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The Case for Global Fiscal Stimulus

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	CONTENTS	PAGE
Executive Summary		2
I. Introduction		2
II. Fiscal Multipliers		3
A. Short Review of the Evidence on Short-Run Fiscal Multipliers		4
B. Structural-Model Based Fiscal Multipliers		5
III. The Importance of Commitment to Long-Run Fiscal Discipline		10
A. Reduced-form Empirical Evidence		11
B. Policy Credibility and Short-Run Stimulus Effectiveness		11
C. Policy Credibility and Long-Run Crowding Out		12
IV. Global Scenarios Before and After Fiscal-Monetary Stimulus		13
V. Concluding Remarks		16
Appendix		17
References		19

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EXECUTIVE SUMMARY

Global fiscal stimulus is essential now to support aggregate demand and restore economic growth. The International Monetary Fund has called for fiscal stimulus in as many countries as possible, including emerging market and advanced economies. This paper uses simulations with a multi-country structural model to show that worldwide expansionary fiscal policy combined with accommodative monetary policy can have significant multiplier effects on the world economy. It also provides a framework for assessing the effects of fiscal actions needed to help counter the projected contractionary pressures in the world economy. But not all countries are in a position to implement such plans. Some countries have financing constraints—either high borrowing costs or difficulties in financing deficits at any cost—while others are constrained by high levels of debt.

I. INTRODUCTION

1. The global economy has recently been hit with major deflationary shocks as aggregate demand has declined sharply owing to the loss of confidence associated with the ongoing financial crisis (see Decressin and Laxton, 2009). Governments and central banks have responded to the problems of financial institutions by introducing a number of substantive and innovative measures to deal with both liquidity and solvency problems. In addition, central banks have reduced interest rates to unprecedented levels to offset the increase in private sector risk premia and to underpin aggregate demand. In spite of these efforts, credit conditions remain very tight and aggregate demand and employment in many countries are weakening rapidly. Negative spillovers from the weakening economies to those economies that had appeared to be more robust have increased, and the concern is rising that the global economy may be moving into a period of deep and prolonged recession (IMF, 2009). With limited scope for further stimulus through monetary policy, attention has turned to fiscal policy. In this context, questions are being asked about how effective government fiscal policy actions would be in lessening the depth and duration of the slowdown in the major industrialized economies and the emerging economies, and what the preferred mix of fiscal policy actions would be. This paper provides a framework for addressing these questions.²

2. In line with the present or likely near-term circumstances in many countries, the analysis posits a situation in which governments around the world have taken unprecedented actions to support their financial sectors, and where central banks have reduced interest rates close to their zero lower bound, but where the world economy is nevertheless faced with a significant risk of deflationary pressures. These pressures are coming from a variety of sources, including the sharp decline in stock market and housing wealth, the related desire to rebuild assets and to repay debts, the difficulty of accessing credit in a world of deleveraging, and the much-increased uncertainty surrounding future economic developments. We will show that even in such circumstances accommodative monetary policy can increase the effectiveness of

² The IMF has recently called for global fiscal stimulus and discussed core principles for the fiscal response to the crisis. See Lipsky (2008), Spilimbergo and others (2008), and Decressin and Laxton (2009). See also IMF (2009) for a discussion of the state of public finances after the 2008 crisis.

stimulative fiscal actions very significantly, despite the well-known debate on the efficacy of monetary policy near the zero bound.³

3. Given the large size of stimulus under consideration, this paper also focuses on the importance of a clear commitment to long-run fiscal discipline by countries wishing to engage in short-run discretionary fiscal stimulus. In the absence of such a perceived commitment, expansionary fiscal actions can lead to increases in long-term real interest rates, which tend to offset the stimulus effects on GDP of the fiscal actions. This concern about long-run sustainability and the associated credibility of the fiscal authorities is all the more important in today's circumstances, where many countries face longer-term fiscal issues related to an aging population, such as expenditures on medical care, and the fiscal pressures generated by measures necessary to deal with the current crisis in the financial system.

4. Our analysis implies that if fiscal policy and monetary policy work together, they can make a significant contribution to preventing the economy from weakening further and falling into a vicious cycle of deep recession and deflation. However, in deciding whether to use fiscal policy, countries must also pay attention to the fiscal space available and to the credibility of the fiscal authorities. Some countries have financing constraints—either high borrowing costs or difficulties in financing deficits at any cost, while others are constrained by high levels of debt. In addition, it is important to emphasize that while fiscal and monetary policy can help support demand in the short run, these tools have limitations and should not be viewed as a substitute for dealing with financial sector issues.

5. The remainder of the paper is divided into four sections. Section II examines the size of fiscal multipliers from a variety of perspectives. Section III analyzes the way in which the credibility of the fiscal authorities influences the effectiveness of fiscal actions. Section IV examines the fiscal elements of the *World Economic Outlook* update released in January 2009. Section V provides some concluding remarks.

II. FISCAL MULTIPLIERS

6. There has been considerable disagreement over the effectiveness of different types of temporary fiscal measures in stimulating aggregate demand. Following a brief review of the empirical literature on short-run fiscal multipliers, we will provide extensive model-based estimates.

7. The main policy conclusions of this multiplier analysis are threefold. First, temporary expansionary fiscal actions can be highly effective provided that monetary policy is accommodative. Second, the effects of the fiscal expansion are magnified if it involves

³ See, for example, Yates (2003). Even those who believe that monetary policy can continue to have significant effects in such circumstances agree that its impact is blunter, less predictable and harder to gauge than in normal situations.

multiple countries. And third, the type of fiscal instrument used to bring about the increased fiscal deficit can have a large influence on the size of the fiscal multiplier.

8. The differences in the multipliers resulting from different combinations of fiscal actions and monetary policy reactions are the result of differences in the direct effects of the fiscal actions and the indirect effects arising from real interest rate movements. The latter derive from movements in nominal interest rates and in expected inflation, which are critically dependent on monetary policy reactions.

A. Short Review of the Evidence on Short-Run Fiscal Multipliers

9. The empirical estimates of fiscal multipliers are dispersed over a very broad range, reflecting the inherent difficulty of identifying a fiscal impulse and its propagation through the economy. In particular, simultaneity problems (most notably the two-way linkages between economic activity and fiscal balances) make it very difficult to pin down the effects of discretionary fiscal actions. In studies that pay close attention to the identification of fiscal stimulus in the United States (Blanchard and Perotti, 2002; and Romer and Romer, 2008), a fiscal stimulus of 1 percent of GDP has been found to increase GDP by close to 1 percentage point at impact and by as much as 2 to 3 percentage points of GDP when the effect peaks a few years later. On the other hand, Perotti (2005) finds much smaller multipliers for European countries using the same identification strategy that was employed by Blanchard and Perotti (2002). Cross-country studies often find small fiscal multipliers and in some cases multipliers with a negative sign (Christiansen, 2008). The most notable studies with “negative multipliers” are found in the literature on expansionary fiscal contraction initiated by Giavazzi and Pagano (1990) and surveyed in Hemming, Kell, and Mahfouz (2002).

10. A critical reading of the literature reveals several causes behind these diverse estimates. The size of fiscal multipliers depends, among other things, on leakages into saving and imports and on responses of monetary policy to the fiscal actions, all of which can differ across countries. Also, as a practical matter, some countries are more able than others to finance stimulative fiscal policy actions without causing real interest rates to rise. For a relatively closed economy with few or no financing constraints for the government, of which the United States is the prototype, it is empirically and theoretically plausible that the fiscal multiplier would exceed 1, especially when combined with accommodative monetary policy. The estimated multiplier would be smaller when the economy is smaller and therefore more open to trade (i.e., higher leakages into imports) and more susceptible to financial market constraints (i.e., upward pressure on real interest rates), or when it is subject to monetary policy that offsets the fiscal stimulus (e.g., IMF, 2008).⁴ And multiplier effects differ with the fiscal instruments adopted, with expenditure measures having larger effects than others.⁵ Cross-

⁴ The problems faced by small open economies can be addressed to some extent through coordinated fiscal stimulus and accommodative monetary policy, as will be further discussed shortly using a structural model.

