
Fiscal Policy Response in Advanced and Emerging Market Economies

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10.1 Introduction

This chapter discusses the fiscal response to the sharp decline in global growth following the financial crisis that erupted in August 2007. The policy response to the financial crisis and economic recession was unprecedented, befitting the exceptional nature of the shock. The average fiscal deficit across all countries increased by 6.3 percent of GDP between 2007 and 2009, with a larger deterioration in advanced economies (figure 10.1). This reflected fiscal stimulus packages—the cyclically adjusted deficit increased by over 3 percent of GDP, the automatic stabilizers, the rescue packages for the financial sector, and a structural decline in revenues as a result of a decline in potential GDP. The relatively strong fiscal position of emerging and low-income countries allowed this group of countries to also implement expansionary fiscal measures.

Public debts increased significantly through 2008 to 2010, especially in advanced economies. For the world economy, general government gross debt rose to 70 percent of world GDP in 2010 (figure 10.1). In advanced economies, the level of general government debt reached about 100 percent of GDP and continued to increase to 108 percent in 2012. This was largely explained by the permanent loss of revenue mentioned above (which explains near half of debt accumulation through 2007 to 2011), and also by private debt bailouts, especially in the financial sector. The latter was needed for stabilization purposes and to shut down the negative feedback loop between the balance sheet of the financial sector and that of the government. Interestingly, the discretionary fiscal stimulus was not the main factor behind the increase in public debt (explains about a quarter of debt accumulation through 2007 to 2011).

As debts continued to rise rapidly, it was clear that an exit strategy balancing the need to support growth in the short term, while ensuring long-term fiscal sustainability, became increasingly important. The effectiveness of fiscal stimulus would depend on many factors, including the size of the stimulus, its composition, the timing of

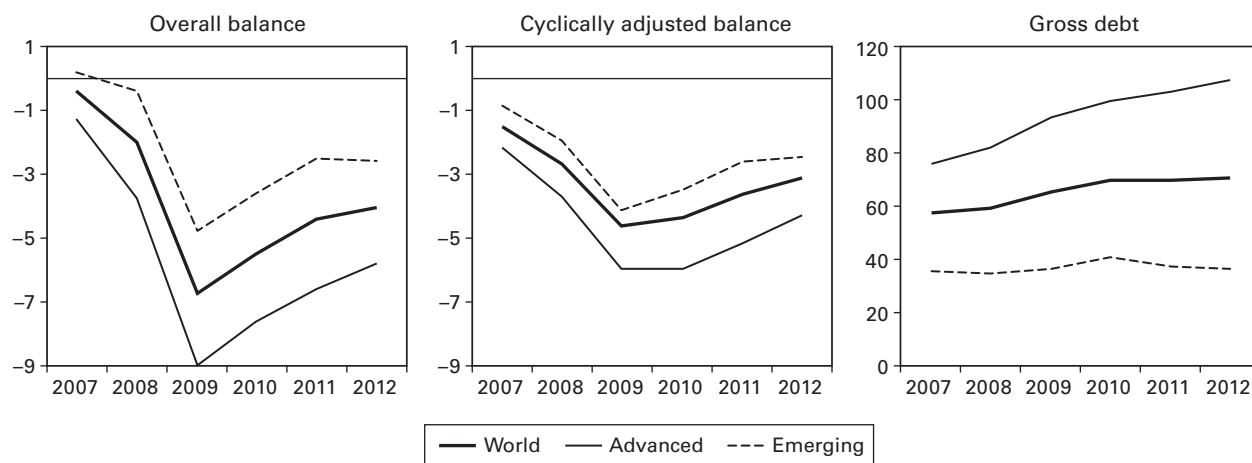


Figure 10.1

Global fiscal developments, 2007 to 2012: Overall balance, gross debt (in percent of GDP); cyclically adjusted balance (in percent of potential GDP)

Source: IMF, *Fiscal Monitor*, April 2012

the exit, and the consolidation plan following stimulus. Under current projections, debt ratios are expected to stabilize in advanced economies by 2015, although this outlook is vulnerable to fiscal slippages or shocks to the interest–growth differential (*Fiscal Monitor*, October 2012). While the average debt ratio in emerging and low-income country groups also initially rose, it fell back reasonably fast to only slightly above the pre-crisis level reflecting both fiscal consolidation and a quicker growth recovery.

