# MONEY MARKET MUTUAL FUNDS:

## A Reaction To Government Regulations Or A Lasting Financial Innovation?

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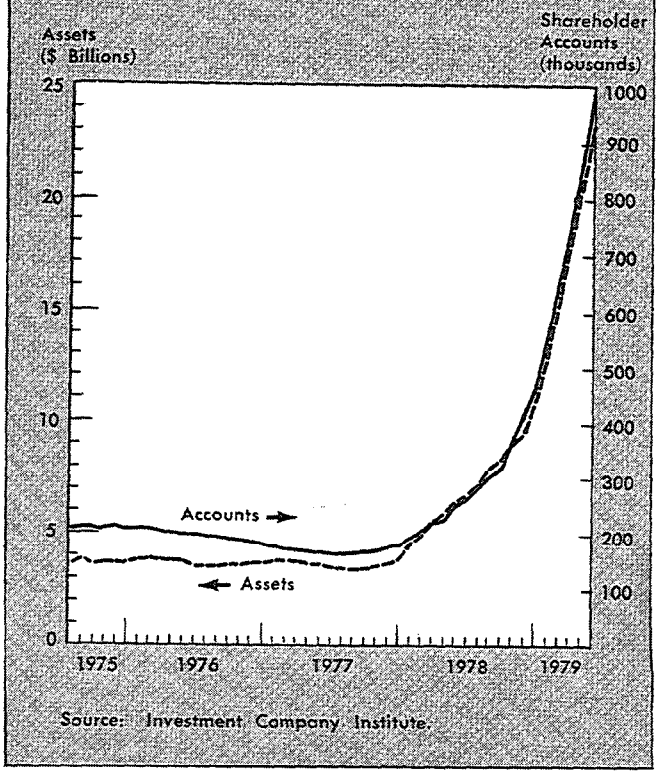
One of the most remarkable changes in the nation's financial system in recent years has been the rapid growth of money market mutual funds (MMFs). These funds are open-end investment companies that invest only in short-term money market instruments. Although the first MMF started offering shares to the public in 1972, prior to 1974 there were only a couple of MMFs. The establishment of many new MMFs followed the very high money market rates in 1974 and by the end of 1975 there were roughly 35 MMFs in existence with assets totaling just under $4 billion. The level of MMF assets remained in a range of $3 to $4 billion until late 1977. At that time, interest rates began to rise and aggregate MMF assets increased sharply. When short-term rates continued to rise in 1978, MMF growth accelerated and in the first five months of 1979 outstanding shares grew by more than $2 billion a month. As shown in Chart 1, the rapid growth in MMF shares was accompanied by equally rapid growth in shareholder accounts, to a level of about 1 million in May 1979.[1]

The general operating characteristics of MMFs are fairly standard, although there are some differences. Investors purchase and redeem MMF shares without paying a sales charge. Expenses of the funds are deducted daily from gross income. Minimum initial investments for most funds vary from $500 to $5,000, although a very small number of funds require no minimum and others, designed for institutional investors only, require minimums of $50,000 or more. The yield paid to the shareholder of a MMF depends primarily on the yields of the securities held by the fund but is also dependent on the expenses of the fund and its accounting policies. Most funds have a checking option that enables shareholders to write checks of $500 or more. Shares can also be redeemed at most MMFs by telephone or wire request, in which case payment by the MMF is either mailed to the investor or remitted by wire to the investor's bank account.

The purpose of this article is to examine the reasons underlying the explosive growth of MMFs. There are two explanations for this growth, both stressing a different broad function served by MMFs. The first explanation is that MMFs are primarily a means for providing *access* to money market yields. According to this view, government regulations and minimum purchase requirements in the money market have significantly limited the ability of some investors to realize market yields on short-term investments. MMFs provide such investors an op-

Chart 1

THE GROWTH OF MONEY MARKET FUNDS




Source: Investment Company Institute.

[1] The shareholder accounts data are somewhat difficult to interpret because MMFs differ in how they report accounts of bank trust departments and other institutional investors. In some cases a bank trust department is treated as one account. In other cases each of the accounts of the bank trust department are treated as separate accounts.

portunity to bypass these obstacles and earn a rate of return close to the yield of money market instruments. To the extent that this explanation is valid, one can argue that changes in certain government regulations would largely eliminate the appeal of MMFs.

The second explanation for the growth of MMFs is that they fill a vacuum in the financial system, which previously lacked an intermediary specializing exclusively in short-term assets and liabilities. According to this view, the growth in MMFs represents a permanent change in the way many institutional and individual investors manage their liquid assets. This change has occurred because MMFs offer these investors the advantages that result from the pooling of large amounts of short-term funds.[2] Briefly, the possible advantages are:

*Economies of Scale* By pooling the funds of many investors, the MMF may experience lower administrative and operating costs per dollar of assets than the investors themselves could achieve. Consequently, a MMF may be able to offer some investors a higher rate of return *net* of expenses than is available to them through direct investment in money market instruments.

*Liquidity and Divisibility* Money fund shares can be purchased and sold on any business day without a sales charge. Also, because of the short-term nature of the money market instruments purchased by MMFs, the investor faces a relatively small probability of loss of principal due to interest rate fluctations. Consequently, a purchase of money fund shares represents a highly liquid investment. The checking option offered by most MMFs further enhances the liquidity of this investment. MMFs are able to offer such liquidity because of the relatively large size of their portfolios, which allows them to schedule maturities so that they usually can meet redemption requests without selling securities prior to maturity. In addition, after satisfying the initial minimum investment requirement, additions to and withdrawals from MMFs can generally be made in very small amounts. By contrast, a direct investment in money market instruments lacks this divisibility.

*Diversification* The MMF diversifies its portfolio by purchasing instruments of a wide variety of issuers. This might expose investors in the fund to lower levels of risk than if they invested their funds directly in the money market.

[2] The functions of financial intermediaries are discussed in Van Horne [13].

Of course, these two explanations for the growth of MMFs are not mutually exclusive. In fact, the central conclusion of this article is that the growth of MMFs has been due to both (1) their ability to provide access to the money market to those previously excluded and (2) the advantages they offer some investors as an alternative to direct investment in the money market. This conclusion is based on a discussion, presented in Section I of this paper, of the factors influencing the participation in MMFs by the three major categories of MMF investors, and on estimates, presented in Section III, of the sources of MMF growth. Section II discusses the determinants of the yields paid by MMFs to shareowners.

## I. MONEY MARKET FUND INVESTORS

This section discusses the factors contributing to the attractiveness of MMFs for the three major categories of MMF investors. The sectors are discussed in the order of their importance as MMF investors as of the end of 1978. The two major categories of MMF investors are individuals and bank trust departments. The third most important investor category is corporations, although this sector holds a much smaller proportion of total MMF shares than individuals and bank trust departments. This ordering—(1) individuals, (2) bank trust departments, and (3) corporations—is also the order of the relative importance of access to money market yields as an explanation for the use of MMFs by these investors. That is, this explanation appears to be an important one underlying the use of MMFs by individuals. The access explanation applies to a lesser extent to bank trust departments and appears to be of negligible importance as an explanation for corporate use of MMFs. For these investors, and also for those individuals who do have access to the money market, the other advantages offered by the MMF as a financial intermediary for short-term funds appear to provide the primary explanation for the use of MMFs.

**Individuals** The role of MMFs in providing access to money market yields is the most prevalent explanation for the use of MMFs by individuals. According to this explanation, the small individual investor has been unable to earn market yields because of minimum purchase requirements in the money market and because regulations limit the rate that can be paid on time and savings deposits at depository institutions. MMFs are attractive to small savers because they provide a means to circumvent these obstacles.

Purchases of money market instruments other than Treasury bills usually require investments of at least $25,000 and more often $100,000 or more. Furthermore, since 1969, purchases of Treasury bills have required a minimum investment of $10,000. In June 1978 banks and thrift institutions were authorized to issue 6-month "money market certificates" with maximum issuing rates tied to the average 6-month Treasury bill discount rate established at the weekly Treasury bill auctions. These certificates, however, carry the same minimum investment of $10,000 as Treasury bills. Consequently, the only short-term investment option facing the investor with less than $10,000 has been to deposit his funds in small time and savings deposits at the deposit institutions[3]. The rates paid on these deposits are subject to ceilings established under Regu-Q of the Federal Reserve Act.

In recent years most banks and thrifts have offered the maximum rates allowed by Regulation Q. Consequently, the spread between money market rates and Regulation Q ceiling rates is an indicator of the cost of limited access to the money market encountered by savers with less than $10,000 of short-term funds. Chart 2 shows the differentials between the 3-month Treasury bill rate and the Regulation Q passbook savings ceiling rate at thrift institutions (RTB-RPS) and between the 3-month certificate of deposit rate and the thrift passbook rate (RCD-RPS). The difference between the two lines is the differential between the 3-month CD and Treasury bill rates.