⁵ This includes direct purchases of goods and services, which can be separated into consumption goods and investment goods.

country econometric studies of fiscal multipliers would not be able to adequately control for these possibilities, particularly the important role of monetary policy responses, and that may be a major reason why they have tended to find lower multipliers than in the United States, and also lower multipliers than in the scenarios with accommodative monetary policy presented in this paper.

11. On balance, the evidence provides some support for the view that, in the current environment where monetary policy remains accommodative, a well-executed global fiscal stimulus could provide an appreciable boost to the world economy in crisis. This statement, of course, leaves open what constitutes a well-executed fiscal stimulus, which this paper discusses using a structural model that is better suited for analyzing the interaction among factors that affect the efficacy of fiscal stimulus than the reduced-form models used in much of the literature. While no model can reflect all complexities that influence the eventual effect of policy, the following analysis clarifies several key elements that are important for enhancing the effectiveness of fiscal stimulus.

B. Structural-Model Based Fiscal Multipliers

Fiscal Multiplier Definition

12. The term fiscal multiplier has been used in a variety of ways in the literature. Broadly speaking, it describes the effects of changes in fiscal instruments on real GDP. Typically, it is defined as the ratio of the change in GDP to the change in the size of the fiscal instrument or the change in the fiscal balance. In this paper, we compare the effects on real GDP of different fiscal instruments. We therefore normalize the fiscal impulses in the experiments using the various fiscal instruments so that the result in each case would be an increase in the deficit-to-GDP ratio of 1 percentage point in year 1 and 0.5 percentage point in year 2. We will report results of the fiscal actions on GDP in years 1 and 2, and their cumulative effect over the two years divided by 1.5 as a summary measure of the fiscal multiplier. We will refer to the latter as the *cumulative multiplier*.

The Model

13. The IMF's Global Integrated Monetary and Fiscal Model (GIMF) is a structural model based on household and firm optimizing behavior. For this paper we use an annual version of GIMF.⁶ The model has a number of features that make it especially suitable for assessing the effectiveness of complementary fiscal and monetary policy actions. First, it is in the new-Keynesian tradition, with a number of nominal and real rigidities that allow monetary policy to have real effects on the economy in the short to medium run. Second, it allows for non-Ricardian responses to fiscal actions by having overlapping generations with finite economic

⁶ The appendix provides a brief summary of the main assumptions of the version of the model used in this paper and why changes in fiscal instruments affect the behavior of the economy. See also Kumhof and Laxton (2007) for a more detailed discussion of GIMF's structure and properties.

lifetimes that respond to lifetime income profiles,⁷ and hand-to-mouth households that respond to current disposable incomes.⁸ Third, it uses a stylized Taylor-type interest rate reaction function in which central banks set interest rates on the basis of the deviation of current or forecast future inflation from the inflation target and output growth. A lagged dependent variable smooths the response of policy interest rates to changes in these factors. Fourth, taxes on labor income have distortionary effects and changes in these taxes cause agents in the model to adjust their behavior. Fifth, government spending invested in infrastructure eventually increases the productivity of private inputs.

14. The version of the model used for the simulations presented in this paper has five economic areas—the United States, the euro area, Japan, emerging Asia, and remaining countries. The model assumes that the share of hand-to-mouth households is 50 percent in emerging Asia and the remaining countries and 25 percent in the United States, the euro area, and Japan. Because they do not have access to credit and therefore are unable to borrow against future income, hand-to-mouth households are assumed to consume all their current income. In contrast, other households have planning horizons over their entire lifetimes and adjust their consumption patterns to take account of expected future incomes and interest rates. Furthermore, in the version of the model used in this paper, emerging Asia is assumed to have its exchange rates pegged to the U.S. dollar, and its interest rates are consequently assumed to follow those of the United States. A more detailed exposition of the properties and calibration of the model is presented in the appendix.

15. Earlier variants of GIMF have allowed researchers to examine a number of issues, including the consequences of a U.S. fiscal consolidation for the U.S. current account (Kumhof, Laxton, and Muir, 2005) and the effects on the United States and other economies of permanent cuts in U.S. government investment and government consumption (Kumhof and Laxton, 2007). More recently, it has been used to assess alternative fiscal policy rules that place greater weight on stabilization objectives.⁹ In this paper, we focus on the effects on economic behavior of temporary fiscal measures in order to address their potential usefulness at a time of economic crisis.

Simulations of Expansionary Fiscal Policies in the Model

16. All the simulations are stylized representations of reality and cannot deal with all the issues that arise in the real world, including some of the practical constraints facing policymakers. As an example of the latter, the speed with which countries can expand

⁷ In normal circumstances, there is little difference between the short-term behavior of Ricardian households and of non-Ricardian households with finite economic lifetimes but relatively long planning horizons.

⁸ Hand-to-mouth households can be interpreted as rule-of-thumb consumers that consume all of their labor and transfer income or as households that are liquidity-constrained and hence cannot smooth their consumption patterns in response to lifetime incomes. Temporary fiscal expansions will be larger when there is a higher share of these households in the economy.

⁹ There is a vast literature on designing monetary policy rules to avoid large boom-and-bust cycles, but much less work on designing fiscal rules. For some examples of early work in this area see Kumhof and Laxton (2009a and b).

government investment expenditures will depend on the planning for such expenditures that has gone on in the past and on the need for such expenditures. Countries that have not maintained their infrastructure and that have been planning to improve it will find it much easier to increase such spending than countries that have invested heavily in improving their infrastructure in the past. Even more important is the inability of the model to reflect all the real world issues that can influence the response of households to changes in their disposable incomes as a result of fiscal actions. In the current crisis situation, leakages into saving could increase due to a desire to rebuild the wealth lost in the decline of asset prices, bequest motives, desires to pay down debt, difficulties in accessing credit at a time of financial sector difficulties, reactions to increased uncertainty, and the like. We thus recognize that, in the current crisis situation, the fiscal multipliers resulting from the simulations could overstate to some extent the actual effects of fiscal actions. Nonetheless, the relative sizes of multipliers in the simulations that result from the use of different types of fiscal instruments continue to be instructive.

17. In this paper, we present the effects of four types of temporary fiscal actions on GDP and the real interest rate (in the world as a whole and five economic areas) under different assumptions regarding monetary accommodation. The first fiscal action involves an increase in lump-sum transfers to all households; the second shows the effect of a decrease in taxes on labor income; the third involves an increase in government investment expenditures; and the fourth examines the case of transfers targeted exclusively to hand-to-mouth households. Much more detailed country-by-country information on these and other simulations is contained in Freedman and others (2009).

18. In each type of fiscal expansion, the fiscal measure involves taking stimulative action equal to 1 percent of GDP in the first year and 0.5 percent of GDP in the second year. In addition, lump-sum transfers are used to offset the resulting endogenous changes in the budget deficit so that the final deficit in the country or countries undertaking the action increases by 1 percent of GDP in the first year and 0.5 percent of GDP in the second year (that is, the working of automatic stabilizers in response to the discretionary actions has been offset by an increase in lump-sum transfers).¹⁰ Moreover, in all cases, in the period following the temporary fiscal action, lump-sum transfers adjust to return government debt back to its baseline value over time. They are assumed to do so very gradually to minimize the effects of fiscal consolidation on post-crisis GDP.

