



BOARD OF GOVERNORS
OF THE
FEDERAL RESERVE SYSTEM
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STRICTLY CONFIDENTIAL (FR)
CLASS I - FOMC

TO: Federal Open Market Committee

DATE: December 10, 1982

FROM: Murray Altmann *M.A.*

The attached memorandum, "Options for Intermediate Targets and Implications for Operating Procedures of Deposit Rate Deregulation," dated December 10, 1982, provides background analysis for the first item on the agenda for the Committee meeting scheduled to begin at 3:00 p.m. on Monday, December 20. Please note that the memorandum bears a CLASS I - FOMC classification. Chairman Volcker request that access to the document be severely limited.

Attachment

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TO: Federal Open Market Committee

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FROM: S. H. Axilrod

The attached memorandum from Messrs. Davis, Judd, Lindsey, and myself represents an effort to lay out implications for monetary targeting and operating procedures of the most recent phase of deposit rate deregulation--particularly as it bears on monetary policy in 1983 (but also beyond).

Attachment

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December 10, 1982

OPTIONS FOR INTERMEDIATE TARGETS
AND IMPLICATIONS FOR OPERATING PROCEDURES
OF DEPOSIT RATE DEREGULATION*

The introduction of the new money market account in mid-December, the super-NOW account in early January, and the probability that the DIDC may soon extend an interest-bearing transactions account to businesses raise questions about the usefulness of M1 as a target for the FOMC in 1983, when the behavior of the aggregate will be complicated by transitional problems. The possible changing character of the aggregate also raises questions about its role after the transition.

Many of the problems that could arise in connection with M1--such as a greater admixture of more purely savings funds with transactions balances and the availability of a market-related interest rate on a large share of the components of the aggregate--already have complicated the role of broader monetary aggregates as policy targets. Heretofore, these aggregates have had a more subsidiary role in the policy process than M1. But if they are to be considered for a more prominent role, as has been the case in recent weeks, their properties as policy targets (just as with newly emerging M1) require careful evaluation, particularly in terms of relation to market conditions and income, controllability, and possible adjustments, if any, in operating procedures.

In addition to broader money supply aggregates (and bank credit) already targeted by the FOMC, other monetary and credit measures can be

*Prepared by Messrs. Axilrod (Board), Davis (New York FRB), Judd (San Francisco FRB), and Lindsey (Board).

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considered for their value as policy targets in the changing financial environment that is ahead. Among them are total liquid assets (L), a "debt proxy" measure consisting of the nonfinancial sectors' holdings of financial assets other than equities, the monetary base, measures of total credit, and interest rates (nominal and real).

Part I of this paper (pp. 3 to 17) evaluates, in summary form, the various potential targets that the Committee might consider (bearing in mind that the Humphrey-Hawkins Act requires the FOMC to report twice a year on "ranges of growth or diminution of the monetary and credit aggregates"), and assesses implications for operating procedures. Part II (pp. 18 to 59) presents a detailed analysis of the advantages and disadvantages of the various intermediate policy targets, including nominal GNP--drawing in large part on the already extensive research bearing on them--and provides the analytic and empirical basis for much of the evaluation of Part I.

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PART I

Monetary and credit aggregates appear to encompass the measures that are most relevant for consideration as intermediate targets representing monetary policy and as guides for open market operations. Other potential targets, such as interest rates and GNP, have major drawbacks.

Announcement of interest rate targets or even interest rate expectations seems clearly counterproductive for a central bank. Such an announcement is unrealistic because it assumes more knowledge of the underlying strength or weakness of the economy, credit demands, and expectations than the central bank (or anyone) can have; the appropriate rates would have to be subject to continuous change as circumstances inevitably alter, undermining the central bank's credibility as it becomes necessary to adjust announced targets; the policy process would tend to be politicized; and markets would be distorted, with the prospect of undesired economic outcomes, in the degree that the central bank's rate "announcement" is itself a dominant factor in establishing market rate levels.

We also assume that the Federal Reserve should not announce a target for GNP, though it should, as it does, give expectations (within a range) of GNP outcomes thought generally consistent with whatever intermediate policy targets are chosen. A GNP target would make the central bank appear to be more powerful than it in fact is, and take on more responsibilities than it is capable of performing. Moreover, establishment of a GNP target would evidently raise difficult questions about the target's relation to goals set by the Administration.

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Monetary targets have a number of well-known advantages that need not be detailed here. Chiefly, when used as a guide for day-to-day open market operations, they buffer the economy against shocks affecting the demand for goods and services by helping to assure that credit conditions will begin varying more or less automatically in an appropriate direction to counteract such shocks. The FOMC need not continuously make decisions about money market rates, but rate movements will be seen as, and will be, the product of money or reserve demand running above or below reserve supply.

The FOMC has long recognized, however, that there are also shocks affecting the demand for money, given GNP and interest rates. Some such shocks are long-run, such as institutional changes, which affect the setting of a long-run target. Some are short-run and possibly self-reversing, which conditions the response of open market operations or the discount rate. But whether shocks are short- or long-run, uncertainties about institutional developments and the behavior of the public with respect to monetary aggregates have led the Committee to target on a variety of aggregates and to specify their growth in terms of ranges.

The institutional changes that are immediately in prospect will have substantial effects, with uncertain dimensions, on the character of M1 and its behavior in the period ahead. M2 will also be influenced, as will M3, though probably to a lesser degree.

Effect on the role of M1

The narrow money supply has in the past been taken as the principal target of monetary policy and guide for open market operations because--dominated as it has been by transactions demands--its relationship to income over time has been more adequately predictable than that of other

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money supply aggregates. It has also had other desirable properties. It is more directly related to the reserve base controllable by the Federal Reserve. And it has exhibited a reasonable degree of demand elasticity in relation to market rates (as the public has shifted into or out of M1 in response to changes in the spread between varying market rates and fixed offering rates on M1 deposits, which are currently either subject to ceiling rates or to a legal prohibition on interest).

Coming institutional changes are likely to affect M1 in a number of ways.

First, the new DIDC money market account (that will probably not be included in M1 but will be in M2) will tend to pull funds out of M1, while the super-NOW will tend to bring funds into M1. Whether the net effect over the next year will be to increase or decrease M1 and by what extent is uncertain. It will depend on pricing strategies adopted by depository institutions, not to mention the public's response to these strategies.

Second, in the degree that super-NOWs attract savings-type balances that may now be held in, for instance, money market funds, M1 will become more a mixture of savings and transaction-type balances, with all the additional complications of interpretation that may be involved.

Third, the availability of a market-related interest rate on deposits in M1 will decrease the interest elasticity of demand of this aggregate. As a result, for example, short-term interest rates will tend to move more than otherwise in response to a given deviation in demand relative to supply (because institutions will at least partially adjust deposit offering rates to changes in market rates, thereby requiring

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larger changes in market rates to bring the quantity demanded into line with supply).

The usefulness of M1 as a monetary target and as a guide for day-to-day open market operations under such circumstances can be evaluated in terms of effects during a transition period and then after. The usefulness of measured M1 as a monetary target would appear to be considerably weakened for 1983, largely because of uncertainties connected with the transition to the new DIDC accounts and the other accounts that may be authorized (such as a proposed interest-bearing transactions account for businesses).

It would take analysis similar to that made for NOW accounts in 1981, when a shift-adjusted M1-B was published, to provide the Committee and the public with an M1 guide that abstracted from institutional changes as they emerge in the course of 1983. That earlier shift adjustment process could conceivably be repeated, but even as applied to the relatively simple 1981 problem it suffered from a number of disadvantages: (i) statistical and informational procedures were stretched close to the point where reasonable estimates are difficult to distinguish from educated guesses; (ii) credibility problems arose with some segments of the public; and (iii) the impact of monetary policy on market conditions was in part influenced by rough estimates of the shift that could easily be off from the unknowable true shift by a significant amount. Such problems would be magnified in the phase of deregulation immediately ahead because shifts of funds into or out of M1 are likely to involve movements between the new accounts and a wide variety of assets, with sources and magnitudes very difficult to estimate.

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Even after the transition period, the character of M1 as a longer-run target may well change. We would see the principal problem as stemming from the possibility that M1 could become a repository for a much larger amount of investment-type funds than at present as NOW accounts become more competitive with market instruments. This would reduce the usefulness of M1, relative to the past, as a target and guide for open market operations. Variations in it would become more affected by factors other than income and the general level of interest rates, including wealth and over-all savings and liquidity propensities. It would take on more of the characteristics of a broader aggregate.

There appears no need at this point to prejudge such an outcome, however. It may not happen. The 12 percent reserve requirement on transactions accounts may provide a reasonable incentive for depository institutions to distinguish, through differential offering rates, accounts that are primarily for transactions purposes from other accounts. Or institutions could develop transaction accounts that bear a relatively low explicit interest rate, with consumers getting the enhanced real return that comes from services provided at no, or less-than-market, cost to them (and whose return, being in kind, is not taxed).

Any longer-run problem posed by an M1 that bears a flexible market rate would be reduced if the aggregate remained predominantly a transactions account. Even in this case, however, it might take some time (beyond a transition period) before there is enough experience with the aggregate to determine how, or whether, its behavioral characteristics in relation to income have changed--as evidenced, for instance, by emerging cyclical and secular behavior of velocity. While M1 may come to be as

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viable a monetary target as in the past, its interest-elasticity would be reduced at least to some extent, which would counsel caution in using it as actively as in the past as a short-run guide for open market operations. A more cautious approach would be needed to avoid excessive interest interest rate volatility that might be generated by short-run deviations in money growth relative to the longer-run target. However, permitting larger deviations in money from target path under these circumstances--and thereby enhancing the risk of missing the longer-run target for a year--need not necessarily worsen economic performance, and indeed could be associated with an improvement, because the economy will be much more sensitive to efforts to achieve the monetary target (given the reduced interest-elasticity of demand for the target variable).

A final point needs to be made in evaluating M1 as a target for next year, or over the next few years. At some point, if and as reasonable price stability is attained, short-term market interest rates will drop to, or possibly even below, current NOW account ceiling rates. Unless institutions quickly drop their offering rates below ceiling rates on conventional NOW accounts, such a decline in money rates would lead to a structural shift in the public's liquidity holdings toward such accounts and to a sizable expansion of M1 at the time. Moreover, as price stability is attained, money may come to be viewed as a more desirable asset for its store of value function. With reasonable price and interest rate stability, the upward trend of velocity of the post-World War II period might be slowed and indeed for a time velocity might even decline. During the transition to a period of price stability, an acceleration in money growth from recent targets might actually be required.