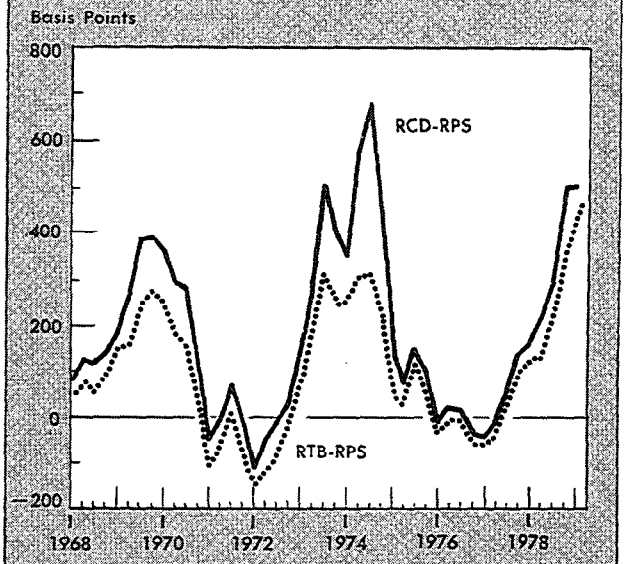
As shown in Chart 2, for much of the past decade money market interest rates have been significantly higher than the savings deposit ceiling rate. The magnitude of the spread between the 3-month Treasury bill rate and the savings deposit rate in such periods as 1973-74 and 1978-79 illustrates the disadvantage suffered in periods of high interest rates by individuals with less than $10,000 to invest. For these individuals MMFs are attractive because they provide the only access to going money market yields.

Even for individuals possessing the $10,000 needed to invest in Treasury bills or money market certificates, there may be circumstances under which limited access to the yields of other types of money market instruments influences their decision to use MMFs. Chart 2 shows that in past periods of high interest rates, Treasury bill rates have often been well below other money market rates. For instance, the spread between the quarterly average 3-month CD and Treasury bill rates reached levels of 350 basis points in mid-1974 and in 1978 was as high as 150 basis points. In periods of rising spreads between the rates of other money market instruments such as CDs and commercial paper and the rate on Treasury bills, the yields paid by many money market funds will rise relative to the yield on bills. In these circumstances individuals holding bills or money market certificates may use MMFs to gain access to yields on money market instruments other than bills.[4]

While the role of MMFs in providing small savers access to money market yields has undoubtedly been

Chart 2

**THE TWO COSTS OF LIMITED ACCESS**




Notes: (1) RTB-RPS is the spread between the three-month Treasury bill rate (RTB) and the Regulation Q ceiling rate on passbook savings at savings and loan associations (RPS). RCD-RPS is the spread between the three-month CD rate (RCD) and the passbook savings rate. (2) All rates are annualized percentage rates. The passbook savings rate assumes a three-month period of deposit with daily compounding.

Source: Board of Governors of the Federal Reserve System.

[3] Actually, there are two minor exceptions to this statement. First, as of July 1979, small savers have been allowed to pool their funds to meet the $10,000 minimum necessary to purchase money market certificates. Second, long-term U. S. government securities are issued in denominations of less than $10,000. As these securities approach maturity they effectively become short-term investments. Transactions costs, however, substantially reduce the yield of such an investment to the small investor.

[4] This assumes that the rise in the spread between CD and Treasury bill yields was not solely due to an increase in default risk. This argument is made by Cook [6].

an important factor contributing to the use of MMFs by individuals, evidence on average size of individual MMF accounts, presented later in the paper, indicates that many individuals who have sufficient funds to invest directly in money market instruments, or at least in Treasury bills, are also using MMFs. For these individuals the benefits of financial intermediation, not access, provide the key attraction of MMFs. This is an important distinction because it implies that even in the absence of Regulation Q ceilings at the deposit institutions, individual use of MMFs would continue.

Two uses of MMFs by individuals deserve special attention because they represent innovations in the management of liquid assets. The first innovation is the large-scale use of MMFs by stockbrokers for the purposes of investing their clients' balances. Many large brokerage firms have established their own MMFs. Most of these are open to the general public but are used mainly by the brokers of the firm as a liquid parking place for investors' funds that become available after a sale of stock shares, bonds, etc. Many brokers unaffiliated with a MMF use MMFs for the same purpose. Previously after a sale of securities, an investor's funds would either have remained uninvested, been placed in a savings account or a relatively low-yielding account offered by the broker, or been invested directly in a money market instrument if the amount of funds made this possible. The increased liquidity and divisibility MMFs provide relative to direct money market investment are probably especially important to this type of investor. Consequently, as a competitive measure, many brokers are using MMFs to ensure that their investors remain fully invested at market rates.

The second innovation is the use of exchange privileges between MMFs and other funds in a mutual fund group. These arrangements allow MMF investors to exchange their MMF shares for shares in any of the other mutual funds in the group, at that fund's share price, plus a sales charge if it is a load fund. Also, shareholders in any of the other funds can exchange their shares for the MMF shares. The exchange privilege offers individual investors the benefit of added flexibility in their investment decisions, allowing them to move in or out of differing types of mutual funds with little or no transactions costs. Just under half of the mutual fund groups whose share prices are listed in the *Wall Street Journal* have established MMFs.

**Bank Trust Departments** The second important user of money market funds is bank trust departments. Trust departments serve as fiduciaries for numerous types of accounts which can broadly be divided into two groups: (1) personal trusts and estates and (2) employee benefit accounts. If funds from these accounts were invested separately, many of the potential advantages of intermediation, such as diversification and reduced administrative costs, would be lacking. Furthermore, individual accounts of the bank trust department can have the same kind of limited access problem faced by individual investors. Some of these accounts have less than $10,000 in short-term assets. Consequently, the only available short-term investment is time and savings deposits which, as shown above, has frequently paid rates well below money market rates.

In order to gain the advantages of intermediation, trust departments can establish "collective investment funds" under Regulation 9 of the Comptroller of the Currency. Collective investment funds for accounts of personal trusts and estates are called "common trust funds." Collective investment funds pool monies from different accounts of the trust department and invest them collectively. Two types of collective investment funds have developed for the investment of short-term funds. The first type to evolve was the "variable amount note" (also called a "master note"), which is a revolving loan agreement, generally without a specified maturity, negotiated with a business borrower.[5] Monies from various accounts in the trust department can be put into the variable amount note and withdrawn from it without fees as the need arises. The rate paid by the borrower of the variable amount note is most commonly the "180 day commercial paper rate placed directly by major finance companies" posted in the *Wall Street Journal*.[6]

While the variable amount note is widely used by bank trust departments, it has some limitations. First, the participating accounts gain little in the way of diversification. Second, the agreement with the borrower typically specifies maximum and minimum limits between which the size of the variable amount note must vary. These limitations reduce the liquidity of a variable amount note investment and may necessitate agreements with several borrowers, each of which requires a separate plan, thereby increasing administrative expenses.

As a result of the weaknesses of the variable amount note, a second type of collective investment funds for short-term investments, called a "short-

[5] The variable amount note is a type of collective investment fund established under Regulation 9.18(c)(2)(ii) of the Comptroller of the Currency.

[6] See [1], p. 25.

term investment fund (STIF)," has grown in usage by bank trust departments. STIFs are essentially MMFs operated by the bank trust departments for their own accounts. The STIF pools funds from individual accounts of the trust department and invests those funds in a variety of short-term money market instruments.

Almost all STIFs fall into two broad categories. The first group is for accounts of personal trusts and estates. These STIFs, operated under Regulation 9.18(a)(1) of the Comptroller of the Currency, receive tax-exempt status under the condition that income earned by the fund is distributed to participating accounts. These STIFs are also limited by the requirement that no participant can have an interest exceeding 10 percent of the value of the fund. The second type of STIF, operated under Regulation 9.18(a)(2) of the Comptroller of the Currency, is for the accounts of pension, profit sharing, stock bonus, thrift, and self-employed retirement plans that are exempt from taxation under the Internal Revenue Code. Because the contributing accounts are themselves tax-exempt, the second type of STIF does not have to distribute income to the participating accounts in order to acquire tax-exempt status. In addition, this type of STIF is not subject to the requirement that no participant's interest exceeds 10 percent. Under IRS regulations, monies of personal trust and estate accounts and "tax-exempt" accounts cannot be mixed. Hence, if a bank trust department wishes to provide STIF services to both types of accounts, it must establish both a 9.18(a)(1) STIF and a 9.18(a)(2) STIF.

Unlike all other types of collective investment funds, which have to value their assets on a current market basis, STIFs are permitted to value their assets on a cost basis and use the "straight-line accrual" method for calculating income of the trust. Under this method the difference between cost and anticipated redemption value at maturity is accrued in a straight-line basis. This accounting procedure is generally preferred by trust departments because it smooths out the flow of income to participating accounts. (An expanded discussion of straight-line accrual versus market valuation accounting methods is given in the Box.) In granting this exemption to STIFs, the Comptroller of the Currency has imposed fairly strict restrictions on the portfolios of STIFs. They are:

1. 80 percent of investments must be payable on demand or have a maturity not exceeding 91 days,
2. assets of the fund must be held to maturity under usual circumstances,
3. not less than 40 percent of the value of assets of the fund must be composed of cash, demand obligations, and assets that mature on the fund's next business day.[7]

If bank trust departments have the option of operating a STIF, why do so many use money market funds? There are two possible answers to this question. The first is that restrictive regulations on STIFs induce bank trust departments to use MMFs, at least for some of their accounts. STIFs are affected by both Comptroller of the Currency regulations and various state regulations. As explained above, the Comptroller of the Currency's regulations impose fairly stringent conditions on the portfolios of STIFs. In addition, regulations require that separate funds be established for accounts of personal trusts and estates and for employee benefit plans. Furthermore, under Comptroller of the Currency regulations, agency accounts of personal trusts and estates are not permitted to invest in common trust funds. Agency accounts are those for which the owner retains title to the property and only delegates to the bank trust department certain responsibilities.

