demise of the implicit contract means the demise of the distinguishing feature of a loan.

The perception that asset quality has declined at many banks and that some may be vulnerable to liquidity problems in difficult market conditions has also undermined bank credibility and the value of the banking relationship. Many of the largest, most creditworthy borrowers find that they can tap the markets at rates more favorable than those offered by most of the largest banks.

International flows of funds also affect the value of the banking relationship by changing the identity of the major lenders in the world. Traditional banking has eroded much less overseas than in the United States. In a country such as Germany, for example, banks' equity investments in major borrowers help cement the borrower-lender relationship. In addition, some foreign banks, especially Japanese banks, have acquired assets aggressively in the past few years.

But domestic borrowers may view foreign banks as less credible in a banking relationship than domestic banks for many reasons: questions regarding the lender of last resort, a history of capital controls, or even conflicts of national interest. In these cases, the borrower may prefer to use an investment bank rather than replace a domestic banking relationship with a foreign one.

Since banks chiefly provide short-term funds, corporate and other borrowers will turn away from banks when their needs call for longer-term finance. Following increased reliance on short-term debt in the latter half of the 1970s, firms turned to the long-term market in 1982 and again in 1984 through 1986, as long-term rates declined.

Finally, sharper competition among banks, including foreign banks, as well as encroachment by finance companies and thrifts on traditional bank activities such as consumer loans and commercial real estate lending, has reduced the perceived cost of severing a banking

relationship. Large, high-quality borrowers now have little difficulty in finding new lenders. And the view that plenty of liquidity is around in the banking system amplifies that effect.

In particular, increased competition and a trend away from specialization by financial institutions allow borrowers to unbundle the banking relationship. By shopping for individual services such as credit lines, loans, and deposit services, the borrower can reproduce the relationship at lower cost. This kind of unbundling is separate from the unbundling of risks seen in the financial markets, which is related to the development of derivative products such as futures and options.

The weakened role of relationship is seen both in the reduced share of large U.S. banks in the prime wholesale lending market and also in the decline of loyalty among medium-size corporate customers. A recent Board survey pointed to a decline in the share of medium-size firms that bank with the institution from which they borrowed.²

Moreover, as the palette of services offered by non-bank financial firms grows to resemble that offered by banks, the customer views the "relationship" as more similar. The loss of uniqueness means a loss of market power. Banks can respond by bolstering their ability to offer better access to funds or they can emulate to the extent legally possible the unique product of investment banks, underwriting, by selling loans or placing commercial paper. That choice will depend on the cost of intermediation.

Bank versus market intermediation

Forms of intermediation

Almost all financial transactions are intermediated in some form. The most significant exception is the direct issuance of commercial paper, although even here the holders are often financial intermediaries. The term intermediation covers a number of functions. In its simplest form, it is brokerage: borrowers are matched with lenders for a fee. A second form of intermediation is underwriting. Borrowers are again matched with lenders, but the borrower receives a certain sum at a certain interest rate at a certain time. The underwriter therefore bears and absorbs uncertainties about the demand for the securities in return for an uncertain spread.

A third kind of intermediation is carried out by mutual funds. It involves selling shares in a pool of assets, where returns to the investor are based on the return of the portfolio of assets the fund holds. Maturities of assets and liabilities are generally matched and are

²Senior Loan Officer Opinion Survey, August 1986, Board of Governors of the Federal Reserve System.

either based on some agreed-upon future date when the fund will be liquidated, as in a closed-end fund, or on the preferences of the fund's investors, with assets liquidated as shareholders make withdrawals. As the fund grows in size, actual asset liquidation costs are minimized by the reasonably predictable flow of payments in and out of the fund and the continual reinvestment of part of the portfolio. Besides matching lenders with borrowers, the principal social benefit of a mutual fund is that it can offer an investor a liquid and diversified investment with a low minimum denomination.

A fourth kind of intermediation is that performed by depository institutions, insurance companies, and finance companies. Such financial firms make loans and issue liabilities against the intermediary as a whole. They absorb the interest rate and funding risk over the life of their loans. They will generally also transform maturities and absorb credit losses, and in the case of banks, thrifts, and finance companies, issue fairly liquid liabilities against rather illiquid assets.

The ability to offer a liquid liability with low credit risk against illiquid, risky assets derives from the intermediary's economies of scale, which enable it to pool risks and generate liquidity, as well as from its capital, which buffers losses. (A mutual fund makes use of these economies of scale as well.) A sizable portfolio allows diversification and thus a reduction of the variability of returns and a minimization of capital needs. Since only a fraction of depositors' liabilities will be converted to cash at any one time, cash or clearing balance needs are fairly predictable and depositors do not usually have to fear for the liquidity of their claims. The existence of a lender of last resort and the presence of deposit insurance or other forms of "safety net" arrangements provide an added layer of protection.³

These four types of intermediation should not be identified too closely with types of institutions, however. An investment bank that funds a large inventory of corporate and government bonds with overnight securities loans is carrying out maturity transformation. But the business purpose of an investment bank is not to bear credit risk or to fund a stock of assets, as it is for other financial intermediaries.

A simple model of bank and market intermediation

Two key questions raised by the spread of securitization are: Has the cost of maturity and liquidity transformation performed by depository institutions risen so much that it is no longer economically profitable? And has it risen sufficiently to allow the proliferation of substitute forms of intermediation? Answers to these

³Originally, commercial loans were made against short-term bills. This type of lending probably involved little maturity transformation and possibly less credit risk than commercial lending today.

questions require a systematic analysis of costs.

This section presents a simple model of banking and the commercial paper market, which is meant to be a representative securities market. The model views the cost of bank intermediation as the spread between lending and deposit rates needed to cover costs and earn a normal profit. The wider the spread, the greater the opportunities for securities underwriting to channel funds from investors to corporate borrowers.

A bank takes deposits from small and large investors, makes commercial and other loans, perhaps conducts nonloan fee income business, and holds capital. The depositor searches for investments that provide an attractive combination of liquidity, safety, and rate of return. Convenience and flexibility in managing other financial assets may also be important. The loan customer has a fixed borrowing need and can choose between the loan or commercial paper market. The banking and commercial paper markets are reasonably competitive, so that prices are close to marginal costs.

For a given deposit rate, the bank must earn an interest rate that will cover its marginal costs and a normal return to capital, the sum of which we will denote BSC, the cost of holding a loan on balance sheet. That cost is:

$$BSC = kE + \frac{(1-k)(R+D)}{(1-q)} + A + LL$$

- where k = capital to asset ratio
- E = required rate of return on equity
- R = market interest rate on deposits
- D = FDIC insurance premium
- q = required reserve ratio
- A = origination and servicing cost, expressed as a rate per dollar
- LL = expected loan loss rate, net of recoveries.

For simplicity, this ignores income taxes and loan fees.

Changes in reserve and capital requirements, when the requirements are binding, will influence the spread between BSC and the deposit rate, which we denote s_b . The influence of these key variables is summarized in Table 1. Movements in the spread s_b may have a loose connection to interest rate cycles. When nominal interest rates rise, the cost of reserve requirements (foregone interest) rises. A change in the cost of capital, that is, the required rate of return determined in the stock market, will also influence s_b . The cost of capital is tied only indirectly to interest rates. As interest rates approach a cyclical peak, it seems likely that the required return would rise since returns on alternative investments will have increased. In general, the required rate of return will always be at least as high as the riskless rate of return, since the investor will view this

as the opportunity cost of funds. But the required rate of return may at times stay high as interest rates begin to fall, because capital gains raise the return on existing long-term instruments.

At its narrowest, the spread s_b may still be large enough to allow some borrowers to finance more cheaply in the commercial paper market. As s_b widens, the commercial paper market becomes attractive to a broader group of borrowers. The cost of a commercial paper borrowing will be

$$CCP = R_{cp} + U,$$

where R_{cp} is the rate of return to the investor and U is the underwriting cost, expressed as a spread. The borrower will prefer to use the commercial paper market whenever BSC is greater than CCP. If we assume for a moment that R_{cp} is greater than R , the deposit rate, securitization will occur whenever

$$s_b > U + (R_{cp}-R).^4$$

⁴With marginal cost pricing, the borrower pays $R_L = R + s_b$ in the loan market and $R'_L = R_{cp} + U$ in the commercial paper market. The borrower will be indifferent between them when $R_L - R'_L = 0$. That implies $R + s_b = U + R_{cp}$ or $s_b = U + (R_{cp}-R)$ at the margin.

To make a commercial paper offering attractive to investor and borrower, the marginal cost of underwriting commercial paper must be less than s_b , since the investor must earn a higher rate of return than on a bank deposit to compensate him for the somewhat higher risk and the borrower must pay a rate below the bank lending rate. If large investors at the margin require a lower rate of return on commercial paper than on bank deposits, this is an additional advantage to the commercial paper market.⁵

If there are large fixed fees involved in setting up a commercial paper program (for example, to obtain a rating), then the discounted present value of interest savings from borrowing through commercial paper must be large enough to compensate for the fixed costs. A narrow spread s_b would allow access to the commercial paper market only to large borrowers; a wider spread would allow access to many more. In other words, the borrower is likely to look at the total cost of a discrete amount of borrowing and choose the cheapest alternative.

If the spread s_b becomes sufficiently wide, more complex arrangements can link borrowers and lenders. Money market mutual funds can collect savings and purchase commercial paper. Since the fund managers will collect a fee that we can think of as a spread, hold some funds in cash at a prudential level of reserves, and earn a return to whatever capital underlies the fund (generally none), the spread s_b has to be wide enough to accommodate both the underwriting cost of the commercial paper and the cost of intermediating through the mutual fund. If we denote the mutual fund's spread as s_{mf} , then the spread is wide enough when $s_b > U + s_{mf}$ and $R_{cp}-s_{mf}$ is greater than the deposit rate available to retail investors.⁶ The fairly simple structure of a mutual fund suggests that the mutual fund's spread is probably low, and certainly lower than at a bank. Some money funds charge only 50 basis points.

This framework can be generalized further to include the decision of an intermediary to sell its assets. An investor is willing to purchase a risky asset or pool of assets if the investor believes it has adequate protection against the risks assumed. If the investor is a financial institution used to assessing and bearing credit risk, it considers its own capital and its funding costs in determining the price to pay and the rate of return it

Table 1

Factors Influencing the Spread between Loan and Deposit Interest Rates

In a competitive market, price will equal marginal cost:

$$R_L = kE + \frac{(1-k)(R-D)}{(1-q)} + A + LL$$

(The variables are those defined in the text.) The spread between the bank lending rate and the deposit rate, s_b , is:

$$s_b = kE + \frac{(1-k)(R+D)}{(1-q)} + A + LL - R.$$

In addition, we assume that the required rate of return on equity is always higher than deposit interest rates by at least a small margin. The table below summarizes the direction of change in the spread s_b when key variables increase:

Variable That Changes	Direction of Change in s_b	Comments
Deposit rate (R)	+	a rise in nominal rates raises s_b
Cost of capital (E)	+	a rise in the capital asset ratio raises s_b
Capital to asset ratio (k)	+, if $E > \frac{R+D}{1-q}$	a rise in the cost of capital raises s_b if the rate of return on equity is above the deposit rate by a sufficient margin, which will generally hold
Reserve requirements (q)	+	a rise in the reserve requirement raises s_b
Deposit insurance premium (D)	+	a rise in the deposit insurance premium raises s_b

⁵Over the last ten years, top-grade commercial paper rates have sometimes been below both bank certificate of deposit (CD) rates and the London interbank offered rate (LIBOR).

⁶The spread $s_b = R_L - R$. A borrower will switch to the commercial paper market when $R_L > R_{cp} + U$. A depositor will switch to mutual funds if $R_{cp}-s_{mf} > R$, if an institutional investor, or if $R_{cp}-s_{mf} > R_D$, the retail deposit rate, if a retail investor.

earns. Most other investors, often lacking capital to absorb losses, seek to avoid nonpayment of principal by requiring greater protection from the seller: larger price discounts or a recourse provision, possibly in the form of a reserve fund. These investors also consider funding or opportunity costs.

The bank selling the asset can express the charge to income from a price discount or from setting up a reserve fund as the equivalent of a level of capital held over the life of the loan. It can compare this level with the capital it is required to hold against the loan if the loan is on its balance sheet. It can also compare the return on the asset required by investors and the bank's cost of funds.

When the amount of credit protection required by the investor is equivalent to less capital than the bank's targeted capital-asset ratio, or there are other funding cost savings, there are potential gains in selling off the asset to investors. Increases in the bank cost of capital also promote a shifting of assets to holders requiring less capital or having a lower cost of capital.

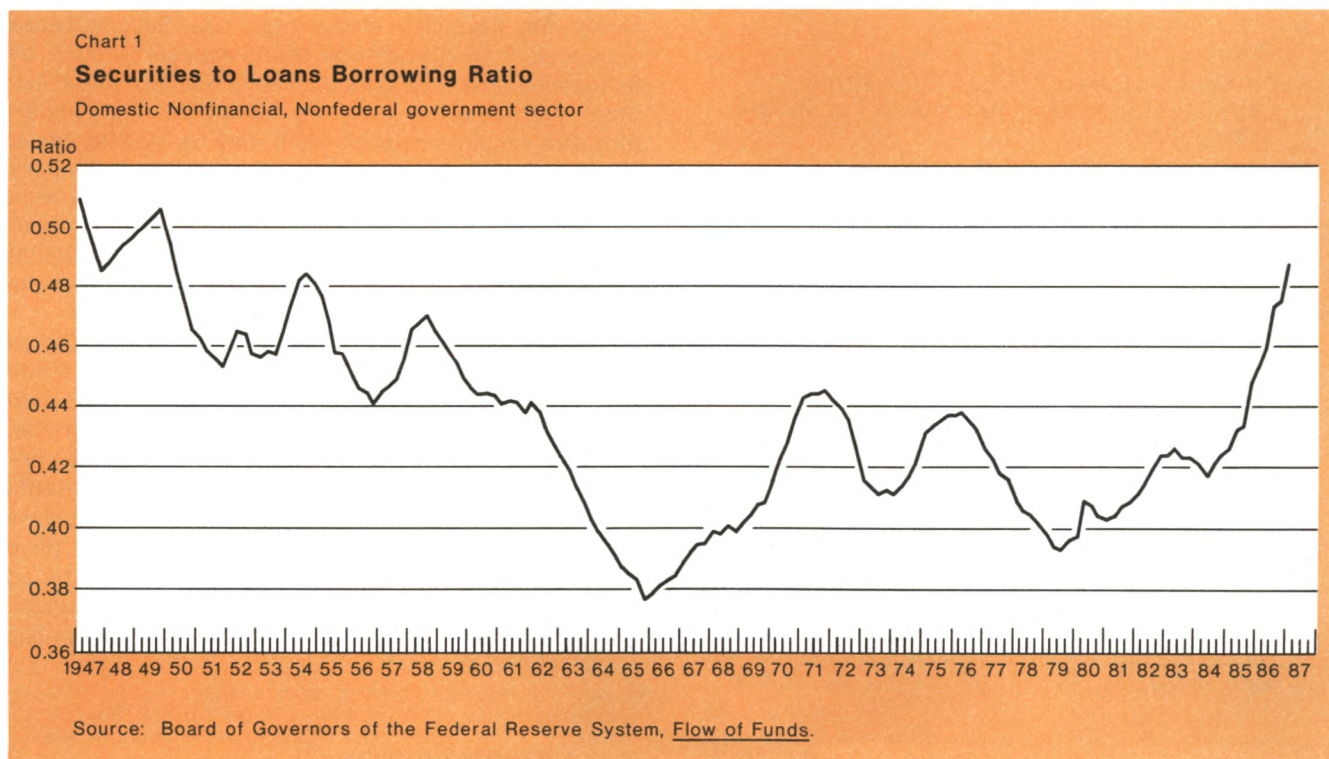
Funding and capital costs are not the only determinants of asset sales. Sales of asset pools have also grown because of the sharp reduction of costs in packaging and servicing the assets.

If the spread between the cost of holding loans and

the deposit rate is loosely tied to the level of interest rates, then the share of securities in total credit extended rises as interest rates are peaking and falls as interest rates reach their trough. A certain amount of cyclicity can be observed (Chart 1).⁷ Two factors work to dampen this cycle, however. First, periods of high interest rates usually coincide with periods of scarce liquidity, low private borrowing, and a shift by investors to safer, more liquid investments. Second, profitable operation of a mutual fund requires large size in order to take advantage of economies of scale inherent in many forms of financial intermediation. To gain sufficient size takes time, and the interest rate cycle in an unregulated environment may normally be too short to attain such a large scale.

These impediments to the securitization cycle have weakened in the last decade. The combination of high inflation and Regulation Q in the latter half of the 1970s created ample opportunity for money market funds to flourish. With low marginal and average costs once they reach a large size, money market funds are unlikely to

⁷Monthly and quarterly data suggest that securitization takes off just as corporate bond rates reach their peak. This pattern probably reflects both increased bank intermediation costs and the resurgence of bond demand in anticipation of capital gains. Aggregating to annual data obscures this pattern, and an inverse relationship between securitization and interest rates emerges.



disappear. Their growth has expanded the market for commercial paper, which might otherwise be limited by the large minimum denomination of the instruments.

Behavior of the cost of bank intermediation

In the late 1970s, the spread s_b widened to unprecedented postwar levels and remained large (Chart 2). Since then, the spread has fallen. Under conservative assumptions, s_b was no wider in 1985-86 than it was in 1975-76. Under other assumptions, the spread since 1982 has risen beyond the 1975-78 levels (see Appendix).

In particular, the assumptions about the target level of capital at banks and the target rate of return on equity affect our perception of the importance of bank intermediation costs since 1982. The base case assumptions are that the desired bank capital-asset ratio is fairly represented by actual capital-asset ratios up to 1981 and by bank regulatory guidelines since then and that the rate of return on market equity has been constant at 15 percent over the whole period. The assumption about bank capital ratios after 1981 would seem to understate the case somewhat since most banks are targeting capital-asset ratios above the minimum required.

Under the base case assumptions, s_b averaged 85

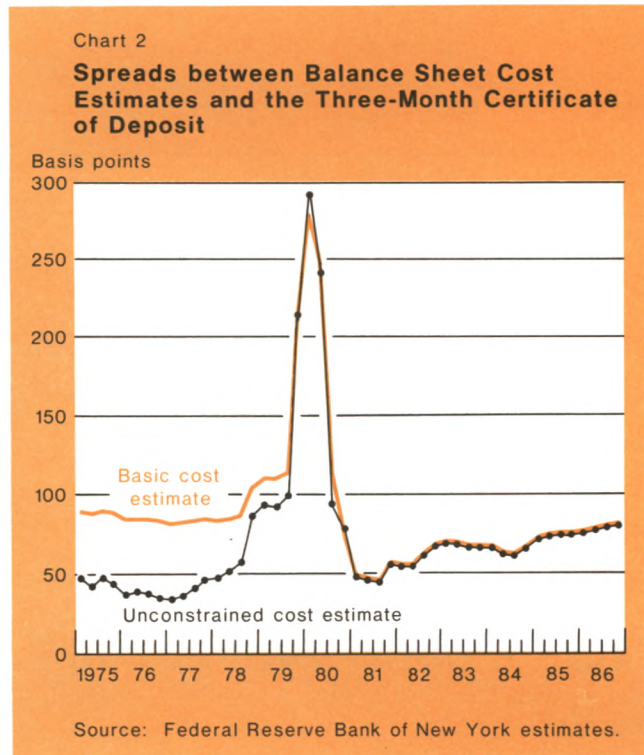
basis points in 1975-78, spiked in 1980-81 under the influence of the temporary imposition of marginal reserve requirements on managed liabilities, and averaged 70 basis points from 1982-85, with a rising trend. Movements in s_b have been larger than the movements in the difference between high-grade 90-day commercial paper and CD rates, which fluctuated trendlessly in a range of -10 to 10 basis points over the whole period, except for a brief dip to -20 basis points in 1978.

The base case assumptions suggest at most that bank intermediation costs remained at their high late-1970s level and thus allowed securitization to spread to new financial transactions. An argument for a cost-driven wave of securitization after 1982 needs to assume that banks were largely unconstrained by capital in the period before 1981 or that their required rate of return on capital rose after 1981. If these assumptions are plausible, the role of bank intermediation costs may be important in the latest wave of securitization.

Indeed, the rise in bank capital requirements alone cannot explain the perceived increased cost of maintaining a loan on the balance sheet. Higher capital requirements should reduce the perceived riskiness of banks and bring about a fall in the required rate of return on equity. This fall does not appear to have occurred, however, for several reasons. First, the rise in capital requirements coincided with a reassessment of the overall riskiness of banks—thus the increased capital may have prevented a larger rise. Second, banks expanded their off-balance sheet exposures even as they raised their capital, undercutting much of the effect. Third, the market for bank capital is most likely imperfect. The required rate of return may be slow to adjust to positive changes and quick to respond to potentially negative developments.⁸ Fourth, the relatively high interest rates in the early 1980s no doubt put a floor under bank capital costs, preventing higher capital requirements from quickly producing a reduction in the bank cost of capital.

