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TO: FOMC Members

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Attached is a copy of the briefing on velocity (with charts)

that I gave at the last FOMC meeting.

Attachment

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CLASS I - FOMC

Velocity Presentation for October FOMC Meeting

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Velocity is of course the link between money and GNP in the equation of exchange (MV = PY), but whether its behavioral properties are sufficiently stable or predictable to provide a strong basis for monetary targeting as a means of attaining ultimate economic objectives over time has, as we all know, been a continuing subject of intensive economic debate. At one extreme, velocity might be considered as no more than the arithmetic by-product of forces acting independently on the supply of money and other forces acting independently on GNP--hence, an economically meaningless number and making the whole equation of exchange useless as a policy framework. At the other extreme velocity might be found to have a trend all of its own--hence providing a reasonably predictable link between money and GNP, and giving policy content to the equation of exchange.

From another viewpoint, velocity can be considered as the inverse of the demand for money relative to GNP. If we can know what influences the demand for money—and among the factors explaining money demand are income, transactions needs, interest rates, wealth, and institutional change—then we can predict the money needed for, say, a given GNP. But the more one has to go beyond income or transactions needs in explaining money demand, the weaker is the argument for pure or rigid monetary targeting. By rigid monetary targeting, I mean staying on a money course irrespective of emerging developments in financial markets and the economy.

Monetary targeting as practiced by the System, or any other central bank, has never been "pure" in this extreme sense of the term.

But after October 1979, the Federal Reserve did give monetary aggregates, particularly MI, more of a role in the implementation of policy than had been the case earlier. Since last fall, though, the weight of MI in policy implementation has been reduced, largely because its velocity has behaved atypically relative to earlier postwar experience. And the FOMC has stated in its policy directive that the future weight of MI in policy will depend on "evidence that velocity characteristics are resuming more predictable patterns."

Some perspective on the problems posed for policy by the behavior of velocity can be gained first by a brief review of MI velocity.

Chart I shows the income velocity of that aggregate over the postwar

years, with periods of cyclical contraction shaded; the 3-month Treasury

bill rate is also plotted (see the bottom line). The two most recent

periods in which MI velocity appears to have been a particular problem,

in the sense of behaving unusually, are circled, and I would like to make
a few comments about each.

"A" marks the period when NOW accounts were introduced on a nationwide basis. There was a sharp upward adjustment in the velocity of old MIA--the top line on the chart--as would be expected in consequence of the public's shifting funds out of demand deposits into newly introduced nationwide NOW accounts. The extent of such departures from "normal" is largely unpredictable, and was the reason for de-emphasizing that aggregate in policy implementation. At the same time the velocity of MI, including NOW accounts, rather surprisingly did not display particularly unusual behavior--continuing to rise about as usual--even though a slower rise in velocity than normal might have been expected, and was indeed implicit in monetary targets at the time, because of shifts into the new NOW accounts

from assets outside MI. But that slower rise in velocity did not develop probably because historically high and rising interest rates in the period led to other shifts <u>out</u> of MI that happened to offset the shifts into that aggregate occasioned by the introduction of NOW accounts.

Area "B" relates to current conditions, showing the unusual drop in MI velocity during the recent cyclical contraction and its slower than usual recovery during the early stages of the expansion. This is seen more clearly in chart 2, which compares recent cyclical experience with earlier postwar cycles. The unusually sharp cyclical drop in MI velocity and slower rebound, shown by the dashed line in the top panel of the chart, probably reflects a number of factors—early in the period economic uncertainties may have heightened precautionary demands for cash, while later in the period the sharp decline in interest rates in the latter part of 1982 seems to have contributed, with a lag, to a large increase in money demand. It should be noted (looking at the bottom panel) that MIA velocity by contrast has behaved in line with previous cyclical experience—which suggests that the sharp departure in MI behavior from earlier experience may have something to do with the presence of NOW accounts.

In this context, a major issue, and one raised particularly in the FRB of San Francisco staff paper circulated by President Balles, relates to whether the recent velocity behavior of MI was predictable from historical experience, given the drop of interest rates that occurred. If it was, it might be said that the introduction of NOW accounts—which have both savings and transactions elements—has not altered the behavioral characteristics of MI.

This is not the place to go into the details of technical economic disputes—which have enlivened, to use a mild word, the field of monetary economics for many decades and show no sign of abating. Let me just say on the technical side that there is little doubt in my mind that the drop of interest rates after the summer of 1982 did contribute importantly to the recent weakness in velocity of MI. However, let me also say that some technical work by the Board staff at least casts doubt on whether the effect has been as great as implied in the San Francisco document. We doubt whether the long-run interest elasticity of the demand for money is as large as they have found, and we also suspect that the introduction of NOW accounts has changed relationships among money, income, and interest rates, contrary to their findings. However that may be, it does appear as if the period of extreme weakness in MI velocity is drawing to a close, with MI velocity showing signs of growth, though still at a slower pace than in previous expansions.

