

Technical Notes

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

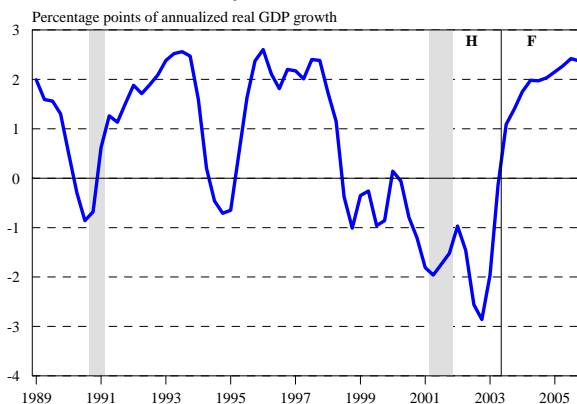
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A Combined Monetary, Financial, and Fiscal Conditions Index

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No doubt regular readers of these pages are familiar with MA's *Monetary and Financial Conditions Index* (MFCI), which measures the contribution to real GDP growth emanating from five variables: (1) short-term interest rates; (2) long-term interest rates; (3) the equity cost of capital; (4) the exchange rate; and (5) wealth effects on consumer spending and residential investment. The magnitude and timing of stimulus (or drag) from each of these variables are derived from the structure of MA's econometric model of the U.S. economy. The index is designed so that if interest rates and the exchange rate are steady while wealth grows at the same rate as potential GDP, then eventually the MFCI settles in at a "neutral" reading of zero.¹ The recent history and forecasted values of this index are shown in the nearby chart. Between late 1997 and late 2002, it fell more than 5 percentage points, from an accommodating high of 2.4 percentage points of real GDP growth to a restrictive low of -2.9 points. It is little wonder the economy eventually decelerated so sharply during this period. Most of the restraint came through two channels: (1) a collapse in equity values following the bursting of the high-tech bubble in the stock market early in 2000; and (2) a persistent appreciation of the real exchange rate during the second half of the 1990's. In our forecast, a rebound in stock prices, the depreciation of the dollar, and the lagged effects of still-low interest rates push the MFCI rapidly into positive territory, with the transition from restraint to stimulus

MA's Monetary & Financial Conditions Index



¹ A technical description of the MFCI can be found at www.macroadvisers.com.

occurring in the third quarter of this year. Indeed, given our projection of further increases in equity wealth and a further decline of the dollar, the MFCI suggests that monetary and financial conditions will become increasingly accommodating through 2004 and remain so in 2005.

MA's New Fiscal Conditions Index. Financial conditions, however, are only part of the story on policy. Fiscal conditions have garnered increased attention the last several years. The Bush Administration has overseen the implementation of three tax cuts: (1) the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA); (2) the Job Creation and Worker Assistance Act of 2002 (JCWAA); and (3) the Jobs, Growth, and Tax Relief Reconciliation Act of 2003 (JGTRRA). In addition, an acceleration of federal spending, which began late in the Clinton presidency, has gathered momentum, first during the early stages of the war on terror, then more recently with the conflict in Iraq. Undoubtedly the stimulus associated with these federal initiatives was at least partly offset by the effects of fiscal belt-tightening on the part of state and local governments, which, faced with a cyclical deterioration of finances, struggled to meet balanced-budget requirements by raising taxes and paring outlays.

What has been the net impact of these fiscal developments on the economy? How have fiscal conditions been undermined or reinforced by monetary and financial conditions? What implications does this have for the forecast? To shed some light on these questions, MA is introducing its new *Fiscal Conditions Index* (FCI), which measures the contribution to real GDP growth of discretionary changes in fiscal policy. In what follows we briefly describe the construction of this new measure, and then sum it with the MFCI to arrive at a combined index of monetary, financial, and fiscal conditions (MFFCI) that provides a useful summary of the overall thrust of government economic policies on aggregate demand.