But the most important reason may be common to all financial firms and helps to explain the breadth of the securitization phenomenon: strong upward pressures on the cost of capital in the financial sector as a whole. Many financial firms share a tendency to fund in shorter-term markets and to hold assets that are longer-term; they tend to have some sort of negative gap. This links their returns on equity and makes their equities close substitutes in investor portfolios. In the 1980s, a broad range of financial firms have sought to raise capital: commercial banks, investment banks seeking public

⁸In particular, the required rate of return on equity may not fall if the capital requirement of the regulator is higher than that required by the market. Higher capital ratios provide a social benefit for which investors cannot be compensated.



ownership, finance companies, and a host of foreign institutions. Falling barriers to entry, especially overseas, a wave of new products, and the growth of secondary market activity have all opened up opportunities that require more financial capital. Moreover, the rate of return on investment bank equities has been much higher than on bank stocks, which puts additional pressure on banks to raise return on equity.

Indeed, as banks have lost business in the prime wholesale and in other loan markets, the loss overall has been not so much to other financial intermediaries as to institutional investors for whom capital is not really a constraint.⁹ That is, as argued earlier, the loss of bank share is not a symptom of classic disintermediation.

The sustained high level of bank intermediation costs has occurred at the same time that many of the costs of transacting in the securities markets have been declining. The introduction of shelf registration through Rule 415 and the opening up of the Euromarkets significantly reduced the cost of underwriting and eased access to the markets. The growth of risk management product markets has made it easier for investment banks to hedge risks in making markets, although higher volatility may have raised those risks. Over the last 15 years, underwriting costs have fallen modestly in the commercial paper market, and more considerably in the bond markets, especially the Eurobond market. Information costs have generally fallen, so that investors are better able to evaluate borrowers. Orders are executed more rapidly.

But capital requirements are not entirely beside the point. Forms of securitization such as loan sales to foreign banks, the expansion of thrift assets where capital requirements until recently have been low (3 percent or less), and the growth of mutual funds with essentially no capital show that capital constraints matter. Even among finance companies, much of the growth has been among special purpose issuers with very thin capitalization.

As a consequence, the financial markets are intermediating a large volume of transactions. Increasingly complex chains of transactions are replacing lending by intermediaries, including mutual funds that purchase mortgage-backed bonds, high-return low-quality corporate bonds, and other securities. Ample liquidity has meant that the surge of securities issuance has not come fully at the expense of bank lending, so that overall credit has grown sharply.

⁹According to the flow of funds accounts, between 1975 and 1985 banks and thrifts lost about 7 percent of market share (measured in holdings of total financial assets), while finance companies gained 1 percent; pension funds and insurance companies, 2 percent; and mutual funds, 4 percent.

The analysis so far points to three conclusions. First, a chain of transactions that uses less capital to intermediate a financial claim than is needed to retain an asset on a bank's balance sheet can substitute for bank lending. Thus, even complex or highly illiquid assets could be securitized if the transformations needed to make them marketable (for example, credit and liquidity enhancements) and the underwriting cost involve lower capital costs and fees than bank lending.

Second, even highly profitable lines of bank lending could be sold to investors through the securities markets if the costs of packaging, underwriting, and protecting against credit losses are less than the difference between the cost of booking the loan and the cost of deposits. By selling the asset, the bank could capture some part of the profits of lending and the reduction of intermediation cost.

Third, the expectation that high spreads in traditional intermediation will persist encourages a lasting shift toward securitization. In the short run, a rise in s_b directs borrowers to the commercial paper market, increases the demand for investment banking services, and raises the rate of return on investment bank capital. If the high returns persist, capital is attracted to investment banking and rates of return begin to decline, enhancing the competitiveness of securities relative to bank lending. In the longer run, the investment bank sector is larger and the commercial bank sector is smaller. Securitization then becomes a structural feature of the financial markets.

Gaining access to the securities market

Some bank loans are not really suitable for replacement by securities. Such loans may be too small; information about the debtor may be scarce; risks assumed by the creditor may be too difficult to assess. Nevertheless, certain kinds of asset-backed securities can overcome these difficulties.

Pooling loans is one important means to reduce transactions costs and improve risk assessment. Some securities, such as mortgage-backed and auto-loan-backed issues, rely on the law of large numbers to provide more reliable statistical probabilities of events that affect the rate of return on the securities. These events include default and prepayment. Pooling implies that certain regularities of behavior can be observed among the population at large. For example, while the individual probabilities of default among all consumer borrowers at a bank may be unknown, the distribution of defaults is revealed over time and is not expected to change much. Further, aggregating a large number of loans reduces the investor's transactions cost.

The process of pooling reduces uncertainty, but in general it cannot be done without introducing new credit

exposures. Most pooling arrangements lead to multiparty exposures: the investor is relying on the past and future performance of an originator, a servicer, a trustee, the "due diligence" staff at the underwriter, and the ultimate borrowers. Even if all the participants are top-quality and entail only minor credit risks, these risks accumulate.¹⁰ Thus, the risk of multiple exposures is still greater than any single exposure.

A second method of gaining access to the market is collateralization or, more loosely, asset-backing.¹¹ Collateralization refers to a perfected security interest in real or financial assets that could be liquidated if the borrower defaults. Asset-backing is weaker than collateralization. The investor has no security interest in the assets but can rely on a transactions structure that removes the assets from the control of the debtor to assure repayment. Both methods substitute either the credit standing of the issuer of the underlying claims or the value of real property (or its cash flow) for the credit standing of the borrower. The substitution may be in whole or in part.

Except for first and refunding mortgage bonds, collateralized securities have never been very common in the United States. They have been common abroad, and in some domestic markets, such as Japan, they are the main form of corporate debt allowed. Recent efforts to increase the use of collateral in the United States have met with mixed success. Frequently, collateralized funding is expensive enough to compare unfavorably to other sources. For example, mortgage repurchase transactions are now generally a cheaper source of funds than collateralized commercial paper. The conservative reinvestment and prepayment assumptions of the ratings agencies account for most of the higher cost of a collateralized security. These conservative assumptions reflect real risks that are hard to quantify.

The less stringent form of asset-backing reduces this problem. In a typical asset-backed transaction, the firm originates and sells assets to a special purpose entity that is structured to be legally independent of the firm and unaffected by the firm's bankruptcy. The assets sold are generally high-quality and self-liquidating. The entity then issues a security that is backed by a letter of credit from a bank or a guarantee from an insurance company. The bank or guarantor looks to the assets to provide a cushion if the commercial paper is not paid off. In

many ways, the letter of credit resembles a performance bond since the main reason the funds generated by the receivables would not be paid over to the commercial paper holders would be if the seller/servicer failed to perform the servicing function. It may also be a way to deal with assets that are not self-liquidating.

Collateralization and asset-backing both reflect a theory of segregation of the originating firm's assets and liabilities into pools or classes. Such a theory claims to offer more security to new creditors, but it does so at the expense of the firm's existing creditors and perhaps its owners. The theory would only work if all the streams of income and expense of the firm were exactly correlated. If the income streams produced by a firm's assets are random and even somewhat uncorrelated, then the firm gains by diversification and the sum of the flows is less variable than the individual flows. Even if assets and liabilities were matched exactly and each pair packaged as an asset-backed transaction, the gains from pooling cash flows having a random component would be foregone.

A disadvantage of collateralization and asset-backing is that it may weaken the internal risk-pooling at already weak firms. The reason for pledging or isolating assets is that the overall sum of the flows is viewed as "too risky." In other words, the originating firm is not of sufficiently high credit standing to gain access to the market. The collateralized or asset-backed technique removes the higher-quality and presumably more certain income flows, weighting the firm's remaining cash flows toward more risky income. The firm can make this problem better or worse depending on how it structures the liabilities to take on interest rate risk. If asset sales or pledges sufficiently reduce its total funding risk, the firm could lower its overall risk.

In many cases, financial institutions are transforming or reducing risk by assisting in securitizing assets (for example, providing a letter of credit) and adding their own credit exposure to them. As a consequence, classes of very unrelated securities may in fact become related. For example, if bank ABC issues commercial paper, guarantees the commercial paper of XYZ, acts as paying agent for AAA's bond issue, and is trustee for auto-loan-backed securities of a major auto finance company, these securities have in common a credit exposure to bank ABC. If the "weakest link" theory is applied, as it is by rating agencies such as Standard and Poor's, a downgrading of a financial institution may lead to downgradings of securities in which the institution plays a part.

This is not to say that investors may not benefit from asset-backed securities. Such securities may offer a better risk-return trade-off than many others. But the reduction of risk—either by pooling or by segregation

¹⁰The risk of a failure of the security is the risk that any participant fails. Assuming participant failures are independent and disjoint events, the probability of default is the sum of the individual probabilities of failure.

¹¹Some pools are sold through collateralized bond issues (for example, collateralized mortgage obligations) for tax reasons. Here we mean that assets of various types are pledged to back a bond issue with no reference to any pooling properties.

from the parent—cannot be achieved without introducing new credit risks, however small they may be. Failure to take account of these credit risks can lead to overpricing of securities in the markets.

If the firm uses the asset-backed market to expand its activities without expanding its balance sheet—a reason cited for some mortgage-backed and receivables-backed transactions—it may also weaken existing creditors. A firm expanding its activities does not increase the burden on its capital if the expanded activity is riskless. But activities financed by asset-backed securities are not riskless. No matter how short the time period in which assets are accumulated for packaging in securities form, some risk exists that interest rates will change and the firm will incur some loss. Unless it is hedged, more risk is borne by the existing creditors and owners of the firm. Moreover, assessing this additional risk is probably difficult.

In summary, complex transactions can replace bank lending if the costs of intermediation are low enough. But some transactions have spillover costs to existing creditors, the firm's owners, and the financial system. They may have hidden risks that are hard to analyze and price. The apparent cost of these transactions might be well below the true cost.

Deposits versus securities

The last link between investor and borrower in the traditional bank lending relationship is between the bank and the investor. Typically, savers have held claims on a bank in the form of deposits. Investors have chosen from an array of bank claims that includes subordinated debt, preferred stock, and equity, as well as deposits. But increasingly, savers and investors are replacing deposits with securities claims on banks or bypassing banks altogether. Ironically, the shift toward securities comes at a time when banks have great freedom in the type of deposit services they can offer.

The essential features of a deposit as opposed to a security of any type are the absolute absence of price risk and the low transactions costs. Certain types of deposits, such as demand and some time deposits, have a high degree of liquidity as well. Between FDIC insurance and the supervision of the banking system, bank deposits also have a very low level of credit risk.

Certificates of deposit (CDs) do not fit into this picture very neatly, since they are deposits but have many of the characteristics of securities. In particular, they can be traded over their life and therefore involve some price risk. Like other deposits, CDs have low transactions costs and the credit risk benefits of supervision.

In general, securities offer a higher rate of return and the potential for sale before maturity but carry far greater risk than bank deposits. Investors assume price,

liquidity and credit risk. In well-developed, liquid markets, securities also increase flexibility in managing assets.

A number of factors have served to weaken the position of deposits as against securities. Investors have learned that some of the ostensible advantages of deposits do not in fact exist. While deposits are not subject to nominal price risk, depositors suffered heavy real losses in the highly inflationary years of the late 1970s and early 1980s. In this respect, deposits are no different from any instrument with fixed nominal value. The perception that deposits are extremely safe has probably also diminished, at least in the eyes of some large depositors. The decline in banking relationships could lead to a reduction in required bank deposits such as compensating balances held in lieu of fees for services.

But these are not the major forces that are changing the balance between deposits and securities. If they were, then new securities would probably be largely index-linked bonds or government-risk securities. Index-linked securities could provide considerable protection against inflation; government securities have no credit risk. In fact, however, the markets have taken a different direction.

Three major factors seem to be behind the stronger growth of securities demand. The first is the institutionalization of savings in the United States and other industrial countries. Savers increasingly hold claims on pension funds, insurance companies, savings plans and mutual funds—all institutional investors that manage large portfolios of assets and usually pay rates of return on liabilities related to portfolio performance. Many such holdings are favored by their tax-exempt status when provided as part of employee compensation, but these institutions also offer lower transactions costs and greater diversification than individual investors can achieve. Such institutionalization leads to the possibility of diversification and management of a portfolio of financial claims within the institution, instead of reliance on deposit-based intermediaries. Institutionalization of savings abroad, especially in Japan, is also important in a period of strong capital inflows into the United States.

Institutionalization of savings is enhanced by the growth of wealth and by investor sophistication. Indeed, the increase in investor sophistication has itself been an important reason for growing securities demand. Individual investors, motivated in part by income tax considerations and by risk/return characteristics, have shown particular interest in zero coupon bonds and equity shares.

A second factor is the development of techniques using options, futures and other hedging instruments to

manage risks, especially price risks. This means that institutional investors again are less reliant on banks to achieve relatively liquid, safe portfolios; they can perform more transformation within their portfolio and hedge any resulting risks. If banks earn economic rents in providing this transformation or are inefficient in their use of capital or other resources, then the process of transformation will shift outside the banks, not just to near-banks like finance companies but also to the portfolios of investors.

The development of risk management techniques has been lopsided, however. Growing wealth and ample liquidity have given investors the wherewithal to take more risk into their portfolios. Still, no new method has been found to hedge or diversify away credit risk any more efficiently than banks have done for decades. This lies behind the paradox of the simultaneous growth of credit enhancement and development of the market for "junk" bonds, bonds with higher returns reflecting presumably higher credit risk.

Some investors are unable or unwilling to bear much credit risk. Examples are money market funds, which publish a prospectus stating that they invest only in top-quality assets so as to attract risk-averse shareholders; some institutional investors that have fiduciary responsibilities; and small retail investors. As their portfolios expand rapidly, perhaps in response to favorable tax benefits or a shift in intermediation costs, they begin to exhaust the supply of quality credits. And this problem can be made worse by a decline in the number of good names, as has occurred in the United States.

With credit enhancement, lower-quality borrowers can be made acceptable to such investors. Thus, if the demand for high-quality credits expands faster than the supply, demand for credit enhancement increases, returns to capital in the credit enhancement sector rise, and new capital is attracted, as seen in the entry of foreign banks into the letter of credit business and the incorporation of new bond insurers.

At the same time, some larger investors, including less constrained institutional investors and high net worth individuals, can manage their portfolios much like banks, holding securities of all types and using the diversification principles that banks use. Higher capital requirements reduce the efficiency of banks relative to many institutional investors, offsetting their comparative advantage in credit analysis. If other efficiencies do not counterbalance these higher capital needs, more banklike portfolios are built up outside the banking system. This expands the market for low quality assets. Junk bonds become cheaper to borrowers than a bank loan paired with a swap that fixes the interest rate.

The final type of change contributing to stronger securities demand is an apparently sharply enhanced

desire for liquidity or transferability on the part of investors. When a security is compared to a deposit of equal maturity, the security offers the option of resale into a secondary market if conditions appear to be changing adversely. The deposit generally does not, although the CD is an important exception. Sometimes it is possible to borrow against a deposit or to withdraw it before maturity after paying a fee. But high penalties, highly leveraged balance sheets, or the wide spread between bank lending and deposit rates may make those alternatives unattractive. Increased volatility in interest rates—or even in the underlying creditworthiness of borrowers—makes the option to transfer a security more attractive to investors. This also helps to explain why more capital is being employed to make markets and enhance secondary market liquidity.

Developments in the last few years can account for changes in the choice between securities and deposits by savers. The wider spread for bank intermediation and the advent of new risk management techniques mean that management of banklike portfolios by investors can also substitute for the transformation performed by banks. That transformation has become more expensive for the banks because of higher capital costs. Finally, the higher volatility of interest rates experienced in recent years, along with more volatility in perceived credit quality, has enhanced the value of liquidity in the market.

Conclusion

The degree of securitization appears to depend on the relative importance of relationship in financial transactions, on the cost of traditional financial intermediation, especially bank intermediation, compared to the cost of intermediation through securities markets or private placement, and on the ability of institutional and other large investors to manage or reduce financial risks. In all three areas, changes in the last few years have hastened the development of securitization.

Relationship with borrowers and with depositors, a key aspect of commercial banking, has probably declined in value over the last few years. The response of banks and thrifts to the higher volatility of interest rates—cutting credit lines, increasing prepayment penalties, and selling assets—has resulted in contractual arrangements more easily reproduced by the market. In addition, increased competition in the financial sector has reduced both the market power of banking institutions and the cost of severing ties to banks.

The spread between deposit rates and the cost of holding loans on the balance sheet widened substantially in the late 1970s and early 1980s at the major commercial banks. By conservative measures, it has remained large or even risen above the 1975-78 levels.

The widening spread reflects the generally high level of interest rates in the early 1980s, the higher capital requirements imposed by bank regulators, and the high cost of capital. This last factor has probably contributed to higher marginal costs at all financial intermediaries and helps to explain securitization's broad base.

These higher costs allow firms specializing in underwriting and placement to capture business from traditional financial intermediaries. Underwriting securities, which has traditionally been expensive relative to bank lending, has become relatively less so. Increased competition among underwriters has lowered fees; new hedging techniques and shelf registration have reduced underwriting cost. A combination of commercial paper underwriting and mutual fund operations by money market funds can in many cases intermediate short-term commercial borrowing more cheaply than a bank.

The change in relative costs is large enough to make it attractive to shift to the market even those activities that are now profitable at banks, such as automobile financing and credit card lending. The shift occurs in part because such sales conserve on expensive capital and in part because the cost of packaging small loans has dropped so sharply. Moreover, banks can help less creditworthy borrowers tap the financial markets by backing securities issues with letters of credit. Banks still exploit their absolute advantage at credit analysis, while tying up relatively little capital.

The final major factor, the preference for securities over deposits, stems from the institutionalization of

savings, improved techniques for analyzing and managing risk, and strong demand for liquidity. Institutional and retail investors are willing to assume risks that previously had been taken largely by banks and other depositories. This appetite for more complex instruments has had the perhaps unintended result of increasing the demand for credit enhancement, since no technological breakthrough in analyzing and managing most forms of credit risk, especially commercial credit risk, has been made.

Some factors have been pervasive throughout this analysis and by their nature suggest that securitization is driven by both long- and short-run forces. Increased competition from foreign banks and other intermediaries, the institutionalization of savings, growing investor sophistication, and declines in information and transactions costs in the securities markets are clearly long-run secular changes that on balance favor securitization. Other factors, such as higher volatility in financial asset prices or a higher cost of capital in the financial sector, may not be permanent and give securitization only a temporary impetus. Together, these factors have permitted the securities markets to replace traditional financial intermediation in many ways. Once established, these new intermediation methods are unlikely to disappear soon.

Christine Cumming

Appendix: Assumptions behind the Marginal Cost of Capital in Chart 2

Base Cost Assumptions

Return on equity: 15 percent assumed target rate of return on market equity

Capital/asset ratio: Before 1981, annual weighted averages for a banking universe of 13 banks: Bank of Boston, Bank America, Bankers Trust, Chase Manhattan, Chemical Bank, Citicorp, Continental Illinois, First Chicago, Harris, J.P. Morgan, Manufacturers Hanover, Mellon, and Northern Trust; after 1981, minimum capital-asset guidelines and requirements, as recommended by the Federal Reserve System

Three-month CD rates: Quarterly averages from Federal Reserve Bank of New York

Marginal reserve requirements: The reserve requirement on non-personal time deposits with original maturity of 18 months or less for the largest banks, Federal Reserve Bulletin

FDIC premium: Federal Deposit Insurance Corporation rate, including rebate

Unconstrained Cost Assumptions

Same as above, except the capital/asset ratio is assumed to be a nonbinding constraint before 1981, represented by a value of zero.

Eurocommercial Paper and U.S. Commercial Paper: Converging Money Markets?

The showing of U.S. banks in securities markets abroad has influenced the debate over new powers for banks in the United States. Observers have for some time looked to the Euromarket as an appropriate laboratory for testing the performance of U.S. banks as underwriters. To some, the test results from Eurobond underwriting are positive: in 20 years of existence, with the important participation by U.S. banks, the Eurobond market has proven "orderly and efficient" and underwriters have not taken on excessive risks.¹ To others, the recent record of "huge losses" suggests the possibility of a "disaster" that might prove costly to the federal deposit insurance system.²

Attention is now shifting to the Eurocommercial paper (ECP) market because the power of the test provided by the Eurobond market has waned recently. In particular, U.S. banks have fallen in the ranks of Eurobond underwriters in the face of stiff competition from affiliates of Japanese securities firms and Continental banks. At the same time, after years of rapid growth, Eurobond issuance in 1987 is running well behind the 1986 pace. Some investors are avoiding the Eurobond market because of concern over market liquidity.

But even as they have ceded market share in Euro-

bond underwriting, some U.S. banks have sought to establish themselves as dealers in the rapidly-growing market for short-term Euronotes or Eurocommercial paper. And the performance of U.S. banks in the ECP market, just as in the Eurobond market, can inform the current debate on bank powers.