The uncertainties connected with MI velocity have naturally led to more attention on the broader money and credit aggregates. Unfortunately, the velocity of these aggregates is no more stable than for MI and on balance less so. The bars in chart 3 depict the degree of variability, as measured by standard deviations, in velocity growth for the three monetary aggregates and for domestic nonfinancial debt over the 1952 to 1983 period. These measures are based on moving 4-quarter averages to get away from the noise in quarterly money and velocity figures—the variance of short—run quarter—to—quarter changes in velocity being 75 to 100 percent greater than for the measures shown here.

The upper panel shows velocity measured contemporaneously—that is, money or credit relative to GNP in the same period. On this basis

the velocities of M2 and M3 are more volatile than for M1, although the velocity of total domestic nonfinancial debt is a shade less so. Because such contemporaneous measures of velocity do not allow for the lags between money and the economy—and as a result may be distorted by swings in velocity growth that are in the nature of the case inversely related to contemporaneous swings in money growth—the lower panel depicts an alternative measure of velocity based on contemporaneous GNP and money or credit lagged two quarters. However, this lagged measure of velocity, often stressed by some who perceive money as the driving force in the economy, is almost as voiatile as the contemporaneous measure. All of the money supply velocities are slightly less voiatile on a lagged basis, difficult as this may be to see on the chart, with M1 still the least volatile by a small margin. On the other hand, the volatility of the domestic nonfinancial debt measure increases markedly from what it is contemporaneously, and it is the most volatile on a lagged basis.

The variability in contemporaneous velocity of the broader monetary aggregates is shown from a cyclical perspective in chart 4. Their velocities in the recent cycle have not behaved unusually relative to past experience—apart from the impact of MMDAs particularly on M2 in the first quarter of this year. However, the range of past cyclical variation for the broad aggregates has been quite wide, as depicted by the shaded areas, and wider than for MI velocity. Thus, merely from observing past behavior one would tend to be less certain about the likely outcomes for velocities of the broad aggregates than would be the case for narrow money.

It is probable that the broad aggregates are more affected than MI by shifting attitudes which influence the way the public manages

its savings and wealth. This adds elements not present so much for MI that affect the volatility in velocities of M2 and M3, effects that appear to persist even when the distorting effects of ceiling rates diminish. As may be seen from the time series plotted in Chart 5, their velocities have not become more stable in recent years even though these aggregates, particularly M2, have been less subject than earlier to distortions from the impact on asset preferences of variations in market interest rates relative to binding deposit ceiling rates.

As with other velocities, credit velocity--plotted as the bottom line of chart 6--also shows substantial cyclical variation, but with some tendency for the variation to be more regular than in the case of the monetary aggregates -- as might be expected from an aggregate that probably is strongly dependent on income. However, during the recent contraction, credit velocity did drop more steeply--as may be seen toward the end of the chart--than it had in all other contractions since the 1950's. That might have occurred because of the unusually large role of the federal deficit in sustaining the economy during the contraction--note that the velocity of private debt (shown in the top line) declined about as usual in the recent period. Debt velocity since the recovery began seems to be beginning to reverse its cyclical decline, as it has in the past, but how far the reversal will go seems conjectural to me. A continued unusually high federal deficit relative to GNP may tend to keep the level of credit velocity lower than usual--that is, the recent cyclical decline may not be fully reversed. This could happen since the Federal Government basically must borrow an amount that matches its deficit, while if private sectors were instead contributing the same amount to expansion they would at

least have a greater opportunity to make needed financial adjustments on either the asset or liability side.

While, as has been earlier noted, the velocity of total credit does show less variability than MI velocity contemporaneously, I would not interpret the greater stability of contemporaneous credit velocity as suggesting that credit is a better intermediate target for monetary policy than, say, MI. Credit flows probably have less connection to income in a causative sense than does MI, at least based on the world as we have known it. For example, we have not found in statistical tests that total credit leads income, whereas we have found such a lead relationship for monetary aggregates, particularly MI. The deterioration in the stability of credit velocity on a lagged basis relative to its contemporaneous velocity that was noted earlier is probably an aspect of this.

MI, also, has its deficiencies as a predictor of future income. Chart 7 shows the difference between predicted and actual values of growth in GNP based on the St. Louis-type model that we have at hand relating GNP growth to current and lagged money growth and a fiscal variable in this case the change in high employment expenditures. A positive value indicates the extent to which actual GNP growth exceeded the model's prediction and a negative value shows the extent to which actual GNP growth came in below the model's prediction. As you can see from the the top panel (with the model fit through 1979) MI did not predict too badly on average in 1980 and 1981 though there were very substantial quarter-to-quarter misses. However, in 1982 and 1983 (with the model fit through 1981) the misses were both substantial and in the same direction, as shown in the middle panel. The model consistently indicated much more nominal GNP, given actual MI and Federal spending, than occurred. This

of course reflects the sharp and unexpected (by the model) downward shift in velocity. The model's performance did not improve much in 1983, indicating that from this perspective velocity is still well off expected patterns. However, if the model is run with MIA as the policy variable, instead of MI--shown in the bottom panel--its track record is appreciably better for last year and this year--another indication perhaps that the velocity of MI was thrown off by the presence of newly-introduced NOW accounts (which of course represent the difference between MI and MIA).