19. The simulations consider two possible types of monetary policy response to the fiscal action. The first is that there is no monetary accommodation in any country, such that the Taylor-type rule in the GIMF model continues to operate in both years of the fiscal expansion. In the second, monetary policy is accommodative in all countries for the two years of fiscal stimulus, i.e., policy interest rates are held unchanged for two years, after which they are

¹⁰ One can therefore think of the fiscal multipliers as the result of a combination of the discretionary action and the lump-sum transfers that offset the automatic stabilizers. The multipliers are thus somewhat larger than those that would be attributed solely to the discretionary action.

allowed to adjust in accordance with the Taylor-type rule.¹¹ Freedman and others (2009) also consider an intermediate case where the policy interest rate is held fixed for only one year.

Results of Global Fiscal Actions

20. Figures 1 and 2 present the results of the four different types of temporary fiscal action undertaken on a global basis, with all the economic areas engaging in the same type and the same amount of discretionary fiscal action and the same type of monetary accommodation. In each case, the figure shows the effect of the fiscal action on real GDP and the real interest rate in the world as a whole (the top panel) and in the five economic areas (the subsequent panels). Figure 1 sets out the results when there is no monetary accommodation and Figure 2 sets out the results when there is monetary accommodation for both years of the fiscal stimulus.

21. In the top two bars of each panel, the fiscal instrument is lump-sum transfers to all households (with the first bar showing the first-year effects and the second bar showing the second-year effects). In the next two bars the fiscal instrument is a reduction in tax rates on labor income, while the following two bars show the effects of an increase in government investment expenditures. The final two bars illustrate the effect of targeted transfers, in which hand-to-mouth households (25 percent of all households in the G-3 economies and 50 percent elsewhere) receive all of the lump-sum transfers in the discretionary fiscal package.

22. Figure 1 shows that, without monetary accommodation, using government investment expenditures as the fiscal instrument results in very much larger effects on GDP than does lump-sum transfers. The former results in a peak effect on world GDP of 1.7 percent in the first year and 0.7 percent in the second year, while the effects of the latter are 0.3 percent in the first year and 0.1 percent in the second year. The cumulative fiscal multipliers¹² are 1.6 percent for government investment expenditures and 0.3 percent for lump-sum transfers. To a considerable extent, this difference relates to the fact that transfer payments that are perceived to be temporary have only a limited effect on the behavior of households that focus on lifetime incomes and are not hand-to-mouth consumers. In contrast, government investment expenditures have a direct effect on aggregate demand, as well as secondary multiplier effects on household spending as incomes increase as a result of the initial investment spending and as wealth increases due to the higher productivity of the economy.¹³

¹¹ We assume throughout that monetary policy remains credible even with monetary accommodation. For countries with explicit or implicit inflation targets this implies a readiness to withdraw liquidity and tighten monetary conditions when the current economic weakness reverses and renewed economic growth starts to put upward pressure on forecast inflation.

¹² Recall that the cumulative multiplier is defined as the cumulative effect on real GDP of the fiscal actions over the two years divided by 1.5 (the sum of the deficits over the two years).

¹³ As shown in Freedman and others (2009), the effects on GDP of government consumption expenditures are similar to those of government investment expenditures with the exception of the impact of the latter on potential output. It may also be somewhat more difficult to reverse increases in government consumption expenditures than in government investment expenditures, which are particularly project oriented. In the academic literature, researchers usually do not distinguish between government consumption and government investment.

23. Because investment expenditures have a larger initial effect on aggregate demand than do lump-sum transfers, they also have a greater effect on inflation. Hence, as can be seen in Figure 1, investment expenditures result in a greater increase in real interest rates than in the case of lump-sum transfers when there is no monetary accommodation and the monetary authorities react strongly to inflation movements. This increase in real interest rates tends to offset the stimulative effects of the fiscal actions and, along with the reduction in the magnitude of the size of the fiscal action in the second year, results in lower effects on real GDP in the second year.¹⁴

24. The largest multipliers occur in emerging Asia and the remaining countries. The reason is that the share of hand-to-mouth households is larger in these areas than in the large industrialized countries and therefore the increased flows of income have a greater overall effect on demand in their economies.

25. Comparing the case of equally distributed lump-sum transfers with targeted transfers, it is clear that the latter have almost twice as large cumulative multiplier effects for the world as a whole (0.5 compared to 0.3). The reason is that hand-to-mouth households have a much higher propensity to consume out of income than households whose focus is on lifetime incomes.¹⁵ The differences in multipliers are larger in the G-3 economies, since the increase in income to hand-to-mouth households from targeting transfers is much larger than in the case of emerging Asia and the remaining countries, given the much smaller proportion of hand-to-mouth households in the G-3 economies.

26. The third and fourth bars in each panel in Figure 1 present the results of a global stimulus package in the form of a reduction in tax rates on labor income. Because of the beneficial reduction in tax distortions, this form of stimulus has a slightly larger effect on GDP than the increase in lump-sum transfers. While not apparent in the multipliers in the short to medium run, changes in the level of taxes with distortionary effects can also have significant long-run effects on behavior.

27. Figure 2 shows the effects of global stimulus in circumstances of monetary accommodation in all five economic areas over the two years of the fiscal expansion. (Note the change of scale between Figure 1 and Figure 2.) It is evident that, with the exception of labor income taxes (where the effects are not so dramatic), the size of the fiscal multipliers is much larger with monetary accommodation. For example, in the case of government expenditures the cumulative multiplier is 1.6 without monetary accommodation and 3.9 with monetary accommodation. The corresponding numbers for targeted transfers are 0.5 and 1.7. The reason for the larger multiplier effects with monetary accommodation is that the demand-stimulating effects of the fiscal actions result in increases in inflation, and therefore lead to declines in real interest rates when nominal interest rates are held unchanged by the monetary authorities. Because real interest rates fall in the case of monetary accommodation, rather than rise as in

¹⁴ The model is consistent with the Taylor principle, which states that at some point the policy rate must be adjusted sufficiently aggressively in response to inflationary pressures (response coefficient greater than 1) to provide an anchor for inflation and inflation expectations.

¹⁵ See Broda and Parker (2008) for related evidence.

the case of no monetary accommodation, they add to the expansionary effect rather than offsetting it. The effects of monetary accommodation, although still positive, are less strong in the case of labor income taxes because the reduction in such taxes results in a supply response that dampens the effects of higher aggregate demand on inflation, and thereby on real interest rates.

28. Even in circumstances where inflation rates were negative and nominal interest rates were at the zero lower bound, the fiscal action would make inflation less negative and thereby lead to lower real interest rates. Thus, in addition to the direct effects of the fiscal actions over the two years in which they are in operation, the upward movement of inflation would result in real interest rates remaining lower than otherwise and would thereby contribute to the overall size of the multipliers. We note however that this transmission channel may be temporarily blocked in a number of countries that, due to banking sector problems, are experiencing problems with the availability, rather than just the price, of credit.

Results of Regional Fiscal Actions

29. Figure 3 presents the effects of fiscal stimulus on each country or region when it alone engages in fiscal stimulus, as opposed to the worldwide stimulus shown in Figure 2 (both with monetary accommodation). The multipliers are clearly smaller in every case. This reflects the smaller overall size of the stimulus at the worldwide level, which reduces the stimulus region's multiplier through smaller trade spillovers. Figure 3 indicates the importance of multilateral action in achieving a strong worldwide multiplier. For example, the effect on U.S. GDP of investment expenditures is 3.9 when there is global fiscal expansion and only 2.4 when the United States acts alone. Similarly, the effect on Japanese GDP of targeted transfers is 1.5 when there is global fiscal expansion and only 1.0 when Japan acts alone. Differences in multipliers across regions relate to the size of leakages in the different areas, including leakages into saving and imports.