There is a danger, however, that the debate will take the domestic and offshore paper markets to be basically identical. This article underscores the differences between the Eurocommercial paper market and the U.S. commercial paper (CP) market. We point to significant differences in credit assessment and quality, buyers, liquidity, clearing, and settlement, and we argue that these differences are unlikely to disappear.

Now is an opportune time to contrast and to compare the two markets. While the amount of commercial paper outstanding in London promises to double again in 1987 to over \$60 billion,³ structure and practice in the ECP market are becoming well established. If London is coming through a formative period, New York may be on the eve of a shake-up: banking powers may be expanded to allow bank underwriting of commercial paper.

Some differences between the two markets are likely to persist while others disappear. Ongoing differences include the following:

- Buyers of ECP, coming from a broad range of countries, draw credit distinctions but do not divide issuers consistently by nationality; U.S. investors

¹Richard M. Levich, "The Experience with Unregulated Underwriting Activities in the Eurobond Market and Recent International Financial Market Innovations," testimony before the Senate Banking Committee, October 13, 1987; see also the same author's "A View from the International Capital Markets," in Ingo Walter, ed., *Deregulating Wall Street* (New York: Wiley, 1985), pp. 255-92.

²Testimony of Robert Gerard, Managing Director of Morgan Stanley and Company, before the Subcommittee on Telecommunications, Consumer Protection, and Finance of the House Committee on Energy and Commerce, October 14, 1987.

³For data on the growth of Europaper issuance, see "Statistics on Euronotes and Eurocommercial Paper," Bank of England *Quarterly Bulletin*, vol. 27 (November 1987), pp. 533-35.

in CP systematically require foreign issuers to offer higher yields than like-rated U.S. issuers.

- The distribution of U.S. issuers in the ECP market is of significantly lower quality than the distribution of U.S. issuers in the U.S. CP market; foreign issuers in the United States show a distribution of quality significantly better than that of U.S. issuers here.
- Central banks, corporations, and banks are important parts of the investor base for particular segments of the ECP market; the most important holders of U.S. CP, money market funds, are not very important abroad.
- The average maturity of ECP remains about twice as long as the average maturity of U.S. CP.
- ECP continues to be actively traded in the secondary market; most U.S. CP is held to maturity by the original investors.
- Issuing, clearance, and payment of ECP are more dispersed geographically and more time-consuming than those same processes for U.S. CP.

The following differences are likely to prove transitory:

- Dealing is very competitive in the Europaper market; just two firms deal half of dealer-placed U.S. CP.
- To date, all ECP has been placed by third parties; many U.S. CP issuers place paper directly with investors.
- Credit ratings are necessary in the domestic market; in the Euromarket they are common but not required.
- ECP has been and mostly continues to be priced in relation to bank deposit interest rates; pricing in the U.S. is based on absolute rates that vary in relation to rates on Treasury bills and bank certificates of deposit (CDs).

Permanent differences

The foreign premium

A cosmopolitan market, the ECP market brings together issuers and investors from a wide range of nations. Buyers and sellers in the U.S. market, by contrast, are overwhelmingly U.S.-based. Foreign banks, companies and sovereigns and their U.S. affiliates have issued only about one-tenth of outstanding U.S. CP (Chart 1).

Buyers in the U.S. CP market have exacted a yield premium from foreign issuers over like-rated U.S. issuers. The premium started at almost one-half of a percentage point in the mid-1970s and declined to around one-quarter by the early 1980s.⁴ In the past year

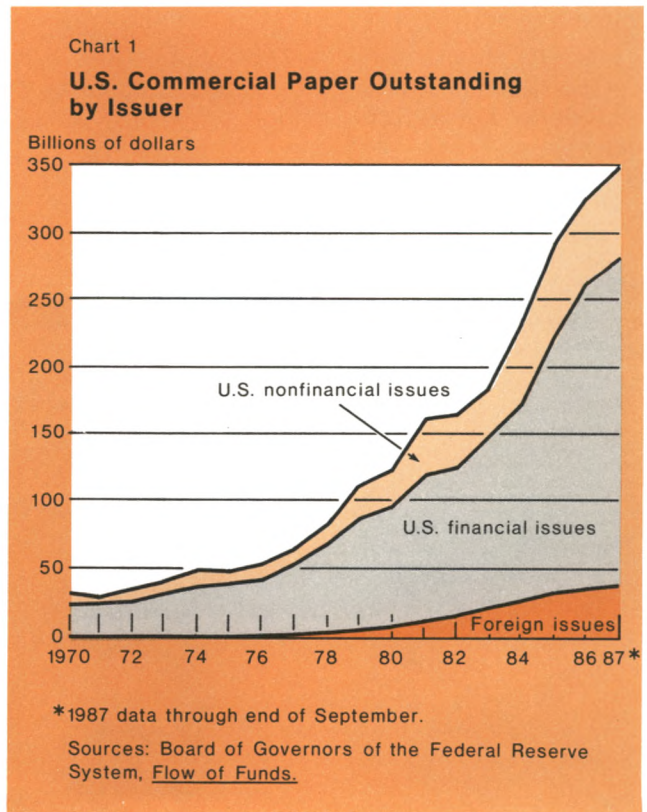
⁴Marcia Stigum, *The Money Market* (Homewood, Illinois: Dow Jones-Irwin, 1983), p. 64.

it has reached eight to ten basis points.

The foreign premium in the U.S. CP market may be traced to restrictions on buying foreign paper, to the greater difficulty of analyzing foreign firms, and to differences in name recognition. Some investors are prohibited by articles of incorporation or by boards of directors from buying foreign-issued paper. Most foreign issuers of commercial paper have attempted to circumvent such restrictions by establishing financing corporations, frequently in Delaware.⁵ But some investors abide by the spirit of such restrictions and even refrain from buying paper issued by U.S. subsidiaries of foreign entities. Other investors, including insurance companies, have internal limits on foreign assets that, defined broadly rather than legally, constrain their purchase of such paper.

A second source of the foreign premium is the difficulty faced by investors who must perform their own analysis of foreign issuers of paper. Accounting standards differ, disclosure requirements vary, and available information remains less accessible. While the rating

⁵See Peter V. Darrow and Michael Gruson, "Establishing a U.S. Commercial Paper Programme," *International Financial Law Review*, April 1985, pp. 8-12.



agencies may be given access to information not publicly available, a buyer of foreign CP cannot easily form an independent judgment.

A final source of the foreign premium is lack of name recognition. Some investors in commercial paper emphasize liquidity and safety; if they are not effortlessly assured of both, they will not buy paper, even from a well-rated issuer.

Some of the same factors that created the foreign premium in the first instance help to account for its decline in recent years. As more information on foreign companies becomes available, paper buyers should require less of an inducement to buy foreign paper. Several forces have worked to increase information over the past twelve years. U.S. banks have widened their relationships with foreign corporations and have thereby given bank trust departments greater access to information on foreign borrowers. In addition, U.S. securities firms have stepped up research on foreign corporations in line with the growing investment by pension funds, mutual funds, and insurance companies in foreign equities. To serve these investors, some foreign firms issue English language annual reports. As for name recognition, the mere presence of Electricité de France in the U.S. CP market for over a dozen years should

have an effect.

Another development that has promoted acceptance of foreign names in the U.S. CP market and has helped to reduce the foreign premium is the rise of money market mutual funds (MMMFs) to their current status as the largest single type of CP buyer. The growth of MMMFs has in fact closely paralleled the decline of the foreign premium. MMMFs came out of nowhere in the mid-1970s to comprise a \$292 billion portfolio at end-1986; the reduction in the foreign premium took place over the same period.

Although this coincidence suggests a link between the growth of MMMFs and the declining foreign premium, the demonstrated readiness of the funds to buy foreign CP provides more convincing evidence. An analysis of the top ten MMMF portfolios shows that, while they vary considerably in the weight given to foreign CP holdings, in aggregate, they do overweight foreign CP. That is, the top MMMFs have allocated 16 percent of their CP holdings to foreign CP (Table 1). This portfolio share stands quite a bit higher than the 10 percent share of foreign CP in the market as a whole. If the top ten funds, which have about half of all MMMF holdings of CP, are representative, MMMFs hold almost half the foreign CP outstanding, as against less than a third of

Table 1

The Holding of Foreign Commercial Paper by Top Ten Money Market Mutual Funds Investing in Commercial Paper*

	Total Assets	Total CP	Foreign CP	Foreign CP	
				As Percent of Assets	As Percent of Total CP
	(In Millions of Dollars)				
Merrill Lynch CMA Money Fund†	17,959	5,117	307	1.7	6.0
Merrill Lynch Ready Assets Trust‡	10,578	7,190	284	2.7	3.9
Dreyfus Liquid Assets§	7,235	1,497	1029	14.2	68.7
Dean Witter/Sears Liquid Asset Fund	6,869	3,646	25	0.4	0.7
Fidelity Cash Reserves¶	6,604	2,528	1309	19.8	51.8
Temporary Investment Fund**	5,782	5,541	129	2.2	2.3
Cash Equivalent Fund—Money Market Portfolio††	5,556	4,153	1540	27.7	37.1
Institutional Liquid Assets—Prime Portfolio‡‡	5,191	4,008	0	0.0	0.0
Prudential-Bache Moneyfarm Assets‡‡	4,308	2,653	520	12.1	19.6
Kemper Money Market Fund§§	4,174	3,862	1418	34.0	36.7
Total of top ten	74,256	40,195	6,561	8.8	16.3

* Two funds in the top ten, the Trust for Short-Term Government Securities and the Trust of U.S. Treasury Obligations, are specialized funds that invest only in specific government-backed paper.

† As of March 31, 1986.

‡ As of June 30, 1986.

§ As of March 12, 1986.

|| As of February 28, 1986.

¶ As of November 30, 1986.

** As of September 30, 1986.

†† As of July 15, 1987.

‡‡ As of December 31, 1986.

§§ As of July 31, 1986.

Sources: Fund Annual and Semiannual Reports.

all CP outstanding. So it seems fair to conclude that the foreign premium fell as more money was channelled to money managers quite prepared to accept a foreign name.

It is understandable that managers of MMMFs have been more willing than the average CP buyer to buy the paper of foreign borrowers. Money fund managers are viewed as more aggressive in seeking yield than many CP buyers. A reason may be that MMMFs are compared and judged exclusively on the basis of their success in managing strictly short-term liquid funds. Managers of insurance companies, bank trust accounts or pension funds, by contrast, pay less attention to the allocation among money-market instruments than to the more consequential weighting of equities and bonds as against money in managed portfolios.

That some sensitivity to foreign paper remains among even MMMF managers is evident from the individual fund portfolio weights. Despite the premium, no MMMF held more than 69 percent of its total commercial paper as foreign CP. And only two funds had as much as one-half of their CP in foreign names. At the same time, the sixth-ranked fund, Goldman Sachs' Institutional Liquid Assets-Prime Portfolio, has virtually no foreign CP. In managing the top two funds, Merrill Lynch significantly underweights foreign CP. Thus, the two major dealers in U.S. CP both avoid foreign CP in managing their institutional and individual money funds.

Credit quality

Starting with Electricité de France in 1974, relatively high quality foreign corporations first entered the New York CP market in search of a wider investment base and better pricing. To this day, foreign issuers in the U.S. market still have a significantly better distribution of ratings than U.S. issuers in the U.S. market.

Consequently, it would be natural to assume that high quality U.S. names predominate in the ECP market. After all, the Eurobond market has for years skimmed the cream of U.S. borrowers.⁶ In fact, in contrast to the Eurobond market, the ECP market takes only the milk. U.S. issuers in the Euromarket have a significantly worse distribution of ratings than all U.S. issuers in the U.S. CP market.

The contrasting behavior of New York and London provides clues to the development of the ECP market. Since top-rated European corporations always paid more in the U.S. CP market than top-rated U.S. borrowers, they were quick to seize the opportunity offered by the emerging ECP market. This step allowed them to sell paper at or below the London interbank rates in 1985

as those rates fell toward U.S. CP rates.⁷ As a consequence, non-U.S. names in the ECP market tended to be among the best. But the first U.S. issuers in London included electric utilities with unfinished or unlicensed nuclear power plants that had found it hard to obtain credit in the United States but found willing lenders in banks across the Atlantic.

Looked at superficially, the ratings of issuers of ECP appear better than those of CP issuers. A statistical comparison⁸ of the distribution of ratings of all rated issuers in the CP market to the distribution of ratings in Europe appears to confirm that a better cut of borrowers sells ECP (Table 2).⁹ But there is an adverse selection problem: high quality European borrowers may disproportionately pay the cost of recasting their accounts, meeting with the raters and paying for the ratings. Thus, that unrated issuers in Europe are generally worse credits than the rated invalidates the comparison to the U.S. CP market, where all issuers are rated.

More revealing is the comparison of non-U.S. borrowers in the U.S. CP market to U.S. names in the same market (Table 3). Non-U.S. CP issuers exhibit a significantly better distribution of ratings than native issuers. In particular, over 70 percent of the foreign firms have the highest paper rating while less than half the U.S. issuers do.

This skewed distribution is caused by the foreign premium. This has kept most good-quality, as distinct from top-quality, non-U.S. credits out of the U.S. market. The distribution of the foreign names in the U.S. CP market is truncated: since merely good-quality foreign names are treated like medium-quality U.S. names, the former do not go through the expense to enter the market. By contrast, no set of borrowers is consistently foreign to the purchasers of ECP.

Also revealing is the comparison of U.S. names in the Euronote/ECP market and the distribution of U.S. CP

⁷For a discussion of cross-market arbitrage opportunities for U.S. issuers, see Rodney H. Mills, "Euro-Commercial Paper Begins to Compete," *Euromoney*, February 1987, pp. 23-24. The foreign premium renders the ECP market more competitive than Mills reckons.

⁸The statistical test used here and throughout this article is the chi-square test. It determines whether factors—credit quality and nationality of issuer or market of issue—covary. It tests whether the distribution of observations is what one would expect knowing only the marginal totals or whether knowing one factor helps predict the other. In this case, a chi-square statistic comparing ECP issuers to U.S. CP issuers was computed. It allowed us to reject the null hypothesis that the rating of the firm and the market in which it is issuing are independent. The probability of error of the test is less than 0.01.

⁹Note the existence of "junk" CP, rated B and C. Issuers in these rating categories are regarded as having only adequate or doubtful capability for payment on maturity of the paper.

⁶See Hendrick J. Kranenburg, "Reaching for 'Quality' Debt," *Standard and Poor's Credit Week International*, Fourth Quarter 1984, pp. 11, 16.

Table 2

Ratings of U.S. and Eurocommercial Paper Issuers*

December 1986

	A-1+	A-1	A-2	A-3	B	C	Total	Percent
U.S. CP issuers	529	301	184	12	2	7	1035	93.2
Eurocommercial paper issuers†	47	16	12	1	0	0	76	6.8
Total	576	317	196	13	2	7	1111	—
Percent	51.8	28.5	17.6	1.2	0.2	0.6	—	—

*The commercial paper ratings used here consist of three categories, ranging from 'A' for the highest quality obligations to 'C' for the lowest. The 'A' category is refined into four subcategories, ranging from 'A1+' for the highest to 'A-3' for the lowest. The universe of U.S. CP issuers excludes those whose credit is supported by bank letters of credit and similar guarantees.

†The ECP sample contains only active programs. Where no ECP rating was available, the U.S. CP rating was substituted.

Computed chi-square statistic: 194.2 (5 degrees of freedom). A statistic in excess of 15.086 allows the rejection of the null hypothesis that the rating of the issuer and the market in which it is issuing are independent factors with a probability of error less than 0.01.

Sources: U.S.: Standard & Poor's *Commercial Paper Ratings Guide*.

Euro: List of active programs was obtained from major market makers.

issuers from which they were selected. U.S. issuers abroad are not representative of the run of U.S. credits in the U.S. CP market (Table 4). U.S. issuers of ECP show a significantly lower distribution of ratings than U.S. CP issuers.

An explanation of this finding may lie in the importance of banks as buyers of less than prime paper in the Euromarket. Some banks take the time to perform their own credit assessment; less careful ones take comfort in the size of a U.S. corporation or familiarity with its name. In addition, unlike many buyers of U.S. CP, few buyers of ECP are required to expose their

portfolios to public scrutiny.

A comparison of ECP issuance by the finance companies of General Motors, Ford, and Chrysler supports the conclusion drawn from the distribution of ratings at a point in time. A2/P2-rated Chrysler Financial Corporation started selling ECP as early as 1984, and is one of the largest ECP issuers. A1+/P1-rated General

Table 3

Ratings of U.S. Commercial Paper Issuers

December 1986

	A-1+	A-1	A-2	A-3	Total	Percent
U.S. issuers	391	249	182	12	834	81.3
Non-U.S. issuers	138	52	2	0	192	18.7
Total	529	301	184	12	1026	—
Percent	51.6	29.3	17.9	1.2	—	—

Computed chi-square statistic: 5194.2 (3 degrees of freedom). A statistic in excess of 11.341 allows the rejection of the null hypothesis that the rating of the issuer and its nationality are independent factors with a probability of error less than 0.01.

Source: U.S.: Standard & Poor's *Commercial Paper Ratings Guide*.

Table 4

Ratings of U.S. Issuers of Eurocommercial and U.S. Commercial Paper

December 1986

	A-1+	A-1	A-2	A-3	Total	Percent
U.S. market	391	249	182	12	834	96.9
Euro-market*	8	6	12	1	27	3.1
Total	399	255	194	13	861	—
Percent	46.3	29.6	22.5	1.5	—	—

*The ECP sample contains only active programs. Where no ECP rating was available, the U.S. CP rating was substituted.

Computed chi-square statistic: 119.4 (3 degrees of freedom). A statistic in excess of 11.341 allows the rejection of the null hypothesis that the rating of the issuer and the market in which it issues are independent factors with a probability of error less than 0.01.

Sources: U.S.: Standard & Poor's *Commercial Paper Ratings Guide*.

Euro: List of active programs was obtained from major market makers.

Motors Acceptance Corporation (GMAC) and Ford Motor Credit only started selling ECP in 1986, and outstanding ECP by each has not generally matched that of Chrysler.

That some issuers sell paper without credit enhancement in London but with a guarantee in New York gives further evidence of the quality difference between the markets. For example, buyers of the obligations of the Australian natural resource companies Comalco and CRA in London accept their credit risk, but buyers of the same firms' U.S. commercial paper look to the banks that have written letters of credit as the ultimate obligors.

Investor base

The role of central banks and commercial banks as investors in ECP distinguishes the market from the U.S. CP market. Central banks investing their dollar reserves in a substitute for U.S. Treasury bills or bank CDs have come to dominate one whole segment of the ECP market. It is difficult to know precisely how much ECP commercial banks buy for their own account, since they also buy for their trust accounts and for distribution to their institutional and individual clients. But it is clear that banks take a considerable share of ECP onto their books, although it is also clear that this share has fallen in 1987. By contrast, banks in the United States buy little CP for their own accounts. Also distinguishing the European markets is the very small representation of money funds in Europe; their U.S. counterparts are the largest investors in U.S. CP.

The buyers of ECP differ among the four distinct ECP issuer classes: sovereigns, top-quality corporates, prime corporates and the rest. In the market for high-quality sovereign paper, central banks account for most of the demand, perhaps 80 percent. The rest is split between fund managers and market makers.

Top quality corporate paper, rated A1+/P1, is bought by fund managers and other corporations. Fund managers include managers of pension funds, bank trusts, and insurance companies. Prime quality paper, rated A1/P1, is bought not only by fund managers and corporations but also by financial institutions, mostly banks. The rest of investment grade paper, rated A2/P2, and unrated paper are bought largely by banks.

The quality spectrum corresponds to the pricing spectrum. Sovereign ECP yields the London Interbank Bid Rate (LIBID) less 10 to 25 basis points; A1+/P1 corporate and bank paper yields a bit below LIBID, in general, and rarely above it; A1/P1 paper yields range from LIBID to midway between the interbank bid and offer range rates (usually LIBID plus 6.25 basis points); and A2/P2 paper and unrated paper yield from just

below the offered rate, LIBOR, to well above LIBOR.

Banks' own funding costs incline them to buy the less-than-prime ECP. Since most banks can fund themselves only at LIBID or perhaps a bit less, they cannot make money holding A1+/P1 paper. Of course, with overnight or weekly rates lower than three- or six-month rates, banks can add a funding spread to the slim intermediation spread by funding their purchases of longer-maturity ECP with shorter-maturity money, but thereby they expose themselves to interest rate risk.

Maturity

Most ECP matures in 60 to 180 days; most U.S. CP matures in less than 60 days. From the perspective of the Euromarket, this difference may partly reflect the emergence of ECP from the note issuance facility market and, more generally, from syndicated loans. Instead of borrowing from banks that in turn sell CDs to fund loans, ECP issuers offer paper of like maturity directly to investors. From the U.S. perspective, the maturity difference reflects the fact that the U.S. market caters to entities such as automobile finance companies and credit card affiliates of banks that must manage shorter, more predictable cash flow schedules. The well-developed secondary market in ECP makes it difficult to explain the difference from the buyer's side. Secondary market activity suggests that the average holding period of ECP is roughly half of its maturity.