To understand the basics of the FCI, consider the simplest of expenditure models in which Gross Domestic Product in period t , Y_t , is the sum of consumption, C_t , investment spending, I_t , which, for simplicity, is here

assumed fixed, and exogenous government consumption & gross investment (C&GI), G_t :²

$$(1) \quad Y_t = C_t + \bar{I}_t + G_t$$

In addition, suppose consumption is a function of after-tax income:

$$(2) \quad C_t = mpc(1 - \tau_t)Y_t$$

Here, mpc is the *marginal propensity to consume* out of disposable income and τ_t is the effective income tax rate. Manipulation of the reduced form of this simple model leads to the following expression for growth in aggregate demand:

$$(3) \quad \dot{Y}_t = m \left(\frac{G_{t-1}}{Y_{t-1}} \dot{G}_t + mpc \Delta \tau_t \right)$$

where a "dot" over a variable denotes its growth rate, and $m = (1 - mpc(1 - \tau_t))^{-1} > 1$. On the right side of expression (3), the term in brackets generally is referred to as the "initial fiscal stimulus". It has two parts: (1) the accounting contribution to GDP growth from government C&GI; i.e., the growth of C&GI weighted by its relative importance in GDP; and (2) the direct impact of changes in the tax rate on GDP growth through the marginal propensity to consume. The total impact on GDP growth is the initial stimulus multiplied by $m > 1$; this "multiplier effect" reflects the rise in after-tax incomes, and hence in consumption, induced subsequent to and by the initial stimulus.

Our fiscal conditions index measures that part of growth in GDP attributable to changes in effective tax rates and growth in government C&GI above or below the growth in potential output, \dot{Q}_t :

$$(4) \quad FCI_t = m \left[\frac{G_{t-1}}{Y_{t-1}} (\dot{G}_t - \dot{Q}_t) + mpc \Delta \tau \right]$$

Hence, it has the property that if the effective tax rate is constant and government consumption & fixed investment is steady relative to potential output, the FCI settles in at a "neutral" reading of zero. Note that since it is measured in percentage points of GDP growth, the FCI is additive with the MFCI.

In concept, our new FCI is a calculation akin to expression (4), but there is a plethora of real-world complexities to consider before arriving at an empirically useful counterpart. A relatively easy decision was to define both C&GI and taxes inclusive of state & local governments. This ensures that the FCI reflects the net effects of fiscal initiatives at all levels of government.

² Of course, in actual implementation, all our real aggregates are computed as chain-type indices, not arithmetic sums. Addition of real magnitudes is used here only to simplify the exposition.

Hence, if federal stimulus is offset, either partly or wholly, by state & local initiatives, that offset is reflected in the index. Another decision was to exclude the effects on consumption of government transfers on the grounds that most — though certainly not all — recent accelerations and decelerations of entitlements have arisen not from discretionary changes in benefit formulas but from shifting demographics and variations in programmatic costs unrelated to government initiatives. Other empirical issues are even more complex. For example, in our econometric model the multiplier response of the economy to a fiscal shock is spread over time; i.e., empirically, GDP is a distributed lag of an initial stimulus. In addition, we model six different types of consumption expenditures, each with different short-run and long-run marginal propensities to consume out of labor income, asset income, and transfer income. We also distinguish between changes in tax rates that we believe are perceived as permanent (and which have a relatively large initial impact on consumer expenditures), and one-time tax "rebates" that have a more modest initial effect on consumption.

Furthermore, in our model, different components of C&GI have different initial or induced impacts on GDP. For example, at one extreme is government consumption of fixed capital (CFC). This is an imputation that, on the expenditure side of the National Income and Product Accounts (NIPAs), is included in C&GI and, on the income side of the NIPAs, is included in depreciation. In our modeling, which is typical in this regard, a change in government CFC has a direct "accounting effect" on GDP but no induced behavioral response; that is, the multiplier is one. At the other extreme is government compensation of employees. Not only is this included in GDP directly, it also is included in disposable income, so it generates an initial effect on consumption that, per dollar, is comparable to a change in taxes. In between is all other C&GI, which, on the expenditure side of the NIPA's, is counted directly in GDP. In our modeling, a change in other C&GI also flows through to National Income, but unlike a change in compensation, it hits mainly corporate profits, out of which the propensity to consume (via dividends and wealth) is relatively low.