III. THE IMPORTANCE OF COMMITMENT TO LONG-RUN FISCAL DISCIPLINE

30. A key prerequisite for a successful fiscal stimulus is that it does not undermine the medium-term sustainability of fiscal policy. But there is a significant risk that the large fiscal deficits envisaged at the current juncture might be difficult to reduce over time and could instead result in permanently lower world saving that causes higher real interest rates and therefore lowers investment and productive capacity. This section illustrates the short- and long-run costs of such a scenario. First, we briefly review the empirical reduced-form evidence linking fiscal deficits and debt to real interest rates. Second, we provide simulations from a structural model to illustrate how the perception of a lack of commitment to keep deficits temporary can impair the effectiveness of the stimulus itself, whether or not the commitment is in fact present. Third, we discuss the very costly long-run crowding-out effects of an actual lack of commitment that lets deficits drift up permanently.¹⁶

¹⁶ See IMF (2009) for a description of the state of public finances.

A. Reduced-Form Empirical Evidence

31. The empirical literature has not found strong evidence that there is a significant positive relationship between government debt and long-term interest rates. However, some estimates show that a persistent increase in debt equal to 1 percent of GDP increases long-term real interest rates by between one and six basis points. The effect of a persistent increase in deficits of the same magnitude is associated with a 10 to 60 basis point increase in long-term real interest rates (Engen and Hubbard, 2004; Gale and Orszag, 2004; Ardagna, Caselli, and Lane, 2004).

32. These studies have been conducted for advanced economies, which so far have not suffered significantly from higher anticipated inflation, inflation risk premia, or default risk premia in response to higher deficits or debt. But in developing countries that have experienced extreme fiscal stresses, these have historically posed additional risks. For example, Catao and Terrones (2005) find that higher debt or deficits have not exhibited a statistically significant correlation with the inflation rate in advanced countries, but they find a significant correlation for emerging markets that have high inflation rates. Aisen and Hauner (2008) find that the effect of deficits on interest rates is higher in countries with low financial depth, likely reflecting high risk premia or a narrow liquidity base.

B. Policy Credibility and Short-Run Stimulus Effectiveness

33. The GIMF model we use for our simulations reflects the above empirical findings. It assumes that when a government runs deficits that result in permanent increases in the ratio of government debt to GDP, private agents' saving does not rise in an offsetting fashion because these agents do not fully take into account the higher future tax obligations resulting from financing the debt obligations. The implication is that if a country's government runs persistently higher deficits, aggregate saving will fall in the long term, and not only in that country but also in the world economy. This causes real interest rates to rise in all countries, crowding out private investment and over time reducing each economy's productive potential. This effect would be magnified under a worldwide increase in deficits.

34. Figure 4 illustrates the effects of a worldwide coordinated fiscal stimulus under different assumptions about policy credibility. In the base case, shown as the solid black line, fiscal deficits increase by 1 percent of GDP in the first year and 0.5 percent of GDP in the second year. In this case, we are focusing on a combination policy in which three-quarters of the increase in deficits is assumed to be due to higher government lump-sum transfers, with the remainder accounted for by higher government infrastructure investment. Monetary policy is accommodative, leaving nominal policy interest rates unchanged for two years. We observe a large effect on GDP of around 1 percent in year one and 1.3 to 1.5 percent in year two, and thereafter a slow fading of the stimulus. Part of the effectiveness of this policy is due to a decline in real interest rates as the additional demand drives up inflation. This, however, depends on agents expecting an actual return to the original level of deficits by year three. The intermediate scenario, shown as the blue dashed line in Figure 4, illustrates the case in which

there is a lack of policy credibility during the first year of the stimulus. Specifically, we consider a situation in which the private sector observes a deficit of 1 percent of GDP in year one and extrapolates a 2 percent deficit in year two and a 3 percent deficit in year three and thereafter. In year two, it is assumed that the private sector comes to the realization that policy will in fact deliver on its originally promised profile of deficits. In this case, while the increase in inflation still succeeds in driving down short-term real interest rates, the anticipation of much lower saving over time leads to increases in expected future short-term rates and therefore drives up real long-term interest rates in year one. This roughly halves the output effect of the stimulus.

35. When, in addition, private sector worries about fiscal sustainability drive up interest rate risk premia and depreciate the currency, the effects are even more severe. The dotted red line in Figure 4 provides an illustrative example which assumes that investors in the rest of the world demand a larger risk premium on U.S. liabilities. This drives a positive wedge between U.S. and rest of the world interest rates, and almost completely neutralizes the effect of the stimulus on the United States, with a small but significant output gain for the rest of the world. To summarize, a credible promise of fiscal discipline is critical even for the short-run effectiveness of the stimulus, and without it the stimulus might in the most extreme case become self-defeating.

C. Policy Credibility and Long-Run Crowding Out

36. Next we analyze the long-run consequences of a real lack of commitment rather than just the perception of a lack of commitment to fiscal discipline. If the newly increased deficits were to add to other known fiscal problems associated with Social Security/aging, Medicare/Medicaid, and financial sector bailouts, the long-term implications could become very serious. We provide an illustrative example in Table 1, which shows the simulated long-run crowding-out effects of a permanent 10 percentage point increase in the ratio of government debt to GDP, brought about by increases in nondistortionary lump-sum transfers during an initial stimulus period and reductions in such transfers thereafter. If the debt increase is limited to the United States, world real interest rates rise by 14 basis points. Without financial market frictions (i.e., no change in risk premia), this change in interest rates is directly transmitted to the global economy, with all countries experiencing a roughly 1.4 percent contraction in investment and a 0.6 percent permanent contraction in GDP. When all countries increase the ratio of their debt to GDP by 10 percentage points, the effect on world real interest rates is almost three times as large at 39 basis points, with GDP permanently contracting by 1.3 percent worldwide. This carries extremely high costs because the contractions are not only large but also permanent. Furthermore, the magnitudes may be understated for two reasons. First, the implied responses of real interest rates to debt are at the low end of the empirical estimates discussed in paragraph 30. Second, in the absence of post-crisis fiscal consolidation the eventual increase in debt is likely to exceed 10 percent of GDP in several countries.

Table 1. Long-Term Crowding Out Effects of Higher Government Debt
(10 percentage point increase in government debt ratios)

	Increase in All Countries	Increase in the United States
<u>Effects on:</u>		
World:		
GDP	-1.3	-0.6
Consumption	-1.0	-0.5
Investment	-3.6	-1.4
Real Interest Rates	0.39	0.14
United States:		
GDP	-1.2	-0.5
Consumption	-0.9	-0.5
Investment	-3.5	-1.3
Real Interest Rates	0.39	0.14
Rest of the World		
GDP	-1.3	-0.6
Consumption	-1.1	-0.5
Investment	-3.6	-1.4
Real Interest Rates	0.39	0.14

IV. GLOBAL SCENARIOS BEFORE AND AFTER FISCAL-MONETARY STIMULUS

37. Table 2 shows the fiscal stimulus packages announced for 2009–10 as of mid-January of this year. Over the two years, the United States has by far the largest package of fiscal actions, followed by Asia excluding Japan. Japan, the euro area, and the rest of the G-20 have so far announced considerably smaller fiscal packages. The relative sizes, at least for the United States, are consistent with the strength of the contractionary pressures that were seen to be buffeting the various economies at the time that the announcements were made.