Secondary market

Partly as a result of the maturity difference, the ECP market has an active secondary market, with weekly turnover in a range of 40 to 60 percent of total ECP turnover (Chart 2). As the market has matured, secondary trading has tended to fall in relation to primary market turnover. Formerly, banks with little placing power bid aggressively for paper to impress borrowers, only to dump it into the secondary market. But such behavior neither earned money nor, ultimately, won over issuers. Many borrowers do not like the loss of control over pricing that secondary market trading can bring. And so great is competition in the market that dealers will sometimes report to an issuer another dealer's disposal of recently issued paper in the secondary market.

There is some evidence that the secondary market turnover increases in relative terms when interest rates are falling (Chart 3). Most recently, as interest rates have risen, the secondary market turnover has dropped. Consistent with this pattern is the tendency of market makers and bank treasuries that actively manage their ECP portfolios to buy more paper when interest rates decline and profits can be earned by funding three-month paper with money borrowed overnight.

Liquidity in the U.S. does not much depend on a secondary market. Instead it is maintained by shorter maturities, the undertaking of dealers to buy back paper from customers, and very limited brokering of directly-placed paper.

Issuance, clearing, and settlement

Differences in the complexity of issuance, clearing, and payment between the U.S. and European markets are likely to persist. The Euromarket locates issuance and custody in London, most clearing in the clearing houses in Belgium and Luxembourg, and ultimate dollar settlement in New York. The entire process usually takes two to three days. By contrast, U.S. CP is issued, delivered, and settled the same day in New York. CEDEL, one of the two major European clearing houses, offers same day settlement, but Euroclear, the other major European clearing house, requires at least two days to settle. Two-day settlement may suit Euro-market investors whose other investments settle on this basis. Nevertheless, as the number of issuers with programs in both markets grows, same day settlement of ECP may become more common, since borrowers shifting from the U.S. CP market to the ECP market require same-day funds to pay off maturing CP. Even now, ECP issuers can circumvent the settlement delay

by arranging "swinglines," facilities for same-day funds from banks in New York. But however quickly ECP settles in the future, ECP issuance, clearing, and settlement will continue to be spread out over different cities.

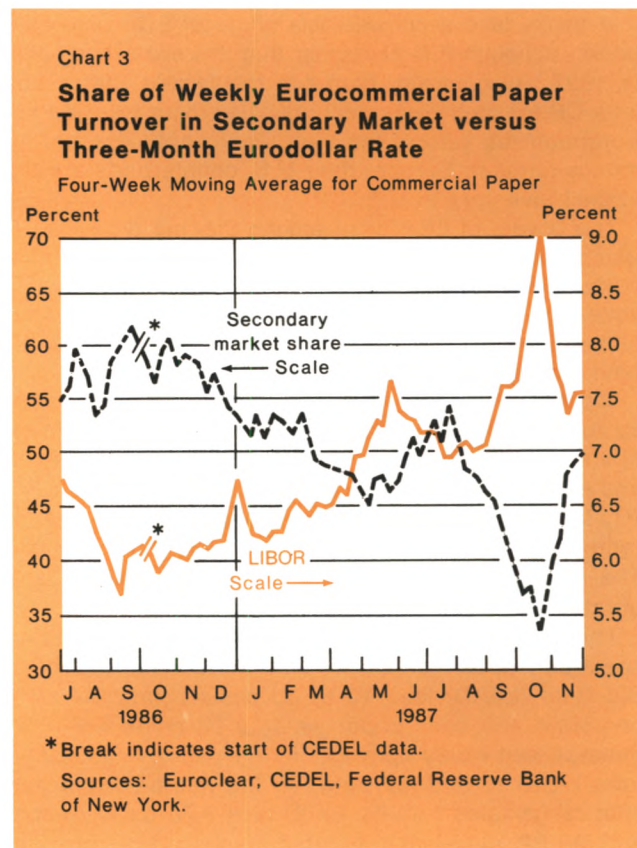
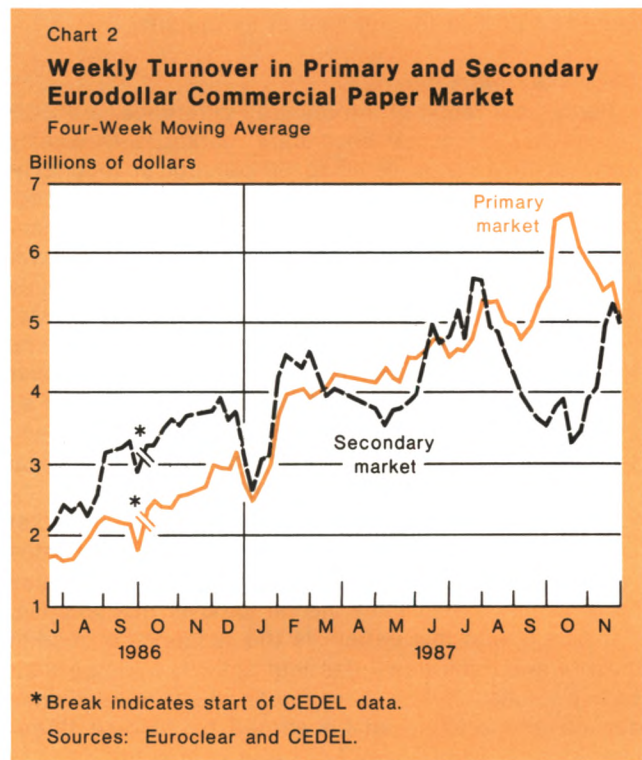
Temporary differences

Some of the differences between the markets are clearly subject to change. Indeed, many observers expect that market practices in various paper markets will become more standardized.¹⁰ Those differences between the ECP and U.S. CP markets that are likely to narrow are discussed in detail below.

Concentration of dealers

The well-publicized and sharp competition among dealers of ECP may well indicate the future of competition in the CP market. As things stand, about half or more of all dealer-placed paper in the United States is sold by just two market leaders, Merrill Lynch and

¹⁰See S.L. Topping, "Commercial Paper Markets," Bank of England Quarterly Bulletin, vol. 27 (February 1987), pp. 46-53.



Goldman Sachs.¹¹ Merrill Lynch officials lay claim to leadership among U.S. dealers, with a market share just short of 30 percent.¹² Merrill's acquisition of A. G. Becker from Paribas in 1984 put it into position to overtake Goldman.

The degree of concentration is much lower in the Euromarket. Estimates vary widely on market shares in the amount of paper issued, but the consensus is that the top six dealers place somewhere around 70 to 75 percent of ECP by value. No dealer can credibly claim a market share much in excess of 20 percent. In terms of number of dealerships for both ECP and Eurodollar certificates of deposit, the top six dealers share less than 50 percent of the market.¹³ By either measure, ECP dealing is less concentrated than CP dealing.

The entry of U.S. banks into the U.S. CP market is sharpening competition. Thus far they have acted only as placing agents, finding buyers for CP without buying the paper themselves. But despite their restricted role as agents, banks are seeking to prove themselves reliable placers, at times offering paper to investors at a favorable, slightly higher yield to ensure its sale. At the same time, by charging a very modest placing fee, the banks raise funds for the issuer at a favorable, slightly lower net cost of funds. By early 1987, U.S. banks served as exclusive placers of CP for 65 issuers with over \$7 billion in paper outstanding. They shared placing in 70 other programs with over \$19 billion outstanding.¹⁴ While these figures indicate a market share for all U.S. banks of about 5 percent or more, they do suggest some measure of success in entry despite ongoing legal restrictions on underwriting. Citicorp's purchase in November 1987 of Paine Webber's CP operation, with paper outstanding in the amount of about \$3 billion under about 40 programs, adds clout to an already sizable placer.

¹¹Moody's *Short-Term Market Record*; Standard and Poor's *Commercial Paper Rating Guide*. The Federal Reserve Board, noting the concentration of dealerships in the U.S. CP market, adduced the public benefit of fostering competition in explaining its decisions to permit banks to place and to deal in U.S. CP. See "Bankers Trust New York Corporation," and "Citicorp, J.P. Morgan & Co. Incorporated, Bankers Trust New York Corporation," *Federal Reserve Bulletin*, vol. 73 (February 1987 and June 1987), pp. 148 and 490. For a review of the Federal Reserve rulings, see Terrance W. Schwab and Bernard J. Karol, "Underwriting by Bank Affiliates," *Review of Financial Services Regulation*, vol. 3 (May 20, 1987), pp. 93-100.

¹²In computing Merrill's market share, the official excluded paper issued by dealers on behalf of their own affiliates to eliminate the effect of Merrill's sizable fund-raising. See Tom Herman, "Goldman Sachs Abandons Policy It Says Hurt Growth in Commercial Paper Field," *Wall Street Journal*, October 2, 1987, p. 29.

¹³*International Financing Review*, July 4, 1987, p. 2202.

¹⁴Moody's *Short-Term Market Record*; Standard and Poor's *Commercial Paper Rating Guide*.

In addition, foreign securities firms are entering the U.S. CP market as dealers for foreign issuers. In late 1986, U.S. affiliates of foreign securities firms, mostly Canadian and Japanese, shared placing in 25 programs with approximately \$5 billion outstanding. The foreign-based securities firms uniformly deal in paper of borrowers from their home country, probably because long-standing relations incline the borrowers to give their dealers an opening. It should be noted, however, that none of the foreign securities dealers serves as a sole placer of U.S. CP.

The competitive challenge in U.S. CP has led a market leader to change a long-held business policy in favor of practice typical of the ECP market. Heretofore Goldman Sachs insisted on a company's sole use of Goldman to place the company's CP. Now, Goldman is prepared to play co-dealer, particularly on large paper programs where the firm has not played a role to date.¹⁵ Although the previous policy might have spurred the dealer to win wide acceptance of an issuer's paper in order to capture all the business so generated, issuers now seem keen to encourage more direct competition.

While U.S. banks have entered the business of placing CP in New York, a U.S. bank ranks among the top ECP dealers in London. It is generally acknowledged that Citicorp Investment Bank, Limited leads its competitors in the amount of paper placed, although the market share it claims is much disputed. Other leaders are the affiliates of U.S. securities firms—Merrill Lynch, Morgan Stanley, and Shearson Lehman—Swiss Banking Corporation International, and the U.S.-Swiss hybrid Credit Suisse First Boston. Each of these six probably enjoys a market share between 10 and 20 percent. All are trying to secure their positions before Japanese institutions enter the market.

The superior performance of Citicorp Investment Bank, Limited in the ECP market is attributable in part to its strength in a traditional banking activity. Most observers credit its leadership to its mixing dollar paper with forward sales of dollars against a variety of currencies to create "cocktail" paper. In effect, buyers of such mixtures get CP in their currency of choice, although they also expose themselves to Citicorp on the forward transaction.

Other U.S. banks are making serious, if less successful, efforts to compete in ECP dealing. U.S. banks represent no less than 8 of the 20 top dealers of ECP and Euro-CDs. Taken together, U.S. banks probably have carved out a market share of a quarter or more. The resources devoted by U.S. banks to the ECP market must be understood in light of their overall investment banking strategies and, in particular, their

¹⁵Tom Herman, "Goldman Sachs Abandons Policy."

interest in demonstrating the inappropriateness of Glass-Steagall restrictions.

Greater competition among dealers in the ECP market brings lower prices for their services. U.S. CP dealers used to collect a fee of one-eighth of a percent for buying paper from the issuer and reselling it or, failing that, taking any unsold paper into position. This fee works out to \$3.47 per million dollars per day until maturity at issue.¹⁶ More recently, fees have fallen to around ten basis points or even lower. In the Euro-market, the spread between what dealers pay for ECP and sell it for averages three basis points. This spread works out to only \$75 for placing \$1 million of 90-day paper. When working as agents for some high-quality issuers who do not want anyone but end-investors to own their paper, ECP placers also make a commission of less than five basis points. Little money is being made at these rates. And some dealers have accepted paper at rates lower than they can place it, to gain market share.

Such intense competition for market share may suggest that a great deal of money is at stake. It appears, however, that dealing dollar CP in New York and London produces only modest revenues. If dealing in the U.S. fetches ten basis points per year on placements of \$180 billion, only \$180 million is earned. If dealing generates three basis points on the roughly \$50 billion outstanding in London, only \$15 million is at stake, matched, perhaps, by another \$10 million in the secondary market. These are estimates of gross revenue out of which overhead and expense must be paid. Only very rapid growth of these markets can justify the resources that financial firms are devoting to them.

The entry of foreign securities firms and U.S. banks as dealers will make the U.S. CP market increasingly competitive. It was this prospect that prompted the exit in October 1987 of Salomon Brothers from the U.S. CP market, where it had achieved a market share in excess of 10 percent. The outlook for the rapidly growing ECP market is less certain: the current competitiveness of the market may continue if heavier future volume is spread out over the current dealing capacity, or it may end in a shake-out that would remove some capacity. Already in 1987, J.H. Shroder Wagg and Salomon Brothers have withdrawn from the ECP market. The more heterogeneous investor base in the ECP market may leave room for more players. In any case, it is likely that the U.S. CP and ECP markets will converge somewhat in the competitive structure of dealing.

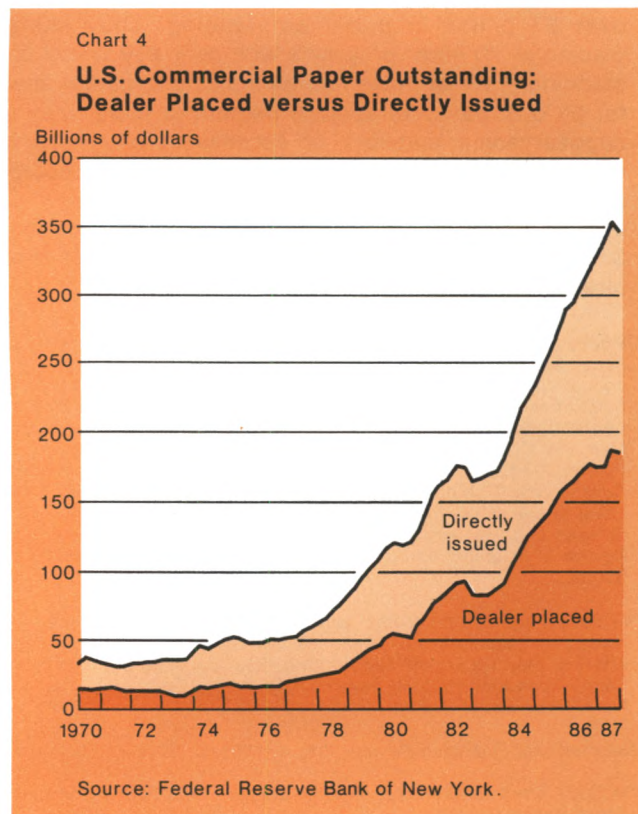
Direct issuance

Changes in the degree of concentration of dealers in

the two markets may reduce another market difference: the fact that no Europaper issuer issues directly. In the United States, finance companies, representing a substantial share of the market, place their own paper directly with investors (Chart 4); in the smaller, less developed Euromarket, no issuer has yet found it worthwhile to bypass the dealers.

Note that foreign issuers in the U.S. CP market, even those with large and long-standing programs, do not directly place paper. It appears that U.S. buyers demand that dealers sell them the paper. The reason usually given is the desire for the monitoring of the more remote borrower's credit standing by the dealer. For direct issuance to take hold in the Euromarket, the buyer of the paper must not make a similar demand for dealers to monitor the credit of foreign borrowers.

A direct issuer of CP in the U.S. essentially replaces the dealer on commission with in-house dealers. Dealer fees of about one-eighth of a percent can exceed the cost of hiring a full-time staff to manage a program, provided that outstandings are sufficiently large, normally in the \$200-250 million range. Thus the concentration of dealers in U.S. CP does not necessarily mean that they have a hold on the business and can exact



¹⁶Stigum, p. 639.

oligopolistic returns. CP dealers face a potential competitor in each customer.

The U.S. CP market looks much less concentrated if the relevant market is taken to be the CP market as a whole rather than dealer-placed CP. Merrill Lynch and Goldman Sachs together place little more than a quarter of all U.S. CP. The fourth-ranked placer is the first-ranked direct issuer, GMAC, with about a 10 percent market share. As a group the top four placers share well less than half the market. On this showing, the U.S. CP market looks much more competitive.

It is reasonable to take the whole CP market as the relevant market for the assessment of concentration even though direct issuance cannot substitute perfectly for hiring a dealer. A direct issuer performs most of the functions that a dealer performs: making arrangements with buyers, assessing the market, posting rates, and closing sales. The direct issuer must set up dealers in a dealing room and buy telephones and screens. The direct issuer cannot, however, free himself of the risk that paper may not be sold in the desired quantity at the posted rates. Still, the direct issuer may fund the shortfall in much the same way that the dealer would fund an overnight CP position, with repos or same-day bank credit. On balance, direct issuance substitutes closely for hiring a dealer; therefore, it makes sense to measure concentration in terms of the CP market as a whole.

Sharpened competition that drives down dealers' fees may over time shift the composition of U.S. CP to more dealer-placed paper. With lower fees, the threshold amount that an issuer must sell regularly before it can break even issuing directly should rise. Over time, one would expect the share of paper directly placed to fall.

Since dealer fees in Europe are currently less than half those in the United States, outstandings of perhaps \$1 billion would be required before savings on dealer fees would outweigh direct issuance costs. At this point, even Chrysler generally has less than that amount of ECP outstanding. Again, the more heterogeneous nature of the investor base for ECP may raise the threshold for an issuer to internalize the dealing function. But as the market grows, it seems safe to anticipate the appearance of direct placement in the Euromarket, especially if the exit of current dealers or other factors should cause dealer fees to rise.

Importance of credit ratings

Euromarket practice should converge to U.S. market practice in requiring paper to be rated. Only about 45 percent of active ECP issuers at end-1986 were rated, while credit ratings are ubiquitous in the United States. There are two plausible explanations for this difference. First, Euromarket investors generally have not relied on

credit agencies and their ratings. This year, an agency called EuroRatings was set up by Fitch Investors Service and Compagnie Beige d'Assurance Credit to serve the Euromarket exclusively. As of September, 1987, EuroRatings advertises 67 short-term ratios, of which 9 are for U.S. firms. By contrast, buyers of U.S. corporate debt have consulted credit ratings for generations. In the United States, regulation has reinforced tradition: prime quality paper, distinguished by a high rating, need not be registered with the Securities and Exchange Commission.¹⁷ Second, borrowers in the Euromarket have not encountered severe liquidity problems or defaulted on their paper. It was only in the wake of the largest shock to the U.S. CP market, Penn Central's default on \$82 million of outstanding paper, that multiple ratings became as widespread in the United States as they are today.¹⁸ But even though Europe has not witnessed such an episode, ratings are becoming more important there as well, as investors become accustomed to the concept.

Tough competition among paper dealers is paralleled by competition among raters. While the third-ranked U.S. CP rater, Fitch, has teamed up with a European partner, the two major raters in the United States have both adopted strategies to establish their position in the Euromarket. Standard and Poor charges an entity with a U.S. rating only \$5000 for an ECP rating on top of the \$25,000 annual U.S. fee. Moody's has gone a step further by making its CP ratings global paper ratings, applicable in any market or currency.

Increasing reliance by Euromarket investors on ratings will undermine the distinction between ECP and Euronotes. Euronotes are said to be underwritten, meaning that the contract governing their issuance also contains an undertaking by a group of banks to buy the paper in the event that it cannot be sold at a yield less than LIBOR plus an agreed spread. For years, however, the U.S. rating firms have required that an issuer of commercial paper have sufficient access to bank credit to repay maturing paper in the event that new paper could not be sold. So rated issuers of ECP must have access to bank credit, even if that access is not contractually bundled with the paper issuance. A rating thus substitutes for an announced, "underwritten" program of paper issuance, and ratings have gained in Europe even as the announcement of Euronote programs has fallen off.

¹⁷Low-rated paper is issued under the private placement exemption that restricts sales to a limited number of sophisticated investors, at the cost of market width and higher yields. See Darrow and Grusen, "Establishing a U.S. Commercial Paper Programme," pp. 10-11.

¹⁸See Thomas M. Timlen, "Commercial Paper—Penn Central and Others," in Edward I. Altman and Arnold W. Sametz, eds., *Financial Crises: Institutions and Markets in a Fragile Environment* (New York: John Wiley, 1977), pp. 220-25.

Pricing base

Pricing differences between the two markets persist but are showing signs of erosion. CP dealers in the U.S. market post absolute rates, while the Euromarket has traditionally based pricing on LIBID or LIBOR, plus or minus a spread. Specifically, a rise in the yield spread between U.S. Treasury bills and Eurodollars would lead ECP rates to rise with the Eurodollar rates one-for-one. U.S. CP rates, by contrast, vary with respect to both Treasury bill rates and Eurodollar rates and generally split the difference when the latter two diverge.¹⁹

But yields on some ECP, that issued by sovereigns, have developed in 1987 a noticeable independence from bank deposit rates. At the beginning of the year, dollar paper for Sweden and Spain gave a return to investors generally 0-10 basis points below the bid rate for Eurodollar deposits with banks (Chart 5). In the spring the Treasury cut back on its issuance of Treasury bills in response to unanticipated tax revenue and recurring approaches to the legislated debt limit. Reduced supply met an increased demand, as central banks sought to invest reserves acquired in support of the dollar, and, consequently, Treasury bill rates hardly rose as three-month Eurodollar rates rose through 7 percent in April. Sovereign ECP rates, however, did not quite rise in step with bank deposit rates. In late April and early May, sovereign ECP offered investors 10-20 basis points less than Eurodollar deposits in banks. When Treasury bill rates rose in late July and Eurodollar rates remained steady, the difference between the yields of sovereign ECP and bank deposits narrowed again.

