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KEYNESIAN TAX AND SPENDING MULTIPLIERS

Many proponents of economic stimulus rely on estimates of "multiplier" effects on output that can follow from the use of tax cuts or government spending to try to boost economic activity. The idea is that if you cut taxes or increase government spending, recipients of those tax cuts or spending increases will realize increases in their after-tax incomes and will spend some of those gains. When the original recipients spend some of those gains, the benefits are extended, or "multiplied," to generate further effects on incomes and spending. This paper discusses Keynesian multipliers and what economists know about the sizes of those multipliers.

What is the idea behind a multiplier? Abstracting from the manner in which the tax cuts or government spending increases are financed, the result can be that a dollar of tax cuts or additional government spending leads, eventually, to more than a dollar's worth of increased spending and output. And, greater employment is likely to accompany the increased output, because it takes labor to help produce output. The multiple effect on overall output in the economy stemming from a one dollar change in taxes or a one dollar change in government spending can be referred to as a Keynesian multiplier or, for simplicity hereafter, simply a multiplier.

The government faces a budget constraint: The abstraction on how the extra government spending or tax cut is financed is important. The government has to pay for its extra spending or tax reduction in some fashion. If government wants to cut taxes or spend more on something today, it must pay for it by cutting spending on something else today, by increasing taxes today, or by borrowing today and paying off the resulting debt in the future through higher future taxes or reduced future spending. The stimulus plans under consideration in the House and Senate involve deficit-financed increases in government spending and reductions in some taxes, meaning that the government intends to spend more today and cut some taxes, borrow to cover the current and near-term increase in the federal deficit that follows, and increase taxes or reduce spending in some unspecified future periods.

This means that the government plans to add over $800 billion to the national debt from the stimulus package alone. This would come on top of the projected $1.2 trillion budget deficit expected for 2009. Placing demands in markets for such a significant amount of resources can lead to increased interest rates now and in the future. Those interest rate increases tend to have a contractionary effect on economic activity. It is important to remember that temporary deficit spending today to help reduce the current economic downturn has the potential to significantly affect future long-term economic growth and could create an environment in which our children and grandchildren have to work increasingly harder just to maintain the same standard of living that we enjoy today.

What are the values of tax and spending multipliers for the U.S.? The honest answer is that economists do not know. What governs short-run fluctuations in important macroeconomic variables is one of the least settled areas of economics. As a consequence, economists do not

know a lot about what are likely to be short-term effects of stimulus measures which, by their nature, ought to be short-term policy actions.

A variety of estimates on relative sizes of multipliers have been provided by economists, but the evidence is mixed. Some economists have provided evidence on tax multipliers (increase in GDP per dollar decrease in taxes), some have provided evidence on spending multipliers (increase in GDP per dollar increase in government spending), and some have provided both, even to a very fine level of detail, supplying different multiplier estimates for the various different types of taxes that could be cut or types of spending that could be increased.

It is important to distinguish two types of multiplier estimates: one where the estimates are derived from largely atheoretical statistical analyses of effects of historic changes in fiscal policy; and another where the estimates come from large-scale Keynesian econometric models. The former attempt to draw conclusions about effects of past tax and government spending changes using historical data, without imposing strong assumptions from economic theories on the models being estimated. The latter are derived from large-scale econometric models that provide multiplier estimates but, in the words of Olivier Blanchard (Chief Economist at the IMF) and Roberto Perotti (Economics professor at IGIER Universita' Bocconi): "because of their very structure, largely postulate rather than document any effect of fiscal policy on [economic] activity." The large-scale econometric models such as the one produced by Moody's Economy.com and by Macroeconomic Advisors, largely postulate that tax and spending policy changes will have certain effects on the economy by imposing an underlying Keynesian theoretical structure and auxiliary assumptions in their models that virtually guarantee those effects.

So, what do we know about multiplier sizes from those who rely on the data and not the imposition of Keynesian theoretical prior beliefs? Here are some examples:

- **Christina Romer** (current Chair of the Council of Economic Advisors**) and David Romer** (U.C. Berkeley) find a tax multiplier of about three: a dollar of tax cuts raises the gross domestic product (GDP) by about three dollars.