38. Table 3 presents the effects on 2009 and 2010 GDP growth of these announced fiscal stimulus packages in the G-20 economies, while Table 4 presents the effects on the levels of GDP of these packages. The effects are aggregated over the five economic areas of this paper, and estimated using the same model and sets of assumptions used in the previous section, which are discussed in more detail in the appendix. The “Other” category in Table 2 is attributed to untargeted transfers. The estimates show that each country group provides a significant contribution to supporting demand in its own group, although there are also positive spillover effects from fiscal stimulus in other groups. It is important to emphasize that these estimates assume that central banks do not raise interest rates for two years in response to the fiscal stimulus. These estimates suggest that the larger fiscal expansion in the United States may have fairly significant spillover effects on other countries in 2009. The estimates for 2010 suggest that the announced U.S. fiscal stimulus at this point may play an even larger role in

Table 2. Fiscal Stimulus Packages Announced for 2009–10 as of January 17, 2009 <i>(As a percent of GDP in the region)</i>		
	2009	2010
United States	1.9	2.9
Tax cuts	0.9	1.2
Infrastructure	0.3	0.8
Other	0.6	1.0
Euro area	0.9	0.8
Tax cuts	0.3	0.3
Infrastructure	0.4	0.0
Other	0.2	0.4
Japan	1.4	0.4
Tax cuts	0.1	0.1
Infrastructure	0.3	0.1
Other	1.0	0.2
Asia excluding Japan	1.5	1.3
Tax cuts	0.1	0.1
Infrastructure	1.1	0.0
Other	0.3	1.2
Rest of G-20	1.1	0.3
Tax cuts	0.5	0.1
Infrastructure	0.2	0.1
Other	0.4	-0.1
Total (PPP-weighted)	1.4	1.3
Tax cuts	0.4	0.4
Infrastructure	0.5	0.3
Other	0.5	0.7

supporting global growth. This partly reflects the fact that the U.S. stimulus packages over the two years have a substantial infrastructure component, and such investment has a larger multiplier than other fiscal instruments. But it is also due to the fact that many of the other countries have front-loaded their own fiscal packages. In fact, in 2010 there would be negative direct effects on growth in these countries without a further adjustment to the fiscal stance in that year (euro area, Japan, emerging Asia, and remaining countries). Figure 5 shows the overall effect of the announced fiscal stimulus packages on the world and the regional economies from 2009 to 2015. Only the United States shows no decline in the effects of fiscal stimulus in 2010 relative to 2009, and real GDP growth in all regions shows the effect in the subsequent years of the removal of the fiscal stimulus after 2010.

Table 3. Growth Effects of Fiscal Stimulus in 2009 and 2010
(Deviation from baseline in percentage points)

	Stimulus in:					
	All	U.S.	Euro Area	Japan	Em. Asia	RoW
Effects on Growth in 2009						
World	1.4	0.5	0.2	0.1	0.4	0.2
United States	1.5	1.3	0.0	0.0	0.1	0.1
Euro Area	0.9	0.2	0.5	0.0	0.1	0.1
Japan	1.1	0.2	0.0	0.7	0.1	0.0
Emerging Asia	2.1	0.6	0.1	0.1	1.3	0.1
Remaining Countries	1.0	0.3	0.1	0.0	0.2	0.4
Effects on Growth in 2010						
World	0.7	0.9	-0.0	0.0	-0.2	-0.0
United States	1.5	1.4	0.0	0.0	0.0	0.0
Euro Area	0.3	0.5	-0.2	0.0	0.0	0.0
Japan	0.4	0.5	0.0	-0.2	-0.0	0.0
Emerging Asia	0.2	1.1	0.0	0.0	-0.9	0.0
Remaining Countries	0.6	0.7	0.0	0.0	-0.0	-0.1

Table 4. Level Effects of Fiscal Stimulus in 2009 and 2010
(Percent deviation from baseline in percent)

	Stimulus in:					
	All	U.S.	Euro Area	Japan	Em. Asia	RoW
Effects on GDP in 2009						
World	1.4	0.5	0.2	0.1	0.4	0.2
United States	1.5	1.3	0.0	0.0	0.1	0.1
Euro Area	0.9	0.2	0.5	0.0	0.1	0.1
Japan	1.1	0.2	0.0	0.7	0.1	0.0
Emerging Asia	2.1	0.6	0.1	0.1	1.3	0.1
Remaining Countries	1.0	0.3	0.1	0.0	0.2	0.4
Effects on GDP in 2010						
World	2.0	1.4	0.1	0.1	0.2	0.2
United States	3.1	2.7	0.1	0.1	0.1	0.1
Euro Area	1.2	0.6	0.3	0.1	0.1	0.1
Japan	1.5	0.7	0.1	0.5	0.1	0.1
Emerging Asia	2.3	1.6	0.1	0.1	0.4	0.1
Remaining Countries	1.7	1.0	0.1	0.1	0.2	0.3

39. The blue solid lines in Figures 6 and 7 show the outlook for growth and inflation in the *World Economic Outlook* January 2009 update for the global economy and for the United States, the euro area, and Japan. This outlook includes the projected effects of the fiscal packages that have already been announced by the G-20 governments, and that are listed in Table 2. The red dotted lines in the two figures show the results of simulations of the January WEO projections excluding the effects of the announced fiscal packages.

V. CONCLUDING REMARKS

40. Given the anticipated weakness in the global economy over the next two years, consideration should be given to providing fiscal stimulus that goes beyond the measures already announced. As is clear from our simulations, either government investment expenditure and/or targeted transfers would have sizable multiplier effects on the economy. In an ideal scenario where fiscal stimulus is both global and supported by monetary accommodation, and where financial sectors that are under pressure are being supported by governments, every dollar spent on government investment can increase GDP by about \$3, while every dollar of targeted transfers can increase GDP by about \$1. In countries in which fiscal space is limited, it will be especially important to focus fiscal stimulus actions on those measures that will have the largest effect on aggregate demand—targeted transfers and government investment where possible. Government investment expenditure has the advantage of augmenting potential output, although the ease and speed with which it can be put into place will be limited by the number of “shovel ready” projects available. Also, it runs the risk of serious wastage when the projects do not make economic sense. However, given the likelihood that the economic weakness will continue into 2010, there should be less concern that the expenditures will only be put into place once the economy has begun to recover. Targeted transfers have the advantage of ease and speed of implementation, although the administrative machinery needed to implement such measures may not be available in some countries. However, they carry some risk of difficulty of reversal once the period in which economic stimulus is needed has passed.

41. The importance of the fiscal stimulus being global and the monetary authorities being accommodative over the period of fiscal stimulus is central to the analysis and, in our view, to the policy prescription. Due to international spillovers of demand, simultaneous fiscal stimulus can raise each region’s multipliers by a factor of about 1.5, while monetary accommodation can achieve even larger improvements. Central banks have thus far been acting in a way that is supportive of government actions to strengthen the economy. And it is important that they continue to do so until the current crisis is over. Fiscal authorities have acted globally, but so far the stimulus packages outside the United States have largely been front-loaded by concentrating spending in 2009, with much less to come in 2010. In these regions, if there is enough fiscal space to do so without endangering the sustainability of government debt, consideration should probably be given to additional fiscal stimulus packages.

42. The large scale stimulus packages now being considered carry additional dangers if they create a perception of a lack of fiscal discipline, and even worse dangers if this lack is not

just perceived but realized. This concern should be addressed through appropriate and credible medium-term fiscal frameworks, such as increased emphasis on containing the ratio of public debt to GDP, and the introduction of fiscal rules of the sort used in Chile, which clearly articulate a long-run target for the ratio of the fiscal deficit to GDP and therefore implicitly for the ratio of public debt to GDP. There will nonetheless be differences across countries in the amount of fiscal space available to engage in stimulus over the short term because of variations in their current fiscal positions and in their credibility. This is particularly the case in small open emerging-market economies and in low-income economies.

43. In conclusion, it is essential in our view that public sector authorities play their appropriate role in preventing a collapse of confidence in the private sector that might lead to a vicious downward spiral. We would therefore emphasize the importance in current circumstances of the aggressive use by the authorities of fiscal and monetary policies, along with continued underpinning of weak financial sectors. And it is particularly important for fiscal policy to take on an increased share of the burden during the period in which the financial sector is recovering and is not yet able or willing to extend credit to households and businesses to the extent that it normally does. Finally, we would note the importance of not adding protectionist elements to fiscal packages, particularly at a time of rapidly declining international trade.