Sovereign ECP yields thus stray from Eurodollar deposit rates to stay closer to Treasury bill rates when the Treasury and Eurodollar rates diverge; ECP yields approach Eurodollar deposit rates when Treasury and Eurodollar rates converge. When the Treasury-Eurodollar spread has been less than 100 basis points this year through September, the Kingdom of Sweden's ECP has yielded an average of about 5 basis points less than LIBID; when the Treasury-Eurodollar spread has reached over 100 basis points, Sweden's ECP has yielded an average of 14 basis points less.

The investment behavior of central banks lies behind these changing rate relations. Formerly, U.S. CP sold by either French state corporations or banks with a government guarantee competed with U.S. Treasury bills in offering sovereign risk on dollar paper. Now central banks can spread their dollars across paper issued by or guaranteed by most of the governments of Western Europe. By investing in sovereign ECP, central banks can pick up more than 100 basis points while sacrificing

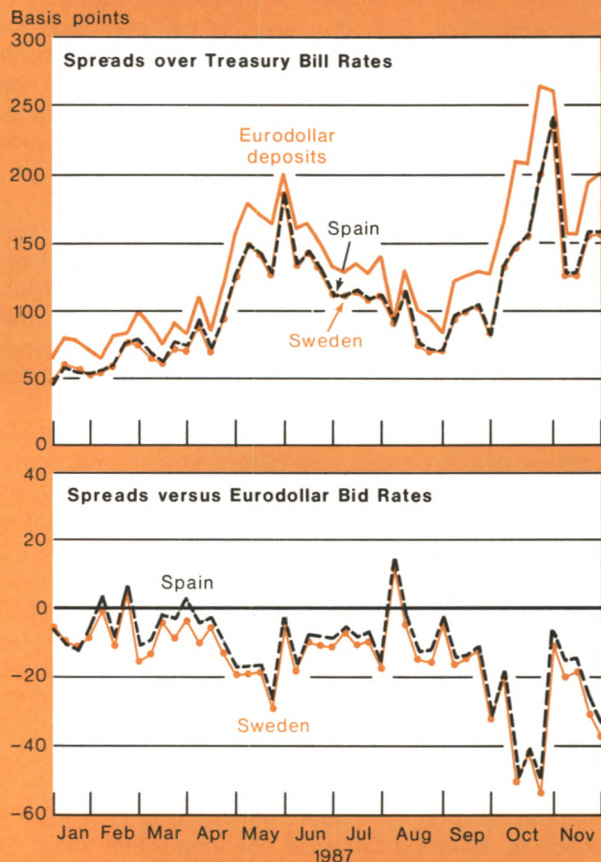
liquidity only modestly: for this reason, such investments are becoming increasingly common.

The pricing of other ECP has not similarly diverged from interbank rates. The ECP yield index that the Bank of England has published just since late August 1987 shows little independence of ECP rates. In particular, the rates published for three-month ECP prime corporate and bank holding company borrowers range narrowly from 0-3 basis points above the London Interbank Bid Rate.

Convergence of rates in the two markets would require ECP rates to fall relative to Eurodollar bank deposit rates. Alternatively, U.S. CP rates could rise relative to domestic bank CD rates. Indeed, with heavy

Chart 5

Rates on Sovereign Eurocommercial Paper of Sweden and Spain and on Eurodollar Deposits*



* London Interbank Offered Rate.

Sources: Federal Reserve Bank of New York, Merrill Lynch.

¹⁹See Nancy J. Kimmelman and Gioia M. Parente, "The TED Spread—Outlook and Implications," Salomon Brothers Bond Market Research Memorandum, July 15, 1987.

issuance of CP, CP rates have approached and sometimes have exceeded domestic CD rates. But since a domestic reserve requirement and a Federal Deposit Insurance Corporation insurance premium drive a wedge of 30 basis points or so between domestic bank rates and Eurodollar deposit rates, considerable distance still generally separates pricing in the two markets, especially for direct issuers in the U.S. market.²⁰ The experience of GMAC, which has not been able to maintain \$1 billion of ECP outstanding at prices no higher than at home, underscores this point. Along the way to convergence, foreign issuers could be expected to exit from the U.S. market, given the foreign premium. Thus, convergence of rates might well be associated with greater specialization by nationality of issuance in the two markets.

Conclusion

This article argues that the Eurocommercial paper market and the U.S. commercial paper market are likely to continue to differ in some important respects. In particular, the U.S. market will probably remain less cosmopolitan than the ECP market, requiring foreign issuers to pay a higher interest rate than U.S. issuers of like quality. As a consequence of the diminished but persistent foreign premium in the U.S. market, the U.S. market funds a prime selection of foreign credits. Conversely, the less quality-conscious ECP market offers funds to a distribution of U.S. borrowers of lower quality than the general run of U.S. issuers of CP. In addition, the ECP market is likely to remain a market for longer-maturity paper with much greater reliance on secondary market trading to provide liquidity. Issuance, clearance

and settlement of ECP span half the globe and take two days while these same processes in the U.S. CP market are carried out in one city in the course of a day.

Other differences are likely to prove transitory. Although dealing in ECP appears much more competitive than dealing in U.S. CP, the entry of U.S. banks serving as placing agents and of foreign securities firms is increasing competition among U.S. dealers in New York. And if direct issuers are recognized as competitors of U.S. securities firms, the market appears even more competitive. In addition, ratings are likely to become as necessary in Europe as they are in the United States. Finally, both pricing methods and levels are likely to converge in the two markets, although this convergence may coincide with greater segmentation by nationality of issuers in the two markets.

Out of these differences come three useful points for the ongoing debate over banks' underwriting in the U.S. CP market. First, dealing in the U.S. CP market is less competitive than dealing in ECP, but the difference is both easy to overstate and already narrowing. Second, foreign issuers of U.S. CP and smaller U.S. firms that do not have programs large enough to warrant direct issuance would be the principal beneficiaries of further competition and lower dealing rates in the United States. Third, since the total revenues at stake, particularly in the competitive circumstances characteristic of the ECP market, do not seem large, only explosive growth of CP issuance would make the policy question at hand decisive for commercial bank revenues or profitability.

Robert N. McCauley
Lauren A. Hargraves

²⁰See Lawrence L. Kreicher, "Eurodollar Arbitrage," this *Quarterly Review*, Summer 1982, pp.10-21.

Current Labor Market Trends and Inflation

The rapid drop in the unemployment rate to 6 percent has caught almost all analysts by surprise. As recently as a year and a half ago, such a low level of unemployment seemed almost unattainable in the foreseeable future. Lawrence Summers' account of unemployment trends is representative of the expectations of that time:¹

Even forecasts that call for steady growth over the next five years do not foresee unemployment rates dipping below 6 percent....Where Kennedy-Johnson economists set 4 percent as an interim full-employment target, contemporary policy makers would regard even the temporary achievement of 6 percent unemployment as a great success.

The decline in the unemployment rate to 6 percent was unusual for two reasons. First, it coincided with much weaker GNP growth than would have been expected on the basis of past relationships. Second, it has not been accompanied by upward pressure on wages or an acceleration in inflation more generally. When the unemployment rate fell to 6 percent in the late 1970s, a rather pronounced upward spiral in wage and price inflation occurred, a sequence of events that makes the current situation quite remarkable in contrast. In this article, we will explore in more detail the circumstances that have made the current drop in the unemployment rate less inflationary than it would have

been by the standards of the late 1970s.²

The first section reviews the relationship between real GNP and the unemployment rate. This relationship is often referred to as Okun's Law—an econometric estimate of the sensitivity of the unemployment rate to changes in GNP growth. Okun's Law has also been used to calculate the growth of potential GNP consistent with maintaining a given unemployment rate. The principal findings from this section are as follows:

- The extent to which the decline in the unemployment rate over the past year might be inflationary is uncertain because the decline has occurred with considerably weaker GNP growth than past relationships would suggest.
- Nonetheless, potential GNP calculations based on Okun's Law, as well as simple scatter diagrams showing changes in the inflation rate and the potential GNP gap (the difference between potential and actual GNP), suggest that we could be approaching a point where inflationary pressures could emerge.

In the second section of this article, we compare current labor market conditions to those in the late 1970s in an effort to understand why the current drop in unemployment has not induced a significant acceleration in wage inflation. We explore this question by using the concept of the NAIRU ("nonaccelerating inflation rate of unemployment"), the level of unem-

¹Lawrence H. Summers, "Why Is the Unemployment Rate So Very High near Full Employment?" *Brookings Papers on Economic Activity*, vol. 2 (1986), pp. 339-83.

²Throughout this analysis, we have assumed that recent stock market turbulence and related developments will have only a relatively small, short effect on nonfinancial business activity.

ployment that is consistent with a stable rate of inflation. More specifically, we review the changes in the labor market over the past 10 years that could have shifted the NAIRU upward or downward at both the aggregate and disaggregated levels. At the same time, we examine whether there are any special factors at the disaggregated level that could account for the large error from Okun's Law. Our analysis in this section points to the following conclusions:

- Measures of overall labor market tightness other than the unemployment rate generally confirm that the demand for labor is stronger now than it was in 1977. Since wage inflation has not accelerated, these indicators suggest that the NAIRU may be lower than it was in 1977.
- The recent decline in the unemployment rate has been widespread across regions, industries and demographic groups, suggesting that the large error over the past year from the empirical estimates of Okun's Law cannot be easily explained by unusual developments in some segments of the labor market.
- At the disaggregated level, some factors imply that the NAIRU currently might be lower now than in 1977, while others suggest that it could be higher. Our impressionistic review of both the aggregate and disaggregated statistics suggests to us that the NAIRU is lower than in 1977, possibly as much as a full percentage point lower.

Okun's Law and unemployment

The decline in the unemployment rate to 6 percent already in 1987 appears to run counter to Okun's Law.³ Although the first formulation of this rule of thumb stated that about 4 percent real GNP growth was necessary to achieve a stable unemployment rate, most analysts have subsequently reduced the estimate of necessary GNP growth to around 2.5 percent to allow for the changes in productivity, labor force growth and work-week that have taken place. Over the past year (the second quarter of 1986 to the second quarter of 1987), however, the unemployment rate has fallen almost a full percentage point while GNP has increased at slightly less than this break-even rate of 2.5 percent. These developments raise the question whether Okun's Law—even in its revised state—has broken down in some fundamental sense.

The problem can be seen more clearly from Chart 1, which compares the Congressional Budget Office (CBO) macroeconomic forecast of August 1986 to the forecast

made in August 1987.⁴ Even with the outlook for real GNP somewhat weaker than the CBO projection of August 1986, the unemployment rate has already fallen to 6 percent, attaining that level some three to four years ahead of the schedule originally predicted by the CBO.

To quantify the amount of this unexpected decline in unemployment, we estimated a version of Okun's equation, drawing on the work of Douglas M. Woodham.⁵ The equation we used, estimated over the 1960-87 period, is shown below:

$$\Delta U = 0.401 - 0.226Y - 0.159Y(t-1) - 0.0018 \text{ time.}$$

(7.8) (10.0) (7.1) (2.6)

$$R^2 = 0.65, D.W. = 1.7, S.E. = 0.23,$$

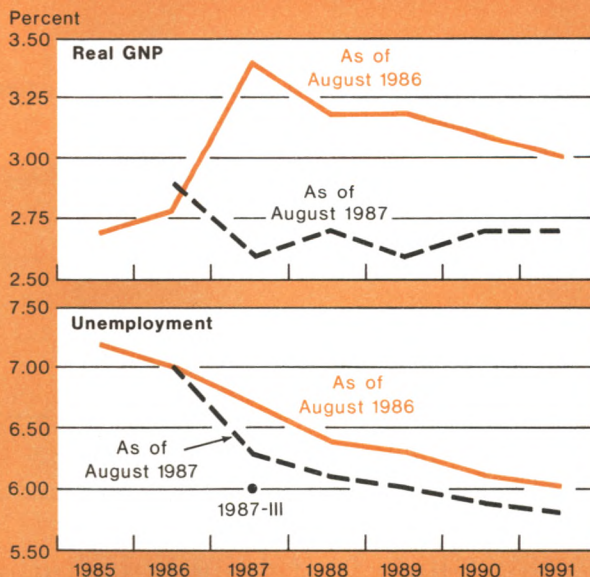
where ΔU is the change in the unemployment rate and Y is the quarterly percent change in real GNP.

⁴Congressional Budget Office, "The Economic and Budget Outlook: An Update," August 1986 and August 1987.

⁵Douglas M. Woodham, "Potential Output Growth and the Long-Term Inflation Outlook," this *Quarterly Review*, Summer 1984. The theory behind Okun's Law is quite straightforward. The growth rate of GNP

Chart 1
Congressional Budget Office Long-Run Forecasts*

For Calendar Years 1986 to 1991



*Congressional Budget Office, *The Economic and Budget Outlook: An Update*, August 1986 and August 1987.

³Arthur M. Okun, "Potential GNP: Its Measurements and Significance," in Joseph Peckman, ed., *Economics Policymaking* (Cambridge: MIT Press, 1983).

Chart 2 contains the recent errors from this equation on a four-quarter moving sum basis. Over the past year, the unemployment rate has declined almost 1 percentage point more than would be expected from this equation. Although this is one of the larger errors for this equation, it is not totally unprecedented. In 1983, for example, the unemployment rate declined 2.1 per-

centage points, while the equation predicted a fall of 1.3 percentage points. In a sense, however, a negative error at this stage of the business cycle (fifth year of the expansion) should not be all that surprising if one assumes that the most productive workers are reemployed first, leaving less productive workers to be employed later in the expansion. This reasoning implies that a given GNP growth rate would be associated with larger declines in unemployment as the expansion continued. It would also suggest (as has been the case over the past year) that the more rapid decline in the unemployment rate would be associated with slower growth in productivity.

Footnote 5 continued

(Y) is equal to the growth rates of the labor force (L), the workweek (W), productivity (P), and the employment rate (E). Or, in equation form: $(Y) = (L+W+P)+E$. $(L+W+P)$ is usually viewed as determining the long-run trend in GNP growth, often called potential GNP (PY). E in contrast is viewed as the cyclical component of Y, and since analysts are often interested in how sensitive the labor market is to changes in GNP growth, the equation is rewritten as: $E=Y-(L+W+P)$. If it is assumed that $L+W+P$ grows at a fairly constant rate, $L+W+P$ can be subsumed into the constant term in a regression equation. In addition, since most analysts tend to focus more on the unemployment rate ($U=1-\text{employment rate}$) than the employment rate, the change in $U(\Delta U)$ is usually substituted for E, yielding the following regression equation: $\Delta U = \text{constant term} - aY$, where the constant term is equal to $(L+W+P)$ and the coefficient "a" measures the sensitivity of ΔU to Y. If $(L+W+P)$ tends to be increasing or decreasing over time, then a time trend would also need to be included, an approach we have followed in this article. Other researchers have allowed $(L+W+P)$ to shift in value from cycle to cycle. To calculate potential GNP growth (PY), we set the cyclical component ΔU equal to zero. The regression equation is then solved for Y, which is the same as PY since the cyclical component has been set equal to zero, and we obtain: $PY = 1/a(L+W+P) + b/a(\text{time trend})$, where "b" is the estimated coefficient on the time trend. In the equation we estimated above, a lagged value of Y was also included because the effect on ΔU from Y appeared to be spread over two quarters. In this case, the calculation of PY requires the additional step of setting $Y=Y(-1)$.

In any case, it appears that over time the errors in this equation, whether positive or negative, have become larger, thus limiting the applicability of the equation to short-run forecasts. Equations relating the unemployment rate to GNP growth can still be used, however, to make rough calculations of the long-run trend in the potential growth rate of GNP.⁶ The results of such a calculation are shown in the top panel of

⁶Our method of obtaining potential growth rate estimates is described in footnote 5. For other approaches to estimating potential GNP, see Congressional Budget Office, "The Economic and Budget Outlook: An Update," August 1987; and Frank de Leeuw and Thomas Holloway, "The Measurement and Significance of the Cyclically-Adjusted Federal Budget and Deficit," *Journal of Money, Credit and Banking*, May 1983, pp. 232-42. For a detailed analytical description, see Peter K. Clark, "Potential GNP in the United States, 1948-80," *Review of Income and Wealth*, June 1979, pp. 141-65. For a brief international comparison that takes the same approach used

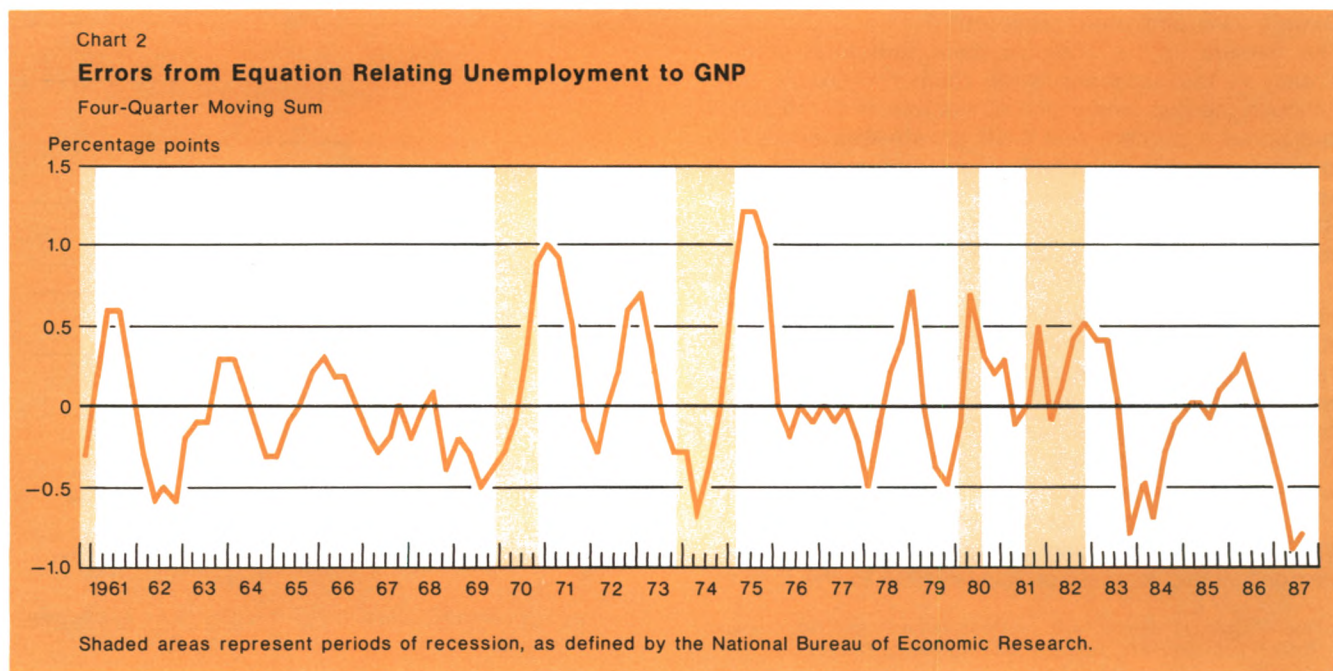


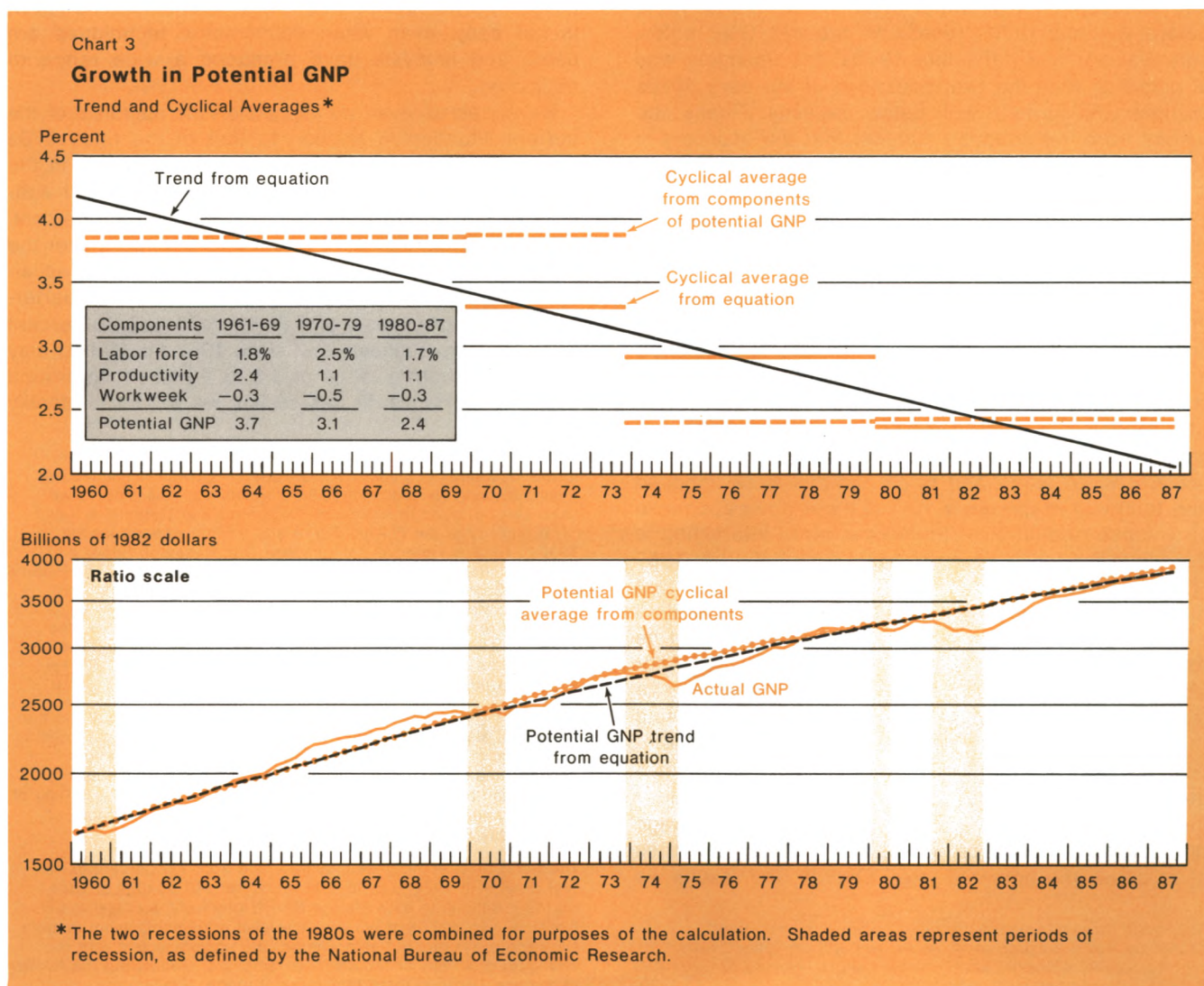
Chart 3 (see footnote 5 for more details on this calculation) both on a trend basis and a cyclical average basis. It appears from these rough estimates that potential GNP has fallen from around 4 percent in the early 1960s to around 2.5 percent in the 1980s, although the process was probably not as smooth as the trend line in the chart suggests.⁷ The table in the lower left corner of the upper part of Chart 3 shows

Footnote 6 continued here, see Robert S. Gay, "Learning to Live with 'Slow' Growth," *Economic Perspectives*, Morgan Stanley, April 12, 1987.