This chapter analyzes how activist fiscal policies were used in response to the crisis. First, it summarizes some of the empirical evidence on whether an expansionary fiscal policy response was indeed appropriate. Some recent evidence indicates that a fiscal expansion was indeed appropriate in the conditions prevalent at the onset of the crisis of sharp and global growth decline and constrained room for monetary response, as policy rates were near the zero lower bound. Under such conditions, there is empirical evidence indicating that fiscal multipliers tend to be positive and large (see next chapter for a discussion on fiscal multipliers). This view, however, was not shared unanimously. An opposite view advocated fiscal consolidation. According to this view, supply-side propagation channels would dominate: further increases in fiscal deficits and public debts would be counterproductive as they would increase interest rates and risks to fiscal sustainability, crowding out private credit and ultimately reducing investment and employment.¹

Second, the chapter evaluates the discretionary fiscal stimulus injected in the economy early in the crisis, based on size, composition, and international coordination.

Finally, the chapter describes the use of governments' balance sheet interventions as a stabilization instrument.

The remainder of this chapter explores in more detail the fiscal policy response. Section 10.2 will look at the fiscal policy response focusing on the G20 economies—the size and composition of the fiscal discretionary stimulus, the fiscal impulse in response to changes in the output gap, and how the different components contributed to the higher debt levels. Section 10.3 will present the main theoretical and empirical arguments in favor and against fiscal stimulus. Section 10.4 will briefly touch on selected issues related to the asset-liability management by governments during the crisis.

10.2 Fiscal Policy Response in G20 Economies

The fiscal policy response during the crisis can be better understood by decomposing the primary fiscal deficit. Given data availability, this will be done focusing on the largest advanced and emerging economies in the G20. Figure 10.2 breaks down the primary deficit for the G20 economies into the contribution from the automatic stabilizers, the discretionary fiscal stimulus, and other structural or discretionary fiscal effects not formally accounted for as part of the fiscal stimulus.² For the advanced G20 economies, the increase in the primary deficit in advanced economies was of broadly similar magnitude across the sources just mentioned. For the emerging G20

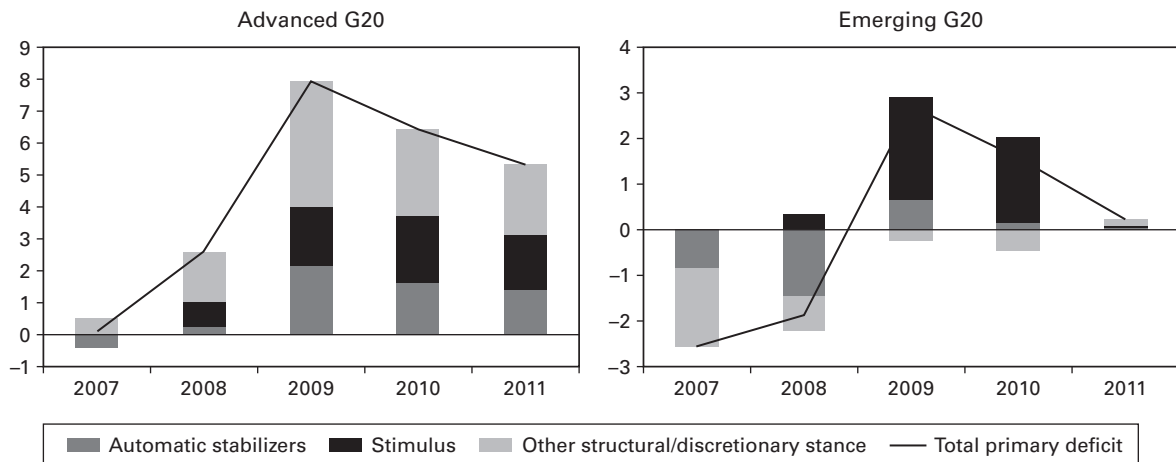


Figure 10.2

G20 economies' composition of the primary deficit (in percent of GDP, PPP-GDP weighted). The cyclical primary balance is presented in the chart as automatic stabilizers; the stimulus is as identified in the text below. The other structural/discretionary part is the unexplained residual.

Sources: IMF staff estimates; *Fiscal Monitor*, April 2012

economies on average, crisis-related fiscal stimulus measures dominated movements in the primary deficit.

10.2.1 Fiscal Stimulus Measures in G20 Countries

G20 countries implemented discretionary fiscal stimulus measures in response to the crisis of almost 2 percent of GDP annually in 2009 and 2010. This section will provide an overview of these measures for the G20 advanced and emerging countries.