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Policy with respect to M1 in 1983. The public's adjustment to the new DIDC accounts should last, in its intensive phase, at least 4 months or so, if experience with nationwide NOW accounts in 1981 is any guide. Moreover the possible introduction of interest-bearing business transactions accounts would also involve further time for adjustment. The magnitude of adjustments--some of which will produce inflows to and some outflows from M1--cannot be readily predicted nor estimated as they occur, as explained earlier. Thus, there is good reason for not providing numerical M1 target ranges in February. While there is a possibility that the net effect of the funds shifts on M1 might not be extremely large, it is also possible that institutional pricing policies will lead either to domination by NOW accounts (which would increase M1 substantially) or to domination by MMDAs (which would decrease M1 substantially).

There is, however, an advantage to retaining some connection of policy to M1, even in a difficult transition period. It might tend to bolster public confidence in the continuity of anti-inflationary policy--which has had M1 as a major focus--and it would more clearly retain a basis for the possible use of M1 as a target later. Thus, the February report on longer-run targets might include a statement to the effect that the Committee intends to monitor developments affecting M1 as they may assist in interpreting movements in the monetary aggregates as a group. By mid-year, the more immediate transitional problems might be behind us, and the Committee could also indicate that it would re-evaluate the feasibility of providing a numerical range for M1 at that time.

Nonetheless, the complications surrounding M1 next year would seem to argue for placing much less weight on it as a guide to short-run open market operations, certainly in the early part of the year, than

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it had prior to October 1982. That suggests, of course, more weight than in the past be given to broader aggregates next year; or consideration could also be given to even narrower aggregates. We would suggest reserving judgment about the role of M1 for the years beyond in view of uncertainties about ultimate adaptations of institutions and the public to deregulation.

Narrower monetary aggregates

The monetary base is often mentioned as a possible intermediate target (as well as an operating instrument). As an intermediate target, it has the virtue of being more directly under the Federal Reserve's control than the broader aggregates. It also may tend to show less variability relative to a target band because of the comparative predictability of currency and the very heavy weight of currency in the aggregate (about 75 percent).

On the other hand, the demand for the base is essentially derived from demands for other monetary aggregates (linked through required reserve ratios varying from 100 percent for currency to zero for most money-like assets). Thus use of the base as a target would still involve the Committee in judging, implicitly if not explicitly, appropriate growth in various money supply measures over the longer-run. Moreover, judgments about the significance of emerging short-run movements in money supply would also have to be made since rigid adherence to a base target could involve substantial, and often undesirable, interest rate movements. Whether the implied automatic response of money market conditions to deviations in the base from some path for it should be permitted to show through would seem to depend on the extent to which they are caused by currency, M1, broader aggregates, and/or various mixes in the aggregates and their components.

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There may be more to be said for the nonborrowed base as an intermediate target than for the total base.^{1/} As with other aggregates, use of the nonborrowed base would permit interest rates to respond automatically in some degree to changes in demand based on a strengthening or weakening of economic activity. But the nonborrowed base would not involve the same risk of substantial interest rate variations as the total base. Because of the borrowing cushion, varying demands for currency and deposits that affect demands for the total base could be accommodated in part without a substantial departure from the nonborrowed base guideline.

Policy oriented toward either a total base or a nonborrowed base target could be implemented in the short-run through a nonborrowed reserve operating procedure, which would eliminate the effect of currency disturbances on market rates in the short-run. Discount rate actions would become a more critical element in policy operations under a nonborrowed base guide since the alternative means of affecting money market conditions through discretionary changes in the nonborrowed reserve operating path would tend to move the nonborrowed base away from target.

While we would view the nonborrowed base as economically a more appropriate very narrow aggregate than the total base, it too has disadvantages. Whether the concept of the nonborrowed base as an intermediate target (either instead of or in addition to standard monetary aggregates)

^{1/} The nonborrowed base represents the true "outside" money provided to the economy by the monetary authority. The total base is not entirely outside money because part of it derives from borrowing of transactors--i.e. depository institutions--which are endogenous to the economy and whose borrowing depends on profit opportunities in the economy.

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has sufficient public understanding or credibility at this time to be an effective means of communication is open to question. Moreover, using the nonborrowed base, or for that matter the total base, as a target could run into difficulties because a public impression that they are indeed readily attainable might conflict with the need to depart from target as economic circumstances and the behavior of more standard aggregates dictate.

Broad money aggregates (M2 and M3)

As targets for next year, the broad money aggregates will also be affected by transitional adjustments to deregulation. M2 and M3 will be influenced in the degree that the new money market and super-NOW accounts attract funds from market instruments. M2 additionally would be affected in an upward direction if the money market account, which is open to businesses, attracts funds from large time deposits. M3, on the other hand, might show little change on balance, depending in part on the extent to which institutions adjust large time deposits in response to inflows of other funds. In setting targets for broad aggregates, therefore, some recognition would need to be given to the likelihood that their growth is likely to be affected, particularly in the case of M2, by structural shifts.

It may, nonetheless, be feasible for the Committee to stipulate a numerical target range for M2 (and more clearly so for M3) in February. The behavior characteristics of these aggregates would not seem to be altered as much as M1. And the effect on M2 growth for the year of the forthcoming shifting of funds may not be so large as to require a substantial increase in the upper bound of the present M2 range, though these shifts make it quite

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likely that actual growth will not be reduced much, if at all, from this year's pace. However, the annualized growth rate for M2 could be rather substantially affected in an upward direction in the early months of the year when the bulk of fund shifts presumably will occur.

Even apart from next year's special problems, the broad aggregates as monetary targets are complicated by being a mixture of transactions, liquidity, and investment funds on much of which market-related interest rates are paid. By now about 70 percent of the nontransactions component of M2 bear a market-related interest rate, up from less than 5 percent in mid-1978.

If the long-run target for a broad money measure turns out to be inappropriate owing to unexpected shifts in behavior toward money, the penalty exacted on the economy as a result of adherence to the target will be much greater because market interest rates will have to move more rapidly than otherwise in a direction inconsistent with broader economic objectives to keep to the target in the face of demand shifts. On the other hand, if spending moves unexpectedly, while broad money demand is reasonably stable, adherence to such an interest-inelastic money target will more quickly set off compensating interest rate movements. To be sure, there is the possibility that these movements could be unduly disturbing to financial markets. Thus, a certain caution and need for flexibility seem called for if broader aggregates assume a more important policy role--as would also seem appropriate in employing M1 as a policy instrument under circumstances when its interest elasticity has been further reduced.

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When an interest-insensitive aggregate deviates from path, the usefulness of the present nonborrowed reserve operating procedure in cushioning money markets becomes enhanced relative to a total reserve procedure.^{1/} However, targeting on the broad M's faces the problem that they are more remote from any reserve operating handle. The bulk of M2 and M3 is nonreservable, and the overall ratio of required reserves to M2 averages only about 2 percent.

Because of this low average requirement, some modification of the current nonborrowed reserve techniques might be considered to avoid an excessive cushioning of money markets in face of deviations from target, which would be particularly important when movements of the broader aggregate are mirroring or anticipating developments in economic activity. Under current procedures, a given percent deviation in M2 from target would tend to generate about the same change in borrowings and therefore about the same automatic effect on market interest rates as was the case with an equal percent deviation of M1 from target under the old procedures. But in fact, the percentage monthly deviations of M2 around trend, or relative to targeted monthly growth paths, has averaged only about three-fifths that of M1. Hence, on average, deviations in M2 might be expected to generate smaller automatic fluctuations in money market rates on a monthly basis than was the case under the M1 approach. Since given interest rate movements would, in turn, have less impact on bringing M2 back to target, in view of its much lower interest elasticity, the desirability of a somewhat more responsive mechanism in targeting M2 may be suggested.

^{1/} By the same token, with a target such as M2, it may be desirable to aim at returning to the long-run target path, once off, somewhat more slowly than had been the case with a more interest elastic narrow money measure.

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The automatic money market response to a deviation in M2 from target could be enhanced by using a "shadow" reserve requirement of, say, 3 percent (instead of 2 percent) for purposes of deriving the borrowing implied by deviations of M2 from target. This is somewhat arbitrary, of course. Another approach would be to make judgmental nonborrowed reserve adjustments--or discount rate adjustments--rather more frequently than has been typical with M1. Efforts to amplify money market response to short-run deviations of broader money from path would, particularly in view of the interest-inelasticity of these aggregates, help to reduce the risk of cumulative departures over time from longer-run targets. However, in the process one would need to guard against over-adjustments of market rates to simply transitory disturbances or to structural demand shifts.

A question may be raised in this context about whether it might not be a better operating procedure to take the federal funds rate, rather than nonborrowed reserves, as a day-to-day target for guiding open market operations. There are two advantages to a nonborrowed reserve procedure. As noted, it encourages some degree of automatic adjustment in money market conditions to evolving changes in money growth, thus probably increasing the odds that Committee targets will be attained over time. Second, reserve paths make it clear that short-term interest rate changes are the product of market demands interacting with a policy-determined supply.

Other aggregates

At a certain level of abstraction, broad credit aggregates, or over-all measures of liquidity, might be thought to be no less useful as

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intermediate targets for monetary policy than are conventional money measures. The market for credit appears to be at least as "important" as the market for money. And developments in both markets can exert effects on the nonfinancial variables which represent the basic objectives of policy.

A relatively close empirical relationship has often been observed between GNP and measures of credit and liquidity. However, this relationship does not necessarily mean that causation runs dominantly from credit to GNP. Sophisticated econometric work in the academic world and at the Board provides mixed results and appears highly sensitive to statistical techniques, equation specifications, and sample and post-sample periods. Moreover, a theory and a large body of empirical work involving separate demand and supply relationships has not yet been developed to buttress a role for credit as an intermediate target.

Targeting on credit also involves certain practical problems, particularly if the target is taken as a guide for short-run open market operations. Data flows are not timely, have considerable gaps, and are subject to substantial revision. As targets, total credit or broad measures of liquidity would be difficult to control, in part because their behavior would seem to depend more on GNP than on Federal Reserve operating policies. To be sure, this is also true, though probably to a lesser degree, for broad money aggregates. But in addition, there is the risk that persistent deviations of credit from "target" will generate more support for credit controls and related measures (such as use of reserve requirements and the discount window to allocate credit).