⁷These results are generally consistent with other estimates of potential GNP growth. The Congressional Budget Office in the January 1987 *Economic and Budget Outlook* estimates that potential

Footnote 7 continued

GNP has fallen from about 3.5 percent in the 1960s to 2.5 percent in the 1980s. Data Resources Incorporated in its Summer 1987 issue of *U.S. Long-Term Review* puts potential GNP growth at around 2.3 percent for the 1986-2012 period, down from 3.2 percent over the 1960-73 period. Robert S. Gay in "Learning to Live with 'Slow' Growth" estimates potential GNP growth at 2.4 percent in the 1980s, compared with 3.4 percent over the 1965-73 period. As noted above, however, the slowdown in the growth rate of potential GNP was probably not as uniform as the simulation in this article suggests; a significant part of it probably took place in the mid-1970s. See Woodham, "Potential Output Growth"; and Frank de Leeuw and others, "The High-Employment Budget: New Estimates, 1955 to 1980," *Survey of Current Business*, November 1980, pp. 13-43. The approach used here, which estimates the long-run trend in potential GNP from an econometric equation, is very slow to recognize shorter-run shifts in the trend, particularly any improvement in potential GNP growth. Hence, these estimates should only be viewed as a rough summary of past trends, not as a good indicator of future, longer-run developments.



another calculation of potential GNP based on the trend growth rates of the labor force, the workweek, and productivity. These calculations are roughly in line with the results from the equation, suggesting that the equation can be used to obtain some very general idea of long-run trends in potential GNP growth.⁹ Other researchers have found similar evidence. If we consider all the evidence (see footnote 7), it appears that the longer-run growth rate of GNP consistent with stable prices is about 2.5 percent at this time.

In assessing the outlook for inflation, we still need to investigate where the economy currently stands relative to potential output. The bottom panel of Chart 3 compares the actual level of GNP to the potential GNP shown in the previous chart. It shows the economy running well above capacity in the mid- to late 1960s and exceeding its potential once more around 1973, before the mid-1970s recession brought GNP below potential again. By the late 1970s, the economy was at potential; then the two recessions of the early 1980s brought GNP growth well below capacity. Finally, the results from the equation suggest that the economy is now beginning to approach capacity once again. Thus, it appears that the current situation parallels that of 1977, when the economy was also nearing its potential. However, at the present time, no acceleration in compensation is apparent.

These observations raise the question, how well has the difference between potential and actual GNP predicted the tendency for the inflation rate to accelerate or decelerate in the past? The upper part of Chart 4 shows a simple scatter diagram linking changes in the CPI inflation rate to the difference between potential and actual GNP. Although large errors have occurred, particularly when wage and price controls were imposed and removed in the early 1970s, there does appear to be a loose relationship. Somewhat more interesting is the result for 1987, which suggests not only that 1987 is turning out more or less as expected, but also that the economy is just about at the level of operation where inflation, excluding any special shocks, would be expected to hold fairly steady, neither accelerating nor slowing. The lower part of Chart 4 shows that more or less the same conclusion could be reached by using the growth of compensation in place of the CPI. (Compensation in 1987 has been increasing less rapidly than generally expected, but the current operating level of the economy is quite close to that threshold where wage pressures could emerge unless the economy operates at or below the potential rate.) Overall, the results we

⁹Any rough measure, such as potential GNP, should be used cautiously. For a detailed explanation, see William Felner, "The High-Employment Budget and Potential Output," *Survey of Current Business*, November 1982, pp. 26-33.

obtained using potential GNP suggest that further significant declines in the unemployment rate or sustained growth in real GNP considerably above the likely growth in potential GNP of about 2.5 percent could add to inflationary pressures.⁹

Unemployment and Inflation

With the economy currently operating at its highest level relative to potential since the late 1970s (Chart 3), it is also an appropriate time to compare current labor market conditions to those in the late 1970s to see whether the NAIRU has changed appreciably since then. In other words, if at this point in time, growth in the economy at about the potential rate would be consistent with stable inflation, then the current unemployment rate is probably close to the NAIRU. Establishing a precise benchmark for the NAIRU in the late 1970s, however, is not easy, even when econometric techniques are used, and analysts have produced a wide range of estimates.

Nevertheless, even an impressionistic appraisal of the current situation in relation to that of the late 1970s would suggest the NAIRU has fallen.¹⁰ Thus far in the current cycle, wage growth has not accelerated substantially since the unemployment rate fell to 6 percent. When the unemployment rate fell to 6 percent over the 1977-78 period, nonfarm compensation growth accelerated sharply (from a cyclical low on a fourth-quarter-to-fourth-quarter basis of 7.75 in 1977 to 8.75 percent in 1978). This suggests that since 1977 the NAIRU may have fallen from a range of 6.5 to 7 percent to around 6 percent.¹¹ Hence, in this section we will try to identify

⁹When we checked this result against the simulations from more formal econometric models of the trade-off between inflation and unemployment, we reached similar conclusions. The models we used can be found in A. Stephen Englander and Cornelis A. Los, "The Stability of the Phillips Curve and Its Implications for the 1980s," Federal Reserve Bank of New York Research Paper 8303, February 1983; and Flint Brayton and Eileen Mauskopf, "The Federal Reserve Board MPS Quarterly Model of the U.S. Economy," in *Economic Modelling* (Butterworth and Co., July 1985). For an extensive review of econometric "Phillips Curve" equations, see Robert J. Gordon, "Inflation, Flexible Exchange Rates, and the Natural Rate of Unemployment," in Martin Neil Baily, ed., *Workers, Jobs, and Inflation* (Washington, DC: Brookings Institute, 1982).

¹⁰Economists have studied the relationship between inflation and the amount of slack in the labor market for many years without general agreement on what the exact relationship is or what level of unemployment is consistent with price stability. For a general introduction to this issue, see Stuart E. Weiner, "The Natural Rate of Unemployment: Concepts and Issues," *Federal Reserve Bank of Kansas City Review*, January 1986, pp. 11-24.

¹¹The rapid drop in the unemployment rate from 7.5 percent in the first quarter of 1977 to 6 percent in the second quarter of 1978 makes it difficult to estimate the NAIRU precisely during that period because it is likely that not only the level of unemployment matters for wage pressures but also whether the unemployment rate is changing gradually or rapidly. Most empirical studies put the NAIRU in the late 1970s in the 6 to 7 percent range. Similar conclusions

those factors responsible for the apparent decline in the NAIRU.

Footnote 11 continued

about the NAIRU in the late 1970s were reached in the 1983 *Economic Report of the President* (pp. 37-38):

While it is not easy to pinpoint the threshold unemployment rate precisely, it probably lies between 6 and 7 percent. Econometric studies of historical data suggest that when unemployment is close to 6 percent the rate of inflation tends to accelerate. For example, during 1978 when the unemployment rate was 6.1 percent, inflation as measured by percent change in the gross national product (GNP) deflator rose to 7.4 percent from 5.8 percent in 1977. An even larger increase occurred in 1979 when the unemployment rate averaged 5.8 percent. For an empirical study that argues NAIRU could have been 7 percent or even somewhat higher in the late 1970s, see Steven Braun, "Productivity and the NAIRU (And Other Phillips Curve Issues)," Working Paper Number 34, Board of Governors of Federal Reserve System, February 1984.

Before we consider the labor market changes that may have contributed to such a decline, however, we review some measures of labor market tightness at the aggregate level to see how their current values compare with those in 1977. Besides the unemployment rate (which is about a percentage point lower), the four other commonly used indicators of labor market tightness (initial claims for unemployment insurance, discouraged workers, help wanted advertising, and the length of the workweek in manufacturing) suggest that the labor market now is somewhat tighter than it was in 1977.

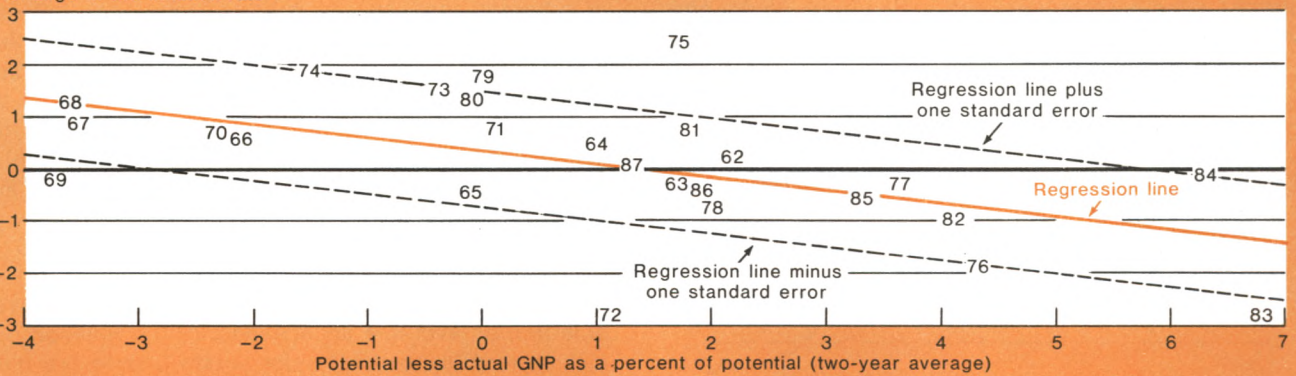
Nevertheless, one less commonly used indicator— involuntary part-time workers as a percent of the labor force—does suggest some additional slack in the labor market in 1987 as compared to 1977 (top panel of

Chart 4

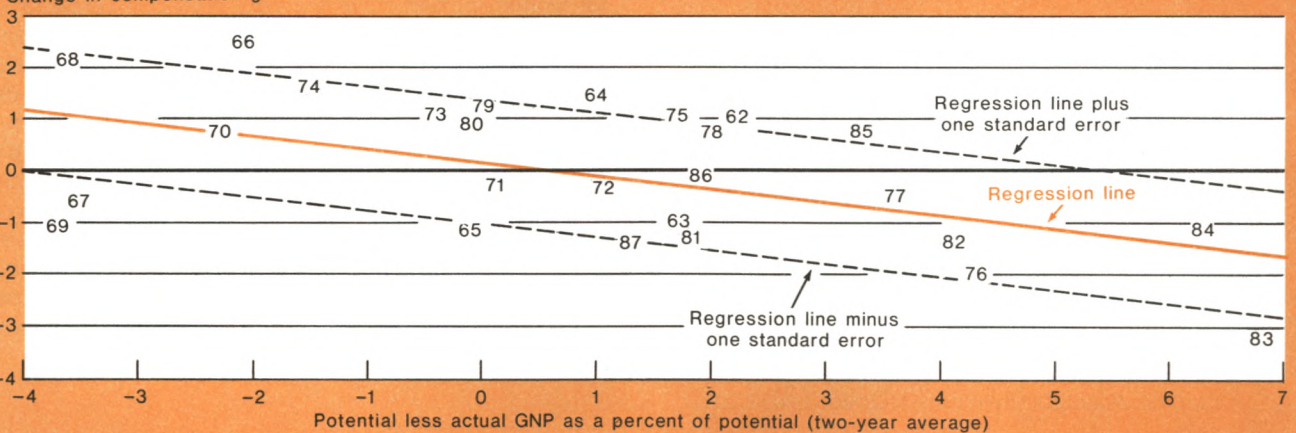
Potential GNP, Inflation, and Compensation

QII to QII of Each Year

Change in the inflation rate*



Change in compensation growth rate †



* CPI excluding food and energy.

† Nonfarm business sector.

Chart 5). It is not possible to know, however, how much slack this high level of involuntary part-time workers represents because the category includes any worker working less than 35 hours who would like any additional employment. Many of the part-time employment opportunities exist in the service industry, and as the bottom panel of Chart 5 indicates, average weekly hours in the service sector have been declining, reflecting an increased use of part-time workers in that sector. This suggests that the service sector may have the capacity to grow if weekly working hours are expanded, even if demographic forces limit the growth of the labor force groups (women and young people) who traditionally have been employed in this sector.

A rough measure of the importance of this relatively high level of involuntary part-time employment can be calculated by assuming that these additional involuntary part-time workers are currently employed about one-half of a normal workweek. Then, if the involuntary part-time employment was to fall back to its 1977 level as these workers took full-time jobs, it would be equivalent to expanding total hours by about one-half of 1 percent. Hence, effective employment and output could rise without lowering the unemployment rate or creating

inflationary pressures. The assumptions behind this calculation are, of course, quite tenuous, and require that the involuntary part-time employed workers would in fact work more hours at the current wage rates.

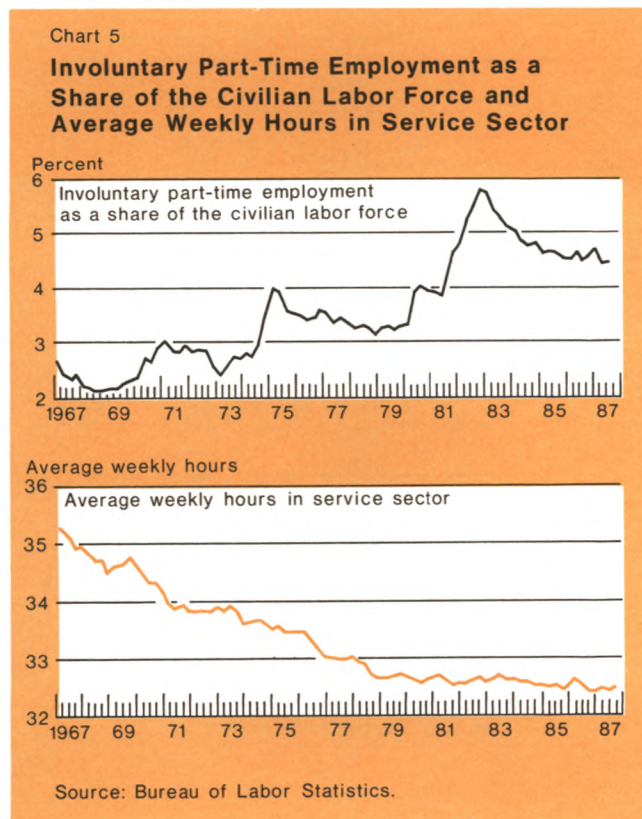
Overall, the aggregate labor market statistics suggest that the demand for labor is stronger than in 1977. These statistics also appear to indicate that the NAIRU has shifted down, because wages have not accelerated significantly as they did when the unemployment rate fell to 6 percent in the late 1970s.

In the remainder of this section we make various comparisons of 1977 and 1987 at the disaggregated level to see if we can identify the reasons for the apparent downward shift in the NAIRU from a range of 6.5 to 7 percent in the late 1970s to around 6 percent currently. We also investigate whether special developments in any segment of the labor market may help to account for the recent instability in Okun's Law.

In exploring these questions, we focus on demographic, industrial and regional statistics. Developments in these labor markets could potentially affect the NAIRU in many different ways. For example, members of different age and sex cohorts experience different frictional unemployment rates because they differ in their turnover frequencies and in their average unemployment durations. Or, from another perspective, changes in the composition of aggregate demand, and hence in the sources of the demand for labor, can affect the level of structural unemployment if workers have relatively limited mobility across industries and regions.¹²

Demographic trends

Changes in demographics since 1977 have both favorable and unfavorable implications for the inflation outlook. Unemployment rates for young people are quite low and labor force participation rates both overall and for women in particular are very high compared to the situation prevailing in 1977. Both developments suggest possible wage pressures, especially at the entry level and in the service sector. On the other hand, the labor force is growing older, suggesting that the average worker is experiencing less turnover and higher productivity. Moreover, prime-age males are experiencing relatively high unemployment for this stage of the cycle. These factors could help contain inflationary pressures, particularly if employment growth becomes more balanced over time as the manufacturing sector grows more rapidly and service-sector growth slows. In what



¹²For a general overview of the theoretical and empirical evidence relating to the NAIRU, see David Laidler and J. Michael Parkin, "Inflation: A Survey," *Economic Journal*, vol. 85 (December 1975), pp. 741-809.

follows, we briefly review these trends and determine how pervasive the recent decline in unemployment has been across demographic categories.

The breakdown of unemployment rates by age in Table 1 reveals that, for almost all age cohorts, unemployment rates have declined over the past year and are now below their 1977 levels. Because the decline in unemployment over the past year is widespread across all groups, we cannot point to any specific developments in age categories that would account for the unexpected sharpness of the drop in the aggregate unemployment rate. This conclusion also holds when the unemployment rate is disaggregated by sex.

The disaggregation by gender also shows that the burden of unemployment is today more evenly distributed across gender. The aggregate unemployment rate for men is only slightly below the level prevailing in 1977, and the unemployment rate for prime-age men remains above its 1977 level. The unemployment rates for females in every age category are considerably lower than in 1977. The first development may reflect the slow growth of manufacturing jobs—jobs which men have traditionally held; the second reflects the increasing strength of the service sector, which employs many women. In addition, the teenage labor market has become increasingly tight, with unemployment rates dropping to cyclical lows, the teenage labor force growing slowly, and teenage workers constituting an increasingly smaller portion of the labor force as a whole (Tables 1 and 2). These developments, combined with the lower unemployment rates for women, suggest that wage pressures could emerge for workers at the

Table 2

Labor Force Trends

Percent of Labor Force by Age and Sex			
Age	1970	1977	1987*
Both sexes, 16 to 19	8.8	9.5	6.7
Both sexes, 20 to 24	12.8	15.0	12.6
Men, 25 and over	50.2	45.7	45.2
Women, 25 and over	28.3	29.8	35.5
Civilian Labor-Force Participation Rates			
	1970	1977	1987*
Both sexes	60.4	62.3	65.3
Men	79.7	77.6	76.3
Women	43.4	48.4	55.9
Civilian Labor Force by Age and Sex (Average Annual Rate of Change)			
	1970-75	1975-80	1980-86
Both sexes, 16 and over	2.5	2.7	1.6
Men	1.9	1.8	1.1
16 to 24	4.9	1.9	-1.7
25 to 54	1.7	2.0	2.3
55 and over	-0.8	0.4	-0.7
Women	3.5	4.0	2.4
16 to 24	4.8	2.7	-0.8
25 to 54	3.7	5.0	3.9
55 and over	0.6	1.9	0.7

*January-September average
Source: Bureau of Labor Statistics

Table 1

Unemployment Rates by Age and Sex

(In Percent)

	1977	1982-IV	1986-II	1987-III	Change since 1982-IV	Change since 1986-II
Both sexes, 16 and over	7.1	10.7	7.1	6.0	-4.7	-1.2
Men, 16 and over	6.3	11.1	7.0	5.9	-5.2	-1.1
16 to 19	17.3	25.4	20.2	16.9	-8.5	-3.3
20 to 24	10.8	17.8	11.3	9.5	-8.4	-1.8
25 to 54	4.3	9.2	5.6	4.8	-4.4	-0.8
55 and over	3.9	5.9	4.0	3.3	-2.5	-0.7
Women, 16 and over	8.2	10.1	7.2	6.1	-4.1	-1.2
16 to 19	18.3	22.3	18.3	14.9	-7.4	-3.3
20 to 24	10.9	14.2	10.5	9.3	-4.9	-1.2
25 to 54	6.4	8.5	6.0	5.0	-3.6	-1.0
55 and over	4.6	5.0	3.5	3.1	-2.0	-0.5

Source: Bureau of Labor Statistics

entry level and in the service sector.