Appendix: How Does Fiscal Policy Affect the Economy in the Global Integrated Monetary and Fiscal Model?

Fiscal policy transmission channels in the GIMF are distinct for government spending on goods and services on the one hand and for taxes and transfers on the other.

Government spending is divided, on the basis of available data, into consumption spending and investment spending. Both directly affect the economy's demand for goods and services. They also have secondary multiplier effects as incomes rise with higher output, thereby supporting additional spending. Government investment in addition has direct supply effects by augmenting the productivity of private factors of production. This tends to increase the response of real output while decreasing the response of inflation to government stimulus.

Taxes and transfers affect the economy through two channels. First, if taxes are distortionary, tax cuts can stimulate output while limiting the increase in inflation. This is, however, of much less quantitative significance in the GIMF than the second channel, wealth and income effects. All agents in the model are myopic with respect to future tax liabilities or transfer cuts. Even the least constrained group of households is assumed to have a finite planning horizon of 20 years and a finite remaining working life of 20 years. This means that such households perceive a temporary tax cut or transfer increase as an increase in wealth that leads them to spend more. This effect is even stronger for the group of hand-to-mouth agents, who are assumed to consume their after-tax income in every period, without possibilities for borrowing or saving. Changes in taxes or transfers directly affect the disposable income and therefore spending of these agents. The size of this group, which can be different across economic regions, is therefore critical for the multipliers of tax or transfer stimulus measures.

But, in general, tax cuts or transfer increases will have smaller multipliers than spending increases, because they rely entirely on propensities to spend out of income or wealth, without any direct effect on the demand for goods and services. The one tax/transfer measure that comes at all close to spending multipliers, however, is transfers targeted exclusively to hand-to-mouth agents.

Monetary policy is assumed to follow a forward-looking Taylor-type interest rate rule that during normal times adjusts nominal policy interest rates in response to one-year-ahead forecasts of inflation.¹⁷ This ensures that inflation expectations and actual inflation are anchored. But when monetary policy accommodates a fiscal stimulus, the assumption is that the policy rate is held constant at its pre-stimulus value for one or two years, thereafter returning to the conventional interest rate rule to anchor inflation in the long run.

Accommodation implies that increases in inflation translate into decreases in real interest rates that provide additional stimulus to the economy, especially for stimulus that mainly affects aggregate demand. But for stimulus that strongly affects aggregate supply, the effect can be a muting of the overall stimulus effect. One example is government investment, which could reduce inflationary pressures sufficiently to reduce its overall multiplier below that of government consumption. The second example is a cut in labor income taxes, whose overall multiplier can be quite low because it stimulates labor supply and thereby significantly reduces the inflationary impact of the stimulus to demand.

All stimulus measures are assumed to be implemented by way of a targeting rule for the ratio of the government deficit to GDP, with stimulus values for the different fiscal instruments implied by the path of the desired deficit target ratio. Specifically, we assume that the deficit target ratio increases by 1 percentage point in year one and by half a percentage point in year two, thereafter returning to its pre-stimulus value. The government-debt-to-GDP ratio increases during the stimulus phase. But returning the deficit target ratio to its original level and keeping it there can be shown to imply that debt will also return to its original level, through changes in primary surpluses. But it will do so very gradually, which means that post-stimulus changes in fiscal instruments will be so small as to not materially affect the recovery period.

¹⁷ The usual feedback coefficient on inflation deviations is 1.6. We also assume interest rate smoothing, but the smoothing parameter is small at 0.25 given that the model is annual.

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Figure 1. Effects of Global Fiscal Stimulus Without Monetary Accommodation

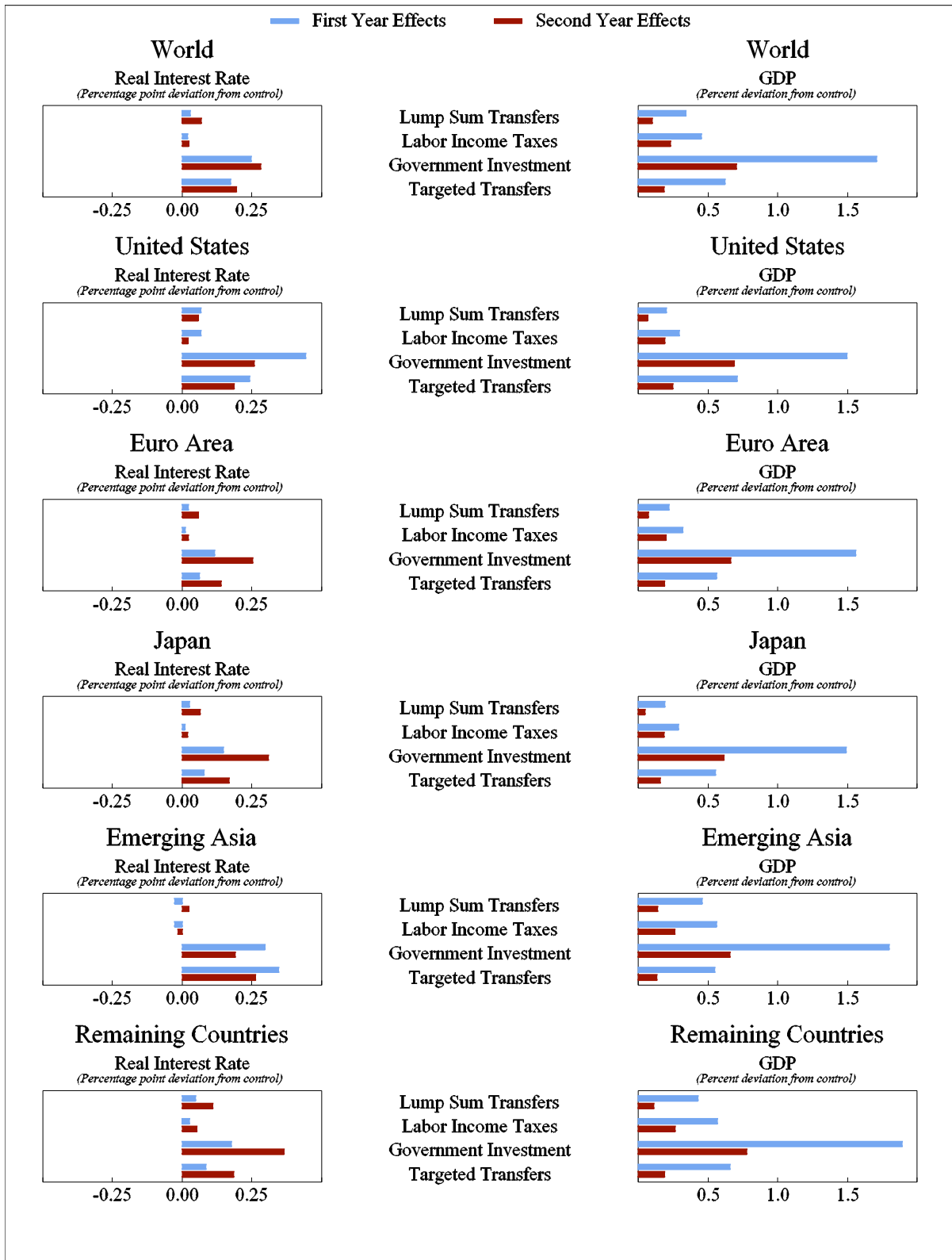
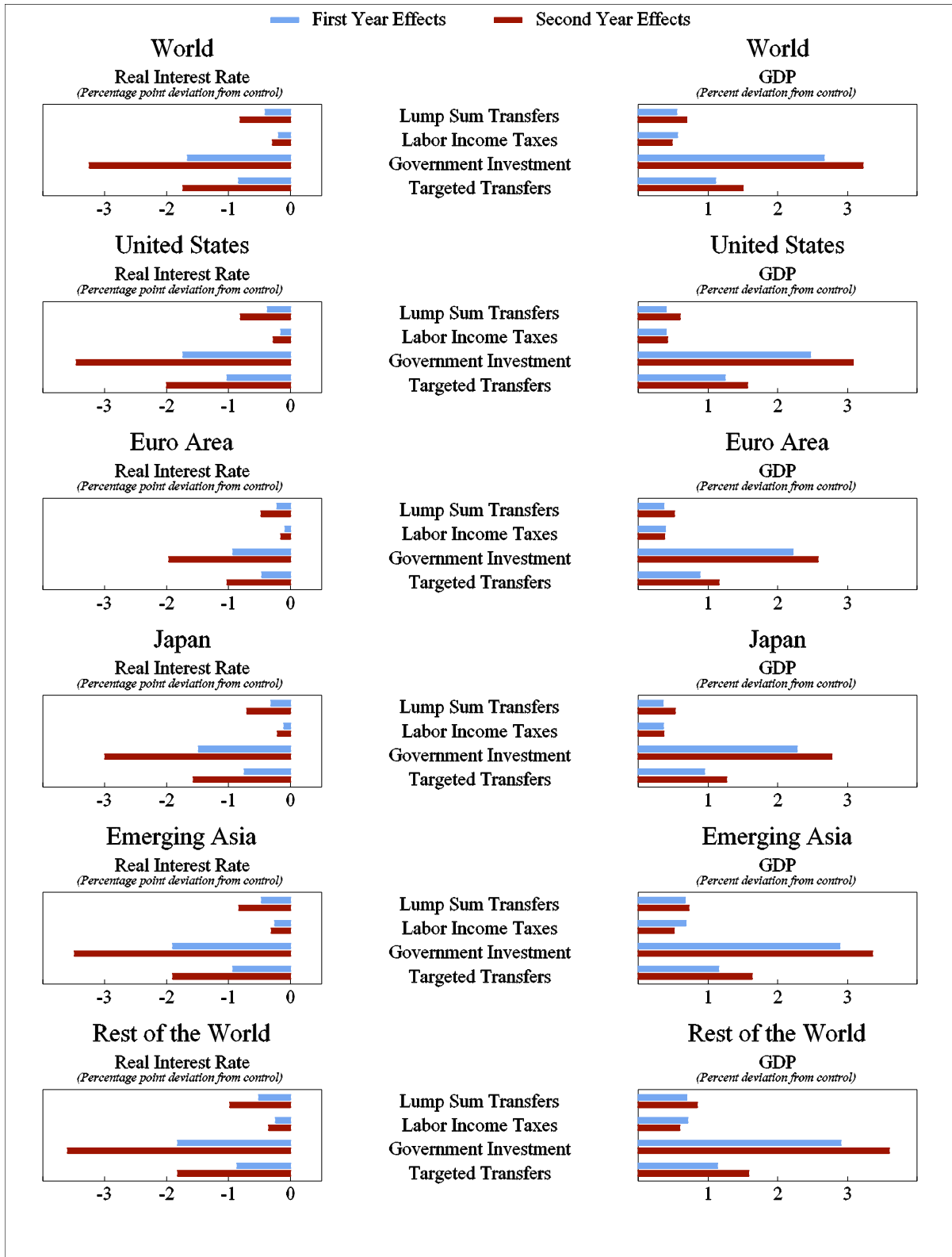