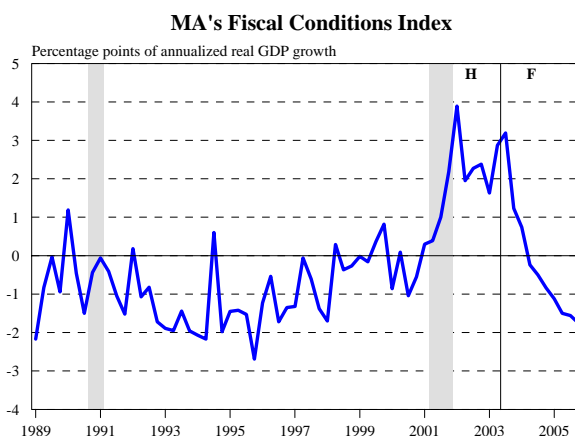
Federal grants in aid to state & local governments warrant a special note. While grants are discretionary, their changes are not included in either GDP or measures of household income. Nevertheless, any indirect influence that grants might have on state & local decisions regarding spending and taxes are appropriately reflected in the FCI. For example, JGTRRA allotted \$20 billion of grants to states. These monies will allow states to avoid spending cuts or tax increases that otherwise might have been required to maintain balanced budgets. The result is fiscal stimulus — actually, in this case, less fiscal drag — at the state & local level, and this is captured in our FCI.

To generate the FCI, we followed much the same procedure used to compute the MFCI. First, we simulated our econometric model to generate “surface response functions”, calibrated in percentage points of annualized GDP growth, for standardized impulses to five fiscal variables: (1) government consumption of fixed capital; (2) government compensation of employees; (3) other government C&GI; (4) effective personal tax rates; and (5) one-off personal tax rebates. In these simulations, in order to avoid double counting, interest rates were held constant, because variations in interest rates already are incorporated in our MFCI, to which we planned to add the FCI. Otherwise, full model dynamics were allowed to operate. Next, the surface response functions were inverted to yield GDP growth as a function of a distributed lag of standardized fiscal impulses. Finally, the historical and forecasted values of the actual impulses to C&GI and taxes were cumulated through the individual distributed lags and then summed across the variables to arrive at the FCI.

This calculation is complicated. Even so, we have taken a number of shortcuts to simplify matters. In particular, for purposes of constructing the FCI, we have aggregated the components of C&GI into three broad categories: consumption of fixed capital, compensation of employees, and "other", each with its own response function. However, in our model, within each of these three broad categories, there are three *additional* classifications: federal defense, federal nondefense, and state & local. Given the chain-type aggregation procedures used in the NIPAs, and differences in the relative prices of the components of C&GI, we actually could estimate up to nine slightly different response functions for the various components of C&GI. Furthermore, there are conceptual issues still outstanding. For example, by ignoring transfer payments, we miss the impact that changes in federal matching Medicaid grants to states, which flow through to state & local medical transfer income, have on consumption of medical services. Indeed, one could argue that a broad index of fiscal conditions should include the impact of transfers — even including unemployment benefits — on consumption, even if that impact does not result from discretionary policy initiatives. After all, our construct described here already includes the "automatic stabilizer" impact of changes in effective personal taxes that are induced by endogenously determined changes in both total taxable income and the distribution of taxable income across taxpayers in facing different marginal tax rates. For consistency, perhaps it would have made sense to define the index to pick up the impact of changes in all fiscal conditions, instead of attempting to limit the index to covering just those changes in conditions that result from discretionary fiscal initiatives.

