Why Hasn't the US Economic Stimulus Been More Effective?
The Debate on Tax and Expenditure Multipliers

F. Gerard Adams
Department of Economics
University of Pennsylvania (emeritus)

Byron Gangnes
Department of Economics
University of Hawaii at Manoa

Abstract

Recent dissatisfaction with the impact of expenditure stimulus on economic activity in the United States, along with the results of academic research, have once again raised questions about the effectiveness of fiscal stimulus policies and about whether stimulus to a recessionary economy should be in the form of tax cuts or expenditure increases. This paper considers alternative methods for evaluating the impacts of stimulus policy strategies. We discuss conceptual challenges involved in effectiveness measurement, and we review alternative empirical approaches applied in recent studies. We then present our own estimates of policy multipliers based on simulations of the IHS Global Insight model of the US economy. Based on this review and analysis, we address the question of why recent US stimulus programs have not been more effective.

Why Hasn't the US Economic Stimulus Been More Effective? The Debate on Tax and Expenditure Multipliers

by F. Gerard Adams and Byron Gangnes[*]

University of Pennsylvania (emeritus) and University of Hawaii at Manoa

Recent dissatisfaction with the impact of expenditure stimulus on economic activity in the United States, along with the results of recent research studies (Alesina and Ardagna, 2009, Romer and Romer, 2007 and forthcoming, Sahm et al, 2009, Mountford and Uhlig 2008, Blanchard and Perotti, 2002), have once again raised questions about the effectiveness of fiscal stimulus policies and about whether stimulus to a recessionary economy should be in the form of tax cuts or expenditure increases. (Mankiw, 2009)

One of the difficulties of putting a quantitative dimension on the tools of fiscal policy has been the effort by many economists to extend thinking beyond traditional Keynesian macro model simulation approaches. Recent studies have tried to put the impact of fiscal policy into a neoclassical general equilibrium framework, with rational expectations and/or real business cycles. To avoid theoretical priors, empirical testing has been largely based on vector autoregressive systems, albeit with imposed constraints. Such efforts should not get in the way of realistic quantification. Nor should they be the basis for politically-motivated policy prescription, as happens all too often. The effectiveness of policy is an important current issue. The need for stimulus remains acute. Public deficits and debts have reached unprecedented highs. It is important that the tools of fiscal policy stimulus be evaluated realistically so that they will be as effective, per dollar of expenditure or revenue loss, as possible.

This paper considers alternative methods for evaluating the impacts of stimulus policy strategies. First, we discuss some conceptual issues involved in effectiveness measurement. Next, we consider alternative empirical approaches applied in recent studies and the problems encountered. We include our own estimates of policy multipliers based on simulations of the IHS Global Insight model of the US economy. We then try to answer the question of why recent US stimulus programs have not been more effective. Finally, we draw some general conclusions from our review of existing research and recent experience.

A Critical Distinction

A critical distinction is between the direct spending effects and the multiplier response to stimulus (or contractionary) policies. The total effect of a stimulus program represents the sum of its first round expenditure effects (FRE) and its incentive effect (IE), multiplied by the system multiplier (M). The first round spending effect (FRE) represents the direct increase in expenditure of an increase in government spending or the amount of expenditure related to the reduction in taxes or increase in transfer payments. Presumably, personal tax and transfer measures will have their first round impact by stimulating consumer spending.

Incentive effects (IE) represent the increases or decreases in expenditures that result from policy-related changes in incentives. The incentive effect represents the impact on behavior as a result of the stimulus, other than simply having more or less money in your pocket. The incentive effect will also include the results of endogenous adjustment in prices and interest rates that may crowd out a portion of the demand change. General tax or spending measures may have important incentive effects. Indeed,

that is a central concern of neoclassical models that suggest that increased government spending may impose negative incentives, crowding out private consumption or investment. Importantly, many tax or spending measures are designed explicitly to influence other dimensions of economic behavior. The investment tax credit is a classic example, as is the "cash for clunkers" program, and, most recently, the employment incentive programs. In these cases the stimulus effect is not only the direct effect through added consumption as a result of added income but additionally the effects of changes in behavior—investment, purchases of new cars, and employment of additional workers.

The system multiplier (M) is the total per dollar effect of changes in first round expenditures (increases or reductions), once additional spending has been induced through the economy's expenditure—production—income—expenditure circuit, so that,

$$dGDP = (FRE + IE) * M. \qquad (1)$$

The typical empirical measure of the multiplier effect of a stimulus, the measured multiplier (Mm), is computed in one figure as the increase in GDP divided by the change in expenditures (or taxes):

$$Mm = dGDP/dE \text{ or } dGDP/dT. \qquad (2)$$

The denominator of this expression may be the sum budgeted, or, as in many cases of analysis with time series data, it may be the amount of change in the government budget associated with the fiscal change. In the latter case, this is an endogenously determined figure, usually but not always smaller than the budgeted amount.[1]

The multiplier must be measured over a period long enough to allow the incentives and related economic circuits to operate, a period that may differ with the type of measure imposed. (See the discussion below.)