The state regulation most seriously affecting the establishment of STIFs was a New York law that imposed heavy reporting requirements on STIFs for personal trust and estate accounts.[8] As a result of these requirements, almost no 9.18(a)(1) STIFs have been established in New York. Since at the end of 1977 New York bank trust departments had 29.3 percent of all trust department assets, this regulation probably directed a significant amount of money to MMFs that otherwise might have gone into STIFs. The heavy reporting requirements on STIFs were eliminated by a revision in the New York law passed in mid-1979.

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[7] The aggregate portfolio of STIFs appears to reflect the Comptroller of the Currency's regulations. In a survey of collective investment funds at the end of 1978 conducted by the Comptroller of the Currency, 24 percent of total STIF assets was variable amount notes ("master notes"), 56.9 percent was commercial paper, 4.3 percent was U. S. Treasury and agency securities, and .8 percent was cash. The remaining 14 percent was mostly time and savings deposits, although a small part was bankers' acceptances and repurchase agreements. (Because of the way the data were collected, it was not possible to separate CDs from other time and savings deposits.)

[8] The New York law required a periodic accounting from common trust funds for personal trust and estate accounts before the surrogate court. This accounting required a record of all transactions of the fund. Because of the volume of transactions of a STIF, this required accounting discouraged N. Y. banks from establishing 9.18(a)(1) STIFs.

**Box**

## MMF ASSET VALUATION AND YIELD DETERMINATION

There are two commonly used methods of valuing a MMF's portfolio of assets and of calculating yields: the mark-to-market and the amortized cost or straight-line accrual methods. The issue of the most appropriate method has been hotly debated. The following paragraphs describe the various accounting techniques and then explain the arguments in the controversy over which method is more appropriate for MMFs.

The most important distinction between the accounting policies of MMFs is in the method used to determine the asset value of the investment portfolio. Marking-to-market, as its name implies, involves appraising portfolio assets at their estimated market value. In the case of securities for which active secondary markets exist, this means valuing the security at its most recent bid price, or alternatively, at the mean of the most recent bid and asked prices. Securities which are not actively traded, such as commercial paper, are generally valued by comparison with marketable securities of similar type, yield, quality, and time to maturity.

In contrast to mark-to-market, amortized cost valuation does not allow changes in market interest rates to affect the value of the MMF's portfolio. The amortized cost method establishes the cost of a security on the date of purchase (or sometimes the market value on a date after purchase) as its "fair value." The difference between the security's cost and its redemption value at maturity is accrued daily on a straight-line basis as an increase in the value of the asset.

Under both mark-to-market and amortized cost methods of valuation, "net asset value" of a fund is the calculated asset value of the portfolio minus the "income" earned that day. The fund's net income, income minus expenses, is credited to shareholders' accounts daily and usually paid monthly. The MMF's share price is the net asset value divided by the number of shares outstanding.

The amortized cost valuation method leads to a constant share price because each security's value is "locked in" on the purchase date and the straight-line increase in its value (the income earned on the security) is credited as dividends, after expenses are deducted, to shareholders daily. The net asset value per share could change only if the MMF found it necessary to sell a security at a price different from its asset value determined by amortized cost or if the issuer of one of the securities in the portfolio defaulted.

Among MMFs that value by marking-to-market there is considerable variation in the method of determining share price. There are three methods:

(1) Many MMFs maintain a constant share price, usually $1.00, allowing the number of shares owned by each shareholder to vary. Interest income and capital appreciation (realized or unrealized) net of expenses accrue daily to the shareholder in the form of additional shares. If the MMF's expenses and capital depreciation are greater than its interest income that day, each investor's shares will be correspondingly reduced.

(2) Another group of MMFs ordinarily maintains a constant share price, but reflects increases in portfolio value by increasing dividends. Similarly, a depreciating portfolio is reflected in reduced dividends. In the event that unrealized and realized capital losses plus expenses are greater than daily interest income, the MMF will first respond by reducing dividends already credited to shareholders during the month, and if this is not sufficient, the MMF will lower its share price.

(3) Unlike the other two groups of MMFs that mark-to-market, a third group does not include unrealized capital gains or losses in the calculation of income but allows the net asset value and the share price to fluctuate with market interest rates. If rates rise (fall), the share price will fall (rise). The extent of the change in share price will depend on the maturity schedule of the portfolio and the magnitude of the change in market rates. In this case, the shareholder has two variables to monitor to determine his effective yield: dividends and share price.

The distinctive feature of amortized cost valuation is that it isolates the share pricing and daily yield determination from the fluctuations of the market. The greater stability, both in principal and in daily yield, that this method leads to, relative to the mark-to-market method, is very appealing to certain institutional investors, especially bank trust departments, who have difficulty justifying to their clients yields that vary widely from day to day. For these reasons, most trust departments consider amortized cost to be the preferable valuation method, and some even consider MMFs using mark-to-market valuation to be an unacceptable form of investment.

Despite the preference of bank trust departments for amortized cost valuation, the Securities and Exchange Commission has stated in an interpretative release that MMFs may use amortized cost valuation only for securities of 60 days or less to maturity and that mark-to-market valuation must be used for securities of longer maturity.[1] The Commission has argued that amortized cost is an inappropriate method of determining the asset value of securities of more than 60 days to maturity because it does not take into account changes in market value and, therefore, the interest of existing shareholders could be diluted under certain circumstances. Such a situation could occur if market interest rates rise (fall) and there are substantial net redemptions (sales) of the MMF's shares.

For instance, if interest rates rise, the market value of the MMF's assets will fall below the value "locked in" by amortized cost valuation. (The extent of the fall is directly related to the length of maturity of the fund's portfolio.) Hence, the MMF's assets are "overvalued" in the sense that the fund is carrying them at a value above their market value. If share redemptions subsequently exceed sales and if the fund

[1] SEC Release, No. IC-9786, May 31, 1977.

is forced to sell securities prior to maturity to meet redemption requests, these securities are sold at prices below that at which they are valued by the fund. Shareowners redeeming their shares are paid the constant share price, but remaining shareholders are stuck with a portfolio of lower asset value per share. This must be reflected in lower dividends or a reduced share price for remaining shareholders.

In the case of falling interest rates, the appreciation of portfolio assets accrues immediately to existing shareholders under mark-to-market valuation. But under amortized cost, this benefit accrues in the form of higher (relative to the market) daily income. If share sales exceed redemptions, however, this benefit must be spread across more shares. As a result, the return to existing shareholders is diluted.

Although some MMFs, many of them dealing exclusively with institutions, have sought permission to use amortized cost, the SEC has continued its efforts to restrict the use of amortized cost. The Commission did grant temporary exemptions under certain conditions in November 1977 to 10 MMFs and shortly afterwards to 4 others, until full judicial disposal of the matter. However, prior to the beginning in November 1978 of the hearing that was to resolve the issue, the majority of the funds involved arrived at a compromise.[2] They agreed to use mark-to-market valuation for assets of more than 60 days to maturity and to maintain a dollar-weighted average maturity of 120 days or less (to minimize fluctuations in asset value). In return they were permitted by the SEC to price their shares to the nearest one penny on a $1.00 share price ("penny rounding") instead of the one-tenth of a penny accuracy the SEC had previously required.

"Penny-rounding" was considered an adequate alternative to amortized cost by the MMFs who joined this agreement, because it was thought to enable the funds to maintain a constant share price and thus provide a very stable investment for institutions. The MMF's share price would not diverge from $1.00 unless the fund's net asset value per share went to $0.9949 or $1.0050, an event thought unlikely given the agreed restriction on the maturity of the portfolio.

Some bank trust departments found even this valuation method unacceptable. One MMF that had used amortized cost but agreed to the penny-rounding compromise lost one bank trust department's investment of $44 million. The MMFs involved in the legal dispute that did not agree to the penny-rounding compromise have continued the litigation over the use of amortized cost. At the time of writing, offers of settlement which, if accepted, would allow the use of amortized cost under certain restrictions have been filed by the MMFs participating. The SEC's Division of Investment Management has recommended these offers of settlement be approved. The decision of the Commission is pending.

[2] SEC Release, No. IC-10451, October 26, 1978.

While the regulations cited above may have had some impact on the decision of bank trust departments to use STIFs, the advantage of size in the operation of short-term financial intermediaries, such as STIFs and MMFs, has probably been a more important determinant. According to this line of reasoning, small- and medium-sized bank trust departments use MMFs rather than establishing STIFs because the greater size of MMFs enables them to better provide the benefits of intermediation discussed earlier. A potentially key benefit is economies of scale resulting in lower average costs for large MMFs (and large STIFs) than for relatively small STIFs. In the presence of these economies of scale, small- and medium-sized trust departments could earn a higher yield *net* of expenses for their accounts by placing their short-term funds in MMFs than by establishing STIFs.