Before discussing the size and composition of different stimulus measures, it is important to define the discretionary stimulus measures reported in this chapter. The stimulus includes only revenue and expenditure measures implemented or announced in response to the crisis up to 2012; in some countries it is difficult to track differences between announced and implemented measures. With respect to revenue measures, because it is often not possible to obtain actual data on implementation, the data are based on estimates by the country authorities or IMF staff. Identifying measures announced purely in response to the crisis involves some judgment and hence measures reported here may differ from other estimates owing to differences in the underlying baseline fiscal path. Finally, the stimulus measures used in this section do not include financial sector support measures (which is the topic of chapter 14 in this volume).

10.2.2 Advanced G20 Economies

The average annual fiscal stimulus in the advanced G20 countries during 2008 to 2010 was about 2 percent of GDP annually. Across individual countries, the stimulus packages differed in timing and size (figure 10.3). The largest packages were adopted in the United States and Japan, followed by Australia, Canada, Germany, and Korea. With limited fiscal space coming into the crisis, Italy was the only G20 country that did not provide fiscal stimulus as the expansionary spending measures were offset by revenue increasing measures. While the United States, the United Kingdom, Australia, Korea, and Japan provided some stimulus in 2008, the packages became generally effective starting only in 2009.

The composition of stimulus packages also differed across countries (figure 10.4). On average, advanced G20 countries adopted fiscal packages that relied slightly more on expenditure measures (3.7 percent of GDP), although revenue measures were also significant (2.8 percent of GDP). In Japan, Canada, and Australia fiscal stimulus was mainly provided by expenditure measures, whereas France, Korea, and the United States balanced revenue and expenditure measures. Germany and the United Kingdom had packages that concentrated mostly on revenue measures. The composition of spending changed over the course of the crisis with revenue measures becoming gradually more important: in 2008 stimulus came largely through revenue measures (about 45 percent of total stimulus in that year) but then

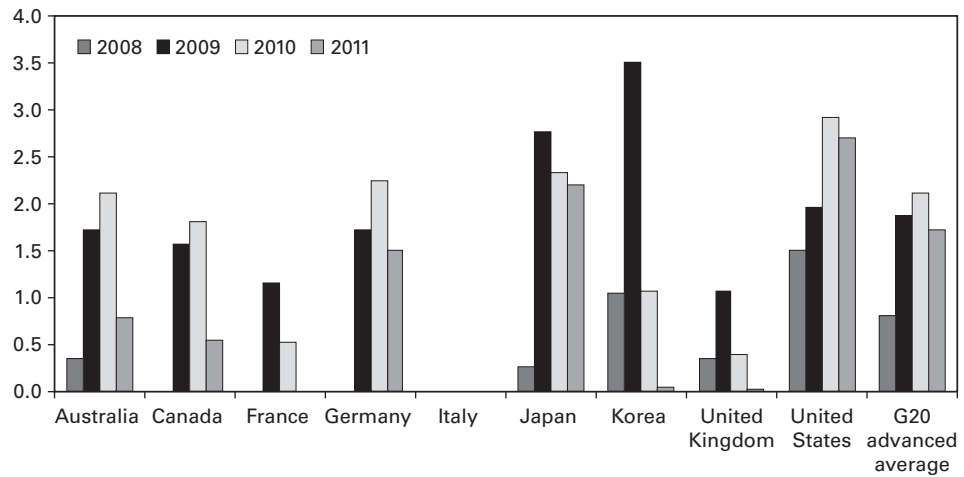


Figure 10.3
G20 advanced economies' fiscal stimulus (in percent of GDP)
Sources: Country authorities; IMF staff estimates