Figure 2. Effects of Global Fiscal Stimulus With Monetary Accommodation



**Figure 3. Effects of Fiscal Stimulus When Each Country/Region Acts Alone
(With Monetary Accommodation)**

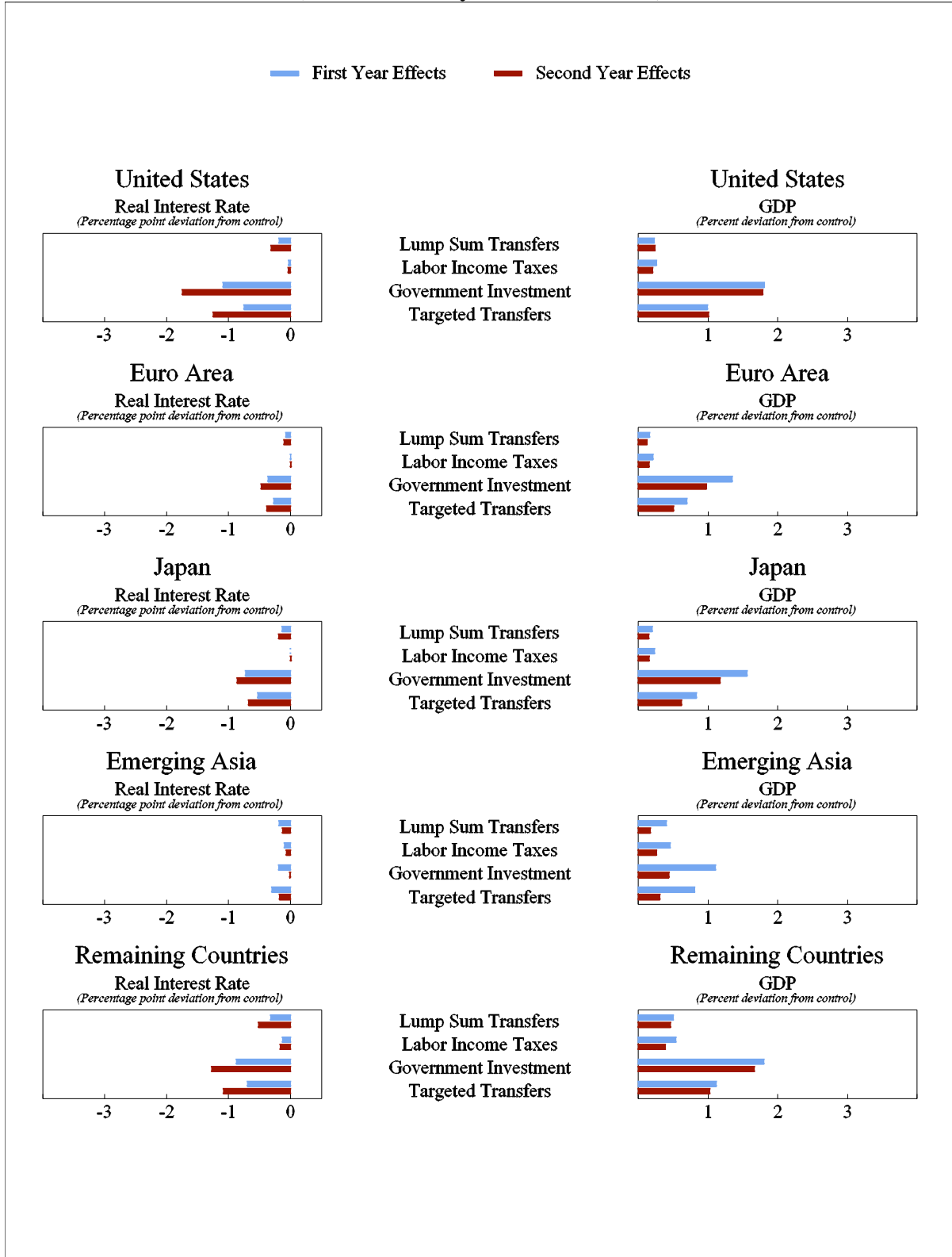


Figure 4. Fiscal Multipliers When Market Participants Expect Permanent Higher Deficits
(Deviation from baseline GDP in percent)