Other demographic trends that might put upward pressure on wages are evident in Table 2. The center panel shows that the total labor force participation rate and the participation rate for women are at very high levels by historical standards. Hence, labor force growth generally is not expected to be nearly as rapid as in the 1970s when a large number of people entered the labor market. As a result, further increases in labor supply, particularly in the service sector, are likely to occur only if higher wages are offered.

Currently, young people who entered the labor force in the 1970s are moving into their most productive years (top panel of Table 2). Over 80 percent of the labor force is currently over age 25, as compared to around 75 percent in 1977. Their higher productivity potential and lower turnover rates could offset at least in part the inflationary consequences of the slower labor force growth cited above. In addition, one potentially high-productivity cohort—prime-age men—still has a relatively high unemployment rate (Table 1). If future labor demand is concentrated in manufacturing and other sectors that employ this cohort, wage inflation will be less severe than if those sectors that primarily employ women and young people grow more rapidly.

The unemployment rate for prime-age men (currently 4.8 percent) could perhaps fall to around its 1977 level (4.3 percent) without creating additional wage pressure. Since this cohort constitutes two-fifths of the total labor force, such a decline in this group's unemployment might reduce the aggregate unemployment rate by 0.2 percentage point without additional inflationary pressures.

In general, the implications of many of these demographic factors for the NAIRU cannot be precisely calculated. In the past, economists have tried to control for a limited number of demographic influences on the unemployment rate by constructing the hypothetical unemployment rates that would have been observed if the relative labor force shares of different population subgroups (with different frictional unemployment rates) had remained constant at some given point in time.¹³ In Chart 6, we constructed a weighted unemployment rate using the labor market shares as of 1967.¹⁴

The actual rate rose above the weighted rate during the 1970s. This increase was due to the rising teenage

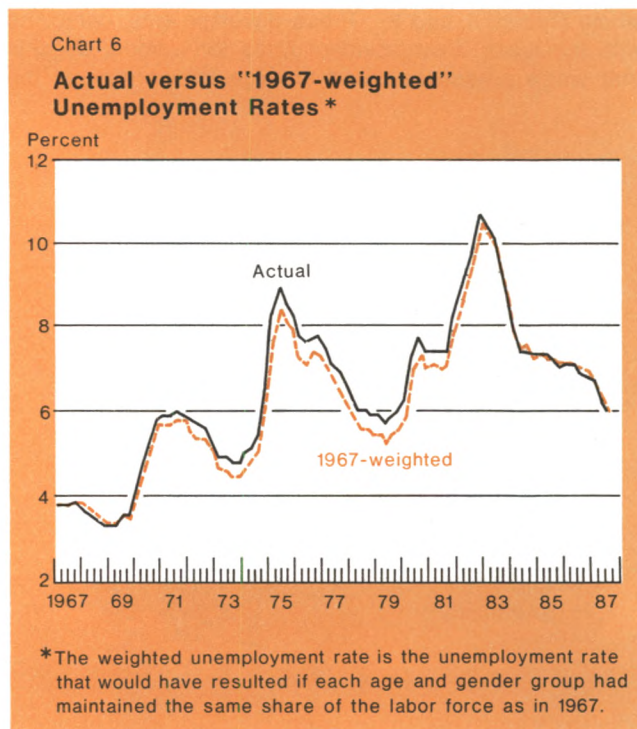
and female shares of the labor force at a time when these cohorts experienced relatively high unemployment rates. In the 1980s, the actual rate and the weighted rate have been about the same because of the reduced numbers of young workers and the lower unemployment rate for women. The recent convergence of the female and male unemployment rates implies that further increases in the female labor force share should no longer necessarily raise the actual unemployment rate relative to the weighted rate. In the 1970s, the observation that the measured unemployment rate had risen above the weighted rate formed the basis of the argument that the NAIRU was higher than what it was in the 1960s. The same logic today would suggest that, all other things equal, the NAIRU has returned to the same level as in the 1960s.¹⁵ By our calculations, it appears that demographic factors could have reduced the NAIRU from its 1977 level by as much as 0.5 percentage point.¹⁶

¹⁵For more detail along these demographic lines, see Congressional Budget Office, "Economic and Budget Outlook"; see also Lawrence H. Summers, "Why is the Unemployment Rate So Very High?" for estimates of the impacts other attributes of the labor force might have on the unemployment rate.

¹⁶Using a similar approach, the Congressional Budget Office estimates that the NAIRU has fallen 0.3 percentage point since 1977. For more detail, see "The Economic and Budget Outlook: An Update," August 1987.

¹³This notion was first introduced by George L. Perry, "Changing Labor Markets and Inflation," *Brookings Papers on Economic Activity*, vol. 3 (1970), pp. 411-41. For recent estimates that are based on the same approach as the one used in this article, see Mark Zandi, "Wage Inflation: Myth or Reality," *U.S. Economic Outlook*, Wharton Econometric Forecasting Services, November 1987.

¹⁴The labor force was separated by sex and by the following age groups: 16-19, 20-24, 25-54, and 55 and over.



Industry trends

Recent unemployment rates disaggregated by industry are shown in Table 3. As was the case with the demographic breakdowns, the recent decline in the unemployment rate has been widespread across industries, again ruling out unusual sectoral reasons for the decline in the aggregate unemployment rate.¹⁷ This breakdown of the labor market statistics also shows that all industries have unemployment rates less than their 1977 levels. The rates for finance, insurance and real estate (FIRE) and services, government, and nondurable manufacturing have even gone below their cyclical lows, attained in 1978.

The low unemployment in FIRE and services reflects in part the rapid growth in jobs in those sectors. Since 1979, employment in FIRE and services has increased at an average rate of 4.5 percent. In contrast, employment in durable and nondurable manufacturing has declined at average rates of 1.6 and 0.6 percent, respectively. These variations suggest that the ability of the economy to expand further without inflation now depends in part upon the industrial composition of future growth. Imbalanced employment growth across industries will raise structural unemployment because workers have only limited ability to move from one industry to another. Although most of the job creation during the current expansion has been in the service sector, manufacturing employment has been quite strong thus far this year. Moreover, many analysts predict that the weaker dollar will further stimulate manufacturing

exports. If the manufacturing sector should expand more rapidly while the service sector slows, the more balanced growth could be a factor contributing to a lower NAIRU. Up to this point in the expansion, however, the imbalanced growth across sectors has probably raised the NAIRU.¹⁸

The NAIRU could also be affected by the pattern of real wages in recent years. Since 1977 real wages have fallen in all industries except FIRE and services, where they rose on average 0.4 percent per year. Real wages in manufacturing have fallen 6.7 percent since 1977, after rising 8.2 percent over the 1970-78 period. Similarly, the real minimum wage has fallen 22 percent since 1979, and the differential between manufacturing and service sector wages has narrowed 24 percent since 1978.

These trends in wages could put both upward and downward pressure on the NAIRU, but we suspect that the net effect has been downward. The decline in real wages in manufacturing should lower the NAIRU, all other things equal, because it should increase the number of workers that can be employed without raising product prices. At the same time, a long period of losses in real wages could make manufacturing workers more militant if they try to recover previous wage losses as the labor market tightens. However, awareness of increased foreign competition and concern about job

¹⁷An unemployed worker's "industry" refers to the industry in which the worker was most recently employed, even if that worker had been employed in a different industry for a longer period of time.

¹⁸The empirical relationship between structural unemployment and the dispersion of employment growth across industries has been explored by David Lilien, "Sectoral Shifts and Structural Unemployment," *Journal of Political Economy*, August 1982, pp. 777-93; and by Katherine Abraham and Lawrence Katz, "Cyclical Unemployment: Sectoral Shifts or Aggregate Disturbances," *Journal of Political Economy*, June 1986, pp. 507-22.

Table 3

Unemployment Rates by Industry (In Percent)

	1977	1982-IV	1986-II	1987-III	Change since 1982-IV	Change since 1986-II
Construction	12.5	21.9	12.6	11.3	-10.6	-1.2
Manufacturing	6.7	14.2	7.2	5.7	-8.5	-1.4
Durables	6.2	16.1	7.1	5.7	-10.4	-1.3
Nondurables	7.4	11.4	7.3	5.8	-5.6	-1.5
Transportation and public utilities	4.7	7.9	5.4	4.2	-3.7	-1.2
Wholesale and retail	8.0	10.6	7.8	6.7	-3.9	-1.1
FIRE* and services	6.0	7.6	5.6	4.9	-2.7	-0.7
Government	4.2	5.1	3.6	3.6	-1.5	0.0
Agriculture	11.2	4.8	14.0	10.1	-4.9	-3.8

*Finance, Insurance, and Real Estate
Source: Bureau of Labor Statistics

security may reduce the wage demands of workers even in a tight labor market. The decline in union representation since 1977 (from 23.5 percent of the labor force to 16.5 percent) might also play a moderating role. The fall in the real minimum wage should help lower the NAIRU because it gives employers more flexibility in hiring marginal workers. Finally, the narrowing of the spread between manufacturing and service sector wages should also reduce the NAIRU because it is likely to increase labor mobility across industries.

Some implications of these changes in real wages for the NAIRU can be roughly measured. The decline in the real minimum wage could have reduced the NAIRU by about 0.2 percentage point, while the decline in unionization could have reduced it by roughly 1 percentage point.¹⁹ But we were unable to find previous

Footnote 19 continued

minimum wage is based on estimates of how much teenage unemployment would be affected by changes in minimum wage. The effect on the total NAIRU is small, of course, because teenagers are a small fraction of the labor force. For more detail, see Howard Wachtel, *Labor and the Economy* (Orlando, Florida: Academic Press, 1984), p. 470. We are not aware of any empirical studies of the impact of unionization on the total unemployment rate or on the NAIRU. Workers in the relatively high-paying union sector are more likely to remain unemployed longer because they hope to be recalled to their former jobs or because they search longer for other union jobs—such behavior would raise the NAIRU as unionization increases. We based our estimates on results derived from interstate comparisons. For more detail, see Summers, "Why is the Unemployment Rate So Very High?"; and Robert T. McGee, "State Unemployment Rates: What Explains the Differences," this *Quarterly Review*, Spring 1985, pp. 28-35. There are some difficulties in using interstate estimates to calculate what the effects might be at the aggregate level, and these results should be interpreted cautiously. For example, interstate estimates are likely to capture not only the effects of unionization on the NAIRU mentioned above but also the effects of unionization on the location decisions of employers. At the aggregate level, of course, the effects of location decisions on unemployment would cancel out. Hence, the 1 percentage point estimate presented here should be viewed as an upper limit.

¹⁹The estimated effect on the total NAIRU for the decline in the

Table 4

Unemployment Rates by Region
(In Percent)

	CLF*	1977	1982-IV	1986-II	1987-III	Change since 1982-IV	Change since 1986-II
New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont)	5.7	7.7	7.2	4.2	2.9	-4.3	-1.3
Middle Atlantic (New Jersey, New York, Pennsylvania)	15.2	8.7	9.9	6.5	4.7	-5.2	-1.8
East North Central (Illinois, Indiana, Michigan, Ohio, Wisconsin)	17.4	6.5	13.5	8.0	6.6	-6.9	-1.4
West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota)	7.5	4.8	8.1	5.6	4.9	-3.2	-0.7
South Atlantic (Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, District of Columbia)	17.0	7.0	9.2	5.7	5.7	-3.5	0.0
East South Central (Alabama, Kentucky, Mississippi, Tennessee)	6.0	6.4	13.0	9.4	7.6	-5.4	-1.8
West South Central (Arkansas, Louisiana, Oklahoma, Texas)	10.9	5.7	8.5	9.9	8.5	0.0	-1.4
Mountain (Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming)	5.4	6.7	9.3	7.7	6.5	-2.7	-1.2
Pacific (Alaska, California, Hawaii, Oregon, Washington)	15.0	8.2	10.9	6.8	5.7	-5.2	-1.1
National unemployment rate		7.1	10.7	7.1	5.9	-4.8	-1.2

*Percent of U.S. Civilian Labor Force.
Source: Bureau of Labor Statistics

studies that would provide a basis for estimating how much the fall in real manufacturing wages might affect the NAIRU or how much shrinking wage differentials across sectors might increase labor mobility.

Regional trends

Like the demographic and industrial unemployment rates, the regional unemployment rates (Table 4) suggest that the decline in unemployment over the past year at the national level has been widespread. Therefore, none of the disaggregated data can help to explain the large error that emerges in tracking the total unemployment rate with a conventional econometric estimate of Okun's Law. In other words, the recent decline in the unemployment rate has not been concentrated in one or two specific components.

Over the longer run, the regional data also capture the imbalanced nature of the current recovery that we noted earlier for industries. The New England, Middle Atlantic and Pacific regions are experiencing unemployment rates below the 6 percent national average. These regions have almost half the U.S. labor force. In 1977, all the regional unemployment rates were contained in a spread from 4.8 to 8.7 percent. Currently, the range is about one-third larger, from 2.9 to 8.5 percent.

This disparity could have some implications for the NAIRU. The level of structural unemployment is likely to increase with the amount of regional imbalance because workers cannot readily move from one geographic area to another.²⁰ Examining the highest and lowest rates—the procedure we followed earlier—is clearly not an entirely adequate way of judging the overall regional imbalance in unemployment. A more comprehensive measure of imbalance is shown in Chart 7. This variable is the weighted standard deviation of annual state unemployment rates, in which each unemployment rate is weighted by each state's annual share of the U.S. labor force. It appears from this measure that the current recovery has been quite imbalanced, and regional imbalance could, therefore, be a factor increasing the NAIRU.²¹ The effect relative to 1977 could be fairly large because the current level of

²⁰For a discussion of the theoretical relationship between regional unemployment and aggregate unemployment, supplemented with empirical evidence for the United Kingdom, see G. C. Archibald, "The Phillips Curve and the Distribution of Unemployment," *American Economic Review*, May 1969 (Papers and Proceedings of the 1968 Annual Meeting of the American Economic Association), pp. 124-34.

²¹Katherine Abraham suggests that the upward drift in regional unemployment dispersion between 1960 and 1985 may explain the increase over that period in the ratio of job vacancies to unemployment. For more detail see Katherine Abraham, "Help Wanted Advertising, Job Vacancies, and Unemployment," *Brookings Papers on Economic Activity*, vol. 1 (1987), pp. 207-43.

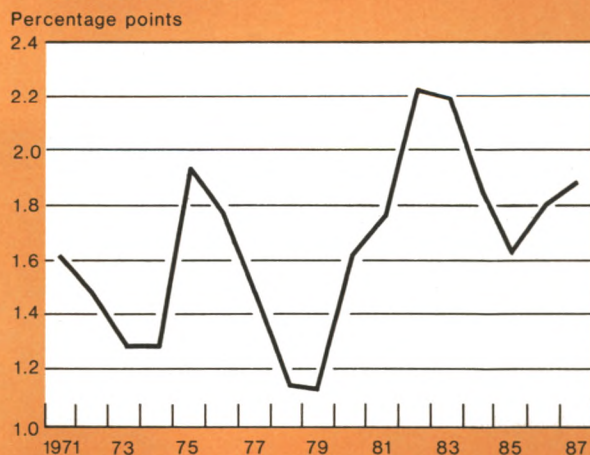
unemployment rate dispersion is about 25 percent above the 1977 level and has been increasing over the last two years.

Conclusion

We have reviewed several factors that could be affecting the trade-off between unemployment and inflation. Most of our comparisons have been relative to 1977, a year when compensation growth reached a cyclical low and began to accelerate. It appears that since 1977 some developments have taken place that could have raised the NAIRU—the unemployment rate at which inflation tends to remain stable—as well as some that could have lowered the NAIRU. We were able to quantify certain factors that could have lowered the NAIRU by as much as 2 percentage points (demographics, minimum wage, and unionization). However, it was not possible to quantify the impacts of some other factors that could have raised the NAIRU, such as regional and industrial imbalance in the current expansion. Overall, our findings suggest that the NAIRU has shifted downward from the 6.5 to 7.0 percent range in the late 1970s to about 6 percent at present, although we will not know with confidence what the NAIRU is in the current cycle until we actually see firm evidence of upward movements in

Chart 7

Unemployment Rate Dispersion across States*



*The dispersion measure is the weighted standard deviation of annual state unemployment rates, in which each unemployment rate is weighted by each state's annual share of the U.S. labor force.

wages.²² The various factors affecting the NAIRU that we have analyzed here will, of course, continue to change over time, and NAIRU will also change as a result.

Interpreting the NAIRU in the current environment is also complicated by the consideration that wage pressures are likely to develop differently than in the past.

²²In looking at this question, some analysts have reached more optimistic conclusions; others, more pessimistic conclusions. For a more optimistic point of view, see "Economic Watch: A Shift Towards Strength?" *Morgan Economic Quarterly*, September 1987. A more pessimistic outlook is presented in Richard Berner and Jerry Pedgen, "Inflation Prospects for 1987-88," Salomon Brothers, July 29, 1987.

Historically, wage pressures emerged first in the manufacturing sector and subsequently spread throughout the economy. Now, however, with the demand for labor in the manufacturing sector remaining quite low until recently, wages are more likely to begin moving gradually upward in response to very tight labor markets in some regions and in many service-producing industries. Such a process will most likely make it more difficult to detect emerging inflationary pressures.

Richard Cantor
John Wenninger

*(This report was released to Congress
and to the press on September 3, 1987)*

Treasury and Federal Reserve Foreign Exchange Operations

May-July 1987

Early in May, the dollar moved down against major foreign currencies, continuing a trend that had prevailed throughout the year. But during the rest of the three-month period ending in July, the dollar first stabilized and then advanced modestly to close up 6½ percent against the Japanese yen and roughly 4 percent against the German mark and other European currencies. The U.S. authorities intervened in the market during three episodes in the period.

As the May-July period opened, many market participants were not yet convinced that the authorities of the major industrialized countries were committed to exchange rate stability. To be sure, statements by both U.S. and Japanese officials during preceding weeks had been interpreted as indicating a genuine concern about the effects of further sharp downward movements in dollar rates and a willingness to cooperate closely to foster exchange rate stability. Nevertheless, traders were disappointed that, after the dollar's 2½-year decline, progress in diminishing the world's external imbalances was so slow. They were mindful of the intense political pressure in the United States over trade issues and wary that there might be new calls for a lower dollar. They were concerned that any further exchange rate decline might add to domestic inflation. They noted, as well, that a decline in U.S. final domestic demand was reported in the first quarter GNP data. Consequently, many market participants remained skeptical that the

authorities would attach a high enough priority to exchange rate stability to alter domestic economic policies if necessary.

Thus, traders retained their bearish attitude toward the dollar, even though they were aware that the authorities of the Group of Seven (G-7) industrial nations had intervened to purchase dollars in substantial amounts since late March. There was skepticism that private investors, already experiencing substantial exchange rate losses on their dollar portfolios, would continue to place funds in the United States. Although long-term interest rate differentials favoring dollar assets were at their highest levels since the dollar was at its peak in 1985, market participants questioned whether this interest rate advantage would prove sufficient to induce heavy participation by Japanese and other investors in the U.S. Treasury's refunding operation early in May. The dollar, therefore, continued to decline during the first week of May. It moved down to DM 1.7590, its lowest level against the mark in nearly seven years. Against the yen, it eased back to Y 137.95, not far above the 40-year low touched just weeks before.

In these circumstances, the U.S. authorities entered the market in early May, in keeping with the February Paris and April Washington agreements, to contain the intense selling pressure on the dollar. On the first two business days of May, the Desk purchased \$140 million against marks and \$20 million against yen in the first intervention episode of the period under review.