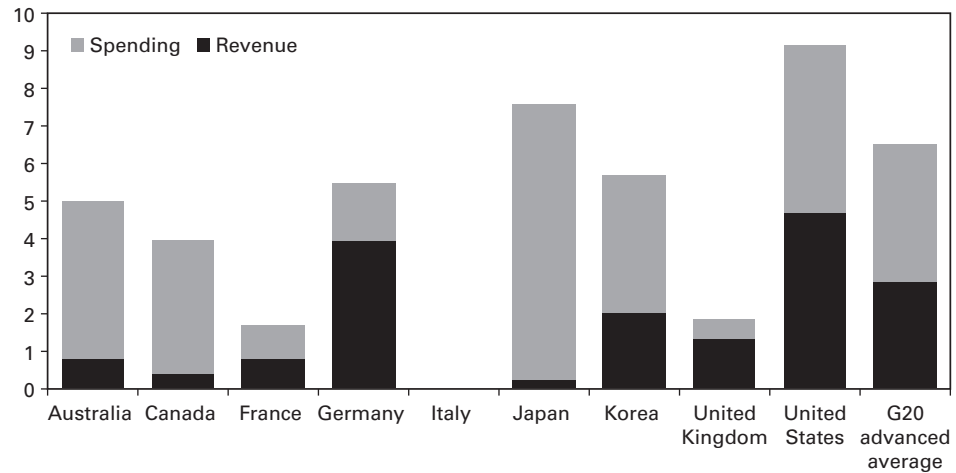


Figure 10.4
G20 advanced economies' composition of fiscal stimulus, 2008 to 2011 (cumulative in percent of GDP)
Sources: Country authorities; IMF staff estimates

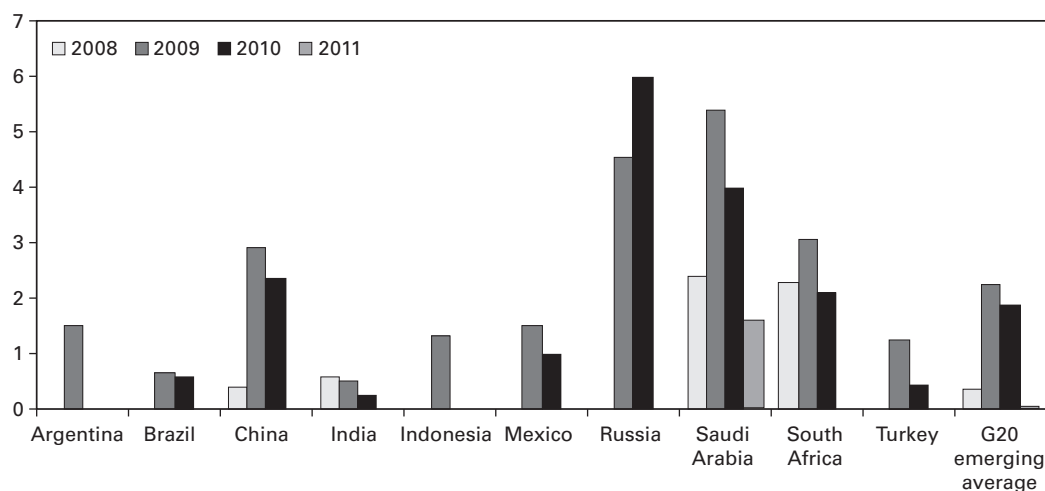


Figure 10.5

G20 emerging economies' fiscal stimulus, 2008 to 2011 (in percent of GDP)

Sources: Country authorities; IMF staff estimates

increased to about 64 percent of total stimulus in 2009 and remained at 60 percent in 2010.

10.2.3 Emerging G20 Economies

The average cumulative fiscal stimulus during 2008 to 2011 for emerging G20 economies was 4.5 percent of GDP, about two-thirds of the level in advanced countries (figure 10.5). The stimulus was concentrated in four countries: Saudi Arabia³ and Russia provided the largest stimulus while South Africa and China also implemented relatively large packages. In other emerging economies the stimulus was more modest. The main stimulus measures were concentrated in 2009 to 2010, and no stimulus plan was announced for 2011 except for Saudi Arabia. In contrast to advanced economies, stimulus in emerging economies was dominated by expenditure measures, especially infrastructure spending (figure 10.6). The preference for expenditure-based stimulus measures may reflect emerging economies' higher infrastructure needs than in advanced economies, combined with lower capacity to increase revenues given more limitations in tax administration and also from tax evasion. In addition the response of private consumption to expenditure stimulus can be larger in emerging than in advanced economies, as a relatively larger share of the population is likely to be subject to liquidity constraints and to exhibit a hand-to-mouth consumption behavior.⁴ Furthermore an increase in expenditure for social protection purposes is also warranted on social grounds, because, among other considerations, social protection systems are typically weaker.