Finally, our FCI does not include any impact from corporate income taxes, excise and sales taxes, or property taxes — only income taxes. Hence, for

example, the FCI does not reflect any stimulus that might arise from, say, the recently enacted provisions allowing faster tax write-offs of business equipment & software purchased before the end of next year. The reason for this omission is not that we consider these channels unimportant or uninteresting, though most of the time they are less important than individual income tax code. However, the manner in which these tax changes influence aggregate demand — through the rental prices of capital and, in the case of excise and sales taxes, through the real aggregate price level relative to wages — is much more difficult, although not impossible, to isolate using the techniques described here. Still, we're going to think about all these issues some more, solicit feedback from other experts, and reserve the right to change our calculations in the future. This is a work in progress!



Be that as it may, the above chart depicts the *Fiscal Conditions Index*, computed as described here, from 1989 through the end of the short-term forecast. For most of the 1990's, fiscal conditions so defined were restrictive. Early in the decade, statutory tax increases were passed during the Administrations of President George H. Bush and President Clinton. Later there occurred a prolonged rise in the effective tax rate, as rapid economic growth and a soaring stock market pushed taxpayers into higher marginal tax brackets. Furthermore, the acceleration of trend growth that occurred after the mid-1990's interacted with statutory caps on discretionary spending to produce a steady, restrictive decline in government C&GI relative to potential GDP. Recently, as alluded to earlier, fiscal policy turned stimulative, as discretionary spending accelerated relative to GDP and as taxes were cut.

There are two final points about the FCI. First, President Bush recently announced his intent to ask Congress for an additional \$87 billion in Fiscal Year 2004 to fund the ongoing U.S. presence in Iraq and the continuing war on terror. Because we had anticipated such funding, our current fiscal projections already are broadly consistent with the levels of spending now sought by the President. Second, our forecast of above-trend growth next year is not especially dependent on continued fiscal stimulus,

which in fact slackens quickly before turning negative during 2004 as the effects of the JGTRRA tax cuts fade and discretionary spending, while remaining at a high level, decelerates sharply relative to GDP.

MA's Combined Monetary, Financial, & Fiscal Conditions Index (MFFCI). Given its construction, the FCI can be summed with the MFCI to form a combined monetary, financial, and fiscal conditions index (MFFCI). The recent history and forecast of the combined index is shown in the nearby chart. It tells a fascinating story. Shortly after the recession of 2001 ended, the combined index hit a momentary peak as the effects of the EGTRRA tax cuts coursed through the economy. However, financial conditions continued to deteriorate so rapidly that they quickly offset the fiscal stimulus. Now, however, the “perfect policy storm” has gathered and is poised to hit the economy during the second half of this year, when sharp increases in discretionary spending — especially defense spending — and the impetus from JGTRRA tax cuts will be reinforced by the swing of monetary and financial conditions from restrictive to accommodating. During the third quarter of 2003, the combined index hits the highest level (+4.3 percentage points) ever during the period for which we have been able to make these calculations. Furthermore, the simultaneous strengthening of both component indices is unusual. This is a key reason for our confidence in a forecast for a strong second-half rebound.

Going further forward, the combined MFFCI declines towards neutrality, as falling fiscal stimulus undercuts the continuing financial stimulus emanating from wealth effects and a declining dollar. This “fade out” need not be viewed with alarm. For one thing, even in 2005 the combined index is still positive, giving economic growth a boost relative to trend. For another, in a “steady state”, the economy *should* grow at trend with policy in neutral; in the end, sustained economic growth is up to the private sector! Hence, perhaps the best way to think about the “policy storm” now roiling is that it provides the private sector an extra two or three quarters of support during which the economy can distance itself further from both the “post-bubble hangover” that followed the boom and bust of the late 1990’s, and the “geopolitical uncertainties” that undercut household and business confidence after the spring of 2002.