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While the usefulness of credit as a target may be subject to question, making available the Federal Reserve's expectations about the behavior of total credit may provide useful additional information regarding economic and financial conditions thought to be associated with other announced monetary policy guides. In the past, bank credit has been the only credit variable for which the Committee has announced annual growth rate ranges. Bank credit has generally been given as an "associated range" after specification of the monetary targets. Since over-all credit flows would be less distorted than bank credit by sectoral shifts, it would seem that supplanting, or complementing, bank credit with a total credit measure (such as growth of domestic nonfinancial debt) would communicate more relevant information. In particular, movements of total credit in relation to expectations may provide more help than bank credit in evaluating policy responses to the behavior of monetary aggregates. However, since total credit would appear to be relatively remote from a reserve operating instrument and since data flows have many gaps and are not timely, the Committee may wish to express its expectation about total credit in such a way as to make it clear that total credit does not have the same role as a short-run operating guide for policy as monetary aggregates have had.

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PART II

A. M1 as an Intermediate Target

Potential Regulatory Impacts on M1 in 1983. Recent actions by the DIDC establishing a new money market deposit account (MMDA) effective December 14, and a so-called "super-NOW" account, effective January 5, appear to represent major regulatory developments affecting M1. The MMDA account is to be free of interest rate ceilings, has a \$2,500 minimum denomination, and allows six automatic transfers per month (including telephone transfers) to third parties. Three of these may take the form of checks. This account is to be free of reserve requirements for personal depositors and to be reservable at the nonpersonal time deposit ratio for other accounts. The super-NOW account is to be available (at least for the present) only for personal depositors, is to be reservable at the transaction reserve requirement ratio, and is subject to a \$2,500 minimum denomination. However, it is to have unlimited third-party transfer facilities and, like the MMDA, is to be free of interest rate ceilings.

These new accounts are likely to generate a complex and hard-to-predict pattern of flows that will affect, at least in some degree, the various money measures. Obviously the super-NOW account has the potential to induce positive net flows into M1 (assuming it is included in that measure) from personal savings and small time deposits, money fund accounts and other instruments included in M2, but not in M1. Such flows will of course increase M1 but will have no effect on M2. A limited movement out of market instruments into the super-NOW is also likely, which would, of course, increase all the money measures to some extent.

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The effects of the MMDA will be different, and with respect to M1, opposite in sign from that of the super-NOW. Despite the unlimited transfer feature of the super-NOW, there are two considerations that will make the MMDA a factor in the pattern of funds movements affecting M1 and the other money measures. First, at least for the present, the super-NOW is not available for businesses, while the MMDAs are available to all depositors. Second, depending on costs, competitive pressures and the marketing strategies of individual institutions, the rate paid on the MMDAs might be expected to be more attractive than that paid on super-NOWs. The MMDA's more limited transfer facilities, and therefore transfer costs, together with its lower or zero reserve requirement "tax" should permit higher yields to be offered on them relative to the yields on super-NOWs.

In view of these considerations, some funds now in conventional transactions accounts may shift, not into super-NOWs, but into the MMDAs, thus tending to depress M1. Some of this money could represent savings-type deposits currently lodged in conventional NOW accounts.

In addition, some funds may be shifted out of the transaction component of conventional transaction deposits into MMDAs rather than into super-NOWs in response to the higher interest return. Such a shift of funds would arise if the public used the new account as a cash management tool to reduce its holdings of true transaction balances. With the limitations of transferability established by the DIDC, transfers of funds between the new account and conventional M1 accounts would seem to allow the public to reduce the level of M1 needed to conduct a given volume of transactions. This process might be made still more effective if banks set up new kinds of sweep-arrangements linking a transaction account (on which

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checks are written) to the new MMDA account (into which funds are deposited). A final source of shifts out of conventional M1 accounts into the MMDA may arise because this new account is, to a limited extent, a transaction instrument itself. Use of the new account to write a few large checks--such as mortgage or credit card payments--would mean that some transaction funds deposited in the new account would never have to pass through an M1 balance.

All of this seems to add up to a potentially significant but highly uncertain reduction in the demand for conventionally defined M1 as a result of shifts into MMDAs. The extent to which the new MMDAs will in fact depress M1, thus offsetting the expansionary effects on M1 of the super-NOW account is, to repeat, highly uncertain and crucially dependent on the pricing policies institutions adopt with respect to the two new accounts. It will also probably depend to some extent on the general level of interest rates. The higher are market rates, the larger will be the effect of reserve requirements on the spread of yields on MMDAs over super-NOWs, tending to move funds from super-NOWs into the MMDAs and other instruments not included in M1. So the effect of M1 may be less positive (or more negative) at high market rates than at low rates. On the other hand, at market rates close to those of current NOW accounts, movements into both types of new accounts could be quite limited. Again, the most important thing to emphasize seems to be the uncertainties attached to the near-term movements in M1 as a result of the introduction of the two new types of accounts.

Advantages and Disadvantages of M1 in 1983. The principal adverse effect of these potential regulatory impacts on M1 in 1983 is that they could shift the demand for M1 relative to given interest rates and GNP by amounts that will be, as noted, extremely difficult to predict.

The task of setting an M1 target range for 1983 consistent with economic objectives will thus be greatly complicated.

One approach to this problem would be to rely on a "shift-adjusted" measure of M1, using techniques developed when NOW accounts were introduced nationwide in 1981. However, estimating the size of the necessary adjustment for the new instruments could be far more difficult than for NOWs in 1981. The new instruments apparently will be a close substitute for a wide variety of liquid instruments issued by depository and nondepository institutions, whereas conventional NOWs appear to have been a close substitute only for demand deposits and passbook savings accounts.

Another disadvantage of shift-adjusting M1 for the new account is that additional transition problems could develop during the year. The DIDC could authorize super-NOWs for business depositors, as is currently under consideration, possibly sharply increasing the demand for M1.

Despite these problems, M1 would seem to retain some of its past advantages as an intermediate target. First, much of the Federal Reserve's experience with monetary targeting centers on M1. The System's stated goal of reducing inflation by gradually lowering growth in money has been viewed within the System, and has been communicated to the public, in good part in terms of M1.

A second advantage of M1 next year is that it will continue to be more directly related to Federal Reserve instruments on the supply side than M2 and the other broader aggregates, including the various liquidity measures, broad credit measures and nominal GNP. All the deposit components of M1 are (or eventually will be) subject to a considerable and substantially uniform reserve requirement, a property that is true of no other money stock or credit aggregate. In addition, M1 even next year may remain somewhat

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more responsive to changes in money market interest rates than M2 and M3, and may well be more promptly responsive than the other broad liquid asset and credit measures about which far less is known. The broader aggregates have flexible own rates of return which tend to move in concert with money market rates to offset partially the effect of changes in market rates on the public's demand. Although this also will be true of the super-NOW component of M1 in 1983, the proportion of M1 paying market related yields will probably be smaller than that of the broader aggregates.

M1 as an Intermediate Target When Fully Deregulated. In addition to the transitional impacts on M1 caused by the new instrument, there are other, more permanent potential impacts on M1 that may develop once depository institutions can pay a competitive, flexible yield on the deposit component of M1. These potential impacts may be substantial as soon as 1983, since the flexible rate, unlimited transfer super-NOW account will be available in January for personal depositors and perhaps for others later in the year.

There are several ways in which the deregulation of yields on M1 may affect M1 targeting in the long-run. First, after deregulation, M1 may no longer be held predominantly for its unique transaction services, but may be held to a greater extent than now as an investment vehicle. Thus, deregulation might induce a more substantial mixing of investment and transaction motives for holding M1. If this occurred, M1 would become a closer substitute for non-checkable financial assets than at present. As a consequence, the demand for M1 might be more highly responsive to changes in the "normal" spreads between its own rate and rates paid on other instruments. This would mean that changes in M1 could be dominated at various times by shifts in the composition of the public's portfolio, and only

incidentally by changes in income and prices. Thus the public's demand function for M1 could become less "stable," detracting from its usefulness as a guide for monetary policy.

The degree to which M1 would remain predominantly a transaction instrument is an empirical issue that depends in part on banks' pricing strategies as they affect the spread between yields on transaction accounts and yields on those liquid assets that are not included in narrow money. The yield on transaction accounts may be held down to some extent, as noted, by the costs incurred by banks in servicing such active instruments--though these costs could be reflected in the explicit pricing of per-transactions costs rather than as discounts relative to yields on market instruments. In any event, the risks borne by banks when they borrow through an instrument payable on such short notice and the cost of reserve requirements on transaction accounts could hold their yields below those on non-reservable money market investments.

It will not be possible to tell how households will react to whatever spread emerges until they actually begin to earn competitive rates of return on transaction accounts. However, the behavior of corporate demand deposits in the 1970s may suggest that corporate transaction and investment demands have largely remained distinct even though they are apparently paid a flexible implicit return on demand deposits at competitive levels. This competitive yield has been below yields on money market instruments because of reserve requirements and other costs. Interviews with corporate treasurers conducted by the Board staff suggest that as a result of this yield spread, large corporations attempt to minimize their inventories of demand deposit balances, given the volume of their transactions, the

level of transaction costs, and the level of cash management technology.¹ Liquid funds in excess of this transactions demand are put into higher yielding money market instruments. In this way, the transaction and investment motives have been effectively separated. Whether this evidence may be applied to consumers, who, it may be argued, will have a narrower range of cash management options, can be questioned. By the same token, though, whether consumer investment balances lodged in M1 will be highly responsive to changing spreads between yields on M1 and other financial assets also can be questioned. Even so, the possible problem of demand instability stemming from an admixture of transaction and investment funds in M1 cannot be dismissed, especially in light of the different motives affecting the demands for each type of balance.

The removal of interest rate ceilings on M1 could tend, on the other hand, to enhance the stability of the demand for that aggregate after a transition period by reducing the rate of financial innovation. Such innovation has been a major source of instability in M1, by allowing the public to conduct transactions with lower levels of checkable balances. Interest rate ceilings on the transaction instruments in M1 have been a major inducement to such innovation. Thus, there is most likely a trade-off between interest rate deregulation and financial innovation. Although deregulation by itself involves considerable uncertainty for policy, it may also contribute to a lasting reduction in uncertainty by lowering the probability of future financial innovation. This could be a major advantage of deregulation, since innovation caused the most dramatic episode of instability in M1 demand in the U.S. over the last decade (in 1975-76).

