

GROWTH AND DEVELOPMENT OF
MONEY MARKET FUNDS

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ABSTRACT

Over the last few years Money Market Funds have grown to be a major sector in the securities industry. The purpose of this paper is to investigate and identify some of the variables which have led to this growth and to explain their importance as a new investment medium.

GROWTH AND DEVELOPMENT OF MONEY MARKET FUNDS

Money market mutual funds (MMM's) have rapidly become a very important competitive force in the market for short term investment funds. Acting as open end investment companies, they specialize in holding securities with maturities of less than one year which satisfy the funds' objectives of maximum income with a high degree of liquidity and safety of principal. Since the first MMM was established at the end of 1971¹, these funds have grown to control over \$33 billion dollars in September of 1979.²

The purpose of this paper is to investigate the phenomenal growth of MMM's in order to determine their importance as financial intermediaries and to analyze the factors which contributed to their sudden increase in growth. In Section I of this paper, the growth and portfolio composition of MMM's will be examined in order to give a better understanding of why they are significant participants in the market for short term funds. Section II will hypothesize the reasons for the growth of MMM's which will be empirically tested in Section III. The final section of the paper will summarize the results of the testing and give the authors' perceptions of what lies ahead for the MMM's.

¹The first money market mutual was The Reserve Fund, Inc. which was open for business November 5, 1971.

²Mitchell C. Lynch, "Some Life Insurers Use Armies of Agents to Get in on Money Market Fund Action," Wall Street Journal, September 14, 1979, p. 11.

I. Growth and Portfolio Composition of MMM's

In order to get a better picture of the rate of growth in net assets of MMM's four periods were chosen for analysis in Table 1. Although MMM's were introduced at the end of 1971, it was not until 1974 that they experienced any significant growth. Over this period, net assets increased by \$1,702.9 million which computes to an annual rate of increase of 13,958.20%. The extraordinary growth in this year was followed by a three year period of relative stability in the industry. From January 1975 through December 1977 the annual rate of growth in MMM's was 31.36%. In 19 out of the 36 months, redemptions exceeded sales.³ As can be seen in Table 2, however, only in 1976 did this result in a decrease in net assets for the year.

The last periods chosen for analysis depict the rapid acceleration in the rate of growth in MMM's over the last two years. In 1978 net assets increased by 179.29% and from January through August 1979, the annual rate of growth was 444.04%.

Another way to look at the growth of MMM's is by the change in the number of funds and the number of account holders as shown in Table 3. At the end of 1974 there were 15 funds and by the end of 1978 the number had increased to 61.⁴ The number of account holders increased by 364,000 over a five year period or an average increase of 72,800 accounts holders per year.⁵

³This information obtained from data supplied by Harry Guinivan of the Investment Company Institute, Washington, D. C.

⁴It should be noted that the number of funds at the end of each year does not reflect that fact that in any given year a number of funds may enter and exit the market.

⁵From year to year the number of account holders is a very volatile figure obviously dependent on the performance of MMM's relative to alternative investments.

TABLE 1
 Rate of Growth in Net Assets of MMM's
 (Dollars in millions)

Time Period	Net Assets (Beginning)	Net Assets (Ending)	Annual Rate of Growth
Jan. 1974-Dec. 1974	\$ 12.2	\$ 1,715.1	13,958.20%
Jan. 1975-Dec. 1977	1,715.1	3,887.7	31.36%
Jan. 1978-Dec. 1978	3,887.7	10,858.0	179.29%
Jan. 1979-Aug. 1979	10,858.0	33,210.0	444.04%

Source: Calculated from data supplied by Harry Guinivan, Investment Company Institute, Washington, D. C.

TABLE 2
Net Sales of MMM's
(Dollars in millions)

Year	Sales	Redemptions	Net Sales (Redemptions)
1974	\$ 2,229.2	\$ 556.0	\$ 1,673.1
1975	6,764.8	5,891.5	873.3
1976	9,360.9	9,609.2	(248.3)
1977	10,673.0	10,662.7	10.3
1978	30,357.0	24,265.3	6,091.7

Source: ~~Data obtained from the Investment Company Institute,~~
Washington, D. C.

TABLE 3
Number of MMM's and Account Holders
(end of year)

Year	Number of Funds	#of Account Holders (000's)
1974	15	103.8
1975	36	208.8
1976	48	180.7
1977	50	177.5
1978	61	467.8

Source: Mutual Fund Fact Book - 1979, Investment Company Institute, Washington, D. C., p. 11.