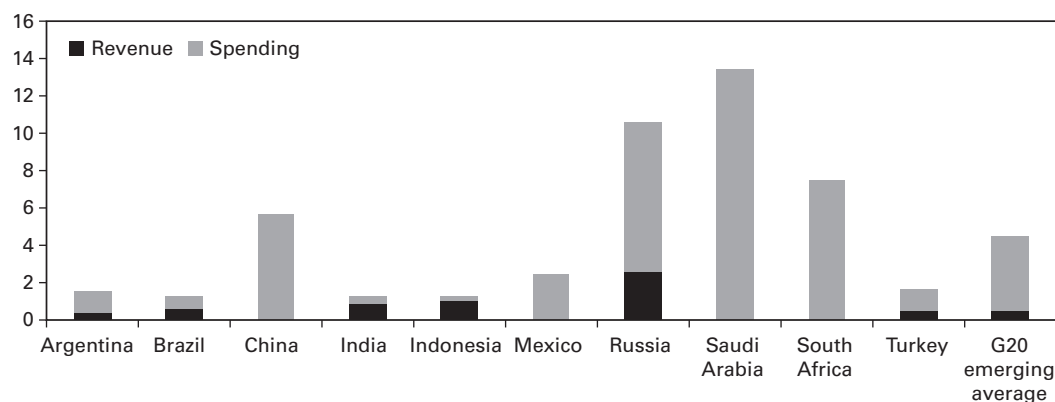


Figure 10.6

G20 emerging economies' composition of stimulus measures, 2008 to 2011 (in percent of GDP)

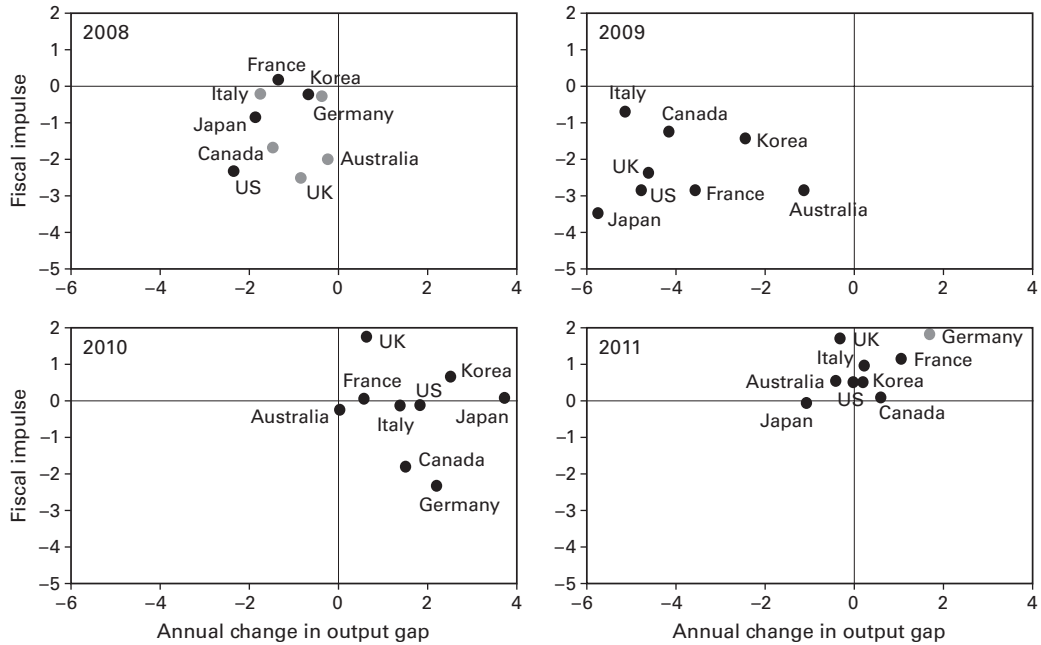
Source: Country authorities; IMF staff estimates