- **Robert Hall** (Stanford University) **and Susan Woodward** (Chair, Sand Hill Econometrics) find a general government spending multiplier of about one: a dollar of additional government spending raises GDP by about one dollar.

- **Andrew Mountford** (University of London) and **Harald Uhlig** (University of Chicago) find that a deficit financed tax cut has a multiplier of 3.8 after 20 quarters, while a deficit financed spending increase has a multiplier of only 0.33 after 20 quarters.

- **Valerie Ramey** (U.C.-San Diego) indicates a government spending multiplier of about 1.4.

- **Olivier Blanchard** (Chief Economist at the IMF) **and Roberto Perotti** (IGIER Universita' Bocconi) find that "In most cases [of tax and spending changes in the U.S.] the multipliers are small, often close to one," and that "…both increases in taxes and increases in government spending have a strong negative effect on private investment spending."

What are estimates of the sizes of multipliers from the builders and marketers of large-scale Keynesian-based econometric models? Here are some examples:

- **Moody's Economy.com** presents a range from a low of 0.30 for a cut in the corporate tax rate to a high of 1.73 for a temporary increase in food stamps.[1]

- **Macroeconomic Advisors** offer a range of multipliers, depending on the timing of the effect considered, from a low below 0.5 for temporary "bonus expensing" incentives for business investment to a high of just over 2.0 for direct federal spending.

- The **Congressional Budget Office**[2] provides estimates of a range of possible cumulative multiplier effects from a dollar reduction in taxes or increase in spending:

Table 5.

The Cumulative Impact on GDP over Several Quarters of Various Policy Options

	High	Low
Purchases of Goods and Services by the Federal Government	2.5	1.0
Transfers to State and Local Governments for Infrastructure	2.5	1.0
Transfers to State and Local Governments Not for Infrastructure	1.9	0.7
Transfers to Persons	2.2	0.8
Temporary (Well-targeted) Tax Cuts for People	1.7	0.5
Tax-Loss Carryback	0.4	0

Source: Congressional Budget Office.

Note: For each option, the figures shown are a range of "multipliers," that is, the cumulative change in gross domestic product over several quarters, measured in dollars, per dollar of additional spending or reduction in taxes.

Yet, interestingly, in an earlier report[3], CBO suggested a lower general multiplier effect, saying: "Estimates using econometric models suggest that an assumption that a dollar's worth of stimulus at a time of economic weakness produces roughly a dollar's worth of additional economic activity..."

"Bang-for-the-Buck" estimates offered with precision (Beware of Forecasters Bearing Add Factors): Purveyors of large-scale macroeconomic models and forecasting services, like Moody's Economy.com and Macroeconomic Advisors, often present their estimated fiscal policy multipliers in a way that suggests a great deal of precision in estimates of multipliers for particular detailed elements of tax and spending policies. There are many reasons to be suspicious.

One reason is that the responses of GDP and other important economic variables to changes in fiscal policy reflect the Keynesian and other theories and assumptions that guides the construction of the macroeconomic models used to produce the estimated multipliers. If, for example, an analyst believes that it is very costly for businesses to change their capital stock

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[1] Detailed estimated multipliers are provided below from a January 21, 2009 paper titled "The Economic Impact of the American Recovery and Reinvestment Act," by **Mark Zandi**, Chief Economist, Moody's Economy.com. (available at http://www.economy.com/mark-zandi/default.asp?src=economy_homepage).

[2] CBO, "The State of the Economy and Issues in Developing an Effective Policy Response," January 27, 2009 testimony of CBO Director Elmendorf before the Committee on the Budget, U.S. House of Representatives.

[3] CBO, "Options for Responding to Short-Term Economic Weakness," January 2008, CBO, available at http://www.cbo.gov/ftpdocs/89xx/doc8916/01-15-Econ_Stimulus.pdf.

rapidly, the assumptions the analyst builds into her model will mean that a temporary investment incentive such as "bonus expensing" will not generate much of a response of business investment. The resulting weak response is as much a result of what the analyst postulates in her model as it is a result driven by data.

Another reason to suspect multipliers from large-scale macro models is that the results are guided by so called "add factors." Add factors in a model are terms that can be varied by the analyst to produce differing results, and they are often varied when an analyst does not obtain results that she deems "reasonable," in order to get results more in line with her judgmental prior beliefs about what the results "should" look like. If, for example, I do not believe that my large-scale macro model implies a large enough consumption boost from a tax cut to low income households, I can change the value I assume for the marginal propensity to consume for low-income households in my model to get a bigger consumption boost.