¹/ See William J. Baumol, "An Inventory Theoretic Approach to the Demand for Money", Quarterly Journal of Economics, 1952.

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Even if the demand for M1 remains relatively stable under interest rate deregulation, other problems could detract from the usefulness of M1 as an intermediate target. These problems concern possible permanent changes in the responsiveness of M1 to movements in the general level of market rates of interest. The significance of this depends importantly on how sensitively depository institutions adjust their offer rates on checkable deposits in response to movements in market yields. As depository institutions adjust deposit rates to changes in market rates, the spread between them will vary much less than do market rates. Since it is this spread that affects the public's demand for M1, given changes in market rates will be associated with smaller changes in M1 than in the past, even recognizing that the existence of the proportional reserve requirement "tax" allows the size of the spread in basis points between market rates and "own" rates to vary positively, to at least some extent, with the level of market rates.

With variations in the level of market interest rates having a smaller effect on M1, movements in the aggregate might well be determined primarily by changes in income and prices. This might mean that M1 would be more closely associated with movements in income and prices making it a better intermediate target. It might also mean, however, that M1 would no longer be a leading indicator of these ultimate goals of policy. The loss of these "structural" lags could detract from the usefulness of M1 as an intermediate target.

A lower responsiveness of M1 to market interest rates also could involve monetary control problems. With a flexible own rate of return on M1, it may take larger changes in market rates to bring M1 back to its target once deviations occur. Thus a given degree of precision in short-run monetary control may involve more substantial interest rate volatility than

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at present. This situation implies a problem in using M1 as an intermediate target to the extent that the volatility necessary for close M1-control disrupts credit flows and real economic activity. Such disruptions might be sufficiently large to constrain the Federal Reserve from attempting to control M1 closely in the short run.

However, this problem would be mitigated to the extent that the public is temporarily willing to hold quantities of transaction balances that deviate from its underlying demand. Since there are transactions costs associated with portfolio adjustment, the public will not attempt to eliminate unwanted M1 balances from its portfolio immediately. Thus the public may be willing to change its money holdings in the short run with little or no change in the interest rate inducement to do so. This further implies that the Federal Reserve may be able to alter the supply of M1 without inducing the large changes in interest rates necessary to change the public's underlying demand. However, whether this will in fact be a significant phenomenon depends on how rapidly holders attempt to work off unwanted balances. Furthermore, many economists argue that the Federal Reserve's control mechanism is not direct, but works indirectly through interest rate demand channels, which casts added doubt on the possibility that the interest rate variation implied by close monetary control could be damped.

While these various potential problems clearly do suggest the probability that the value of M1 as a target will be significantly reduced in 1983 and perhaps also in the longer run, the usefulness of M1 as an intermediate target should be evaluated in relation to the usefulness of alternative intermediate targets. The following discussion evaluates these alternatives.

B. Broader Monetary Aggregates: M2 and M3

Uncertainties regarding the behavior of money during and after the deregulation of deposit-rate ceilings might be less acute for the broader monetary aggregates than for M1. Such an expectation lay behind the FOMC's decision this fall to place considerably more emphasis, at least temporarily, on M2 and M3 relative to M1. The Committee believed that the broader aggregates would be less distorted than M1 by the shifting of funds out of maturing ASCs starting in October and then into the MMDA beginning in mid-December. On previous occasions as well, when special influences have rendered M1 more difficult to interpret, the Committee's Directives have given greater weight to the broader monetary aggregates as guides for conducting monetary policy.

Despite the advantages the broader monetary aggregates have offered on these occasions, regulatory changes and financial innovation also have significantly, albeit more gradually, altered their properties as intermediate targets of policy. Indeed, many of the aforementioned problems potentially confronting M1 in a deregulated financial environment already apply to a considerable degree to the broader measures. After assessing the degree of distortion to M2 and M3 likely to arise next year from the introduction of the MMDA and a super-NOW account, this section will then examine more general issues involving the controllability of M2 and M3 and their desirability as intermediate monetary policy targets.

Anticipated Distortions to M2 and M3 in 1983. The transaction and other liquidity features of the MMDA and the super-NOW--particularly if the latter account is permitted for businesses--are likely to attract some funds from non-M2 assets such as large CDs, term Eurodollar deposits

and Treasury bills that even now bear market-determined yields.¹ Thus, it seems likely that M2 growth will be raised in some degree by the new accounts. Indeed, M2 growth could well be affected by more than M1 growth (since the impacts on M1 from MMDA outflows and super-NOW inflows would tend to be in offsetting directions.

The direct effect of flows into the new accounts from non-M3 sources, tending to raise M3 growth, could be about offset by an induced decline in the net large CD and net RP components of M3. The latter declines could arise in large part as depository institutions reduce their issuance of these managed liabilities in response to the infusion of core deposits in the form of the new accounts. (To the extent that the public's reduced demands for open market instruments lead to additional credit provided by financial intermediaries, M3 might be a little higher than otherwise.) These considerations suggest that the new accounts are not likely to have a major impact on M3 growth next year.

This analysis suggests that target ranges for M2 and M3 next year, and particularly M2, would need to be set in light of deposit shifts engendered by the newly authorized accounts. That inevitably adds an additional degree of uncertainty to the ranges' value as a guide for monetary policy. An option that would rely less on advance projections of the impact of the new accounts would be to announce ranges for a "shift-adjusted" measure of M2 for 1983 and to remove from M2 updated estimates of MMDA and super-NOW funds originating from non-M2 sources as the year progresses. Unfortunately, such estimates could only be based on rather spotty and unreliable information,

^{1/} A ruling by the DIDC permits institutions to issue MMDAs with minimum fixed maturities from zero to 30-days. At present, most domestic time deposits have a 14-day minimum maturity, with the 7- to 31-day account the exception.

and would be subject to at least as much error as an attempt to shift adjust M1.

General Characteristics of M2 and M3. Once the shifting to the new MMDA and other accounts has run its course, the characteristics of M2 and M3 might be expected to stabilize. Some insight into this situation can be obtained by examining the ways in which M2 and M3 have, at this point, been altered by the spate of regulatory changes and financial innovations of recent years. The authorization of new types of small time deposits, together with the growth of MMMFs and RPs, have caused the share of the nontransaction component of M2 bearing market-related yields to rise markedly since mid-1978, when the MMC was authorized. While less than 5 percent of the nontransaction component of M2 bore market-related yields at that time, by mid-December of this year this figure has already reached about 70 percent. The introduction of the MMDA should, by late 1983, raise this proportion to the neighborhood of 80 percent, assuming this account is not included in M1.

A substantial reduction in the responsiveness of this component of M2 to changes in the level of market interest rates has emerged. The tendency for rates paid on these monetary assets to move in response to changes in rates on market instruments prevents the spread of market yields over those on the nontransaction component of M2 from varying as much as previously. Whether the sensitivity of the nontransaction component to variations in these interest spreads has changed since the mid- to late-1970s is less clear. Assuming this relationship has remained invariant over time, estimates of the present elasticity of the nontransaction component with respect to movements in short-term market interest rates may be obtained fairly simply from a set of econometric equations--including a demand function fit with

data covering a fairly long sample period beginning well before the introduction of MMCs. This first equation in the set relates the nontransaction component of M2 both to a scale variable, like income or wealth, and to the spread of a market interest rate over a representative rate paid on assets within this component. Because of lagged or incomplete adjustments in such own rates, this spread varies over time. The second equation in the set--fitted to data after mid-1978--relates movements in the representative market-related own rate for the nontransaction component to movements in short-term market interest rates. Other equations relate these market interest rates to the federal funds rate. The computation of the overall interest elasticity of M2 at any point in time requires weighting the elasticity of the nontransaction component and the independently-determined elasticity of M1 by their shares in total M2.

Such an approach using monthly data suggests that given the current composition of M2, a one percent change in the federal funds rate affects the nontransaction component of M2 over a month in percent terms by only about 1/8 as much as M1, and over the long run of a year or so by only about 1/5 as much as M1.^{1/} Because M1 is a relatively small fraction of M2, these

^{1/} The monthly elasticities with respect to the federal funds rate for the nontransaction component of M2, M1 and M2 were estimated to be -.0025, -.02, and -.0067, respectively. The long-run figures are -.024, -.11, and -.046. These estimates are taken from Helen T. Farr, "Elasticities of M1 and M2 in Monthly and Quarterly Models," Board of Governors memorandum, December 2, 1982. Econometric relationships estimated by Board staff from quarterly data suggest a larger interest sensitivity of the nontransactions component, and of M2, than implied by these monthly estimates, although there is a suspicion that the quarterly relationships have overestimated this effect. The scale variable employed in the monthly equations for the nontransactions component of M2 is personal income; the evidence suggests a fairly rapid reaction of the change in this part of M2 to a change in personal income. In the quarterly model, the scale variable is a measure of the public's holdings of overall deposits and credit market instruments. Similarly, there is a rapid reaction to changes in this measure of financial wealth according to this quarterly specification.

estimates mean that the interest elasticity of M2 is now only about 1/3 that of M1 over a month and about two-fifths that of M1 over the long run. It should be noted, moreover, that to the extent that the MMDA draws funds both out of M1 and out of instruments not included in either M1 or M2, the proportion of M2 represented by the nontransaction component should rise. Thus the responsiveness of M2 to a given change in market rates should decline further. Furthermore, introduction of a super NOW account will reduce the interest elasticity of M1, and hence further reduce that of M2 as well. Another econometric method provides additional evidence that the interest elasticity of M2 has already fallen sharply since the introduction of money market certificates in mid-1978.^{1/}

Controllability. The interest elasticity estimates are instructive, despite the uncertainty that surrounds them and despite the fact that they have to be modified in the future. They suggest that, even though quite sharp jumps in interest rates would be needed to offset fully a surge in M1 demand over a month, the interest rate impact of countering an equal percentage jump in the demand for M2 would be about three times greater.^{2/} Even over a year's time, interest rates would have to move about 2-1/2 times as much to offset a change in the demand for M2 compared to the same percent change in M1 demand, abstracting from feedback effects on income.

^{1/} This long run elasticity of M2 has been estimated to be -0.3 during 1960 through mid-1978 and -0.06 during mid-1978 through 1981. See John P. Judd and John L. Scadding, "Financial Change and Monetary Targeting in the United States," Federal Reserve Bank of San Francisco memorandum, November 1982.

