Technical Notes

From the US Economic Outlook MA *Macroeconomic Advisers, LLC*

September 5, 1998

The real fed funds rate has risen roughly a percentage point over the last 12 months indicating that the Fed has "passively" tightened policy while holding the nominal fed funds target steady at 5.50%. Many analysts point to this passive tightening as evidence that the Fed has tightened the monetary screw a couple turns too many. In addition, the recent spread of financial crisis from Asia to Russia and then Latin America and has raised the specter in many investor's minds of a global financial and economic meltdown. As a result the pressure is building on the Fed to lower rates in order to prop up an ailing global financial system. Are monetary and financial conditions squeezing the real economy so severely that a Fed ease is needed? *MA has developed a new index of monetary and financial conditions that suggests that, although the real fed funds rate has risen recently, broad monetary and financial conditions in the US have been and continue to be quite accommodative*. It may even be the case that the Fed should have done more to insure that monetary and financial conditions, broadly defined, contributed less to the strength of aggregate demand over the past couple of years. This does not, however, imply that the Fed should now raise the Fed Funds rate target. Moreover, the recent correction in the stock market may suggest the need for an easing move down the road.

Any judgment regarding whether policy is appropriate is, in part, a judgment regarding whether the Fed has identified the right goals of policy, and, in part, whether the stance of policy is, or has been, maximally consistent with those goals. Different observers have different opinions about both of these criteria. Our purpose here is not to debate the appropriateness of the Fed's goals. We simply assert that the long-term goal of policy is a low and stable rate of inflation, one consistent with maximum sustainable real growth over the long run. However, we do hope to shed some light on whether the stance of policy has been consistent with this goal, and the starting point for this exercise is to ask just what have been the effects of the recent stance of monetary policy. Obviously, monetary policy is not carried out in a vacuum; policy must respond to ongoing developments in the domestic financial and foreign exchange markets to insure that overall monetary and financial conditions are consistent with the Fed's objectives.

A case in point is the Bank of Canada's (BOC) explicit recognition of the importance of changes in the exchange rate to the Canadian economy in setting near-term policy. The BOC combines changes in the short-term interest rate and changes in the exchange rate in a monetary conditions index (MCI) that is regularly highlighted in statements by BOC officials in explaining the stance of policy. The index weights changes in the exchange rate and the short-term interest rate (since January 1987) by the relative size of their estimated impacts on the economy[3]. What is the motivation for including the exchange rate in the index? While the exchange rate is one channel through which changes in interest rates are transmitted to aggregate demand, it is also susceptible to outside influence, and hence often moves independent of changes in Canadian interest rates. Therefore, the BOC is right to convert exchange rate movements into "interest-rate equivalents" (in terms of the impact on the economy) and combine both exchange-rate changes and interest changes in a single index of "monetary" conditions. In this way, significant changes in the exchange rate can be offset by changes in short-term interest rates, leaving the MCI approximately unchanged from its target path. Ideally, neutralizing the effect of "undesirable" changes in the exchange rate on the MCI also approximately neutralizes the effects of the exchange rate change on the economy.

This approach, although certainly an improvement over simply looking at movements in the (real) short-term interest rate, has two major shortcomings. First, it ignores other important channels of monetary policy such as changes in stock and bond prices. Second, it treats too simplistically the dynamic response of the economy to changes in the values of these key indicators. Last year Lyle Gramley developed a version of the MCI for the US that to some extent addressed both of these shortcomings and presented this improved index at our Washington Policy Seminar in 1997. Gramley extended the MCI to include changes in real long-term yields and changes in real wealth. Given the inclusion of variables that are even further beyond the direct control of the Fed, we change notation and refer to this index as a "monetary and financial conditions index," or MFCI. Gramley used simulations of the Washington University Macro Model to gauge the relative impacts of changes in each of the four key monetary indicator variables -- the real fed funds rate, the real 10-year Treasury Note yield, the real exchange rate, and real wealth held by households -- on GDP four quarters ahead.