If this second explanation for the use of MMFs by bank trust departments is accurate, there should be a positive relationship between the size of bank trust departments and their use of STIFs. That is, larger bank trust departments should be more likely to establish STIFs than smaller bank trust departments. A survey of collective investment funds at the end of 1978 provides convincing evidence of this relationship. This survey, done by the Comptroller of the Currency, covered almost 1000 bank trust departments and included almost all of those that operate collective investment funds. Ninety-six banks in the survey had STIFs.[9] Of these, 68 were national banks. By comparing the bank trust departments in this group with the total universe of national bank trust departments, it is possible to get a distribution of STIFs according to size of bank trust department. This distribution is shown in Table I. The table shows negligible use of STIFs by bank trust departments with less than $100 million in assets and only slight use by trust departments with $100 million to $500 million in assets. In contrast, 38.5 percent of the trust departments with assets of $500 million to $1 billion had STIFs and 64.6 percent of the departments with assets of greater than $1 billion had STIFs.[10] Finally, it

[9] These 96 banks operated a total of 147 STIFs. Total assets of these STIFs were $15.2 billion. Seventy-six of the STIFs, with $4.4 billion of assets, were 9.18(a)(1) funds, while 69 of the STIFs, with $10.4 billion of assets, were 9.18(a)(2) funds. The other two funds were covered by Section 9.18(c)(5) of Regulation 9.

[10] All of the percentages in Table I may be understated somewhat because the data on STIFs were collected from the common trust fund survey before the survey was checked for delinquencies. This would not, however, have a significant effect on the relative magnitude of the percentages shown in Table I.

Table I

**THE DISTRIBUTION OF STIFs BY SIZE OF BANK TRUST DEPARTMENT**

(National Banks Only)

| Size of Bank Trust Department | No. of Trust Departments | No. of Trust Departments with STIFs | Percent |
|---|---|---|---|
| Less than $10 million | 960 | 0 | 0.0 |
| $10 to $25 million | 248 | 1 | 0.4 |
| $25 to $100 million | 295 | 2 | 0.7 |
| $100 to $500 million | 191 | 19 | 9.9 |
| $500 million to $1 billion | 39 | 15 | 38.5 |
| More than $1 billion | 48 | 31 | 64.6 |

Note: Bank trust departments reporting zero assets were excluded from the sample. The bank trust department distribution is as of December 31, 1977; the STIF survey data were collected for fiscal year end dates ranging over 1978.

Sources: "Common Trust Fund Survey—1978," Comptroller of the Currency; "Trust Assets and Number of Accounts of National Banks With Trust Departments as of December 31, 1977," Comptroller of the Currency.

should be noted that many bank trust departments that have STIFs nevertheless use MMFs to some extent, especially for those agency accounts that are not permitted to be invested in common trust funds. STIFs, themselves, may also invest in MMFs as a means of satisfying the 40 percent liquidity requirement.

These survey results make it clear that size is the primary factor underlying a bank trust department's decision on whether or not to operate a STIF.[11] The third article in this *Review* provides empirical support for the contention that there are economies of scale in the operation of financial intermediaries for short-term funds. These economies of scale provide an explanation for the decision of small- and medium-sized trust departments to use MMFs rather than operate their own STIFs.

**Corporations** A third category of MMF investors is nonfinancial corporations. While this sector has a very large amount of funds held in short-term financial assets, its use of MMFs to date has been limited relative to individuals and bank trust departments. In discussing the attractiveness of MMFs as an investment alternative for nonfinancial corporations, it is useful to consider two components of corporate liquid financial holdings: (1) assets held for transactions purposes and (2) assets held for a slightly longer period and usually invested in the money market.

*MMFs and Transactions Balances* As noted, most MMFs offer checking for amounts of $500 or more. The payment of explicit interest on demand deposits at banks is prohibited by the Banking Act of 1933. Since corporations hold a large amount of demand deposits, the opportunity to write large checks on MMF shares would appear to have created a potential role for MMFs in corporate cash management. The comparison of money market fund shares to demand deposits, however, is complicated by the fact that banks do pay an implicit rate of return on demand deposits. This return is paid in the form of lines of credit, use of credit, cash management services and other banking services. Clearly, MMF shares cannot be considered a substitute for demand deposits held to compensate a bank for services it alone provides. To the extent that the checking privilege of most MMFs can be substituted for this service provided by banks, however, MMFs may enable corporations to reduce the amount of compensating balances held.[12]

The regulatory prohibition of payment of interest on demand deposits has encouraged substantial corporate involvement in the repurchase agreement (RP) market. Corporate demand deposits in excess of compensating balances are often invested overnight in RPs arranged through the bank. A comparison of rates offered on RPs by government securities dealers and average MMF yields for 1978 and the first four months of 1979 shows very little difference.[13] As bank fees for investing in overnight RPs are likely to be higher than the cost of investing in MMF shares, which consists only of wire charges, MMFs appear to have offered corporations a competitive alternative to RPs in this period. Also, MMFs appear to provide an overnight investment opportunity for those corporations without sufficient funds to meet the substantial minimum purchase requirements on RPs.

Despite the fact that MMFs appear to represent a partial substitute for conventional means of holding

[11] Bent [2] asked marketers of STIF computer packages at an ABA Midcontinent Trust Convention at what level a STIF made economic sense. The reply was that "a department with $500 million in assets would realize an advantage." That reply is consistent with these survey results.

[12] Also, there are some banking services that may be paid for in fees, rather than by holding compensating balances. To the extent that paying fees allows the corporation to economize on its demand deposit holdings, funds are freed for investment elsewhere. If the corporation wishes to keep these funds liquid, MMFs might be an attractive option.

[13] MMF yields used in this comparison are from **Donoghue's Money Fund Report** of Holliston, Mass. RP yields are averages of yields offered by government securities dealers.

transactions balances, evidence on MMF share turnover rates strongly suggests that neither corporations nor other MMF investors have used MMFs extensively for transactions purposes. Turnover rates of demand deposits, savings deposits, and MMF shares are presented in Table II. These rates are measured as total debits or redemptions in a given month times 12 (to annualize) divided by the average level of deposits or shares outstanding. The data shown are for every third month beginning in July 1977, the first month the savings deposit turnover rates are available. Over the period shown in the table, the turnover rate of MMF shares varied from 3 to 4. In sharp contrast, the turnover rate of demand deposits was in a range of 128 to 157 per year. The turnover rate for MMF shares is about halfway between the turnover rates for business savings deposits and individual savings deposits. After adjusting for the greater percentage of business and other institutional money in MMFs, as opposed to savings deposits, the aggregate turnover rate for MMFs is remarkably similar to the aggregate turnover rate for savings deposits.

The aggregate MMF share turnover rates are so low, relative to demand deposit turnover rates, that they strongly indicate that corporations have not used MMFs for transactions purposes to any significant degree. It might be argued that since corporations hold a relatively small proportion of MMF shares, the aggregate data are masking heavy share turnover among some funds that deal more heavily with corporations. Examination of *individual* MMF turnover rates, however, provide little support for this conjecture. Turnover rate data for 40 individual MMFs over an annual period are listed in the accompanying article [7]. This group of 40 funds encompasses all types of funds, including those that deal only with institutions and some that deal heavily with corporations. Yet only 2 of the 40 funds had share turnover rates greater than 8 in the period covered. One small fund had a turnover rate of 28, suggesting that its shares were being used for transactions purposes. In fact, this fund's turnover rate subsequently reached a level of over 100, but then dropped sharply to 2.

Two reasons can be advanced for the limited corporate use of MMFs for transactions purposes. First, certain features of MMF share purchase and redemption systems lessen the attractiveness of MMFs as a substitute for repurchase agreements. Secondly, MMFs may be unwilling to allow shares to turnover very rapidly.

The share purchase and redemption systems of almost two-thirds of MMFs surveyed prevent these MMFs from being used by corporations as a substitute for overnight RPs because a corporation can not invest in one of these MMFs one day, and receive payment with one day's dividends the following day. An investment in one of these MMFs entails the loss of one day's dividends (unless shares are redeemed by check), which results in a significant reduction in the rate of return of an investment placed for just a couple of days. Thus, these MMFs are not a substitute for overnight RPs, nor do they provide a competitive yield on an investment for just a few days.[14]

[14] A survey of MMF prospectuses revealed that 39 of 61 MMFs in the survey effect share purchase and redemption orders once each business day at the close of the New York Stock Exchange. Dividends are declared each business day before share orders are processed. Therefore, at one of these MMFs, a purchase order effective on Monday is not credited with dividends until Tuesday. A redemption request on Tuesday would result in the shares being redeemed at the close of the NYSE that day. Remittance would not be sent until Wednesday at the earliest, with only one day's dividends. Check-writing redemption avoids the loss of a day's dividends because shares earn dividends up to and including the day the check is presented to the MMF's bank.