A. Portfolio Composition

The main types of securities found in MMM's portfolios are large negotiable certificates of deposit, prime commercial paper, short term U. S. Government securities (including agency issues), and bankers' acceptances. As should be expected, all of the assets in the portfolio are highly liquid, relatively riskless as to default, and generally have maturities less than one year. Some fund managers have attempted to earn higher yields by purchasing longer term securities, but most funds have restrictions on both the types of instruments that can be purchased and their maturities. The relative importance to the overall portfolio of each of the major components is shown in Table 4.

An interesting point to note is that commercial paper and bankers' acceptances are becoming more important in the portfolio while U. S. Government and agency securities seem to have become less attractive as investments over the period of 1976 through 1978. A possible reason for the restructuring of the MMM's portfolio would be a change in yield differentials among the major components. A close examination of Tables 4 and 5 will make this point relatively clear. For example from 1977 to 1978 the percentage of CD's in the average portfolio increased from 46.1% to 48.8%, at the same time the percentage of U.S. Government or agency issues decreased from 22.7% to 13.7%. During this same period the average yield differential (calculated from Table 5) in favor of CD's over 3-month Treasury Bills widened from 31 basis points to 101 basis points.⁶

⁶Three month Treasury Bill rates are used as a proxy for short term U.S. Government or agency securities. The same analysis would hold true if 6-month Treasury Bill rates were used. The basis differential in favor of CD's would have increased from 1 basis point to 72 basis points over the same period.

TABLE 4
Average Portfolio Composition of
Money Market Mutuals (Dollars in Billions)

Asset	Dec. 1976		Dec. 1977		Dec. 1978		Aug. 1979	
	Amount	%	Amount	%	Amount	%	Amount	%
Certificate of Deposits	\$1.5	40.4	\$ 1.8	46.1	\$5.3	48.8	\$ 8.8	37.6
Commercial Paper	.9	24.6	.9	24.2	2.8	26.2	6.9	29.5
U. S. Govt. Securities	1.1	31.2	.9	22.7	1.5	13.7	3.6	15.6
Bankers' Acceptances	*	.5	.1	2.6	.8	7.0	2.3	9.9
Others	<u>.2</u>	<u>3.3</u>	<u>.2</u>	<u>4.4</u>	<u>.5</u>	<u>4.3</u>	<u>1.7</u>	<u>7.4</u>
TOTAL	\$3.7	100.0%	\$ 3.9	100.0%	\$10.9	100.0%	\$23.2	100.0%

*Not significant when stated in billions of dollars.

Sources: Mutual Fund Fact Book - 1979, Investment Company Institute, Washington, D. C., p. 26.

Trends in Mutual Fund Activity, Investment Company Institute, Washington, D. C., May 1979.

TABLE 5
Average Yields on
MMM's Portfolio Components

Asset	Jan.-Dec. 1976	Jan.-Dec. 1977	Jan.-Dec. 1978	Jan.- Aug. 1979
Certificate of Deposit (3 months)	5.26	5.58	8.20	10.20
Commercial Paper (90-119 day)	5.24	5.54	7.94	9.98
U. S. Gov't. Sec.-Treasury Bills				
3-month Secondary Market	4.98	5.27	7.19	9.44
6-month Secondary Market	5.26	5.53	7.58	9.48
Bankers' Acceptance (90 day)	5.19	5.59	8.11	10.13

Source: Federal Reserve Bulletin, Board of Governors of the Federal Reserve System, August, 1979, Table A-29.

Therefore, it would appear that when the yield differential widens in favor of one or more of the major asset classifications, there will be a restructuring of the portfolio which would increase holdings of higher yielding assets and lower other holdings. Further analysis of Tables 4 and 5 will give similar results.

B. Importance to the Money Market

Due to the amount of funds controlled by MMM's (over \$33 billion as of September 1979), they have become very important financial intermediaries in the money market. MMM's provide a source of funds to borrowers such as business, commercial banks, and the U.S. Government and its agencies through the purchase of such assets as certificates of deposit, commercial paper, bankers' acceptances and various short term government securities. They also provide an outlet for excess funds for businesses, institutional investors and individuals. From Table 6, it can be seen that MMM's are an important force in the negotiable CD market because they held over 11% of the outstanding CD's as of May 1979. MMM's also held significant shares of the market for commercial paper and bankers' acceptance while holding a minor portion of the outstanding short term U. S. Government securities.