I should note that we also ran the same tests for M2 and M3. They did about as badly as M1 in 1982, but improved much more markedly in 1983 on the average, though there were still sizable errors in individual quarters.

Conclusions about the usefulness of the aggregates that may be drawn from this review of velocities do not suggest any very dramatic adjustment in the process of policy implementation.

First, it does seem to me that the cyclical behavior of Mi velocity in 1982 and much of 1983 was unusual enough to have warranted downplaying the role of that aggregate in policy relative to earlier experience—unless one takes the view that this unusual behavior could have been foreseen within reasonable bounds in advance (which would have meant foreseeing a substantial recession among other things) and that the announcement of a greatly increased Mi objective would not have been misinterpreted by the market and counterproductive for policy.

Second, I would not read the evidence about velocity as suggesting that the broader aggregates have become more reliable as MI has become
less so. But they do not seem to have deteriorated as much as MI in this
particular period.

Third, evidence that MI velocity is beginning to behave a little more in line with historical experience suggests that the weight of this aggregate in policy implementation might now be enhanced, if it has not already been so. But the evidence is not strong, at least in my view, particularly when the behavior of lagged as well as contemporaneous velocity is taken into account. The circled areas in Chart 8 show in the upper panel that the contemporaneous velocity of MI--the solid line-has stopped declining and is beginning to rise, though the rise remains quite modest; however, the lagged velocity shown as the solid line in the middle panel, still seems to be atypically declining (and would continue to be in the fourth quarter, not plotted, if the staff GNP forecast or even a somewhat higher one is realized).

In evaluating very recent MI velocity, it may also be useful to look at the turnover rate of its MIA component, the dashed lines in the top two panels. On both a contemporaneous and lagged basis, the velocity of that component appears to have been conforming more to historical patterns following the upward structural adjustment in velocity that dominated its behavior in 1981 and may have had a lingering effect in 1982. This behavior in MIA velocity may add a bit of plausibility to the thought that the small increases we are beginning to see in MI velocity could represent something close to the underlying cyclical behavior for that broader aggregate, whose NOW account component may not be actively used to meet changing transactions needs over the course of the business cycle.

But this is conjectural. Moreover, there are reasons—at least two important ones—that argue for limiting the weight given to Mi in policy at this time. First, if the interest elasticity of demand for Mi is much higher than we had believed in 1979—say on the order of that in

the San Francisco document--a fixed money target would become less valuable as a quide for stabilizing income in the face of unanticipated shifts in the demand for goods and services. Instead, the money target itself would have to be modified, perhaps substantially, in response to the sizable impact on money demand, or velocity, of the changes in interest rates that might be needed to stabilize income. Looked at another way, with a relatively interest elastic money demand, policy would have the option in, say, a weakening economy of accommodating to a decline in velocity initiated by a reduction in spending propensities either by seeing GNP weaken or by strengthening money, or both. While I doubt that the interest elasticity of MI demand over time is or will be as high as it may recently appear to have been from some perspectives, over the near-term--so long as NOW accounts with fixed ceiling rates are an important component of MI--the interest elasticity may in practice be fairly high and hence its velocity may be reasonably sensitive to market interest rate variations.

A second reason for caution in increasing the weight of MI in policy implementation is that we are probably dealing with a <u>new MI</u> aggregate, not simply an extension of the old one prior to NOW accounts, or at least we can't yet be sure that we are not. And if we are dealing with a new one, we don't have enough experience yet to form a clear notion about its underlying velocity patterns—which in any event will probably be subject to shocks from further institutional change should super NOW accounts become more important, should interest be paid on demand deposits, should interest be paid on bank reserves, or should the deregulation of NOW account ceiling rates proceed more rapidly than expected.

Thus, while there is probable cause to enhance the weight of MI in policy implementation a bit--perhaps buttressed by supplementary evaluation of its M-IA component--I would not suggest that the time is right to give MI the same weight or role in policy implementation as in the three years following October 1979. But I would not want to be misunderstood as suggesting that over time the behavior of money in its various manifestations can be downplayed. Money may be more difficult to interpret now because of the institutional changes that we have been, and are living through, but that does not alter the fundamental that too much money growth over time will lead to inflation and too little to recession in the short-run--it just makes it more difficult to gauge what is too much and too little.