---

[1] That depends on whether the impact of fiscal action is expansionary or contractionary.

Table 1 summarizes in approximate terms what many economists anticipate on the basis of traditional Keynesian economic modeling for direct and indirect effects and measured multipliers. The main conclusions are:

- the first round effect of tax cuts is likely to be much smaller than that of expenditures,

- the system multiplier is likely to take a value of 1.5 to 2 for expenditures and 0.9 to 1 for general taxes and transfers, much lower than what is sometimes computed in the classroom on the basis of simplified theory,

- but, per dollar of government expenditure or revenue loss, some tax incentives may be more effective than spending or general tax reduction.

Table 1

Approximate Effects and Multipliers of Alternative Stimuli

	Change in Expenditures or Taxes	First Round Effects	Incentive Effects (IE)	System Multiplier (M)	Measured Multiplier (Mm)
Govt. Expenditures on Goods and Services (dE)	1.0	1.0	0	1.5 to 2.0	1.5 to 2.0
Income Tax Cuts or Transfers (dT, dY)	1.0	0.3 to 0.5	0	1.5 to 2.0	0.45 to 1.0
Tax incentives, investment tax credit (dTI)	1.0	Depends on use	3.0-6.0	1.5-2.0	4.5-12.0

A Question of Timing

The timing of the effect of stimulus policy is also an important consideration. Since most recessions occur without clear prior warning, it is important that policy be effective quickly in influencing GDP and employment. The delays associated with implementing counter-cyclical measures mean that they frequently take effect after the

bottom of the recession has been reached. The timing of the removal of stimulus measures is also an important consideration. Table 2 illustrates the typical thinking about the delays encountered. We speak about *inside lags*, that occur while the public sector decision is being made "inside" the government, and *outside lags*, those resulting from the time it takes the economy to make use of the stimulus after it has been put in place.

Table 2

Inside and Outside Lags of Government Stimulus Policy

	Inside Lag	Outside Lag
Fiscal Policy—expenditure increase or tax cut	Depends on political system—in the US , long but could be short	Depends on policy management— thought to be short but in US, long.
Fiscal Policy—incentive program	Depends on political system—in the US , long	Long lag
Monetary Policy	Depends on Central Bank, typically short	Long lag

The time dimensions visualized in Table 2 are approximately one to two quarters for short lags, and 8 to 12 quarters for long lags. But incentive programs may entail still longer lags.

The inside or decision-making lags depend on the political framework in which they are invoked, so that the inside fiscal lag, which is typically long in the United States as a result of extended discussions in Congress, may be much shorter in a parliamentary system. Monetary policy that is administered by a central bank is likely to have a shorter inside decision lag. It has generally been assumed that outside lags for fiscal policy are quite short. In theory, expenditures and or tax cuts can be implemented quickly. In practice, recent experience in the United States suggests that it takes time to implement expenditure programs. Incentive tax measures and monetary policy are likely to take

more time to become effective as they rely on decision making in the private sector that may stretch over a lengthy period. For this reason, they may be more appropriate for long run growth policies than for short run stabilization.

An interesting aspect is the question of whether the program faces a time constraint, whether it is a one-time benefit and/or whether it is set to expire at a specific date. Economic theory (Friedman, 1957, Modigliani and Brumberg, 1954) would suggest that a tax cut favoring consumers would have more direct effect on expenditures if it were permanent or extended over a long period since consumers are unlikely to change their expenditure patterns for a short term or one-time tax reduction. On the other hand, it is possible that crowding out effects could be larger—and net policy effects smaller—if a permanent policy shift creates expectations of large budget deficits down the road. In the case of a tax incentive program that is explicitly limited to a short period, consumers and investors facing a time deadline may quickly take advantage of it before it expires. Like the US "cash for clunkers" and home purchase programs, consumers may advance their purchases to take advantage of the incentive, thus transferring some purchases from the future to the present. At the expiration of the program, the effect may be reversed to the extent that expenditures have been borrowed from the future. Given the difficulty of predicting the timing of a business cycle recovery, this may pose some challenges,

Alternative Approaches to Effect Measurement

The literature on measuring the effect of stimulus and stabilization policies is very large[2]. We will focus on the most recent studies representative of alternative approaches. In an effort to emphasize post-Keynesian theory, this work has taken a number of new

---

[2] Rather than summarize the extensive literature, we recommend summaries in Alesina and Ardagna (2009) p. 3, Mountford and Uhlig, 2006, p. 2, and CBO, 1990). A longer summary is Hemming et al (2002)

directions. We focus here on fiscal policies, changes in expenditures and taxes, but there is also an extensive literature on the effectiveness of monetary policy (Uhlig, 2005)

Historical/ Episodic Approach

Historical views of multiplier effects, descriptive or empirical, run into the difficulty that the impact of tax or expenditure changes must be disentangled from everything else that may be going on at the same time. In most cases this has meant the selection of particular periods for analysis, an "episodic" approach.