II. Reason for Growth of MMM's

As financial intermediaries, MMM's pool investors funds and then purchase short-term financial assets which satisfy the funds' objectives of preservation of capital, liquidity, and current income. The fact that

TABLE 6
Importance of MMM's in Money Markets (May 1979)

Investment	Amount Outstanding (\$ Billions)	Amount Held by MMM's (\$ Billions)	% of Total
Certificates of Deposits	\$ 77.9	\$8.8	11.0%
Commercial Paper	96.1	6.9	7.2
Bankers' Acceptance	35.3	2.3	6.5
U. S. Gov't. Securities	243.9*	3.6	1.5

*As a proxy for MMM's holdings of U. S. Government and agency securities, the figure for U.S. Government marketable securities which mature in one year was used.

Sources: Federal Reserve Bulletin, Board of Governors of The Federal Reserve System, August, 1979, Tables A-23,25.

Mutual Fund Fact Book, 1979, Investment Company Institute, Washington, D. C., p. 26.

Trends in Mutual Fund Activity, Investment Company Institute, Washington, D. C., May, 1979.

these funds have low initial investment requirements and operate without restrictive rules and regulations which apply to depository financial intermediaries, make them very attractive for the small saver looking high returns with a minimal amount of risk. MMM's also offer advantages to those investors with larger sums of money because of the reduction in transaction costs and diversification features.

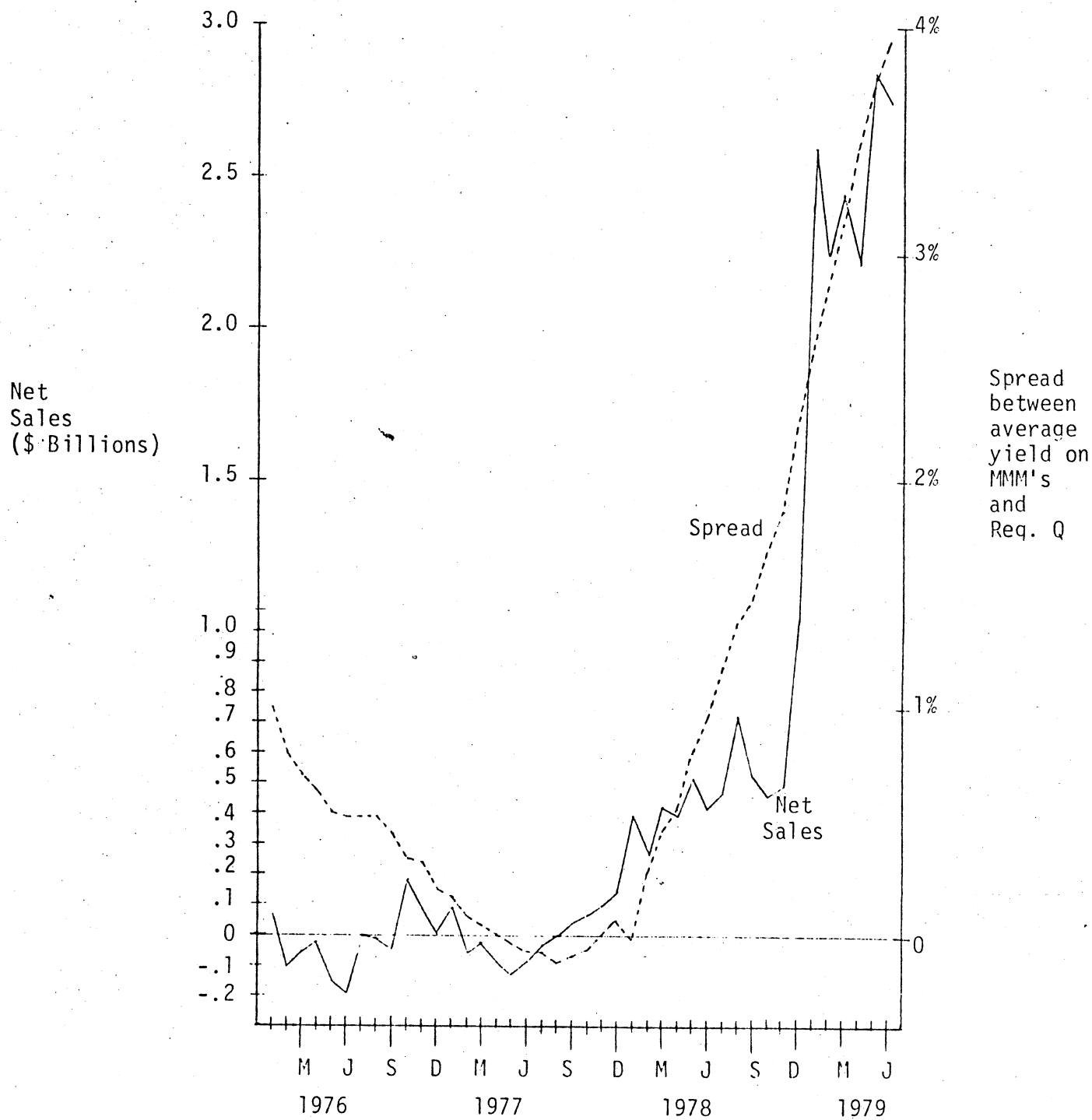
The rapid growth of MMM's is due primarily to the interest rate ceilings and reserve requirements on bank deposits at a time in which interest rates were exceptionally high.⁷ In Figure 1 you can see that as the spread between the MMM yields and the Regulation Q ceiling widens, the flow of funds to the MMM's increases.