^{2/} As discussed more fully below, the monthly percentage variation in M2 around its trend has averaged only three-fifths that of M1. Thus, rigidly holding M2 on a target path month-by-month would on average imply about 1-1/2 to 2 times more monthly volatility of short-term interest rates than would doing so with M1.

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Given the comparative unresponsiveness of its nontransaction component to changes in market interest rates, particularly in the very short run, it seems clear that controlling M2 over a reasonably short time horizon depends in considerable part on affecting its M1 component. And of course an impact on M1 is not reflected dollar for dollar on M2 to the extent that movements into or out of M1 reflect shifts out of or into the nontransaction component of M2. These considerations raise questions about the adequacy of the present procedures involving nonborrowed reserves that are used to control M2. With the non-M2 component of M3 composed of large time deposits, term RPs and institution-only MMMFs, all of which have variable yields, these questions would apply with even more force to a consideration of control procedures for M3.

Because the bulk of M2 is not subject to reserve requirements, the ratio of required reserves to M2 is only around 2 percent, in contrast to a ratio of total required reserves to M1 of somewhat under 10 percent.^{1/} The operating procedure now used for adjusting reserve paths between FOMC meetings in response to variations in M1 and in the nontransaction component of M2 can usefully be examined abstracting from any explicit willingness expressed by the Committee in the Directive to tolerate over- or under-shoots of M2 from its short-run target. In effect, all components of M2 are treated as if they have a 2 percent reserve requirement. Thus, the procedure implies that a \$100 deviation of M2 from its intermeeting target path will in principle

^{1/} The average ratios tend to vary over time with the composition of deposits and the position of institutions in the phase-in process to the new MCA requirements. These and subsequent numbers in the text are presented in rounded form for simplicity of exposition.

give rise to only a \$2 change in discount window borrowings in the same direction.^{1/}

One feature of this procedure is that because M2 is almost five times the level of M1, a given percentage deviation of M2 from its target would automatically induce a dollar change in borrowings similar to the dollar change resulting from an equal-sized percentage deviation in M1 from its target under the old procedures. A similar adjustment of short-term interest rates therefore also would be involved. However, as has been pointed out above, the same change in interest rates will, in the short-run, have less than half the effect on the growth of M2 as on the growth of M1. Accordingly, the present control procedure on average would allow more slippage in M2 from its short-run growth rate target than previously was the case for M1 if the underlying percent deviations of demand for these aggregates from their targets tended to be of similar size.

In fact, however, the month-to-month variability in percent terms of M2 growth has only been about three-fifths as large as that of M1 since the mid-1970s. Moreover, the mean absolute deviations of M2 growth from the Committee's current month and one month ahead target rates since October 1979

^{1/} For example, suppose the \$100 overshoot of M2 from target is equally divided between overruns of M1 and the nontransaction component of M2. The \$50 overshoot in M1 from its target path--arising, say, from a surge of transaction deposits at member banks--generated under the old procedures a \$5 increase in both required reserves and the implied level of borrowing. With the present procedures concentrating on M2 targeting, only a \$1 increase in borrowing is allowed, other things equal, because the nonborrowed reserve path is raised by \$4. Thus, the procedures have been adapted so that M1, in effect, has a 2 percent, rather than a 10 percent, reserve ratio applied to it. By contrast, the \$50 overshoot in the nontransaction component of M2, which is virtually free of reserve requirements, is countered by an additional reduction in the nonborrowed reserve path of \$1, thereby inducing an additional \$1 increase in the intermeeting average level of borrowed reserves, given the unchanged demands for total reserves.

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also have been about three-fifths as large as those of M1 growth. Therefore, since the automatic interest rate effects of a given percent deviation in M2 appear to be about the same as they were for an equal percent deviation in M1 under the old procedure, and since deviations in M2 have historically been smaller in percentage terms than deviations in M1, it follows that the new M2-oriented procedures would tend to give rise to less monthly variability in short-term market interest rates compared to the old M1-oriented procedures.^{1/}

Whether as much or more variability should be risked depends in part on the danger that short-run deviations will tend to cumulate, even though the deviations are relatively small in any given month. Given its more stable and predictable demand on a month-to-month basis, M2 growth might on average stay closer to its short-run targets than was the case for M1. However, the risk of a cumulative divergence from long-term targets and the interest inelasticity of the broader aggregates argue for a procedure that leads to reasonably sizable short-run interest rate responses. Indeed, in that context it appears that open market policy could be carried out as if the required reserve ratio were 3 percent rather than the 2 percent implied in the current M2 procedure without risking any more monthly instability on average in money market conditions than was automatically induced under the old M1 targeting procedures. Of course, as the interest sensitivity of both components of M2 continue to fall over time with further deposit-rate ceiling deregulation, increasingly substantial fluctuations in market rates

^{1/} In both cases, these "automatic" interest rate effects exclude impacts associated both with special adjustments to the nonborrowed reserve path in response to divergences of total reserves from target and with changes in the discount rate.

would be required to hold M2 within a given degree of tolerance to its long-run target over time.

Advantages and Disadvantages of M2 and M3 as Intermediate Policy Targets. The foregoing leaves unresolved the basic question of how well targeting on M2 and M3 will foster attainment of ultimate economic objectives. A relatively interest-inelastic demand for the intermediate target has certain advantages for stabilization policy when shifts in spending behavior occur, assuming the implied interest rate variations do not excessively disturb the functioning of financial markets. However, shifts in the demand for the monetary aggregate relative to nominal GNP create greater problems when interest elasticity of demand is low since they tend to generate relatively larger interest rate movements and therefore relatively larger unwanted effects on GNP. Both conceptual considerations and historical experience raise questions about the longer-run stability of the demand for M2 and M3.

M2 and M3 include a heterogeneous collection of assets with varying maturities, some quite long. Moreover, the statistical relations between M2 and other important macroeconomic variables have been less predictable during the last two decades on average than the same relations for M1.^{1/} The performance of equations using M3 has been still less satisfactory, as this aggregate has been affected over time by changing liability strategies of banks and thrifts. Recognition of the sweeping alterations of recent years in the characteristics of various accounts making up M2 and M3 raises the risk that even these fairly unreliable econometric equations may be in the process of breaking down.

^{1/} See, for example, Edward Offenbacher and Richard Porter, "Update and Extensions on Econometric Properties of Selected Monetary Aggregates," Board of Governors memorandum, April 7, 1982.

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To be sure, the risk of distortions to M2 and M3 arising from periods of disintermediation and reintermediation induced in the past by deposit rate ceilings may have lessened appreciably. Indeed, during the three years 1979 through 1981 the largest annual change in the velocity of M2 on a fourth quarter to fourth quarter basis was only 1.2 percent (as shown in Table 2) while the largest change for M3 was -1.6 percent, despite wide swings in interest rates. These small variations in velocity might have led to the view that the reduced interest sensitivity of these two monetary aggregates had rendered their velocities reasonably predictable in advance. However, this year's experience--during which the velocities of M2 and M3 are expected to fall by around 5-1/2 and 6 percentage points, respectively--is a cause for caution.

On the other hand, placing primary emphasis on M2 and M3 as intermediate targets, but at the same time recognizing the need for a degree of flexibility, has certain advantages. The view is widely accepted that a central bank's primary task should be to control the stock of money to prevent "too much money from chasing too few goods." These broader measures of money are now familiar to participants in financial markets and many others. Using M2 and M3 is consistent with present legislation embodied in the Humphrey-Hawkins Act of 1978. Moreover, reliable and timely sources of data are in place and the Federal Reserve has congressional authority to maintain this quality.

C. Broad Financial Asset Aggregates: L, Divisia L and the Debt Proxy

Conceptual Underpinnings. The Federal Reserve's official measure of total liquid assets (L) has been suggested as a potential intermediate

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target of monetary policy.^{1/} The main rationale for employing this measure derives from the intellectual tradition exemplified by the Radcliffe Report in the late 1950s.^{2/} The idea is that the more liquid the assets of economic agents, the more willing they will be to spend and the greater the ease of exchanging financial assets for goods and services, and hence the more expansionary will be monetary policy. On the other hand, it needs to be recognized that liquid asset holdings can be influenced by investment motives, given attitudes toward risk and the outlook for interest rates. For other reasons they may not be indicative of liquidity in general. For instance, a corporation may come to be more liquid after it has issued long-term debt and paid down short-term debt (thereby reducing liquid assets in the hands of the public).

More recently, a measure of L giving various components different weights--called "Divisia L"--has been advanced as superior to the standard measure. It is designed to measure the amount of monetary services in the economy. The difference between the highest yielding market interest rate, called the "benchmark rate," and the own interest rate on each component of L is viewed as the pecuniary sacrifice willingly incurred by asset holders in return for the implicit monetary services flowing from the asset. This rate differential is in fact taken as a measure of the value of these

^{1/} The L measure consists of M3, savings bonds, Treasury securities of less than 18 months remaining maturity, bankers acceptances, commercial paper, and term Eurodollar deposits of U.S. residents, with the items measured net of holdings of various governmental units and money stock issuing institutions.

^{2/} The Rt. Hon. the Lord Radcliffe, C.B.E., Chairman, Committee on the Working of the Monetary System, Report, Presented to Parliament by the Chancellor of the Exchequer by Command of Her Majesty, August, 1959 (London, Her Majesty's Stationary Office).

services provided per dollar of the component. The weights for the growth rates of each component are simply the relative share of total monetary services yielded by each component (the value of services per dollar of a component times the dollars held in the component all divided by the sum of these figures for all components.)

The translation of these concepts to an empirical measure raises difficult questions about the appropriate benchmark rate, the treatment of implicit own rates on demand deposits, and the role of risk premiums in the interest rate structure. In addition, a super NOW account paying a market interest rate would normally receive a low weight in the Divisia measure, which seems counterintuitive. Some critics of L assert that determining weights by the relative turnover of each component would be a superior approach.

The Federal Reserve's Flow of Funds measure of the deposits, currency and credit market instruments (excluding equities) held by private domestic nonfinancial sectors also has received some support. This measure, sometimes referred to as the "debt proxy", is the sum of financial assets owned by private domestic nonfinancial sectors, and may have value on that basis. However, it is available no sooner, and with no greater frequency than any number of debt aggregates derived from the Flow of Funds accounts. (Debt and credit aggregates are discussed in section E.)