Table II

**TURNOVER RATES AT COMMERCIAL BANKS AND MONEY MARKET FUNDS**

| | July '77 | Oct. '77 | Jan. '78 | April '78 | July '78 | Oct. '78 | Jan. '79 | April '79 |
|---|---|---|---|---|---|---|---|---|
| Demand Deposits | 128.1 | 134.6 | 131.5 | 138.0 | 139.4 | 144.1 | 151.2 | 156.8 |
| Savings Deposits | | | | | | | | |
| All Customers | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 | 2.1 | 2.7 | 3.2 |
| Business Customers | 4.0 | 4.5 | 4.7 | 4.7 | 5.1 | 5.8 | 6.8 | 7.0 |
| Others | 1.5 | 1.5 | 1.7 | 1.8 | 1.8 | 1.9 | 2.5 | 3.0 |
| Money Market Fund Shares | 3.1 | 3.3 | 3.6 | 3.7 | 3.5 | 3.7 | 3.8 | 3.1 |

Note: Turnover rate for demand deposits are seasonally adjusted. Turnover rates for savings deposits and MMF shares are not seasonally adjusted.

Sources: Federal Reserve Bulletin; Donoghue's Money Fund Report of Holliston, Mass.

The share purchase and redemption policies of the remainder of the MMFs surveyed potentially allow the investor to avoid uninvested days. Thus, a corporation investing in one of these MMFs on Monday could earn one day's dividends and expect remittance on Tuesday.[15] However, MMF prospectuses rarely provide guarantees as to what day, let alone what time, remittance will be sent. A MMF's delay in remitting payment may mean lost investment opportunities and a lower effective yield for the corporation. Thus, the attractiveness of a very short-term MMF investment to a corporation may be diminished by the uncertainty as to when remittance can be expected, an uncertainty largely absent in repurchase agreements. Nevertheless, if one of the MMFs in this second group provides assurances of prompt remittance for redeemed shares, a MMF could offer corporations a competitive alternative to RPs depending on the relative net yields of the two forms of investment.

The second, and probably more important, reason for the limited use of MMF shares for transactions purposes is a degree of unwillingness on the part of MMFs to serve their shareholders' transactions needs. Rapid turnover of shares involves significant costs arising from bank charges for processing checks and the MMF's expenses when shares are redeemed. MMFs have not developed pricing systems that allocate these costs to individual shareholders who turnover shares rapidly. In the absence of such systems, MMFs sometimes find it necessary to simply restrict the turnover activity of some investors. A dramatic example is provided by the MMF, cited earlier, whose turnover rate reached a level of over 100 because one corporation was using this MMF extensively for transactions purposes. Subsequently, the corporation was asked to refrain from doing so and within a month the fund's turnover rate plummeted to 2.

This discussion is not meant to imply that under no circumstances would a MMF tolerate rapid turnover of its shares by an investor. The costs associated with a redemption of shares are relatively fixed, while the fees earned by the MMF's manager and advisor on an investor's funds are positively related to the size of the shareholder's investment. Hence, the willingness of a MMF to tolerate turnover by a given customer should increase with the average size of the customer's investment. For any share turnover rate there should be an average share level at which the MMF will permit that rate of turnover. If the investor is not maintaining that level then, under current institutional arrangements, the only options available to the MMF are to ask the investor to decrease the turnover rate of his shares or to refuse to accept new share purchase orders from the investor.[16]

*MMFs Versus Direct Money Market Investment*

Nonfinancial corporations also have a very large volume of direct investments in money market instruments such as CDs and commercial paper. The decision of a corporation to use an in-house program of direct investment in the money market or to use MMFs is solely dependent on which investment mechanism offers the highest net yield consistent with the desired degree of liquidity and diversification. Corporations do not appear to be significantly affected in this decision by government regulations. It should be noted, however, that small-sized corporations with savings deposits at the depository institutions are, like individuals, affected by Regulation Q ceilings. (There was $10.3 billion of corporate savings deposits outstanding in June 1979.)

Conversations with MMF officials reveal that those corporations that are using MMFs are at the smaller end of the size spectrum, which seems reasonable since corporations with smaller amounts of short-term funds available for investment are more likely to benefit from the advantages a MMF offers as a financial intermediary. The ability to offer these

[15] Shares can be purchased and redeemed in most of these MMFs on business days at noon and at 4 p.m. Eastern time. Dividends are credited just prior to the processing of share orders at either noon or 4, depending on the MMF, to shareholders of record. In the case that the MMF declares dividends at noon, for example, a purchase order effected at either noon or 4 p.m. Monday would first receive dividends at noon Tuesday. If the investor's redemption request was received before noon on Tuesday, shares would be redeemed at noon and payment with a day's dividends could be expected that afternoon.

[16] The rapid growth of MMFs in 1978 resulted in much speculation on the impact of MMFs on the growth rates of the monetary aggregates. Most of this speculation centered on whether or not MMFs were a factor contributing to the slowdown in the growth rate of $M_1$ in the fall of 1978. The main argument for the presence of an effect of MMFs on $M_1$ is that the liquidity of an investment in MMFs—especially the check-writing feature—makes them a virtually perfect, interest-earning substitute to $M_1$ for transactions purposes. This argument fails to take into account the almost universal minimum $500 requirement on checks. Nor does it consider the two factors limiting the use of MMFs for transactions purposes discussed in this section. In any case the MMF share turnover rate data provide virtually no support for the position that MMFs have served as a close substitute for demand deposits.

advantages is a corollary of the MMF's portfolio size. The greater size of the MMF's portfolio may enable the small corporation to gain greater liquidity and diversification than it could get by running an in-house money market investment program. Also, if there are economies of scale in the operation of corporate money market investment programs, as there appear to be in the operation of MMFs [7], the small corporation may gain a higher net yield by investing through a MMF than through an in-house program.

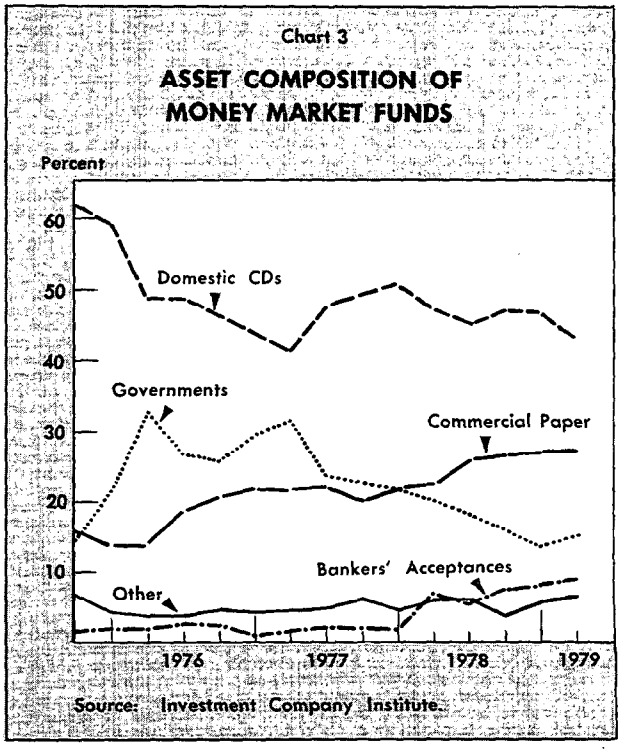
## II. MONEY MARKET FUND YIELDS

The assumption that MMFs offer rates of return comparable to money market rates underpin the two broad explanations advanced above for the rapid growth of MMF assets. The first emphasized the ability of MMFs to provide money market rates to those previously denied access. The second explanation emphasized the advantages offered to some investors by MMFs which act as an intermediary for short-term funds. One such advantage is that, due especially to economies of scale, some investors can gain a higher net rate of return by investing in a MMF than by investing directly in the money market. As both explanations depend heavily on the assumption that rates of return on MMF investments and on other money market instruments are comparable, this section will examine the relationship between MMF and money market yields. The following section analyzes the growth of MMF assets in the context of a MMF yield series developed below.

A crucial distinction must be made in comparing MMF rates with money market rates. When purchasing a money market security, the investor is quoted a rate of return that he will receive if he holds that security to maturity, assuming the issuer does not default. A purchaser of MMF shares, on the other hand, receives no quotation as to what return he will gain if he holds his shares for a certain period. Rather, a yield quoted to the investor on the date of purchase indicates the annualized net yield received on an investment in the MMF over the *past* day, week, month, or year. The actual yield received by the MMF investor is determined after he purchases his shares, and is influenced by many factors. These factors are (1) the general level of money market yields, (2) the composition of assets of the MMF, (3) the expenses of the fund absorbed by its shareowners, (4) the movement in interest rates over the period shares are held and (5) the accounting procedure used by the fund to calculate share prices and daily dividends.

The MMF investor's yield is fundamentally dependent on the interest accrued daily on the MMF's ever-changing portfolio of securities. The amount of interest accrued depends on the general level of money market yields and on the type and maturity of securities held at a given time. MMFs vary considerably in both the type and average maturity of securities held. A large percentage of most MMFs' holdings are in domestic and Eurodollar CDs, commercial paper and Treasury bills, but various other high grade money market instruments are also commonly purchased. A small number of MMFs have restricted their portfolio investments to purchases of government securities, apparently to attract more risk-averse investors. Chart 3 shows the asset composition of all MMFs from the third quarter of 1975 to the first quarter of 1979. The aggregate asset composition of MMFs appears to be quite responsive to changes in yield differentials. For instance, the large spread between Treasury bill rates and other money market rates in the latter half of 1978 resulted in a significant movement out of government securities.