A recent paper in the episodic tradition is Romer and Romer's (2007, forthcoming) study. Its conceptual framework is to use "the historical record to identify the motivations, revenue effects, and other characteristics of legislated post war tax changes," to "separate legislated tax changes into those that can legitimately be used to estimate the macroeconomic effects of tax changes, and those that are likely to be contaminated by other developments." (p.2)

The difficulty the Romers faced with using the historical record is precisely the problem of holding "everything else" constant. They deal with this problem by separating tax changes on the basis of their <u>intent</u>; those that are intended for countercyclical purposes or to offset an increase in spending, as distinguished from those that are intended for other purposes: to affect long-run growth, to remedy an inherited government debt, or to improve fairness, for example. The "intent" is the Romer's perception of what lies behind the tax action at the legislative level. However, the taxpayer, or for that matter, the legislator, may not always know or care what the intent of the legislation had been. Somewhat counter-intuitively, the former tax changes are called endogenous and the latter are described as exogenous.

Endogenous tax changes imply that, because the tax change is intended to be countercyclical or to offset increased expenditures, other things are going on at the same time. In that case, the Romers argue, the effect of the tax change cannot be measured without bias from the historical data. For example, suppose that a recession is anticipated and the tax change is designed to put sufficient purchasing power into the economy to bring it back to its target. The tax change is considered endogenous because of the objective of cyclical remediation; it is intended to offset ongoing recessionary forces. The statistical record following the tax change will reflect a combination of negative market forces as well as the impact of the tax cut, making it impossible to distinguish its separate impact.

Exogenous tax changes are seen as being made in the absence of other correlated changes in the economy. It is assumed that recorded changes in the economy following the tax change represent its impact. If there is an increase in GDP growth and/or in GDP components like investment, other than their prevailing trend, these are said to represent tax change effects. These tax changes, which represent a selection out of the total, are the basis for evaluating the impact of tax changes.

The rationale behind this distinction does not lie in a hypothesis that different kinds of tax changes have different impacts. Rather, it is imposed as a necessity to deal with the fact that the historical method used does not provide counterfactuals. In these cases, we do not know what would have happened in the absence of the tax change. Note that if the tax stimulus is successful in achieving its objective, its measured impact would be exactly zero! And, if it does not achieve its objective, its measured impact on the path of the economy may well appear to be adverse.

The Romers find that so-called "exogenous" tax changes have a multiplier of approximately 3, a point they emphasize, whereas calculations based more broadly on all tax changes or on endogenous tax changes show multipliers in a more conventional 0.5 to 1.5 range. The Romers' approach represents selective history, not a very reliable way to measure the impact of countercyclical policy.

Alesina and Ardagna (2009) compare the impact of tax and spending change over a universe of OECD countries from 1970 to 2007. While the basic methodology employs statistics, we refer to it also as episodic since the authors select a limited number of periods[3] when large changes in the fiscal balance occurred. Only episodes (years) when cyclically-adjusted primary fiscal balance improves (or deteriorates) by more than 1.5% of GDP were included, hence the reference in the title of the article to "large" changes in fiscal policy. This means that small fiscal changes, some of which may be important but were spread over several years, are not taken into account. Business cycle effects are eliminated by using cyclically adjusted variables and by computing differences between the data before and the data after the fiscal change. Fiscal changes are distinguished between stimuli and "adjustments", presumably reductions, either of which can take the form of changes in expenditures or changes in taxes. A further distinction is made between times when the impact on the economy was substantially positive and those when it was small or negative. The results of such calculations are summarized briefly in Table 4.

---

[3] Only 6 % of the available country/year points are included.

Table 4

Effects of Fiscal Stimuli and Adjustments: Statistics of Episodes in Fiscal

Policy Study (Alesina and Ardagna, 2009)

(change in % of GDP, after cyclical adjustment)

Growth	Fiscal Stimuli		Fiscal Adjustments	
	Expansionary	Contractionary	Expansionary	Contractionary
GDP	**0.47**	**-1.1**	**1.54**	**0.22**
Govt. expenditure.	1.05	2.84	2.19	-0.64
Transfers	0.18	1.22	-0.58	0.47
Govt. Revenues	2.57	0.42	0.34	1.21
Private Investment	3.99	-3.29	6.49	2.11

Source: Tables 1 and 2 Alesina and Ardagna (2009)

Explaining these data, the change in GDP in the expansionary and contractionary cases simply reflects the computed results for the episodes, whether they resulted in expansion or contraction. Other data are the computed accompanying changes in expenditures, revenues, and private investment. . Fiscal stimuli show a small positive effect or a negative effect that seems to be associated with what happens to private investment. The fiscal "adjustments", surprisingly, also show some expansionary effects which appear to be associated with government spending and, again, private investment. This study, as well as a predecessor (Alesina et al., 1999) suggests that there are strong negative relationships between public spending, profits, and investment.