Gramley's MFCI, like the BOC index, measured the changes in the four "impulse variables" from a fixed reference period. This approach still ignores the specific dynamic response of the economy to changes in each of the impulse variables, since the reference period was fixed and the distance in time from the reference period was the same for all variables. This can be a problem since the value of the MFCI would be the same whether the changes in the impulse variable happened recently or long ago. In fact, we would expect the effects of distant changes in the MFCI variables to have washed out. In addition, the time path of the economy's response to changes in each of the four impulse variables is not identical, as is implied when the MFCI is constructed this way.

There remains one additional shortcoming of this type of MFCI. Since the weights on the other impulse variables were determined relative to a weight of 1 on the short-term real interest rate, this type of MFCI is dimensioned in percentage points and interpretable as a change in the real interest rate since the reference period. This leaves us still guessing about the thing we are ultimately interested in, which is what are monetary and financial conditions contributing to, or subtracting from, aggregate demand. Even we model-spinners would have to think hard and long about how to translate changes in such an index into even a ballpark estimate of what the impact on the economy might be. Thus, at best, changes in an MFCI constructed this way indicate the direction of change in monetary and financial conditions, inform us a little about the relative magnitude of effects to expect on GDP, but tell us nothing about the absolute magnitude of effects on GDP stemming from recent changes in the four impulse varables.

Fortunately, there is a way to address all these shortcomings and get directly to crux of the issue. Macroeconomic Advisers, with the encouragement and input of Lyle Gramley, has devised a new approach to constructing an MFCI for the US that addresses the specific problems noted above. Here's what we did. First, we identified five monetary/financial impulse variables: the real fed funds rate, the real exchange rate, the real 10-year Treasury Note yield, real household equity wealth, and the dividend price ratio. Note that this involved splitting the wealth channel into the part that affects households directly and the part that affects business through the equity cost of capital. We made some technical adjustments to a couple of these series so that they are theoretically meaningful, and are appropriately constructed given the structure of the model. Second, we ran five separate simulations to isolate the model's estimates of the partial effects of changes in each of the five variables, while holding the other four constant, and while allowing multiplier/accelerator mechanisms in the model to work. The resulting time path of the response of real GDP growth to changes in each of the impulse variables measured as the difference of GDP growth in the alternative and GDP growth in the base simulation, is termed a surface-response function. The five surface response functions corresponding to each of the five monetary/financial impulse variables are shown on this page. Third, we reversed these impulse responses to create distributed lags of the response of GDP growth to changes in the impulse variables. Finally, we define the MFCI at each point in time as the sum of the distributed lags (reversed surface response functions) for each of the five variables.

The equation for the MFCI is then:

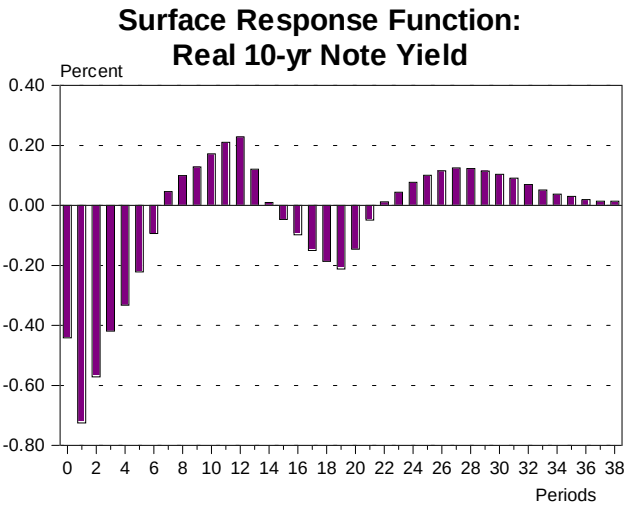
$$MFCI_t = \Sigma_{v=1,5} \Sigma_{i=0,38} \alpha_{v,i} M_{v,t-i}$$