Empirical Evidence. On the surface, it would appear that these measures have something to recommend them in terms of their past statistical association with nominal GNP. In various "horse races" run against monetary aggregates, Divisia L has done remarkably well in several tests, even compared to M1, with the standard L measure often finishing respectably as

well.^{1/} Annual growth rates of L have averaged somewhat more than nominal GNP since the early 1970s, as shown in Table 1. Its velocity (the ratio of nominal GNP to L) has registered a gently declining trend over most of these years with a year-to-year variability in its rate of change among the lowest over this period for all the non-debt measures shown in Table 2. By contrast, Divisia L has grown much slower than nominal GNP, and its velocity has increased markedly over this period, particularly in accompaniment with the rise in market interest rates during the late 1970s and early 1980s. This development tended to make its velocity growth more variable than the other measures. The debt proxy measure has not only evinced a fairly stable velocity secularly, but the level of its velocity has also averaged close to unity. The variability of its velocity growth, though clearly reflecting some cyclical component, is also relatively low.

As was noted earlier in the cases of M2 and M3, however, standard L, Divisia L and the debt proxy all grew substantially more rapidly than nominal GNP in 1982 so that their velocities declined, substantially in some cases. In all cases, the 1982 velocity behavior represented a sharp departure both from 1981 behavior and relative to trend.

Controllability. The obvious drawback to reliance on these measures as monetary targets is the lack of a reliable control mechanism. Indeed, it is entirely possible that part of the reason for the tightness of the association between these measures and nominal GNP historically is

^{1/} See the results reported in Offenbacher and Porter, op.cit.; David Bennett and others, "Econometric Properties of the Redefined Monetary Aggregates," Board of Governors memorandum, February 1980; and William A. Barnett, "The Optimal Level of Monetary Aggregation," Journal of Money, Credit and Banking (November, 1982).

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precisely because they were not closely controlled by the Federal Reserve. Much of the close association with GNP may thus reflect "reverse causation" and common influences of movements in other variables. If these aggregates somehow were brought under control, their apparent statistical association with GNP might well tend to break down.^{1/} In any event, it has not been demonstrated that the demands for these aggregates would necessarily respond predictably to movements in short-term market rates if such a control instrument were chosen by the Federal Reserve. These measures likely would bear an even less predictable relationship to the various reserve aggregates, which do have a reliable link at least to M1 on the supply side through reserve requirements.

Another related drawback to these measures is the lack of timely and frequent data. L, though available monthly, is published with a three to four month lag, primarily owing to the unavailability of its term Euro-dollar deposit component. To be sure, to avoid this problem for Divisia L, Divisia M3 instead could be monitored without too much loss of information. The debt proxy is available quarterly along with other measures in the Flow of Funds accounts with a 6-week delay. Earlier estimates of these various measures would be subject to relatively large error and subsequent revisions. On balance, it would appear that controllability problems together with the lack of a widely-accepted conceptual framework would argue against using these measures as policy targets in the same sense that narrower money aggregates have been used. Nevertheless, comparison of actual movements

^{1/} The stability and predictability of the velocity of a financial aggregate is influenced by whether it is determined endogenously with income or is held exogenous by Federal Reserve policy. For a discussion of this point see David E. Lindsey, "Recent Monetary Developments and Controversies," Brookings Papers on Economic Activity, 1982.1.

in these measures relative to movements initially projected as compatible with ranges chosen for targeted measures could be of value to the Committee.

D. The Monetary Base and the Nonborrowed Monetary Base

Doubts about the wisdom of moving to broader monetary or financial asset aggregates as primary policy guides when rapid financial change renders M1 difficult to interpret have led to the recommendation of going, instead, in the direction of a narrower aggregate. The monetary base has been advanced for some time by various economists as a worthy intermediate (as well as operating) target for monetary policy. The base allegedly is more immune from distortion by financial innovations and more susceptible to close short-run control than the monetary aggregates.

Conceptual Underpinnings. The monetary base, or at least its nonborrowed component, represents "outside money" provided to the economy by the monetary authority--i.e., the base represents monetary assets of the private sector that are not offset by private liabilities as are deposits. Variations in the supply of the base relative to its demand presumably transmit expansionary or contractionary impulses to interest rates and the economy at large. However, the demand for the monetary base is largely derived from the public's demands for currency and, as intermediated by reserve requirements, for various money and near-money assets. The demand for the base is less affected than monetary aggregates by financial developments altering the characteristics of various deposits only in the sense that such deposits are weighted less heavily (via the required reserves against them), while currency is weighted more heavily in the makeup of the base.

The derived demand for the base also will have a low elasticity relative to market interest rates when deposit-rate deregulation is

completed. The underlying responsiveness of deposits to interest rate movements will become even smaller, while currency has never seemed to exhibit a sizable interest rate sensitivity. Over time horizons as short as a week, the base demand has been very interest-insensitive since 1968 because required reserves have been predetermined by the 2-week lag in reserve accounting.

The aforementioned problems of financial market instability arising from tight control over monetary aggregates in a deregulated environment also will confront the monetary base, even after the establishment of contemporaneous reserve accounting in early 1984. Shifting demands for deposits in the short-run would be cause for concern but variations in currency demands would be an even greater source of market instability. To keep the base on track in the face of an increased demand for currency would require an offsetting dollar-for-dollar reduction in total reserves. An abrupt reaching of money markets, as well as a multiple contraction of deposits, would tend to develop. Thus tight short-run control of the monetary base would be even more destabilizing to financial markets in the short-run than would closing the discount window under present operating procedures or aiming at a total reserves operating target.

Indeed, even in the longer run, it appears likely that protracted shifts in currency demand would require resetting of monetary base targets to avoid undesired effects on interest rates and aggregate demand. The need to anticipate and respond to often-hard-to-explain speed ups or slow-downs in currency growth would become much more important than under money stock targets where currency's weight is much smaller.

The potential interest rate instability implied by seeking to maintain a target growth rate of the total monetary base in the face of

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shifting demands for required reserves and shifts in currency demand might argue for focusing, instead, on the nonborrowed base. In this case, shifting demands for the components of the base would be met in part by borrowing at the discount window. While the resulting fluctuations in borrowings would lead to corresponding fluctuations in the funds rate and other short rates as at present, these fluctuations would be milder than if the total monetary base were to be rigidly controlled. Under such an approach, the setting of the discount rate would of course be a very important determinant of the movements of short-term interest rates over time.

This nonborrowed base approach coupled with an administratively-determined discount rate, however, would undercut the major justification for using the monetary base as an intermediate target that many of its proponents seem to have in mind. (Most of them would keep the discount rate in continuous close alignment with market rates.) In some cases at least, their advocacy appears to rest more on arguments in support of rules versus discretion in the conduct of monetary policy than on empirical evidence favoring the monetary base as a superior intermediate guide to policy in the context of a discretionary policy framework.

Empirical Evidence. The empirical evidence on the stability and predictability of the relationship of the monetary base to nominal GNP is somewhat mixed. On the one hand, the available studies suggest that shorter term movements in GNP are rather poorly predicted by current and lagged movements in the monetary base--or at least that the record for the base is poorer than that for M1.^{1/} There is also some evidence

^{1/} See Richard G. Davis, "The Monetary Base as an Intermediate Target for Monetary Policy," Federal Reserve Bank of New York Quarterly Review (Winter, 1979-80) and Carl M. Gamba, "Federal Reserve Intermediate Targets: Money or the Monetary Base," Federal Reserve Bank of Kansas City Economic Review (January 1980).

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that the base does a relatively poor job of tracking business cycle movements in GNP--for example so-called "reduced form" equations using the base evidently fail to pick up the 1973-75 recession in GNP.^{1/}

On the other hand, some other evidence suggests that the base may track nominal GNP fairly well over longer periods of time; one study suggests that the drift of GNP away from the track suggested by the path of M1 associated with the well-documented shift in money demand in the mid-1970s is avoided if the base rather than M1 is used to predict GNP.^{2/} However, in the absence of a strong and widely-accepted theoretical case for expecting long-run stability in the relation of the base to GNP especially when the demand for resevable deposits is expected to shift, it is hard to know how much confidence to have in the continuation of such an apparent long-run empirical regularity in the future.

E. Broad Credit Measures

Conceptual Underpinnings. At a purely conceptual level, broad credit aggregates perhaps have as good a claim to consideration for targeting purposes as money stock aggregates. The market for credit is at least as large and "important" as the market for money. Developments in both markets are capable of exerting effects on the nonfinancial measures of ultimate concern to policy-makers. Both broad credit aggregates and monetary aggregates are "endogenous" measures in a modern economy in that they cannot be controlled directly by the authorities but can only be influenced indirectly. Historically, policy analysis has tended to focus much more heavily on money aggregates than on broad credit aggregates for several reasons. The most important is probably the presumption that

^{1/} See William E. Cullison, "Money, The Monetary Base and Nominal GNP," Federal Reserve Bank of Richmond Economic Review (May/June 1982).

^{2/} Cullison, ibid.

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the money stock has been much more directly influenced by policy actions than have broad credit aggregates. Whether this would necessarily continue to be the case in a world where an increasing proportion of "monetary" instruments were free of reserve requirements and paid market-related rates is open to question. In any case, some other arguments for money stock targets have focused on the transactions role as a unique property strengthening the connection of the (narrow) money stock to aggregate demand and to prices in the longer run.

The relative usefulness of money and credit aggregates as targets (like the usefulness of the measures examined earlier) depends importantly on the relative stability of the demand for such aggregates and on the stability and closeness of their relationship to the major nonfinancial measures, as well as, of course, the extent to which such relationships could be exploited to influence aggregate demand through the instruments available to the central bank.

Choice of Broad Credit Measures. As in the case of money measures, there is a broad array of credit measures that could be considered for targeting purposes without any strong a priori basis for choosing among them. Since credit in the U.S. economy is highly fungible and since no credit measure possesses unique properties of the kind claimed for transactions measures of money, there would seem to be a preference for broad measures over narrow measures. Concentration on credit made available only by a limited class of lenders (such as banks) or in a limited array of markets could suffer from the ready ability of borrowers and lenders to shift among markets, instruments, and intermediaries.