Note that this work covers a range of OECD countries that are likely to differ greatly in size, and openness and, consequently, in their ability to carry on independent policy. We note, for example, that the seemingly perverse results found for Denmark and Ireland (Hassett, 2009) may simply reflect these small open countries' economic structures. While this data source provides a large number of observations, the

heterogeneity of the underlying cases may undermine the reliability of the results obtained.

A simple regression analysis supporting this work shows a <u>negative</u> relationship between GDP growth and government spending, along, of course, with a selection of other explanatory variables.

On this basis, Alesina and Ardargna reach strong conclusions. They write that, "Our results suggest that tax cuts are more expansionary than spending increase in the case of financial stimulus." (p.3) "This correlation seems to suggest that stimulus packages used along the spending side do not work….." (p.10) "…fiscal stimuli more heavily associated with current spending items…are associated with lower growth, while fiscal stimulus packages based on cuts in expenditures, business and indirect taxes are more likely to be expansionary." (p. 14) "In this respect the US stimulus plan seems too much based upon spending" (p. 15) One may disagree on whether their statistical results justify such unqualified conclusions.

Vector Autoregressive Approaches

Numerous studies have approached the empirics of fiscal policy with variants of reduced form or vector autoregressive calculations. Among these, perhaps the most well known is Blanchard and Perotti (2002) whose VAR approach introduces structural considerations and dummy variables for some large tax change episodes to separate exogenous tax and spending changes from cyclical ones. The analysis uses quarterly data for the United States.

Blanchard and Perotti conclude by finding systematically positive effects on GDP for expenditure increases and negative ones for tax increases. These are consistent with

standard theory, though the multipliers obtained are small (over a period of 12 quarters) in the range of 0.66 to 1.13 for expenditures and 0.43 to 1.30 for tax cuts depending on the underlying assumptions about the trend. Most interesting, however, is the implication that private investment is crowded out by changes in government expenditures but with considerable time delay.

Arin and Koray (2005) investigate the effect on output of different categories of government expenditures and taxes. Decomposing taxes, they find that indirect taxes and corporate taxes have contractionary effects, while personal taxes have neither contractionary nor expansionary effects. In turn, expenditures on wages and salaries have a contractionary effect and defense spending has expansionary effects. These results are not self-explanatory, though they suggest that disaggregation might be useful.

Non-Structural Statistical Studies

There have been numerous vector autoregressive studies of tax and expenditure effects.[4] Most recently this work has sought to deal with the problems of identification with an "agnostic" identification procedure (Uhlig, 1997). We refer particularly to Mountford and Uhlig (2008). The basis for this study is quarterly data for the United States economy. The aim is to filter out the automatic responses of fiscal variables to business cycle variations and to obtain fiscal shocks that are orthogonal to the business cycle and to monetary policy variations. Vector autoregressive techniques are supplemented with sign restrictions. Mountford and Uhlig find relatively large tax cut responses, a multiplier for a deficit financed tax cut of 0.93 after 4 quarters and 3.41 after 12 quarters. (Mountford and Uhlig, 2008, Table 3). Deficit-financed spending policy

---

[4] See discussion in Hemming et al. (2002)

yields a multiplier of only 0.27 after 4 quarters and a <u>negative</u> effect of 1.19 after 12 quarters (Mountford and Uhlig, 2008, Table 4). These results reflect only a small increase in consumption at the beginning of the stimulus and negative impacts on investment.

Cross Section Survey Studies

While difficulties of reconciling aggregate information with cross section studies are well known, survey studies provide information on the first stage, direct effects, of changes in personal taxes. They may also provide information on the indirect effects associated with incentive tax schemes. Most recently, the 2008 tax rebate, a tax credit of $300 to $600 for single people and $600 to $1,200 for married couples, available to a broad group of households, was studied (Sahm et al., 2009). The survey results suggest that roughly one-third of the rebate income was spent in 2008 and that the spending response was concentrated in the first few months after receipt. Note, however, that households that said they saved the rebate or used it to pay off debt might later increase their spending. Aggregate national accounts numbers and other micro surveys[5] support this result. (Sahm et al., op cit) This analysis does not account for indirect effects or the multiplier. Taking account of a multiplier effect would yield impacts on the low end of the estimates in Table 1.