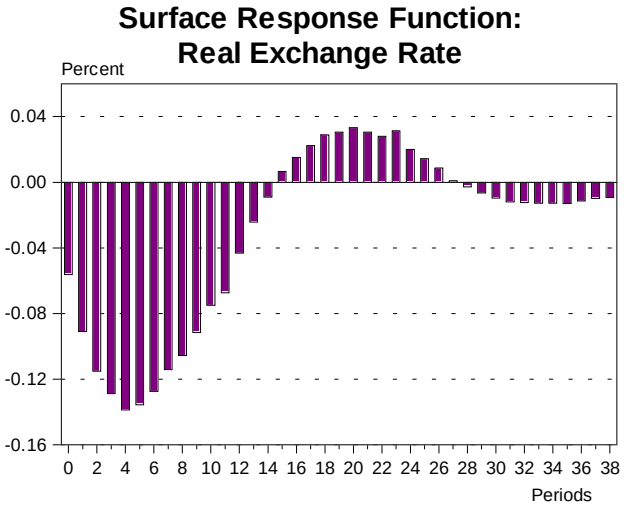
Where the $M_{v,t-i}$ are the values of the five monetary impulse variables and the $\alpha_{v,i}$ are the coefficients taken from the surface response functions.

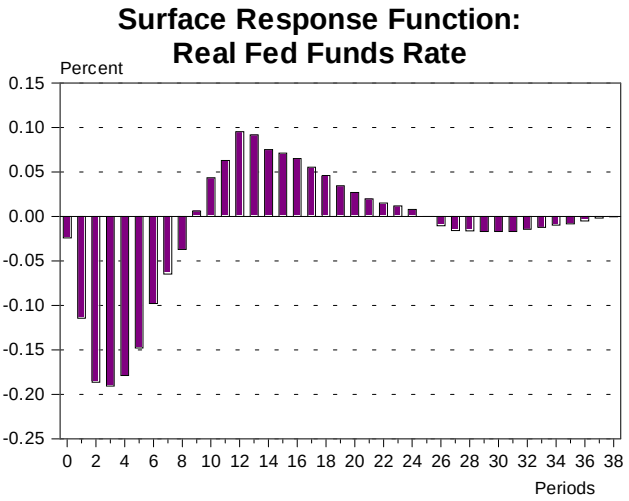
Each of the five distributed lags measures the cumulative impact of past changes in each monetary impulse variable on GDP growth, measured in percentage points. This allows us to interpret the contribution from each of the four lag distributions as the contribution that each monetary impulse variable is making to GDP growth in the current period. Because we were careful to extract only the partial effects on GDP of changes in each monetary impulse variable, we can sum the five distributed lags to arrive at the total effect on GDP. Importantly, this approach calculates an MFCI that is dimensioned in percentage points of growth of real GDP, a more meaningful measure than one that is dimensioned in "interest rate equivalents."