Another important determinant of the yield received by an investor in a MMF is the expenses deducted from the income of the fund before dividends are declared each day. The percent of net expenses (total expenses minus expenses absorbed



by the fund's administrator) to average assets on an annual basis varies in a range from 0.4 to 1.4, although most funds have net expense ratios of 1.0 percent or less. MMF expenses are discussed in more detail in the third article in this *Review*.

The extent of movement in market interest rates over the period shares are held also affects the investor's yield. These movements affect the rate earned on new assets of the MMF and also result in capital gains or losses on the assets already held by the MMF. The magnitude of the gains or losses is inversely related to the average maturity of the MMF's assets. The shorter the average maturity, the less the change in market value of the MMF's portfolio resulting from a given change in market rates.

The influence of capital gains and losses on the MMF's yield depends on the accounting procedures used by the fund. Some funds, using "mark-to-market" accounting procedures pass on these gains or losses (whether realized or not) on a daily basis. Others, using "amortized cost" accounting methods, do not allow unrealized capital gains or losses to affect yield. The yield of an investor in a MMF that uses amortized cost valuation may be affected by net redemptions (sales) of the MMF's shares in periods of rising (falling) market rates. The accounting methods used by MMFs have been the center of substantial controversy, not yet fully resolved. The Box describes in greater detail the various accounting methods used by MMFs and outlines the nature of the controversy.

As noted above, all quoted MMF yields are *ex post* yields, based on the behavior of a MMF over a certain period of time in the past. By contrast, the quoted rate on a money market instrument represents the promised yield on a security held to maturity. In order to compare MMF yields with money market yields it is useful to construct an *ex ante* yield series for MMFs that would be similar in concept to yield-to-maturity series for money market instruments. Table III presents such an *ex ante* average yield series for the five largest MMFs by asset size. The series was constructed using money market rates and MMF asset composition and average maturity data. Specifically, each MMF's *ex ante* yield for each month was determined by calculating the yield-to-maturity on a portfolio with the same asset composition as the MMF, under the assumption that each security in the portfolio matured in the number of days equal to the average maturity of the MMF's assets. The *ex ante* yield series was then calculated using an asset-weighted average of the five MMFs' *ex ante* yield series. Finally, 60 basis points were subtracted from each month's annualized yield to form a yield series net of expenses. This 60 basis points figure is roughly equal to the average annual expense ratio over the 1975-78 period of the five MMFs that were most consistently among the largest five MMFs.

Table III

**AVERAGE EX ANTE YIELD SERIES FOR FIVE LARGEST MMFs**

| Date | Yield | Average Maturity (Days) | Date | Yield | Average Maturity (Days) |
|---|---|---|---|---|---|
| Oct. 1975 | 5.90 | 78 | Aug. 1977 | 5.39 | 90 |
| Nov. 1975 | 5.36 | 86 | Sept. 1977 | 5.65 | 83 |
| Dec. 1975 | 5.41 | 79 | Oct. 1977 | 6.00 | 75 |
| Jan. 1976 | 4.68 | 119 | Nov. 1977 | 6.01 | 88 |
| Feb. 1976 | 4.75 | 125 | Dec. 1977 | 6.02 | 87 |
| Mar. 1976 | 4.80 | 113 | Jan. 1978 | 6.34 | 82 |
| Apr. 1976 | 4.49 | 104 | Feb. 1978 | 6.27 | 87 |
| May 1976 | 4.95 | 95 | Mar. 1978 | 6.21 | 91 |
| June 1976 | 5.27 | 94 | Apr. 1978 | 6.40 | 80 |
| July 1976 | 4.98 | 104 | May 1978 | 6.73 | 76 |
| Aug. 1976 | 4.87 | 111 | June 1978 | 7.31 | 69 |
| Sept. 1976 | 4.82 | 115 | July 1978 | 7.44 | 65 |
| Oct. 1976 | 4.46 | 111 | Aug. 1978 | 7.51 | 75 |
| Nov. 1976 | 4.38 | 107 | Sept. 1978 | 8.14 | 68 |
| Dec. 1976 | 4.10 | 122 | Oct. 1978 | 8.66 | 60 |
| Jan. 1977 | 4.31 | 105 | Nov. 1978 | 9.55 | 52 |
| Feb. 1977 | 4.25 | 108 | Dec. 1978 | 9.96 | 50 |
| Mar. 1977 | 4.28 | 98 | Jan. 1979 | 9.56 | 50 |
| Apr. 1977 | 4.28 | 105 | Feb. 1979 | 9.54 | 54 |
| May 1977 | 4.99 | 97 | Mar. 1979 | 9.45 | 50 |
| June 1977 | 4.87 | 102 | Apr. 1979 | 9.28 | 48 |
| July 1977 | 4.93 | 96 | | | |

Note: The average ex ante yield series for the five largest MMFs was constructed in the following way: (1) Asset composition and average maturity data for the five largest MMFs (by asset size) in each month were collected from **Donoghue's Money Fund Report** of Holliston, Mass. (2) Each MMF's entire portfolio was assumed to mature in the number of days given by the MMF's average maturity. Yields for each type of security held were determined from 1-month, 3-month, and 6-month yield series by extrapolation and interpolation assuming a linear term structure. For securities for which yield data were not available, such as RPs and securities in the "other" category, the yield was assumed to be the simple average of the yields on other securities in the portfolio. All yields were converted into annualized percentage rates. (3) The ex ante yield for each MMF in each month was calculated as the average yield on the securities held, weighted by the percentage of each security type in the portfolio, minus 60 basis points for expenses. (4) For each month, an asset-weighted average yield and an asset-weighted average maturity were found for the five MMFs.

Sources: Salomon Brothers, **Bond Market Roundup**; **Donoghue's Money Fund Report of Holliston, Mass.**

The *ex ante* yield series is a rough estimate of the net yield that could be expected from a MMF investment held at the time indicated over the period given by the average maturity of the MMFs' portfolio.[17] The series is comparable to yields on money market instruments except that the maturity of the MMF portfolio varies and the MMF yield series is net of investment costs. Thus, the series is useful in showing the relative attractiveness of a MMF investment at a given time. The yield that should be compared to this MMF yield series depends on the investor in question. For individuals with less than $10,000 to invest, the relevant alternative rate is the Regulation Q ceiling rate on savings deposits and small short-term time deposits. For individuals with greater than $10,000, it is the yield on Treasury bills and money market certificates at depository institutions. And for investors with sufficient funds to invest in other money market instruments, such as commercial paper and CDs, it is the yield on these instruments. Of course, as noted, the yields on money market instruments are gross yields whereas the MMF yield series is net of expenses.

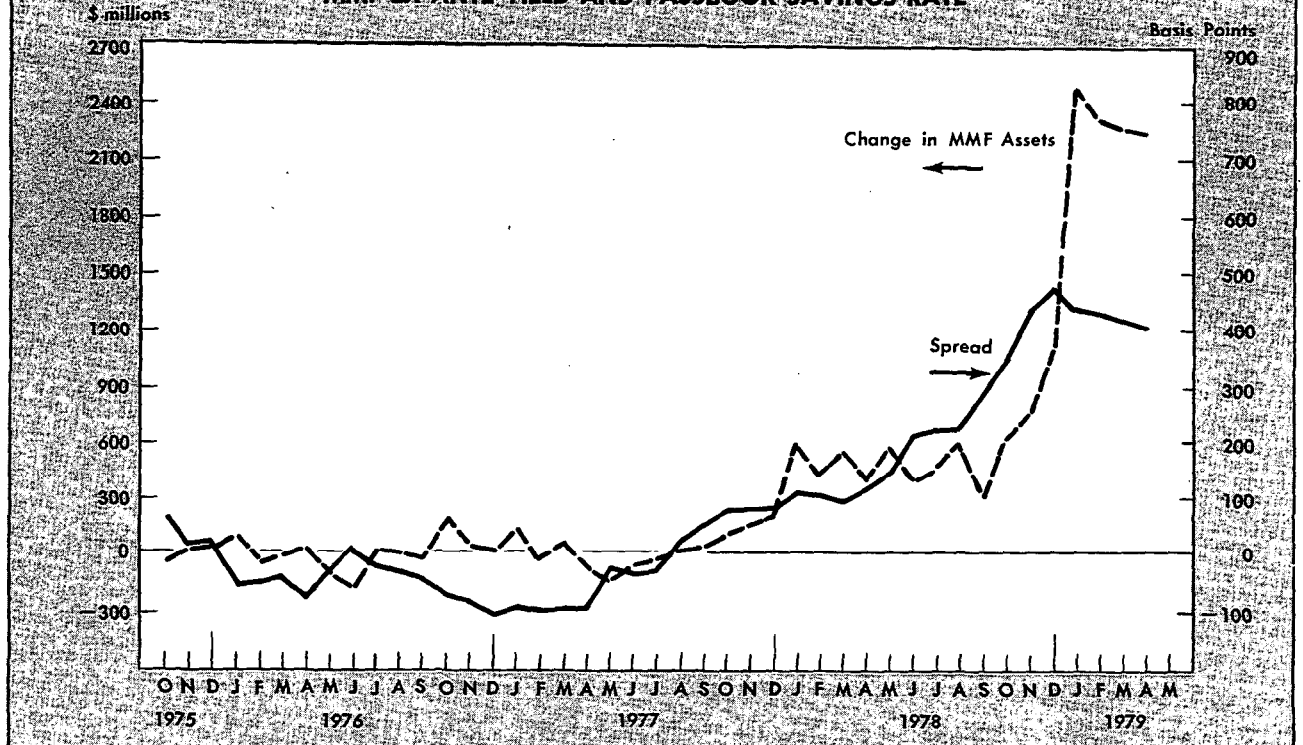
[17] The implicit assumption underlying the construction of the **ex ante** yield series is that interest rates remain constant over the period given by the average maturity. Expectations of interest rate fluctuations will affect the expected MMF yield for two reasons. First, as securities mature new assets are purchased at different rates. Second, under the mark-to-market method of valuing MMF portfolios, the capital gains or losses on the MMF's portfolio associated with interest rate fluctuations will accrue to shareholders whether they are realized or not.