Econometric Model Multiplier Estimates

Simulations with econometric models have been the traditional methodology for evaluating multipliers. The advantage of such calculations is that simulations with and without tax changes provide a simple mechanism of comparing *what if* alternatives, one that embodies the expenditure or tax change and one that does not. Assumptions about

---

[5] Twelve survey studies showed spending of the rebate in a range from 19% to 53%, with a mean of 27%. (Sahm et al. op cit. Table 16)

other aspects of policy and/or relationships with neighboring countries can also be specified.

Admittedly, the results of such calculations depend on the theory embodied in the model and its parameters. Most macro models are constructed around the Keynesian demand paradigm with important feedback from the supply side. The structure of the typical model takes the economy's capacity constraints into account, so that model responses depend on the economic environment, for example whether output is at or below its capacity ceiling. While most applied econometric models do not impose rational expectations or Ricardian equivalence,[6] they are likely to provide adequate descriptions of the aggregate economy's behavior. particularly over the short and medium term. Because the situation in which stimulus or contractionary policies are applied differ, it is important to base simulation exercises on a starting point that corresponds closely to the actual situation of the economy, presumably one that reflects current conditions as closely as possible.

We have performed multiplier calculations using the IHS Global Insight model of the United States economy, a highly disaggregated modern used as a regular platform for business cycle prediction. While it attempts to include elements of New Keynesian and Neoclassical growth economics, it is built largely around the Keynesian demand paradigm. The simulation performance of this system is roughly consistent with those obtained in other macroeconometric models of the US economy.[7]

In Table 5, we show recent multiplier calculations based on simulations of the IHS Global Insight model (Global Insight, undated). Short-run business cycle behavior

---

[6] For a discussion, see Global Insight (undated).
[7] For example, see Hemming et al., 2002, Table 1.

of the quarterly model is driven principally by developments in aggregate demand, which the model articulates in considerable detail. Demand-supply interactions govern the evolution of wages and prices and so the net response to innovations in demand. Over the long run, the economy expands through labor force growth, capital accumulation and increases in productivity, consistent with neoclassical growth models. Forward-looking expectations also influence the path of the economy, although rational expectations are not assumed. The model economy is linked to the international sector through trade in goods and services, exchange rates and commodity prices.

We perform three simulations: (1) an exogenous increase in real Federal government consumption spending, (2) a reduction in marginal (and average) personal income tax rates, and (3) the introduction of a broad investment tax credit. In each case, the policy changes are imposed as permanent changes over the forecast horizon. There are several noteworthy results:

Looking at the first panel of Table 5, we confirm the result that impacts of spending changes have larger dollar-for-dollar impacts than tax changes. The model's expenditure multiplier, which peaks at 1.9, is at the high end of the expected range, while the income tax impact is just under 1. The near-term impact of the investment tax credit is just a bit larger than that of the tax change.

The dynamic pattern of effects shows that the largest initial stimulus is associated with fiscal spending, while the impact of the investment tax credit builds gradually over time, reaching 2.0 after sixteen quarters, because of lagged response of production to he accumulating capital stock.

Table 5

Econometric Model Multipliers
(% Change / %Change in Policy Variable as % of GDP)

	Effect After:			
	4 quarters	8 quarters	12 quarters	16 quarters
Real GDP				
Government Consumption	1.9	1.9	1.7	1.4
Personal income tax rate	0.8	0.9	0.9	0.9
Investment tax credit	1.1	1.5	1.8	2.0
Employment				
Government Consumption	1.1	1.4	1.3	1.0
Personal income tax rate	0.5	0.7	0.7	0.7
Investment tax credit	0.5	0.9	1.1	1.1
Real Private Consumption				
Government Consumption	1.0	1.3	1.2	1.0
Personal income tax rate	1.2	1.6	1.7	1.8
Investment tax credit	0.5	1.1	1.5	1.8
Real Business Fixed Investment				
Government Consumption	3.1	2.7	1.3	0.6
Personal income tax rate	1.1	1.2	0.5	0.2
Investment tax credit	8.3	9.9	11.1	12.1
Note: Based on simulations of the IHS Global Insight Model.				

Increasing near-term employment is the biggest concern at present, and here direct government spending wins hands down. The second panel of the table shows that each one percent of GDP increase in Federal spending raises employment by 1.1% in the first year and 1.4% by the end of year 2. Income tax and investment tax cuts yield less than half the amount of job creation initially, although this gap closes over time.

Where the investment tax credit excels, not surprisingly, is in its longer-run effects. The permanent credit produces a large investment response, with each percent of

reduction in tax revenues producing a 12 percent increase in investment spending after four years, as shown in the last panel of the table. As a result the boost to GDP rises over time, after twelve quarters exceeding that of government spending, which begins to taper off. This demonstrates the potentially powerful growth effects of incentive-type fiscal policies over the long term. Interestingly, the same cannot be said for income tax cuts, which, in this model, primarily stimulate consumption spending.