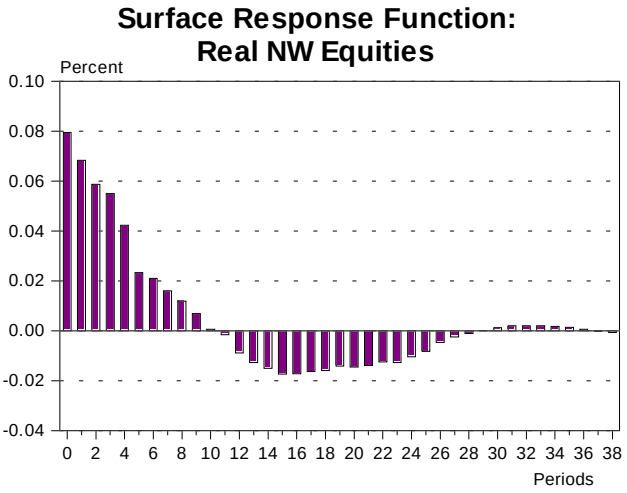
The figure below shows the values of this new monetary/financial conditions index, both historically and in the forecast period. The MFCI is intended to capture the *systemic* effects of changes in the five impulse variables on the growth of aggregate demand. It specifically excludes the effects of aggregate demand shocks (whether of domestic or foreign origin), price shocks that may have spillovers to aggregate demand, and the effects of changes in fiscal policy. All of these other forces can and have had significant impact on GDP growth which the Fed has often seen fit to offset. As a result, the degree of correlation between GDP growth and the value of the MFCI depends in part on how large are the other sources of "shocks" to GDP growth and how aggressive is the Fed in offsetting them. If the Fed could perfectly guide the MFCI, and was perfect at offsetting the shocks to GDP growth from other sources, there would be zero correlation between the MFCI and GDP growth.

In the recent period, with growth rates of real GDP nearly double many analyst's estimates of trend growth, and with the level of GDP perhaps two percentage points above potential, monetary conditions appear to have been



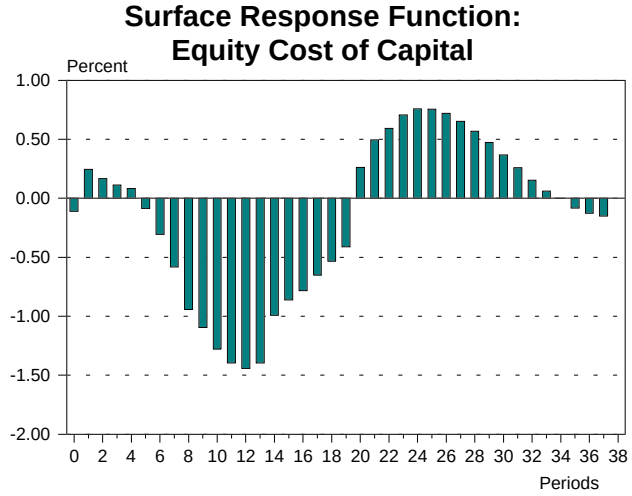






quite supportive of growth, at least up through the second quarter of 1998. The rise in the real exchange rate over the last few years is subtracting significantly from growth, while the rise in the real funds rate is also exerting some modest drag, according to the index. However, these effects are swamped by the contributions to growth coming from the rise in stock prices over the last several years, and from the recent decline in real long-term yields. Indeed, this may be the only period since at least the mid 1970s (as far back as we're able to construct the MFCI at this point) when GDP growth consistently in excess of the rate of growth of potential was met with such accommodative monetary conditions.