## III. GROWTH OF MMFs

Chart 4 compares (1) the differential between the *ex ante* money market fund yield series derived above and the Regulation Q ceiling rate on savings deposits at thrift institutions with (2) monthly changes in the dollar volume of MMF shares outstanding. The chart shows that MMFs experienced little net contraction in assets during 1976 and the first half of 1977, despite *ex ante* MMF yields that were well below the Regulation Q ceiling rate for savings de-

Chart 4

**CHANGE IN MMF ASSETS AND SPREAD BETWEEN MMF EX ANTE YIELD AND PASSBOOK SAVINGS RATE**




Note: MMF yield series is described in Table III. Passbook savings rate is the ceiling rate at thrift institutions.

Source: Donoghue's Money Fund Report of Holliston, Mass.

posits. After the spread between the *ex ante* MMF rate and the savings deposit rate rose to roughly 100 basis points in late 1977 and early 1978, MMF assets increased by $0.5 billion per month on average. The monthly changes in the dollar volume of MMF shares outstanding remained at that level throughout most of 1978, while the spread between the *ex ante* yield series and the savings deposit rate rose to 200 basis points in the middle of the year. After market interest rates increased further in the fall of 1978, however, the monthly increases in money market fund shares rose sharply. By the first month of 1979, the increase in MMF shares was over $2 billion per month and the monthly increase remained at that level through the first five months of 1979.

The rough association between the rise in the spread between the MMF yield series and the Regulation Q ceiling rate and the increases in money market fund shares explains the belief that the growth of MMFs was solely a result of funds being withdrawn from the deposit institutions and put into MMFs. According to this view, the only function served by MMFs is to provide access to money market yields to individuals having relatively small amounts of funds to invest. While it is undoubtedly true that a significant part of the growth of MMFs has resulted from the withdrawal of funds by individuals from the deposit institutions, the position taken in this article is that much of the growth over this period also represented a lasting change in the way some investors manage their short-term assets. The best example of this fundamental change is the case of small- and medium-sized bank trust departments, which use MMFs to manage their short-term assets in order to take advantage of the economies of scale resulting from the pooling of large amounts of funds.

The answer to the question of whether the growth in MMFs is simply a result of government regulations or whether it also is due to other advantages MMFs offer investors as a financial intermediary would be aided by a breakdown of money market shares by investor category. Large investors, such as bank trust departments and corporations, have access to the money market. Hence, growth in those sectors cannot be attributed primarily to Regulation Q. While there are no comprehensive data on ownership of money market fund shares by type of investor, there is some useful information.

Beginning in late 1977, a number of funds began to limit their investors to institutions (i.e., all investors except individuals) and to require minimum initial investments of $50,000.[18] It is possible to derive a series beginning at that point in time for funds that deal only with institutions. This series does not include all institutional money in MMFs, since many of the other MMFs also have significant amounts of institutional money. Chart 5 shows the growth of MMFs divided into three groups: (1) those MMFs that deal only with institutions, (2) general purpose MMFs sponsored by stockbrokers and (3) other general purpose MMFs.[19] Many of the MMFs in the third group are part of a fund group having a variety of different mutual funds. The chart shows that the group of MMFs excluding individual investors had grown to $6.5 billion by the end of May 1979.

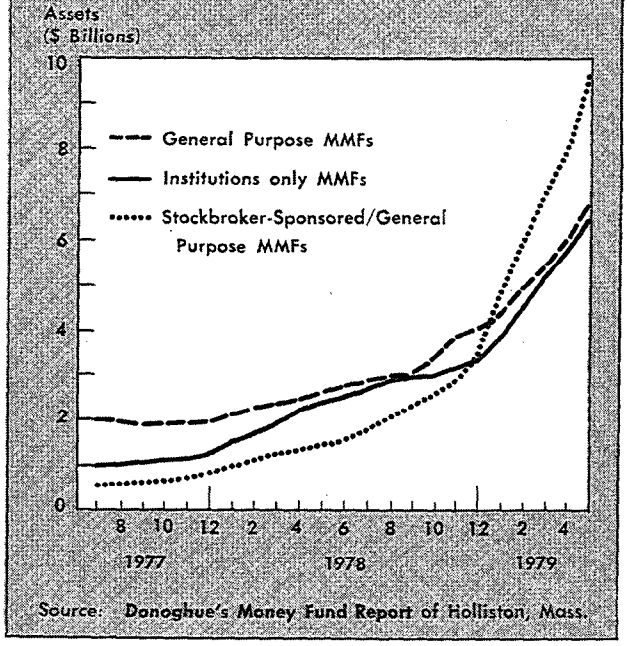
Information on the relative ownership of shares by institutions and individuals is also provided by a survey conducted by the Investment Company Institute [10] at the end of 1978. The survey estimated

[18] These restrictions were imposed as part of an agreement with the SEC. Under this agreement these MMFs were given temporary permission to use straight-line accrual accounting methods under certain conditions. Two of these conditions were that the MMFs restrict themselves to institutional investors and set minimum account size at $50,000.

[19] This classification and the data used to construct the series are taken from **Donoghue's Money Fund Report** of Holliston, Mass.

Chart 5

**GROWTH OF MMF ASSETS BY TYPE OF FUND**




Source: Donoghue's Money Fund Report of Holliston, Mass.

that 46 percent of the dollar volume of MMF shares was held by individuals and 54 percent was held by institutions (the rapid growth of the stockbroker-sponsored MMFs in 1979 has probably increased the percent of shares held by individuals). It seems likely that at least half and probably as much as three-quarters of the total MMF shares held by institutions at the end of 1978 were held by bank trust departments.[20]

With regard to investment in MMFs by individuals, it is impossible to estimate how much is coming from individuals seeking access to the money market and how much is from individuals who already had this access but who are nevertheless attracted to MMFs for other reasons. It appears, however, that a significant amount of money from this source is coming from individuals who are not using MMFs primarily to gain access to money market yields. Three pieces of information support this conclusion. The first is the rapid growth of the stockbroker-sponsored MMFs, which by May 1979 had combined assets of roughly $10 billion. Most of the money in these MMFs comes from individuals through brokers.[21] It seems unlikely that a large part of the growth of these MMFs is due to money being withdrawn by small investors from deposit institutions. Rather it appears that most of the growth in this group of MMFs has resulted from larger investors taking advantage of the opportunity offered by MMFs as an investment vehicle for funds freed by the sale of market securities.

The second piece of information on individual use of MMFs is data on MMF shares purchased and redeemed due to exchanges with other types of mutual funds in a fund group. These data suggest extensive use of MMFs by individuals for this purpose. Monthly purchases of MMF shares with money redeemed from other funds averaged $178 million a month in the year ending April 1979, and redemptions of MMFs for the purpose of buying shares of other mutual funds in a fund group averaged $135 million per month over the same period. From January 1978 through April 1979 the difference between total MMF share sales due to exchanges and total MMF redemptions due to exchanges was $619 million.[22] This figure is an estimate of the growth of MMFs due to exchanges with other mutual funds.

Lastly, information on individual participation in MMFs comes from the Investment Company Institute survey cited above. This survey gathered data on average account size for individuals and institutions. The average account size for individual investors of the 30 MMFs (representing 43.5% of total MMF assets) which provided detailed data for the survey was $11,905.[23] Since this figure is above the $10,000 minimum required for purchases of Treasury bills and money market certificates, it implies that many individual MMF shareholders have these investment alternatives. Of course, the average is low enough to indicate that there are many individuals with accounts smaller than $10,000 for whom MMFs do provide the only access to money market yields.

Before concluding this section, it should be noted that one basic question has not been raised. If, as the evidence indicates, MMFs are not only a reaction to government regulations but also represent a new form of specialization in the financial markets, what economic explanation accounts for the timing of this new form of specialization? That is, why did MMFs spring up in the 1970's when mutual funds for stocks and bonds started decades earlier? A thorough answer to that question is beyond the scope of this paper. However, one possible explanation is that because MMFs have many more shareholder transactions than do mutual funds for stocks or bonds, they were not economically feasible prior to advances in computer technology in the late 1960's and 1970's that reduced the administrative and recordkeeping expenses associated with these transactions.