Taken as a whole, these model simulations support the presumption in favor of direct government spending to target output and job growth in the short run, while demonstrating the potential advantage of investment incentives for expanding growth over longer horizons.

General Equilibrium Model Results

There is a broad consensus among economists that traditional macroeconometric models have not taken into account sufficiently the field's micro theoretical foundations. Woodford (2009) refers to current theoretical thinking as the "new synthesis". The idea is to incorporate an intertemporal general equilibrium structure, one that makes growth models and business cycle models consistent with each other. Rational expectations is central to these systems. On the other hand, they recognize important market imperfections such as price and/or wage rigidities, investment adjustment costs, etc. The Smets and Wouters model (Smets and Wouters, 2007) is a small structural dynamic stochastic general equilibrium (DSGE) model—14 exogenous variables, and 7 exogenous shocks, much more aggregated than traditional macroeconometric systems. Its parameters are estimated by Bayesian techniques on 7 quarterly data series. Cogan et al. (2009) have

used such a model to estimate multipliers for increases in government spending on economic activity. The results are summarized in Table 6.

Table 6

Impact of Increase in Government Spending in the Smets/Wouters Model
(% effect on GDP of a permanent increase in spending of 1% of GDP)

After 1 quarter	After 4 quarters	After 8 quarters	After 12 quarters
1.05	0.89	0.61	0.44

The explanation for the rapid decline of the multiplier from its initial level near unity appears to lie in a strong and rapid crowding out of private investment and consumption. It is not certain, however, whether this response reflects reality or rather the structural constraints of the model. Chari et al. (2009) argue that the government spending shock in this model covers a broad category and has little to do with "government spending", having a variance greatly in excess of that typically observed for this category. On this basis and on the basis of other concerns, Chari et al. argue that "the New Keynesian models are not yet useful for policy analysis." (p. 265)

Why Has the Economic Stimulus Program Not Been More Effective?

Despite the stimulus program, at the time of writing, March, 2010, United States GDP remains approximately 9 percent below its potential and the unemployment rate, presently 9.7 percent, is approximately 5 percent higher than it would be at full employment. Why has the enormous $787 billion stimulus of the American Recovery and Reinvestment Act of 2009 (ARRA), enacted in February 2009, not done more to bring the economy back? As we discuss further below, this is not just a matter of multipliers. The impact of a stimulus depends critically on how the funding is allocated—between spending, tax cuts, transfer benefits, and payments to the states, for

example. And importantly, it depends on the time scheduling of the expenditures, how quickly they are disbursed. We note that:

1. The Great Recession has been more severe than had been expected. In the absence of a stimulus program (and the $700 billion TARP program to deal with financial crisis), the situation of the economy would have been a good deal worse.

2. As many economists have pointed out, the stimulus program was not sufficiently large. On the basis of the multipliers in Table 5 above, we estimate that the impact would be 3.6 percent of GDP for the years 2009 and 2010.[8] Using Okun's law (a 1 percent increase in GDP translates into an roughly 0.5% decrease in the unemployment rate), we estimate that unemployment has been reduced by 1.8 percent[9]. In other words, in the absence of the stimulus program, the recession would have been considerably more severe. A similar picture is illustrated in the Congressional Budget Office's estimates (Figure 1) and in Romer and Bernstein (2009). Note, moreover, that CBO had underestimated the depth of the recession and had assumed a V shaped recovery. Even so, their estimates do not bring the economy back to potential output until 2014.

3. The expenditures in ARRA are allocated to a variety of purposes. (Table 7.) Some of these measures, like income tax cuts and transfer payments

---

[8] The CBO estimates an impact on GDP between 1.2 and 3.2 percent and an impact on employment of 600 thousand to 1.6 million. (CBO 2009) The major consulting firms have estimated an impact of 2.5 million jobs (*New York Times* 2/17/2010) but that figure must be spread over 2 years. Also see the discussion quarter-by-quarter in the CEA (2010b).

that make up an important share, have relatively small multipliers.[10] Other measures benefit the budgets of states and local areas, but may simply be avoiding cuts in spending that would otherwise have been made over the next fiscal years. Government investment spending has likely been more effective but represents only a small share of the total and some of the programs stretch out over many years. "The types of stimulus that could get out the door most quickly, in particular tax cuts, tend to have a smaller impact on GDP growth than increases in government investment spending." (CEA, 2010a, p23)

4. The ARRA program has been slow in getting started. As of December 2009, only one third had been disbursed. (CEA, 2010a) While the tax cuts take force immediately, the government spending initiatives take time. Much planning and permitting is required to initiate investment projects. The shovels simply were not ready! And, it turns out that road repair projects are much less labor intensive today than they were in the thirties.