High interest rates are obviously an incentive to economize on your cash balances or to shift funds from lower to higher return assets. Many businesses and higher income individuals are now using MMM's in their cash management programs because of the interest return on idle cash balances and the check-writing privileges provided by most.⁸ For example, if large expenditures such as quarterly tax payments are paid from funds on deposit in MMM's, the firm or individual will continue to receive interest on these funds until the check is cleared.

⁷John B. Carlson, "Money Market Funds and the Implications of Their Rapid Growth," Economic Commentary, Federal Reserve Bank of Cleveland, July 23, 1979.

⁸Most funds which provide free checking to participants require that checks be for \$500 or more.

Figure 1
 Net Sales of MMM's



Since MMM's are a close substitute for savings for households, this would account for the fact that about two-thirds of funds assets are held by individuals.⁹ Although individuals have been able to receive market rates on some savings instruments such as money market certificates of deposit (MMCD's) issued by commercial banks and savings and loans, their minimum denomination (\$10,000), lack of liquidity,¹⁰ and fixed returns over six months have encouraged some savers to shift funds out of these institutions into MMM's.

Other factors which have contributed to the growth in these funds which will be tested in Section III are the growth in personal income, rates on alternative investments (both short and long term), the inflation rate (a surrogate for purchase of real assets), and stock market performance measures. These variables will be tested to determine their effect on net sales of MMM's over time.

III. Empirical Analysis of MMM's Growth

In order to determine which variables best explain net sales of MMM's, ordinary least squares regression techniques were employed to analyze monthly data for the period January 1976 through June 1979. This period was chosen to allow for an initial stabilization in the growth and development of MMM's as discussed in Section I and Tables 1-3. Explanatory variables were selected to reflect factors influencing the composition and size of

⁹"The Money Fund Phenomenon," Financial World, April 1, 1979, pp. 27-28.

¹⁰Current regulations require interest penalties for early withdrawal of funds from MMCD's.

an individual's asset portfolio (e.g., rates of return on MMM's, personal income, and rates of return on competing assets - bonds, stocks, and goods). A list of these variables is found in Table 7.

Multiple regression analysis was performed on alternative combinations of the explanatory variables in order to identify those which best explained net sales of MMM's.¹¹ Various lag structures including geometric and Almon specifications were employed to capture observation/information lags with no appreciable improvement in the results. Degrees of freedom limitations and multicollinearity problems made it necessary to keep the number of variables reflecting returns on alternative investments to minimum in each equation.

As a result of the regression analysis the following variables were identified as having a significant impact on net sales of MMM's: yield on MMM's (YIELD),¹² aggregate personal income (PI), composite short term interest rates (STR),¹³ Aaa bond rates (AAA), rate of change in the New York Stock Exchange Composite Index (RCNYSE),¹⁴ rate of change in the Consumer

¹¹ Both real nominal values for the variables in Table 7 were tested with no significant difference. Therefore, all results reported are based on nominal values.

¹² YIELD was calculated by taking the mean current return of a selected group of representative MMM's. The funds chosen were the six largest in terms of net assets at the midpoint of the sample period and comprised approximately 56% of assets at that time.

¹³ STR represents an average of the three month Treasury Bill rate in the secondary market, the 90-119 day prime commercial paper rate and the 90 day prime bankers' acceptances rate.

¹⁴ RCNYSE was calculated as a four month moving average expressed as an annual rate. Averages of one, three, and six months were also examined, but the four month average was selected based on goodness of fit.