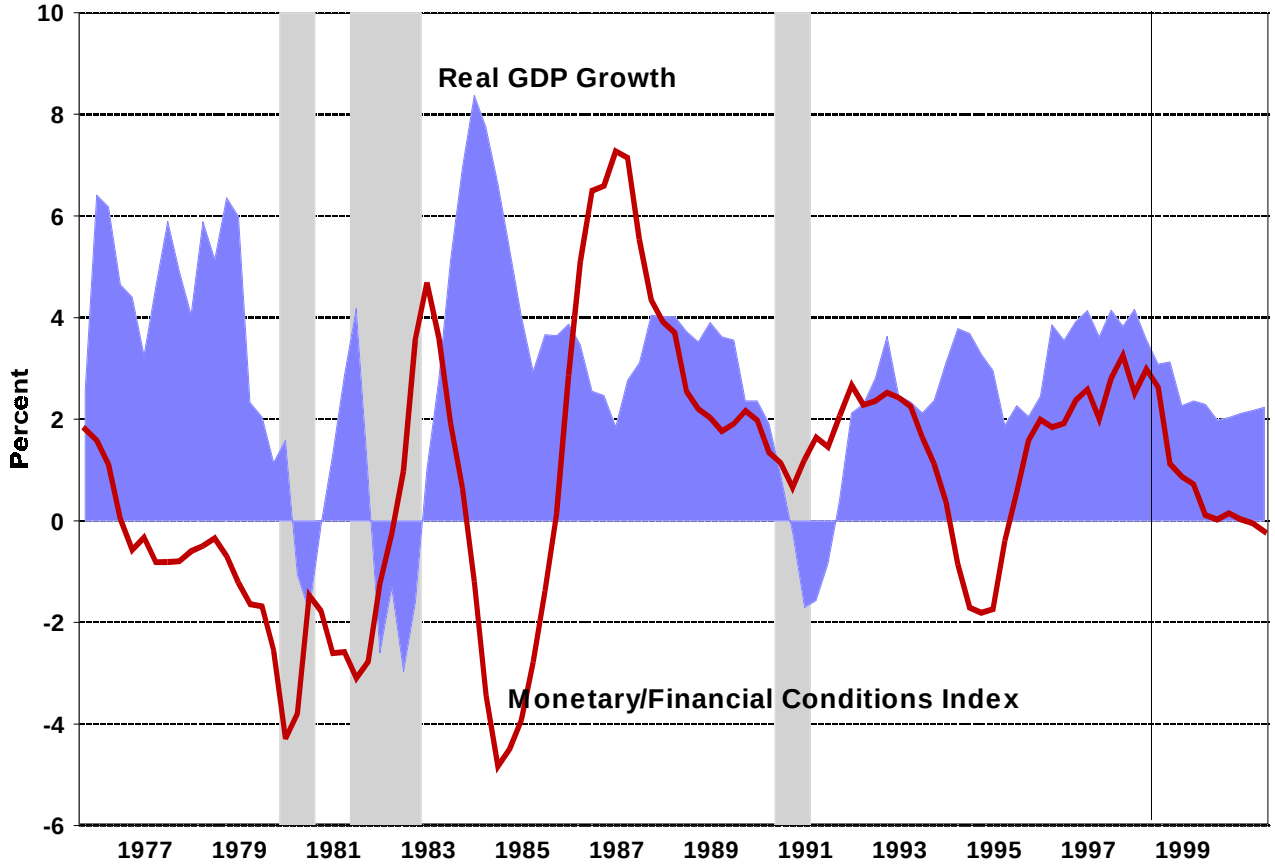
At first blush we're tempted to interpret this as signaling that policy has been too accommodative, i.e., the Fed has not offset the effects of the rise in the stock market on aggregate demand by raising interest rates. However, if positive supply shocks are partly responsible for the US's recent excellent performance, then the Fed could afford to foster more accommodate monetary conditions, allowing the supply shocks to be realized in the form of both lower inflation and more rapid growth, than would otherwise be desirable. In addition, over the last six to nine months, the specter of a severe contraction in Asia imposing a significant drag on the US, plus the recent



correction in the stock market, has provided some leeway to be more accommodative.

In MA's recent forecasts we have incorporated a significant correction in the stock market that, given a modest upward drift in long-term interest rates, a relatively steady dollar, and steady short-term rates, pulls the MFCI sharply lower. Extending the MFCI with these assumptions pulls the index fairly quickly toward 0, a neutral value for the index. In the event of a significant

GDP Growth and the Monetary/Financial Conditions Index



correction in the stock market, a Fed easing to partially offset the impact of lower equity wealth might be appropriate.

A final comment on interpretation: While we use the label "Monetary and Financial Conditions Index," it is important not to rotely interpret the MFCI as an indicator of monetary policy. Recall that while changes in the short-term rate controlled by the central bank are a significant determinant of changes in long-term yields, the exchange rate and stock prices, they are not, by far, the only determinant. When other forces intervene to cause sharp changes in the exchange rate, long-term yields, or stock prices, the Fed has the option of responding in an offsetting manner or not.