Estimates by the Council of Economic Advisers, using simple VAR projection procedures to establish a *no stimulus* baseline, confirms our view that the stimulus program, while too small to close the output gap, has improved conditions to some extent. They find that by 2009.4 GDP was 2.0% higher than it would have been in the absence of stimulus. In a similar calculation, the impact on employment is estimated at 2 million jobs. (CEA, 2010a)

---

[10] Note that temporary tax reductions and transfer payments go in significant part to pay off debts or to build bank balances, as shown by cross section surveys.

It is clear that the ARRA stimulus is having an impact on the economy, one that is likely to be more apparent in 2010 than it was in 2009. But it is also apparent that, barring a quick natural resurgence of the economy that is not presently expected, additional stimulus programs will be required to bring the economy back to full employment in the near term.

Table 7
Content of the ARRA Stimulus Program

	$ billions	
Personal and Corporate Tax Relief	288	36.6%
State and Local Fiscal Relief	144	18.3%
Aid to Low Income Workers	81	10.3%
Investment in Roads, Bridges, etc.	111	14.1%
Energy	43	5.5%
Health Care	59	7.5%
Education and Training	53	6.7%
Other	8	1.0%
	787	100.0%

Source: Wikipedia.

_____

Figure 1. Difference Between Potential GDP in CBO's Baseline and Actual GDP Without
and With the Impact of the American Recovery and Reinvestment Act of 2009
_____

(Percentage difference in the fourth quarter of each year)
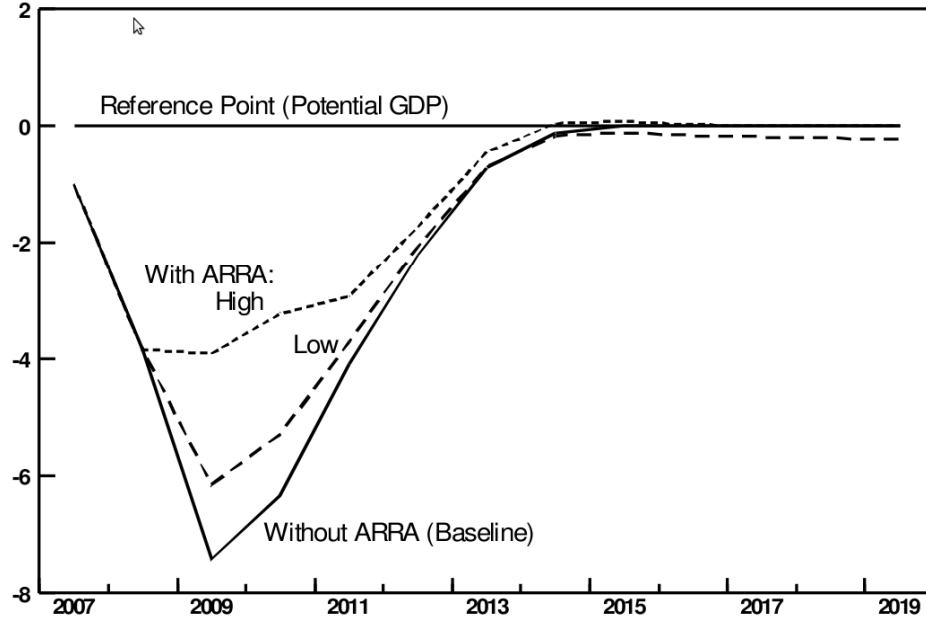
Source: Congressional Budget Office.

Conclusions

The results of multiplier studies of the impact of spending and tax policies differ
greatly depending on the methodology and its underlying assumptions. Such differences
have become particularly apparent, as economists have attempted to impose
microeconomic constraints on their modeling systems and to utilize constrained VAR
estimation methods. The variation of results in recent studies lends only dubious support
to some rather strong policy recommendations, for example, favoring tax cuts over
expenditure stimulus.

Nevertheless, disagreements about the effectiveness of fiscal policies for
stabilization are not as serious as the rhetoric would suggest. Most computations,

whether model based or statistical, suggest that the multipliers for government expenditures are positive but not exceptionally large, in the 1 to 2 range. Most studies suggest that the multipliers for general tax cuts or transfer payments are somewhat smaller. There is not agreement on whether there are significant adverse effects of increased government spending on consumption or investment, an issue that seems to depend greatly on the constraints imposed on the underlying model.. Tax or expenditure programs that embody expenditure incentives for the private sector, like the investment tax credit or the homebuyer credit, may have advantages on a per dollar of expenditure basis over income tax changes or other current expenditure programs. However, the timing of their impact may make them less effective devices for economic stabilization than for achieving long run growth.