TABLE 7

Explanatory Variables

General Variable

- YIELD - average yield on the top six MMM's
- PI - personal income (annual rate in \$ billion).
- TIME - assigned a value of 1 to the first month, 2 to the second month, etc.
- INFL - rate of change of Consumer Price Index over:
 - 1 month
 - 3 months
 - 4 months* (reported on Table 8)
 - 6 months

Money Market Variables

- STR - average short term rate (average of *'s).
- *Prime Commercial Paper - 90-119 day.
- *Prime Bankers' Acceptances - 90 day.
- *Treasury Bills - 3 month, secondary market rates.
- Treasury Bills - 6 month, secondary market rates.
- Federal Funds
- CD Dummy.

Capital Market Variables

- DDP - dividend to price ratio for preferred stock.
- DPC - dividend to price ratio for common stock.
- MF - percent yield on flexible policy income mutual funds.
- S&P - Standard and Poor's Common Stock Index.
- NYSE - New York Stock Exchange Composite Index.
- RCSP) - rate of change of above over
- RCNYSE)
 - 1 month
 - 3 months
 - 4 months* (reported on Table 8)
 - 6 months

Price Index (INFL),¹⁵ and a dummy variable reflecting the availability of money market certificates of deposit (CD Dummy).¹⁶ The ordinary least squares regressions results using these variables are shown in Table 8. The findings are consistent with what one would expect. Higher nominal rates of return on alternative assets (including goods) have negative impacts on sales on MMM's, higher yield on MMM's and higher personal incomes result in increased net sales. R^2 statistics adjusted for degrees of freedom were consistently between .90 and .93, although high degrees of correlation between the explanatory variables resulted in low t-statistics in many cases, particularly when long term interest rates were included. Durbin-Watson statistics, used to test for the absence of first order serial correlation, were in the indecisive region at the .025 level of significance. The CD dummy is statistically significant at the 95% confidence level in all cases and has the anticipated sign, indicating that the six month certificates of deposit appear to have cut considerably into MMM sales. All other variables in Table 8 are statistically significant at the 90% confidence level (based on t-statistics) except for the inflation variable INFL.

¹⁵INFL is also a four month moving average expressed as an annual rate. Other averages (one, three, and six months) were also tested with no significant improvement. This measure is a surrogate for investment in goods.

¹⁶The CD Dummy was introduced to capture anticipated negative effects of the money market certificates of deposit (introduced in June of 1978) on net sales of MMM's.

TABLE 8

REGRESSION RESULTS FOR NET SALES OF MMM'S
(t-ratios are given in parentheses, 42 observations)

Constant	YIELD*	PI	STR*	AAA*	RCNYSE*	INFL*	CD Dummy	R _a ²	F	DW
-6.34 (-8.17)	.82 (9.34)	.00234 (3.38)	-.25 (-2.81)		-.007 (-3.11)			.91	104.9	1.28
-5.25 (- .89)	.81 (6.90)	.00084 (1.97)		-.47 (-1.72)	-.005 (-2.10)			.90	92.4	1.20
-7.33 (-6.20)	.90 (7.81)	.00316 (3.13)	-.33 (-2.92)		-.007 (-3.12)	-.040 (-1.10)		.91	84.7	1.31
-7.25 (-8.83)	.87 (10.22)	.00250 (3.81)	-.18 (-2.05)		-.006 (-2.78)		-.51 (-2.41)	.92	96.1	1.52
-8.53 (-7.16)	.98 (8.80)	.00351 (3.71)	-.27 (-2.54)		-.006 (-2.79)	-.049 (-1.47)	-.54 (-2.60)	.92	92.3	1.59
-3.60 (-2.06)	.94 (7.68)	.00164 (2.94)		-.45 (-1.77)	-.004 (-1.86)	-.007 (- .23)	-.65 (-3.03)	.92	75.8	1.61

*All Rates of Return and Rates of Change are expressed as percentages.

IV. Summary and Conclusions

Money market mutual funds provide investors (individuals, institutions, and corporations) with an attractive alternative to direct investment of their funds. The phenomenal growth in total assets of MMM's has been shown to be significantly influenced by their yield, growth in personal income, and rates of return on competing financial assets. They have enabled small savers and others with excess funds to be able to get a market rate of return on their money with a high degree of liquidity and with many advantages not currently available through previously existing investment media.

The viability of MMM's is somewhat dependent upon the continued existence of Reg. Q, the prohibition of interest payments on demand deposits, and minimum deposit denomination requirements. As long as the spread between the market rate of interest and Reg. Q remains wide, individuals (which control over two thirds of MMM assets) will continue to be active participants in these funds and insure their role as financial intermediaries.

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