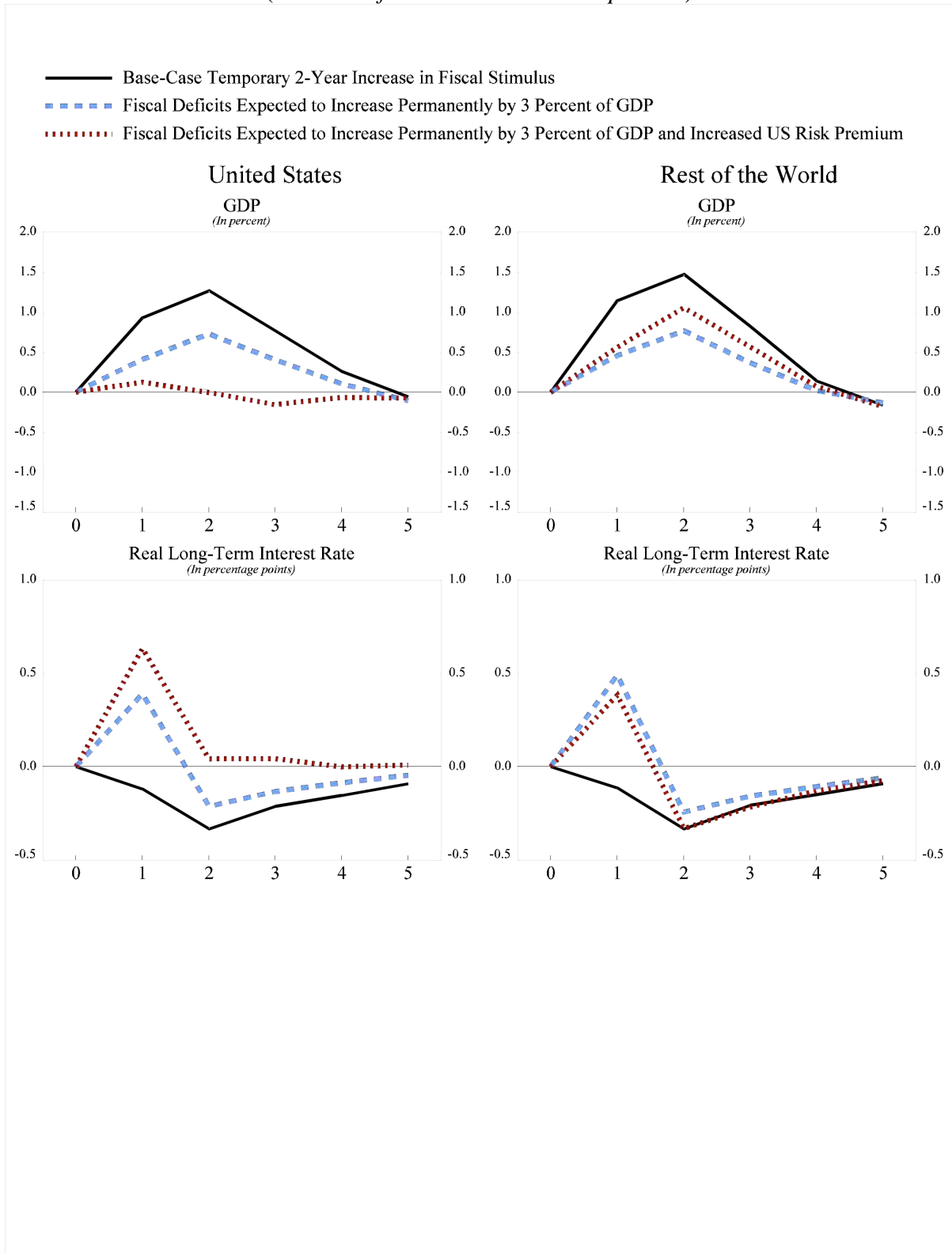
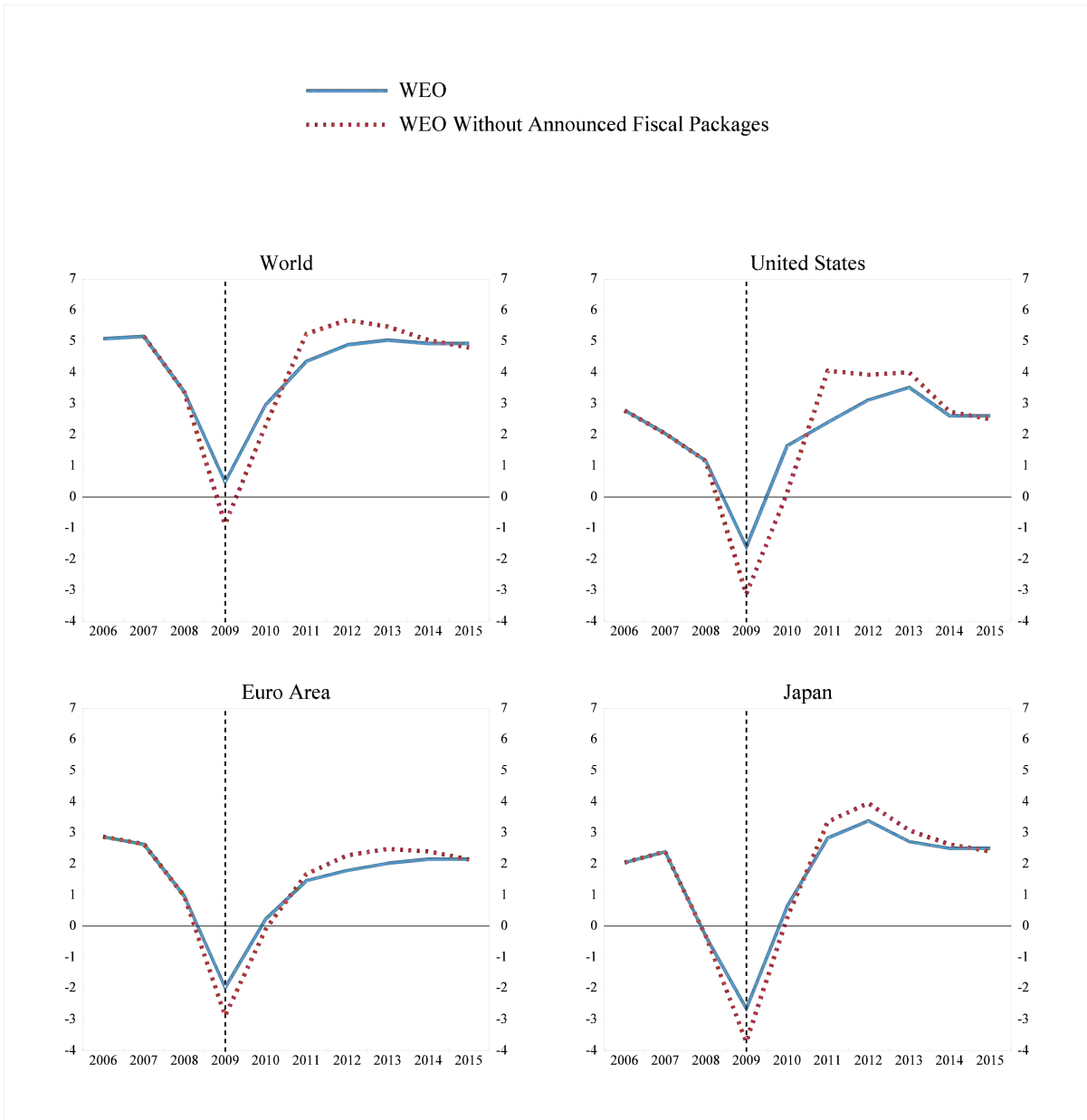


Figure 5. Effects of G-20 Stimulus
(Deviations from control in growth rates)



**Figure 6. World Economic Outlook Global Growth Projections, January 2009
(With and Without Estimated G-20 Fiscal Stimulus)**



**Figure 7. World Economic Outlook Inflation Projections, January 2009
(With and Without Estimated G-20 Fiscal Stimulus)**