The broadest credit measure generally used for analytical purposes is total credit extended to the nonfinancial sectors as recorded

in the Flow of Funds accounts.^{1/} A somewhat narrower measure would exclude credit extended to the Federal Government. While money measures exclude U.S. Treasury deposits, presumably on the grounds that they do not affect spending, the analogous argument for excluding Treasury borrowing from a targeted credit measure seems harder to make. Another exclusion from total credit that is sometimes considered is credit extended to the foreign sector, but in fact, the amounts involved are relatively small and such an exclusion seems to have little effect on the movement of the credit measure. (See Tables 1 and 2.) It should be noted that all these credit measures exclude equities and they also exclude credit extended to financial intermediaries to avoid double counting. Measures including equities could also be considered. However such measures would raise questions of how to treat capital gains in computing growth rates.

Statistical Properties of Credit Measures. While there exists a limited literature on the statistical properties of broad credit measures in relationship to nominal GNP, real GNP and prices, it is not comparable to the vast literature on the money measures. There apparently exists no attempt to study econometrically an aggregate "demand for credit" function comparable to the numerous money demand studies.

A few generalizations about the statistical properties of broad credit measures and credit velocity are nonetheless possible. First, the velocity of total credit (the ratio of nominal GNP to total credit including Federal credit) appears to be relatively trendless. (See Table 1.) However, from the point of view of policy, it is the predictability of variations

^{1/} Data on annual growth rates and growth rates for the velocities of several credit measures are reported in Tables 1 and 2.

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around trend of such velocity measures that is important rather than the trend itself. The evidence appears to be that since 1960, at least, broad credit velocity has shown less variability around its (approximately zero) trend than have at least narrow money measures.^{1/} However, the importance of this is easily exaggerated since it is, to repeat, the predictability of velocity movements rather than their amplitude that is important for many purposes. In general, the credit velocity measure shows much the same business cycle and subcyclical patterns displayed by M1 velocity.

One commonly used test of the predictability of the relationship of a financial measure to GNP is the extent to which current and past movements in the financial measure can "explain" current movement in nominal GNP. Such tests tend to be sensitive to details of specification. One review of the available evidence seems to suggest that current movements in GNP are about as well "explained" by current and past movements in broad credit measures as they are by M1 and better explained than they are by the broader money measures.^{2/} However, the application of more sophisticated statistical tests raises serious questions as to whether the apparent explanatory power of broad credit is really as great as that of M1 once an effort has been made to remove the effects of "reverse causation"--i.e., once the effects of movements in aggregate demand itself on movements in credit have been removed.^{3/} Some tests suggest, for example, that after an effort has been made statistically to adjust for the effects of interest rates on aggregate demand, broad credit exerts little or no

^{1/} See Benjamin Friedman, "Monetary Policy With a Credit Aggregate Target." multilith, 1982.

^{2/} Friedman, *ibid.*

^{3/} Edward Offenbacher, Richard Porter and Edward McKelvey, "Empirical Comparisons of Credit and Monetary Aggregates Using Vector Autoregression Methods", (Board Staff), multilith, July 1982.

additional influence on such demand. All these tests present thorny technical problems, so that a good deal of open mindedness about the independent explanatory power of credit for aggregate demand, both absolutely and in relation to the money aggregates, is probably warranted.

Controllability. Controllability would appear to be a significant problem for broad credit measures as targets. Since there is no body of statistical work relating aggregate credit demand to short-term interest rates (and other measures) and since it is not at all clear that a stable credit demand relationship exists in terms of short-term rates, an interest rate instrument for achieving credit growth targets might be even more difficult to implement than in the case of monetary targets. Since total credit consists of a wide range of short- and long-term instruments, the demand for it may well depend significantly on both short- and long-term rates and on the relationship between them, again raising serious problems for control through a short-term interest rate instrument such as the federal funds rate.

With respect to a nonborrowed reserve instrument, control of total credit targets would of course be seriously impeded by the absence of reserve requirements and thus of any well-defined multiplier relationship. As with any other nonreservable aggregate, control through the use of nonborrowed reserve paths could in principle be implemented by assigning "shadow reserve requirements" to total credit and allowing borrowings to move up or down whenever the "shadow required reserves" moved up or down relative to a given nonborrowed reserve path. But the choice of the initial reserve path and the size of the shadow reserve requirements would be essentially arbitrary.

None of this is to say that a total credit measure could not be controlled in the longer run with existing Federal Reserve instruments. As

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at present, changes in reserve availability would operate to affect interest rates and ultimately aggregate demand, which, in turn, would have implications for total credit demand. But such an approach is obviously quite indirect at best. It amounts, effectively, to employing GNP as the intermediate target.

It should be noted that despite these control problems, a total credit target could be operationally meaningful in a multiple target setting if deviations from the credit target could be used as a qualitative signal to shift instrument settings that in the shorter run were more closely geared to other objectives such as M1 or the monetary base. Indeed, actual movements of broad credit measures relative to projections could be a useful source of information even if such measures were not formally adopted as targets--as was noted earlier with respect to the broad liquidity measures.

At the same time, however, the usefulness of the broad credit measures as operationally meaningful targets is hampered, like that of other measures that derive in whole or in part from the Flow of Funds data, by the fact that the data is currently available only quarterly and with a lag of about six weeks, as noted earlier. While monthly estimates of broad credit measures could probably be constructed, such figures would seem inevitably to be slower in coming, less accurate and more subject to revision than the money stock or monetary base data.

F. Nominal or Real Interest Rates as Targets

Conceptual Underpinnings. Nominal (and real) interest rate targets would of course both circumvent problems of defining and measuring appropriate money and/or credit aggregates and would be immune to the disturbances to the nonfinancial economy that may result when pre-determined

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money (or credit) targets are adhered to in the face of shifts in money (or credit) demand. Thus both nominal and real interest rate targets would circumvent the potential problems for monetary policy created by ongoing financial innovation and deregulation related to money and near-money instruments.

On the other hand, it is apparent that interest rates, and especially nominal rates, have a number of serious disadvantages as long-term targets if not, under some conditions, as short term operating instruments. To set in advance interest rate targets for a period as long as a year, the current time horizon of the monetary aggregate intermediate targets, would require the ability to determine long in advance the levels, or at least the path, of interest rates that would produce given results for economic magnitudes that are of more basic concern. The evidence is overwhelming that neither the Federal Reserve nor anyone else is capable of projecting interest rates that will produce given results. It should be especially noted that in determining economic activity it is not merely short term rates that matter, but long rates as well. Thus a target for short rates alone would probably not be sufficient to achieve determinate economic results.

With the rising trend and increased variability of inflation rates over the past 15 years or more, the significance of a given level of nominal interest rates for real activity and inflation can be determined only by trying to take into account the expected rate of inflation embedded in market interest rates. Consequently some support has been expressed for using so-called "real interest rates" (nominal rates adjusted for the expected rate of inflation) as targets. But measurement problems aside (discussed below), real rates clearing also share many of the problems of

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nominal rates as targets and have some special problems of their own. Thus to achieve desired results for economic measures that ultimately matter, it would be necessary in setting a real interest rate target to determine what level and trajectory of real rates would be associated with desired paths for real aggregate demand and employment. This relationship is certainly also subject to numerous sources of disturbances that are difficult to predict and even to detect as they happen. It should be noted that since real interest rates are more closely related to real than to nominal aggregate demand, derivation of the inflation implications of a given real interest rate target would require translation of the associated real output and employment implications into price and wage behavior.

Real interest rate targets may well be a less satisfactory vehicle for achieving long-run price stability objectives than are--at least in principle--money growth rate targets. In the absence of chronic and unforeseen shifts in money demand, money growth targets can be set to constrain inflation in the long run and, if desired, gradually to eliminate it. However, if real interest rate targets are chronically set at too low levels--at levels that tend to create chronic capacity pressures in the economy--inflation could in fact accelerate steadily even though nominal interest rates were always adjusted up in line with accelerating expected rate of inflation to keep the real rate constant.

One could argue, moreover, that the same sorts of institutional pressures that seem to generate chronically too low nominal interest rate targets and to cause nominal interest rate targets to response too sluggishly

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to ongoing developments would also operate in the case of real interest rate targets. Successful use of real interest rate targets to avoid inflation would require widespread public acceptance of the idea that nominal rates should be raised at least as rapidly as rises in the expected rate of inflation. And when a given real rate target appeared likely to generate accelerating inflation, there would have to be acceptance of the notion that appropriate policy requires increases in nominal rates above and beyond the increases required merely to offset accelerating inflationary expectations. Public understanding of such a need might be harder to achieve than is support for the idea that ending inflation requires restraint on monetary and/or credit growth.

Measurement. Since the "real interest rate" is usually defined as the nominal rate adjusted for the rate of inflation expected by the market over the lifetime of the instrument, it becomes necessary to measure, somehow, the "expected" rate of inflation in order to measure a real rate of interest. This cannot be done directly. Instead, expected inflation must be estimated either from the limited available survey data of inflationary expectations or from past price performance measured over periods of some specified length. The problems of measuring the expected inflation rate are probably especially difficult for longer maturities. Even the choice of a particular price index to use in measuring past or expected inflation can make a significant difference at times. And since rates on different instruments of the same maturity do not move in lock-step, the choice of the particular rate to be targeted could also make a difference.

These various measurement problems are compounded by the likelihood that it is after-tax, rather than before-tax real interest rates

that are economically relevant for most purposes. To be sure this complication is probably less significant for corporations than for households. Corporations generally earn taxable income from the real assets they finance by borrowing. Thus, as nominal interest rates rise, gross taxable income and interest tax deductions tend to rise in parallel, effectively, though often in practice not entirely, causing tax effects to cancel out. On the other hand, households often earn nontaxable implicit income on the assets financed by borrowing. Thus for a given before-tax real rate, the after-tax real rate varies inversely with the relevant tax bracket. Moreover for a given tax bracket and a given before-tax real rate, the higher is the rate of inflation (and nominal interest rates), the lower is the after-tax real rate. Consequently, before- and after-tax real rates need not move in parallel and have in fact diverged substantially at times.^{1/}

Controllability of Real Rates. The ability to control a real interest rate clearly requires as a minimum the ability to control nominal rates. Past experience demonstrates that the Federal Reserve does have the ability to control the nominal federal funds rate with a high degree of precision. This control generally provided rough control over the whole congeries of short-term market rates, although spreads between particular rates and the funds rate were obviously subject to some variation. The Federal Reserve could presumably also effectively peg the Treasury bill rate at targeted levels. But given the current sensitivity of inflationary expectations to money growth, it is reasonably apparent that the Federal Reserve's ability to peg nominal rates, even nominal

^{1/} See C. Cumming and C. Miners, "Measures of Real Rates of Interest" (mimeo), Federal Reserve Bank of New York, March 1982.

short-term rates, by unlimited expansions of reserves for any period of time is severely limited as a practical matter.