Meanwhile, market participants had taken note of comments made by Chairman Volcker and by Japanese Prime Minister Nakasone in late April, indicating that

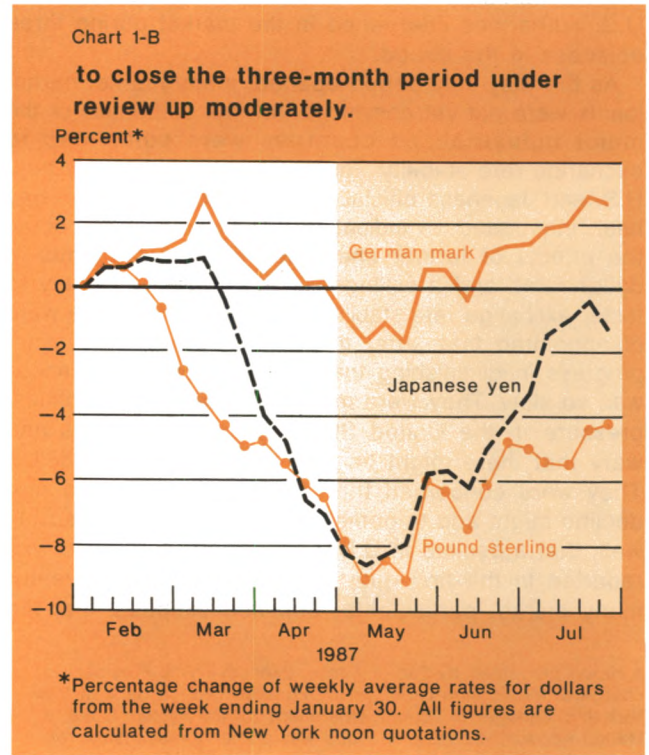
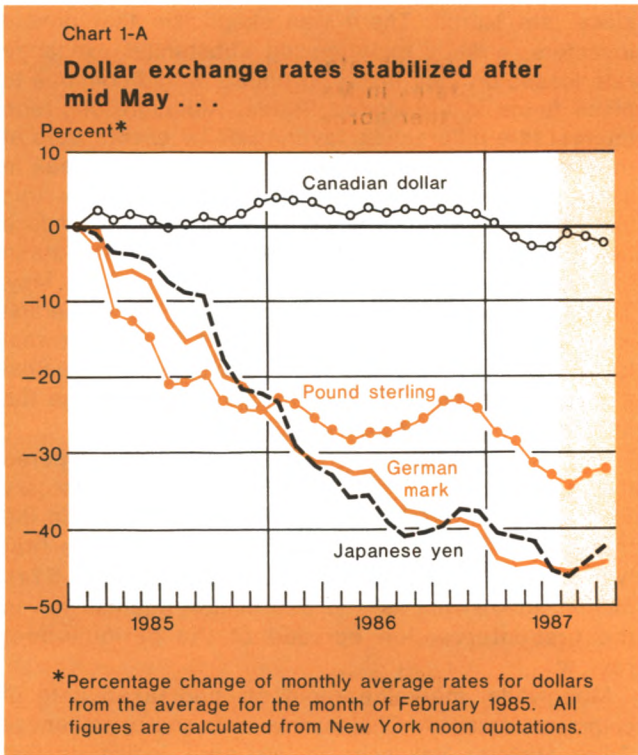
A report presented by Sam Y. Cross, Executive Vice President in charge of the Foreign Group at the Federal Reserve Bank of New York and Manager of Foreign Operations for the System Open Market Account. Christopher Rude was primarily responsible for preparation of the report.

the central banks of the two countries were willing to adjust their monetary policies in a way that would lend support to the dollar. Mr. Nakasone announced that the Bank of Japan would act to ease short-term interest rates. Mr. Volcker stated that the Federal Reserve had "snugged up" monetary policy in light of the exchange rate pressure. Short-term interest rate differentials had already widened in favor of the dollar even before these comments, as U.S. market rates responded to growing inflation concerns. But when U.S. interest rates continued to firm and these differentials continued to expand in May, market participants came increasingly to see the industrialized countries as committed to exchange rate stability.

At the same time, some of the markets' worst fears proved to be unfounded. It soon became clear that Japanese institutions had, in fact, made sizable bond purchases at the May Treasury refunding. Reports that the U.S. unemployment rate had fallen to 6.3 percent in April and that producer prices had increased sharply by 0.7 percent for the same month were seen as giving the U.S. monetary authorities both more room and a greater need to tighten policy. Meanwhile, officials in Japan indicated that they were willing to guide money market rates lower. Also, the Bundesbank lowered the minimum rate on its repurchase agreements and

reduced the lower limit for money market rates by cutting the rate at which it stood ready to sell three-day Treasury bills. These actions were interpreted by the markets as indicating that the German authorities were willing to join the Japanese and U.S. central banks in adjusting monetary policies to foster exchange rate stability.

Other developments also helped to reduce selling pressures against the dollar. After Japanese authorities urged financial institutions in Japan to refrain from speculative dollar sales and required these institutions to report their foreign exchange positions much more frequently, traders in Tokyo became reluctant to make sizable dollar sales. Later in May, the prospect for greater economic policy convergence improved when Japan's Parliament finally approved the budget for the fiscal year ending March 1988, paving the way for an extraordinary parliamentary session during the summer to draw up a supplementary budget aimed at expanding domestic demand. Then, following reports of an attack on a U.S. naval vessel in the Persian Gulf, the dollar also began to derive some benefit from the view that a disruption in oil supplies would be relatively less detrimental to the United States than to many other developed countries. In response to these developments, the dollar gradually moved up from its early May



lows to trade at DM 1.7830 and at Y 140.40 on May 18.

The underlying market sentiment toward the dollar remained cautious, however, and the dollar was still vulnerable to potentially adverse news. In fact, two episodes did occur between mid-May and early June that temporarily precipitated renewed bouts of selling pressure against the dollar. The first occurred on May 19 when a major U.S. money-center bank announced a restructuring of its capital and loan-loss reserves that would imply a substantial reported loss for the second quarter. The second episode occurred on June 2 following the announcement that Paul Volcker would not serve a third term as Chairman of the Federal Reserve. In both episodes the U.S. authorities intervened to blunt the selling pressures. In the first, the Desk purchased a total of \$133 million against the mark, partly in New York and partly in Pacific markets in coordination with the Bank of Japan. In the second, the Desk purchased a total of \$410 million against marks along with \$103 million against yen in New York and the Far East. This latter operation was undertaken in cooperation with the Bundesbank, the Bank of France, the Bank of Italy, and the Bank of Japan. In both episodes, the intervention operations helped reassure market participants, and the dollar promptly moved up to levels higher than had prevailed beforehand. Market participants began to feel that the dollar was regaining notable resiliency.

In mid-June, at the time of the Venice summit meeting, the leaders of the G-7 industrial nations reaffirmed the earlier Paris and Washington agreements with respect to exchange rates. Moreover, the communique announced a plan for enhanced multilateral surveillance, including more extensive use of medium-term economic objectives and interim performance indicators. The call for improved surveillance, though seen by some observers as a sign that international economic policy cooperation would increase in the future, left market participants initially disappointed that no concrete initiatives to support the dollar were forthcoming. But the dollar softened only temporarily during the meeting, subsequently reversing the decline without intervention support.

By late June, traders were becoming increasingly impressed with the resilience that the dollar had shown to adverse news in the preceding weeks. In addition, the dollar began to benefit from the release of several economic statistics and other evidence suggesting a better-than-expected performance for the U.S. economy. During the course of the summer, anecdotal reports of rising export volumes gave market participants a basis for seeing the external sector as a growing source of demand. Preliminary estimates of the GNP data for the second quarter released in mid-July, indicating that the

Table 1

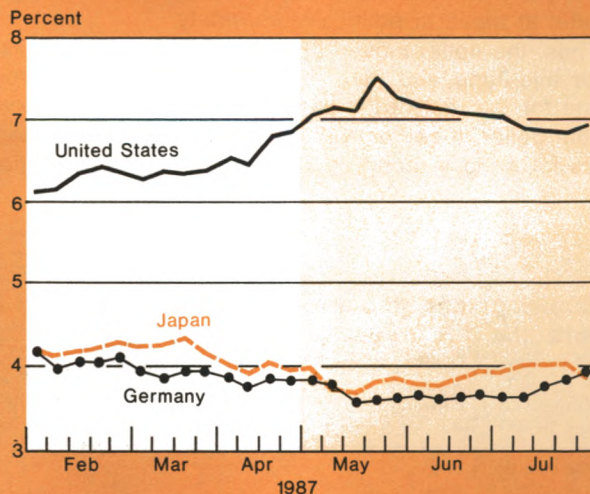
Federal Reserve Reciprocal Currency Arrangements

In Millions of Dollars

Institution	Amount of Facility July 31, 1987
Austrian National Bank	250
National Bank of Belgium	1,000
Bank of Canada	2,000
National Bank of Denmark	250
Bank of England	3,000
Bank of France	2,000
German Federal Bank	6,000
Bank of Italy	3,000
Bank of Japan	5,000
Bank of Mexico	700
Netherlands Bank	500
Bank of Norway	250
Bank of Sweden	300
Swiss National Bank	4,000
Bank for International Settlements:	
Dollars against Swiss francs	600
Dollars against other authorized European currencies	1,250
Total	30,100

Chart 2

Short-term interest rates moved higher in the United States in May while declining somewhat further abroad.



The chart shows weekly average rates on three-month Euro-deposits denominated in dollars, German marks, and Japanese yen.

change in the level of net exports was positive for the third consecutive quarter, seemed to confirm this view. Under these circumstances, the market showed only short-lived disappointment when, in the middle of July, the U.S. trade figures showed a modest widening in the deficit to \$14.4 billion in May after having declined in March and April. Indeed, this was yet another occasion when selling pressure against the dollar was quickly shaken off.

By contrast, market participants were becoming disappointed about the economic outlook for many of the United States' trading partners. Although there were some indications that the Japanese economy was beginning to recover from the depressing effects of the yen's earlier rise, news in Germany that manufacturing orders and retail sales had declined in May and that unemployment remained high underscored market views about the underlying weakness of the economy there. Even in the United Kingdom, the European country with the most optimistic outlook just a few months before, a series of disappointing statistics tended to suggest that the economy was beginning to overheat and raised questions in the market about the near-term outlook for sterling-denominated bonds and stocks.

Against this background, market participants began to buy back dollars previously sold. Reports of increased corporate demand ahead of the quarter end, buying by Japanese investors to reduce hedges on U.S. investments, and renewed investor interest in U.S. securities circulated in the market. Meanwhile, rising tensions in the Persian Gulf and talk of large dollar purchases from the Middle East tended to strengthen the dollar's role as a store of value and currency of choice for flight capital at times of political uncertainty.

Thus, the dollar moved up steadily for several weeks after mid-June and then firmed within a fairly narrow range for the rest of the period under review. The more stable dollar, together with the receding of inflationary fears following a report of a slowdown in producer price

inflation for May, gave a lift to U.S. bond prices and led to an easing of market interest rates generally. At the same time, some of the bullish sentiment that had prevailed in the Japanese and German bond markets faded, so that interest rate differentials favoring the dollar narrowed somewhat.

As the dollar firmed, market participants came increasingly to expect the G-7 central banks to intervene at some point to sell dollars in an effort to restrain the dollar's rise. Traders assumed that the U.S. authorities would try to retain the favorable trade effects of the dollar's depreciation of the past two years and noted that the U.S. authorities had sold dollars in early March

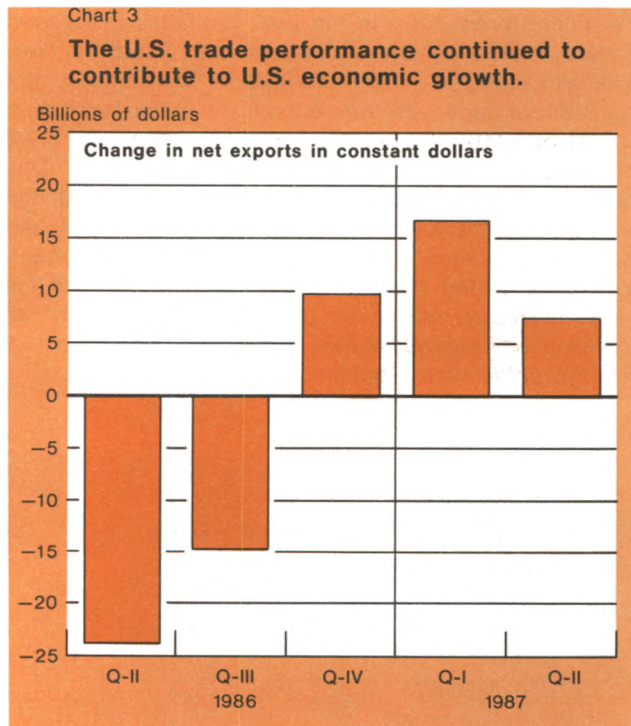


Table 2

Drawings and Repayments by Foreign Central Banks under Special Swap Arrangement with the U.S. Treasury

In Millions of Dollars; Drawings (+) or Repayments (-)

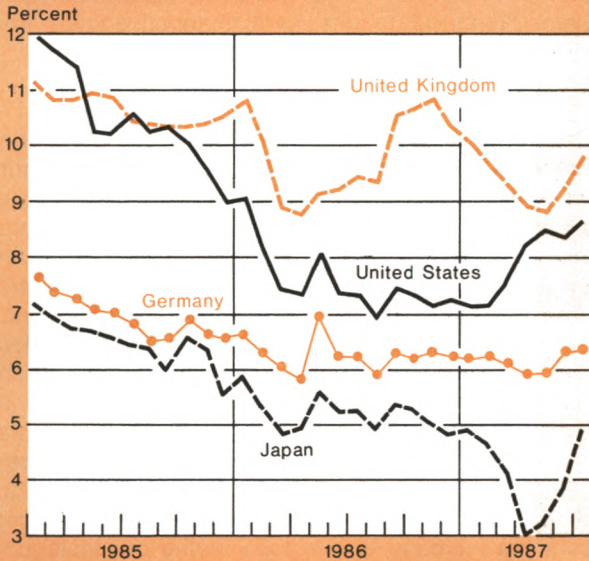
Central Bank Drawing on the U.S. Treasury	Amount of Facility	Outstanding as of May 1, 1987	May	June	July	Outstanding as of July 31, 1987
Central Bank of the Argentine Republic	225.0	225.0	0	0	-225.0	*

Data are on a value-date basis.

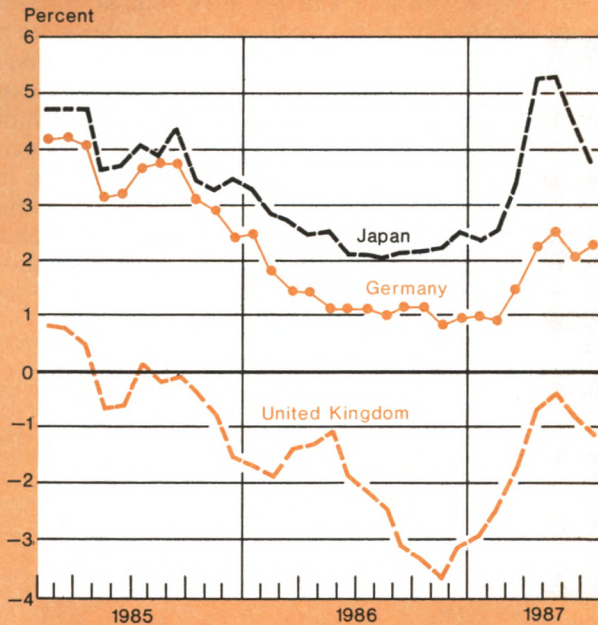
*No facility

Chart 4

The upward trend in long-term U.S. interest rates slowed while rates abroad rebounded . . .



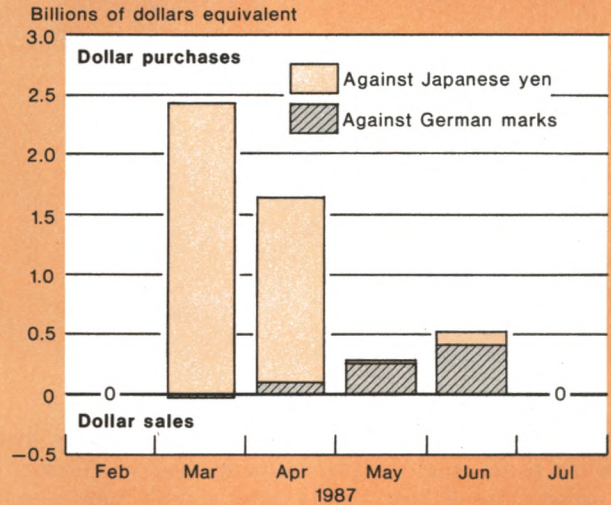
so that interest differentials favorable to dollar assets narrowed.



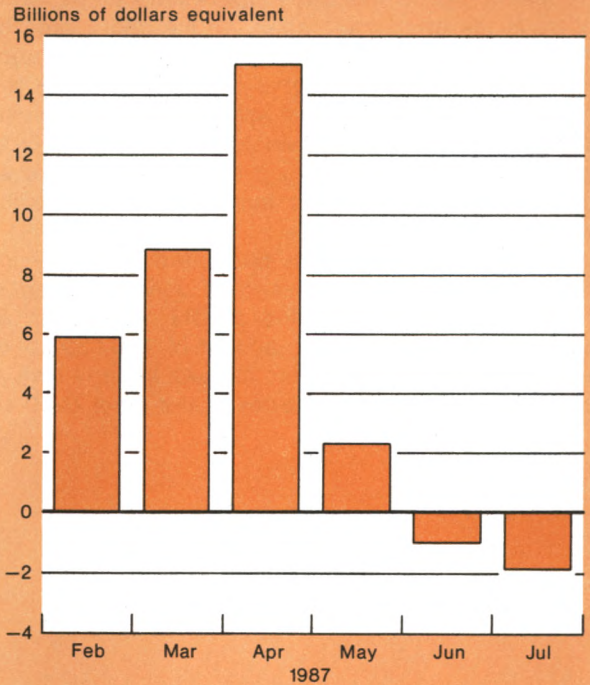
The top chart shows long-term government bond yields and the bottom chart shows the differentials between U.S. Treasury bonds and foreign government securities.

Chart 5

Dollar purchases by the U.S. authorities were far smaller during the current three-month period . . .



and the foreign exchange reserves of other G-7 countries stopped rising.



The bottom chart shows monthly changes in foreign exchange reserves of the G-7 industrial countries, excluding the United States, as reported in the International Monetary Fund's International Financial Statistics, various issues.

Table 3

**Net Profits (+) or Losses (-) on
United States Treasury and Federal Reserve
Current Foreign Exchange Operations**

In Millions of Dollars

Period	Federal Reserve	United States Treasury Exchange Stabilization Fund
May 1, 1987 – July 31, 1987	+ 103.2	+ 109.7
Valuation profits and losses on outstanding assets and liabilities as of July 31, 1987	+ 1,580.2	+ 1,422.8

Data are on a value-date basis.

at around DM 1.87 against the mark. They were also aware that, with central bank money in Germany growing more rapidly than targeted by the Bundesbank for the year, the German central bank might try to absorb liquidity once the dollar strengthened—either through domestic monetary operations or by selling dollars in the exchange market. As the rate approached DM 1.87, rumors circulated in the market at various times that the Federal Reserve or the Bundesbank were selling dollars. As long as some market participants believed the central banks would effectively contain any significant upward pressure against the dollar, there was little incentive for them to build up speculative long positions in the dollar.

Consequently, the dollar fluctuated generally in a narrow range through the end of July. It closed the three-month reporting period at DM 1.8600, up 5³/₄ percent against the mark, and at Y 150.05, up 8³/₄ percent against the yen, from its lows in early May. On a trade-weighted basis in terms of the other G-10 cur-

rencies, as measured by the index developed by the staff of the Federal Reserve Board, the dollar had risen by nearly 4 percent during the three-month period. During the period, the U.S. authorities sold a total of \$806 million equivalent of foreign exchange—\$683 million equivalent of marks and \$123 million equivalent of yen. These operations were financed equally from Federal Reserve and U.S. Treasury balances.

* * * *

On July 15, the Central Bank of the Argentine Republic fully repaid a \$500 million multilateral short-term credit facility provided by the U.S. Treasury through the Exchange Stabilization Fund (ESF) and the central banks of a number of other countries. As noted in the previous report, the full amount was drawn on March 9. The ESF's portion of the facility was \$225 million.

In the period from May 1 through July 31, the Federal Reserve and ESF realized profits of \$103.2 million and \$109.7 million, respectively, on sales of foreign currency. As of July 31, cumulative bookkeeping or valuation gains on outstanding foreign currency balances were \$1,580.2 million for the Federal Reserve and \$1,422.8 million for Treasury's ESF. These valuation gains represent the increase in the dollar value of outstanding foreign currency assets valued at end-of-period exchange rates, compared with the rates prevailing at the time the currencies were acquired.

The Federal Reserve and the ESF regularly invest foreign currency balances acquired in the market as a result of their foreign exchange operations in a variety of instruments that yield market rates of return and that have a high degree of quality and liquidity. A portion of the Federal Reserve's invested balances—\$953.6 million equivalent as of July 31, 1987—were held in securities issued by foreign governments under the authority provided by the Monetary Control Act of 1980. The Treasury also held some of its invested balances—\$2,537.2 million equivalent as of the same date—in such securities.

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