## IV. CONCLUSION: THE FUTURE OF MMFs

The central conclusion of this paper is that the rapid growth of MMFs in 1978 and 1979 has been both a reaction to government regulations and a result of fundamental changes in the way some institutional and individual investors manage their short-

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[20] This estimate is based on conversations with MMF officials. The Investment Company Institute survey estimates that at the end of 1978 51.8 percent of institutional shares were held by "total fiduciary accounts." This figure probably understates the trust department percentage because the survey also estimates that 20.7 percent of institutional shares were held by "other institutional accounts" and 7.6 percent were held by "total employee plans." Both of these categories probably include some funds handled by bank trust departments.

[21] Tyson [11] reports that 98 percent of the shareholders of the largest MMF (with assets of over $4 billion in June 1979) were already customers of the brokerage firm that operates the fund.

[22] These figures were provided by the Investment Company Institute.

[23] The average account size for institutions of the 30 MMFs that provided detailed data was $34,904. However, as noted in footnote 1, this figure is difficult to interpret because of the difference in the way these accounts are treated by different MMFs.

term financial assets. A corollary of this conclusion is that MMFs will survive as a new intermediary in the financial markets regardless of the future course of government regulations that have contributed to their growth in the past. While the future growth of MMFs can not be predicted with any certainty, some limited comments can be made regarding the three major categories of investors discussed in the paper.

*Individuals* Regulation Q ceiling rates on savings and short-term time deposits less than $10,000 have been a major factor underlying the participation of individuals in MMFs. As long as MMFs offer small savers the only means of gaining access to money market yields, the use of MMFs by individuals and, hence, the level of MMF assets will be sensitive to the differential between money market rates and Regulation Q ceiling rates. Much of the growth of individual participation in MMFs, however, is attributable to factors other than the limited access of small savers. Individuals with $10,000 or more to invest find MMFs attractive because of the advantages they offer as a financial intermediary: diversification, liquidity, possibly higher net yield, etc. Moreover, the growth of the stockbroker-sponsored MMFs suggests that MMFs are attractive to the individual investor as a repository for money available after a sale of stocks, bonds, or other financial assets. The exchange privilege offered by many MMFs in mutual fund groups is a further, but less important, reason why use of MMFs by individuals should continue regardless of the future of Regulation Q.

*Bank Trust Departments* The flow of funds into MMFs from bank trust departments is primarily a basic change in the way small- and medium-sized trust departments manage their short-term assets. A rough estimate of the amount of funds potentially available to MMFs from this source is derived in Table IV. The information used in deriving this estimate consists of (1) the fraction of short-term to total assets of bank trust departments and (2) the fractions of short-term funds in different size bank trust departments potentially available to MMFs.

The first fraction is estimated largely on the basis of the ratio of STIF assets to total assets for the national trust departments that reported STIFs in the common trust fund survey discussed in Section I.[24] This ratio, .067, probably understates the true ratio of short-term to total trust department assets because money from agency accounts of personal trusts and estates cannot be put into STIFs. Consequently, the estimate used in Table II is set slightly higher. The increase in the estimate is based on the ratio of assets of agency accounts of personal trusts and estates to total trust department assets. For each size category of bank trust department, the portion of short-term funds potentially available to MMFs is based primarily on the frequency of STIF usage by trust department size shown in Table I. The assumption is that money in, or likely to end up in, STIFs is not potentially available to MMFs.

Column (5) in Table IV gives the estimate of total short-term funds potentially available for MMFs from each trust department size category. The total

[24] It would be more desirable to calculate the ratio of short-term assets to total assets directly. Data on trust assets are collected in the annual survey, **Trust Assets of Insured Commercial Banks** [5]. The data, however, are not collected in a manner that permits the division of short-term and long-term assets.

Table IV

**A ROUGH ESTIMATE OF BANK TRUST DEPARTMENT SHORT-TERM FUNDS AVAILABLE TO MMFs**

| | Bank Trust Department Assets ($ millions) (1) | Estimate of Ratio of Short-Term to Total Assets (2) | Estimate of Total Short-Term Assets ($ millions) (3) = (1) X (2) | Estimate of Fraction of Short-Term Assets Available to MMFs (4) | Estimate of Total Short-Term Assets Available to MMFs ($ millions) (5) = (3) X (4) |
|---|---|---|---|---|---|
| Less than $100 million | 5,546 | .08 | 444 | 1.0 | 444 |
| $10-25 million | 7,555 | .08 | 604 | 1.0 | 604 |
| $25-100 million | 26,535 | .08 | 2,123 | 1.0 | 2,123 |
| $100-500 million | 59,242 | .08 | 4,739 | 0.8 | 3,791 |
| $500 million-1 billion | 38,128 | .08 | 3,050 | 0.5 | 1,525 |
| More than $1 billion | 365,709 | .08 | 29,257 | 0.2 | 5,851 |
| TOTAL | 502,715 | | 40,217 | | 14,338 |

Note: The derivation of the estimate in column (2) is described in the text. Estimates in column (4) are based on Table I.

Source: Comptroller of the Currency, Federal Deposit Insurance Corporation, and Board of Governors of the Federal Reserve System, **Trust Assets of Insured Commercial Banks - 1977.**

estimate is $14.3 billion. Of course, this is only a rough estimate. (Also, the estimate, which is based on trust assets at the end of 1977, would be expected to grow slowly as trust assets increase.) Nevertheless, the estimate makes the point that the flow of bank trust department money into MMFs will probably not continue at the rapid pace of 1978-79. A reasonable judgment is that as of mid-1979 at least half of the trust department money potentially available to MMFs was already in these funds.

One caveat should be added. The survey of *Trust Assets of Insured Commercial Banks,* from which the total assets figures in column (1) of Table IV are taken, omits strictly custodial agency accounts and corporate trusts and corporate agency accounts. Strictly custodial agency accounts are those for which the trust department neither exercises investment discretion nor provides investment advice.[25] Corporate trusts and corporate agency accounts are created by a corporation to secure bond issues and for other purposes. No data are available on the magnitude of these two items.

*Corporations* Nonfinancial corporations have used MMFs only to a fairly limited degree. MMF share turnover rate data strongly suggest that MMFs have not been used extensively by corporate investors for transactions purposes. The unwillingness of MMFs to bear the costs of rapid share turnover is the most plausible explanation for this low turnover. One possibility is that pricing systems will evolve in the MMF industry that allocate the costs of rapid share turnover to investors using MMFs for transactions purposes. If so, the reluctance of MMFs to tolerate rapid turnover would diminish, and corporate use of MMFs as a partial substitute for demand deposit balances and as an alternative to RPs might increase.

To date, most of the limited use of MMFs by corporations have been due to smaller corporations which invest in MMFs rather than investing directly in the money market. This decision is primarily based on which investment alternative offers the highest yield net of expenses consistent with the desired degree of liquidity and diversification. An analysis of the costs involved in running corporate money market investment programs was beyond the scope of this paper. If, however, MMFs are able to offer a higher net yield than some corporations can gain through investing directly in the money market, then it is likely that corporate use of MMFs will grow in the future.

[25] There are three types of agency accounts: (1) **strictly custodial accounts** for which the trust department provides no investment advice and exercises no investment discretion; (2) **advisory agency accounts,** for which the bank trustee offers investment advice; and (3) **managing agency accounts,** for which the bank has investment discretion. Strictly custodial accounts are omitted from the survey of **Trust Assets of Insured Commercial Banks** because trust departments have no influence over the investment of the funds in these accounts.

## References


1. Bank Administration Institute. The Trust Administration Investments Task Force. *Trust Investments.* Park Ridge, Illinois: Bank Administration Institute, 1976.
2. Bent, Bruce R. "Sorting Out the Money Market Funds." *Trusts and Estates* (June 1976), pp. 408-15.
3. Comptroller of the Currency. "Trust Assets and Number of Accounts of National Banks with Trust Departments as of December 31, 1977."
4. ————. "Common Trust Fund Survey-1978."
5. ————, Federal Deposit Insurance Corporation, and Board of Governors of the Federal Reserve System. *Trust Assets of Insured Commercial Banks - 1977.* Washington, D. C.: Federal Deposit Insurance Corporation, 1977.
6. Cook, Timothy Q. "The Determinants of Spreads Between Treasury Bill and Other Money Market Rates." Working Paper No. 79-4, Federal Reserve Bank of Richmond, August 1979.
7. ————, and Duffield, Jeremy G. "Average Costs of Money Market Mutual Funds." *Economic Review,* Federal Reserve Bank of Richmond (July/August 1979).
8. Donoghue, William E. *The Cash Management Manual.* Holliston, Mass.: Cash Management Institute, 1977.
9. *Donoghue's Money Fund Report* of Holliston, Mass. Various issues.
10. Investment Company Institute. "Survey of the Institutional Activity of Money Market Funds." Washington, D. C., July 10, 1979.
11. Reserve Management Corporation. *The Effects of Shareholder Servicing on the Returns to Investors in 13 Selected Money Funds.* New York: Reserve Management Corporation, 1976.
12. Tyson, David O. "Merrill Lynch Trust Has in 4 Years Become Largest Mutual Fund." *American Banker,* June 19, 1979, p. 1.
13. Van Horne, James C. *Financial Market Rates and Flows.* Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1978.