The US economic stimulus has not been more effective because, large as it is, it has not been sufficient to offset the impact of a serious recession and because it has been phased in slowly. The difficulties of achieving more rapid implementation of a stimulus program have become apparent. Multiplier simulations and other studies suggest that the recession would have been considerably more serious in the absence of the economic stimulus program.

References

Alesina, Alberto, and Silvia Ardagna (2009) "Large Changes in Fiscal Policy: Taxes versus Spending"
<http://www.economics.Harvard.edu/faculty/alesina/files/large%2Bchanges%2Bin%2Bfiscal%2Bpolicy_October_2009.pdf> accessed 2/16/2010

Alesina, Alberto, Silvia Ardagna, Roberto Perotti, and Fabio Schiantarelli (1999) "Fiscal Policy, Profits, and Investment" Working Paper 7207 Cambridge, MA: National Bureau of Economic Research

Arin, K. P., and D. Koray (2005) "Fiscal Policy and Economic Activity: U.S. Evidence" http://www.diw.de/documents/dokumentenarchiv/17/44879/arin.pdf accessed 262010

Blanchard, Olivier, and Roberto Perotti (2002) "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output" *Quarterly Journal of Economics* 117 4 1329-1368

Chari, V. V., Patrick J. Kehoe, and Ellen R. McGrattan (2009) "New Keynesian Models Not Yet Useful for Policy Analysis" *American Economic Journal Macroeconomics* 1 1 242-266

Cogan, John F., Tobias Cwik, John B. Taylor, and Volker Wieland (2009) "New Keynesian versus Old Keynesian government Spending Multipliers" http://www.volkerwieland.com/docs/CCTW%20Mar%202.pdf accessed 2/15/2010

Congressional Budget Office (2009)"Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output as of September 2009", Washington DC: CBO http://www.cbo.gov/ftpdocs/106xx/doc10682/11-30-ARRA.pdf#10 accessed 2/13/2010

Council of Economic Advisers (2010a) "The Economic Impact of the American Recovery and Reinvestment Act of 2009: Second Quarterly Report", Washington DC: Council of Economic Advisers

Council of Economic Advisers (2010b) :*Economic Report of the President*, Washington DC; Council of Economic Advisers

Friedman, Milton (1957). *A Theory of the Consumption Function*. Princeton Univ Press

Hassett, Kevin A. (2009) "The Impact of the Recovery Act on Economic Growth" Testimony to the Joint Economic Committee, October 29, 2009

Hemming, Richard, Michael Kell, and Selma Mahfouz (2002) "The Effectiveness of Fiscal Policy in Stimulating Economic Activity—A Review of the Literature" IMF Working Paper WP/02/208

IHS Global Insight (undated) "Global Insight Model of the US Economy," Lexington, Massachusetts.

Joint Economic Committee (2009) "Keynesian Tax and Spending Multipliers" February 7, 2009 http://jec.senate/gov/republicans/public/_files/Keynesiantaxandspendingmultipliers.pdf accessed 1/20/2010

Mankiw, N. Gregory (200(0 "Tax Cuts Might Accomplish What Spending Hasn't" New York Times December 13, 2009,

Modigliani, F. & R. Brumberg (1954): Utility Analysis and the Consumption Function: An Interpretation of Cross-section Data. In: Kurihara, K.K (ed.): *Post-Keynesian Economics*. New Brunswick, NJ: Rutgers University Press.

Mountford, Andrew and Harald Uhlig (2008) "What Are the Effects of Fiscal Policy Shocks?" NBER Working Paper No. 14551

Romer, Christina D., and Jared Bernstein (2009) " The Job Impact of the American Recovery and Reinvestment Plan" http://www.ampo.org/assets/library/104_obama.pdf accessed 2/15/2010

Romer, Christina D. and David H Romer, (2007 and AER forthcoming) "The Macroeconomic Effect Of Tax Changes: Estimates Based On A New Measure Of Fiscal Shocks" *American Economic Review* (forthcoming)

Sahm, Claudia R., Matthew D. Shapiro, and Joel B. Slemrod (2009) "Household Response to the 2008 Tax Rebate" NBER Working Paper No. 15421

Smets, Frank, and Rafael Wouters (2007) "Shocks and Frictions in US Business Cycles" *American Economic Review* 97 3 586-606

Uhlig, Harald (1999) "What Are the Effects of Monetary Policy on Output? Results from an Agnostic Identification Procedure" <http://ideas.repec.org/p/dgr/kubcen/199928.html>

Wikipedia (2009) Congressional Budget Office (2009) in "American Recovery and Reinvestment Act of 2009" http://en.wikipedia.org/wiki/American_Recovery_and_Reinvestment_Act_of_2009> accessed 1/20/2010

Woodford, Michael (2009) "Convergence in Macroeconomics: Elements of the New Synthesis" *American Economic Journal Macroeconomics* 1 1 267-279