A third reason for suspicion about multipliers from large-scale macroeconometric models is that policy analysis using such models fell out of favor in the 1970s, when Nobel Prize winning economist Robert F. Lucas (Economics professor at the University of Chicago) issued his famous "Lucas Critique."

The Lucas Critique and its importance: Lucas formulated his critique of policy analysis using large-scale macroeconometric models estimated from historical data when models rooted in Keynesian theory seemed to have suffered some serious breakdowns.

The basic idea behind the Lucas critique is that we cannot expect people's economic decisions to remain invariant to changes in the economic environment that they face, including the macroeconomic policy environment. Consequently, if we use models estimated using historical data, drawn from environments far different from the current environment, to analyze effects of fiscal policy in the current environment, policy conclusions from the models can potentially be very misleading.

For example, behavior of consumers and financial markets in an economic model estimated using historical data may differ significantly from what we should expect from consumers and financial markets in the current environment. Those historical data arose in economic environments with far different characteristics than the current one. Consequently, relying on large-scale macro models with structural features that are estimated using data drawn from past experiences and environments may give misleading estimates of what we should expect will be the response of the economy to policy changes in today's environment. The idea behind the Lucas Critique seems very important in current, largely unprecedented circumstances.

As an example of why we might be particularly suspect of multiplier estimates from large-scale macroeconometric models, consider the estimated "bang for the buck" fiscal policy multiplier estimates provided by Moody's Economy.com on two different dates, in two different economic environments. The table below shows Dr. Mark Zandi's Economy.com model estimates offered on January 21 of 2009 as well as those presented using the same model on January 22 of 2008.[4]

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[4] Estimates are from "Assessing the Macro impact of Fiscal Stimulus 2008" by Mark M. Zandi, available at www.economy.com/mark-zandi/documents/assissing-the-**impact**-of-the-**fiscal-stimulus**.pdf and from January 21, 2009 paper titled "The Economic Impact of the American Recovery and Reinvestment Act," by **Mark Zandi**, Chief Economist, Moody's Economy.com. (available at http://www.economy.com/mark-zandi/default.asp?src=economy_homepage). "Bang for the buck" in the figure represents the multiplier associated with each possible fiscal policy measure—the dollar increase in GDP after one year stemming from a one dollar reduction in taxes or increase in spending.

Fiscal Stimulus Bang for the Buck: Moody's Economy.com Estimates from 2008 and 2009

Source: Moody's Economy.com	Bang for the buck	
Tax Cuts	Jan., 2009	Jan., 2008
Nonrefundable Lump-Sum Tax Rebate	1.01	1.02
Refundable Lump-Sum Tax Rebate	1.22	1.26
Temporary Tax Cuts		
Payroll Tax Holiday	1.28	1.29
Across the Board Tax Cut	1.03	1.03
Accelerated Depreciation	0.25	0.27
Permanent Tax Cuts		
Extend Alternative Minimum Tax Patch	0.49	0.48
Make Bush Income Tax Cuts Permanent	0.31	0.029
Make Dividend and Capital Gains Tax Cuts Permanent	0.38	0.037
Cut in Corporate Tax Rate	0.3	0.3
Spending Increases		
Extending Unemployment Insurance Benefits	1.63	1.64
Temporary Increase in Food Stamps	1.73	1.73
General Aid to State Governments	1.38	1.36
Increased Infrastructure Spending	1.59	1.59

Note: The bang for the buck is estimated by the one year $ change in GDP for a given $ reduction in federal tax revenue or increase in spending.

The detailed list of multipliers possesses, incredibly, virtually the same values in the January 2009 estimates as in the January 2008 estimates. Today's financial markets, and any transmission of fiscal policy effects through financial markets and decisions, are very structurally different today than they were at the beginning of 2008. Yet, incredibly, the Moody's Economy.com multiplier estimates seem almost entirely invariant to a change in the economic environment that partly governs economic decisions and structural economic relations. It would be prudent to follow the warning that stems from the Lucas Critique and realize that policy conclusions based on estimated large-scale structural (Keynesian based) econometric model could be very misleading.