In any case, control over nominal rates most emphatically need not imply control over real rates since the Federal Reserve does not control the expected rate of inflation even though its actions may well influence this expected rate. To be sure, expected short-term rates of inflation may be relatively invariant to Federal Reserve actions. Thus, for example, a one percentage point reduction in a nominal three-month rate engineered by open market operations might imply a roughly equal reduction in the three-month real rate. But if the associated acceleration in reserve and monetary growth leads the market to expect higher inflation rates further out in the future, nominal rates on longer maturities may rise accordingly, with little or no change in the corresponding real rates.

An Inflation-Adjusted Nominal Rate Target. Some of the measurement problems of adopting the "theoretically correct" concept of a "real interest rate" as a target would be sidestepped by adopting, instead, a nominal interest rate target and determining that this target should be adjusted quasi-automatically in response to movements in some reasonably broad and stable measure of recent past inflation--e.g., the 12-month change in the consumption deflator. The Committee would, of course, be free to adjust its inflation-adjusted nominal rate target as seemed appropriate alongside the automatic adjustment in the nominal rate resulting from changes in the recent inflation rate. To be sure, such an inflation-adjusted nominal rate target would, measurement of expected inflation aside, have most of the problems of a true "real interest rate" intermediate target, especially those of having to estimate, and announce in advance, a value to be maintained for a period as long as a year. And it could have an

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additional disadvantage to the extent that changes in the inflation rate over the recent past diverged from changes in the economically-more-relevant expected rate of inflation. Such divergencies could generate inappropriate changes in the nominal interest rate. But by ensuring that nominal rate targets at the least would tend to keep up with actual accelerations or decelerations in measured inflation, an inflation-adjusted nominal rate target might be less likely to result in chronically too low nominal rates than would be a pure nominal rate target and it might also tend to truncate spikes of acutely high real interest rates.

G. Nominal GNP as a Target

Conceptual Underpinnings. Nominal aggregate demand as measured by nominal GNP is substantially closer to the ultimate inflation and output objectives of policy than money, credit, or nominal or real interest rates. Given nominal GNP as an intermediate target (perhaps measured on a fourth-quarter to fourth-quarter growth basis) many problems associated with intermediate targets would cease to matter. Thus with instrument settings constantly readjusted as needed to achieve such a GNP target, shifts in money demand and all the problems associated with financial deregulation and innovation would be of much-reduced importance. Similarly, shifts in aggregate demand at given interest rate levels, while they would require resetting the instrument variables, would not themselves require a change of the intermediate target as such. And of course the various measurement problems associated with a real interest rate target would be avoided. Finally, nominal GNP growth rates would appear to be a rather natural way of indicating limits on the trend rate of inflation that would be tolerated and a strategy of multi-year reductions in nominal

GNP growth rates would appear to be an effective way of structuring a longer term strategy of reducing inflation.

Controllability. Like most other potential "intermediate targets", nominal GNP can of course not be directly controlled. Whether it is more or less controllable than a number of other potential candidates such as broad credit measures is not clear. In any case, most economists regard the main link between the financial economy, to which monetary policy is closely-related, and nominal GNP to be through interest rates--whether regarded as the cost of capital, as a determinant of nominal wealth or as an index of credit availability effects. Thus the most "natural" instrument for controlling nominal GNP would appear to be nominal interest rates. But the use of a (presumably short-term) interest rate instrument to control nominal GNP raises a number of familiar problems: (1) Can the path of rates needed for a given GNP outcome be determined with any confidence? (2) If nominal rates are to be used as the instrument, can the apparent past chronic tendency to set such rate levels too low and to move them too sluggishly be avoided? (3) To what extent would an interest rate approach to a nominal GNP objective simply represent a return to the pre-1970s approach to policy?

The prospects for using a reserves or nonborrowed base instrument to achieve a nominal GNP target do not appear at all encouraging. Presumably the advantage of such a seemingly circuitous approach would be to provide some automaticity of interest rate response to off-target movements in nominal GNP. In theory, such an approach might be implemented by assigning a "shadow" reserve requirement to nominal GNP and allowing borrowing (and thus interest rates) to move up or down relative to an initial setting whenever some proxy measure for nominal GNP moved up or down relative to

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the short-run path set for it. But the arbitrariness involved in setting such a shadow reserve requirement and the absence of quickly available short-run proxies for nominal GNP argues against the practicality of such an approach.

Other Issues. The question may also arise as to the extent to which it would be appropriate for the Federal Reserve to have a nominal GNP objective different from the one contained in the Administration's early-year economic and budget reports. But if it is not appropriate for the formal nominal GNP objectives of the central bank and the Administration to differ, then the appropriateness of adopting a formal nominal GNP target on the part of the independent central bank may also be questioned.

Table 1
ANNUAL RATES OF GROWTH OF VARIOUS MONETARY AND CREDIT AGGREGATES

	Nonbor- rowed Monetary Base ¹	Mone- tary Base ¹	M1 ¹	M2 ¹	M3 ¹	L ¹	Divisia L ¹	Debt Proxy ²	Private Domestic Nonfinan- cial Debt ²	Domestic Nonfinan- cial Debt ²	Total Nonfi- nancial Debt ²	Total Nonfi- nancial Debt and Equity ³	Nominal GNP ¹
1972	7.8	8.5	8.5	12.9	14.0	12.9	12.0	12.0	11.7	10.3	10.2	7.4	11.5
1973	7.2	7.8	5.8	7.4	11.8	12.4	8.6	11.9	12.9	10.8	10.8	7.6	11.6
1974	9.0	8.8	4.8	5.9	8.7	9.6	6.1	9.0	10.4	9.1	9.6	7.2	7.1
1975	7.7	6.4	5.0	12.2	9.3	9.7	9.3	10.1	6.2	9.2	9.4	8.0	10.1
1976	7.3	7.2	6.2	13.6	11.3	11.1	10.4	10.8	9.5	10.6	11.0	8.9	9.3
1977	7.5	8.3	8.2	11.5	12.5	12.7	11.8	10.2	12.9	12.5	12.5	9.7	12.2
1978	9.1	9.0	8.2	8.2	11.3	12.3	8.7	11.1	13.8	12.9	13.5	10.7	14.7
1979	7.2	7.8	7.4	8.4	9.8	11.9	2.9	12.3	13.6	12.1	12.1	9.6	9.7
1980	8.9	8.7	7.3	9.2	10.0	9.5	4.3	10.7	9.4	9.9	10.1	8.4	9.4
1981	5.5	4.9	5.0	9.5	11.4	11.6	2.8	11.6	9.4	9.9	10.0	7.4	9.6
1982p	7.7	7.5	8.4	9.7	10.4	11.2	8.6	9.5	7.5	9.4	9.2	7.4	4.3
1972-1982:													
Mean	7.7	7.7	6.8	9.9	11.0	11.4	7.8	10.8	10.7	10.6	10.8	8.4	10.0
Standard Deviation	1.0	1.2	1.5	2.4	1.5	1.3	3.3	1.0	2.4	1.3	1.3	1.2	2.6

p--projected

1. Growth rate based on the end quarterly average of the year from the end quarterly average of the previous year. Monetary aggregates taken from projections available December 10, 1982; GNP taken from the Greenbook, Part I, November 10, 1982.
2. Growth defined as the annual flow as percent of outstandings at the end of the previous year, taken from the Flow of Funds, November 12, 1982.
3. Growth defined as net changes in credit-market debt plus net new equities as a percent of credit-market debt (at historical value) plus equities (at market value) outstanding at the end of the previous year.

Table 2
ANNUAL RATES OF GROWTH IN PERCENT OF THE VELOCITY OF
VARIOUS MONETARY AND CREDIT AGGREGATES

	Nonbor- rowed Monetary Base ¹	Mon- etary Base ¹	M1 ¹	M2 ¹	M3 ¹	L ¹	Divisia L ¹	Debt Proxy ²	Private Domestic Nonfinan- cial Debt ²	Domestic Nonfinan- cial Debt ²	Total Nonfi- nancial Debt ²	Total Nonfi- nancial Debt and Equity ³
1972	3.4	2.8	2.8	-1.2	-2.2	-1.2	-0.5	-0.3	-0.2	1.2	1.2	3.8
1973	4.2	3.5	5.5	4.0	-0.1	-0.7	2.8	-0.2	-1.2	0.7	0.7	3.7
1974	-1.8	-1.6	2.2	1.1	-1.6	-2.3	0.9	-1.9	-3.0	-1.9	-2.2	-0.1
1975	2.2	3.5	4.8	-1.9	0.7	0.3	0.6	-0.1	3.5	0.7	0.5	1.9
1976	1.8	1.9	2.9	-3.8	-1.8	-1.5	-1.0	-1.4	-0.1	-1.2	-1.6	0.4
1977	4.4	3.7	3.7	0.7	-0.3	-0.4	0.4	1.8	-0.7	-0.4	-0.3	2.3
1978	5.1	5.2	6.0	6.0	3.1	2.2	5.5	3.3	1.0	1.8	1.1	3.6
1979	2.3	1.7	2.1	1.2	-0.1	-2.0	6.6	-2.3	-3.4	-2.1	-2.2	0.1
1980	0.5	0.7	2.0	0.2	-0.4	0.0	4.9	-1.2	0.1	-0.4	-0.6	0.9
1981	3.9	4.5	4.4	0.2	-1.6	-1.8	6.7	-1.7	0.2	-0.2	-0.3	2.0
1982p	-3.2	-3.0	-3.8	-5.0	-5.5	-6.1	-4.0	-4.8	-3.0	-4.6	-4.5	-2.9
1972-1982:												
Mean	2.1	2.1	3.0	0.1	-0.9	-1.2	2.1	-0.8	-0.6	-0.6	-0.8	1.4
Standard Deviation	2.6	2.5	2.6	3.1	2.1	2.1	3.5	2.1	2.0	1.8	1.7	2.0

p--projected

1. Velocity growth rate based on the end quarterly average of the year from the end quarterly average of the previous year. Monetary aggregates taken from projections available December 10, 1982 and GNP taken from the Greenbook, Part I, November 10, 1982.
2. GNP based on quarterly average data taken from the Greenbook, Part I, November 10, 1982 and Flow of Funds measures based on end-of-year data, taken from the Flow of Funds, November 12, 1982.
3. See footnote 3 to Table 1.