10.2.4 Fiscal Impulse during the Crisis

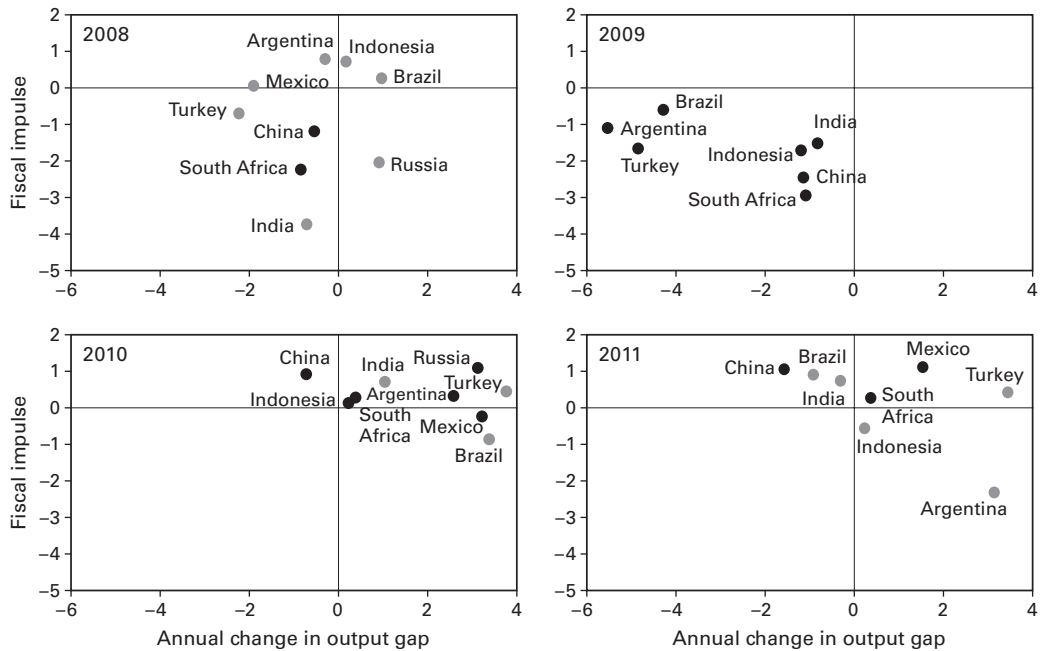
The fiscal impulse measures the demand impact of discretionary fiscal policy. It is estimated as the (negative of the) change in the cyclically adjusted primary balance. This captures the discretionary policy response by excluding the contribution from the automatic fiscal stabilizers (appendix B at the end of this chapter defines the fiscal policy terminology used). Notice that actual fiscal stimulus packages, as defined in policy records, would generally differ from the fiscal impulse calculated using statistical methods. First, stimulus packages need not in general include all fiscal measures in a given period. Second, the calculation of cyclically adjusted primary balances is subject to statistical error, including that from the difficulties in estimating potential GDP (particularly in the period under analysis), but also from other indicators that can affect the structural component of revenues, such as asset prices.

The evolution of the fiscal impulse during the crisis period provides additional insights. Figure 10.7 plots the fiscal impulse against the annual change in the output gap for G20 economies for 2008 to 2010.⁵ Looking first at advanced G20 economies, in 2008, while the output gap worsened in all countries, it turned negative in only about half of the countries. In response, more than half of the countries injected fiscal impulse (most markedly in the United States and the United Kingdom). In 2009, all advanced economies had a negative output gap and responded with countercyclical fiscal impulse (albeit less so in Italy and Canada). In 2010, with signs of insipient recovery the output gap began closing in some countries, although it remained negative for all advanced G20 economies. The policy stance also started to diverge. Some countries began withdrawing fiscal impulse (the United Kingdom and Korea), others continued to provide fiscal impulse (Canada and Germany), while

Advanced economies



Emerging economies



the remaining countries did neither inject nor withdraw fiscal stimulus. In 2011, the majority of advanced G20 economies began tightening fiscal policy by withdrawing fiscal stimulus.

Among G20 emerging economies, while a few countries began expansionary fiscal policies in 2008, only China and South Africa had a negative output gap at the time. However, by 2009, all emerging G20 economies had negative output gaps and provided fiscal impulse in response. In 2010 and 2011, both the economic conditions and the fiscal policy response became more diverse across countries. Although the economic recovery was stronger than in advanced economies (with fewer emerging economies having negative output gaps in 2011), there was seemingly less pressure to begin fiscal consolidation.

10.2.5 Decomposing the Increase in Government Debt in G20 Economies

As noted in the introduction, most advanced economies experienced significant and sustained increases in their debt levels, whereas emerging economies had relatively small increases that were eventually reversed. Looking specifically at G20 economies, the cumulative average increase in gross debt levels during 2007 to 2011 for advanced economies was about 31 percent of GDP, with the largest increases in Japan, United States, and United Kingdom (figure 10.8). In emerging G20 economies, on the other hand, average debt only increased by 1 percent of GDP with modest increases in some countries such as Mexico, China, and South Africa offset by declines in Argentina, Indonesia, and India.

By decomposing the increase in debt, the contributing factors to the higher debt level can be identified.⁶ Over 60 percent of the debt increase in advanced economies can be attributed to the larger primary deficits (figure 10.8). This reflects the automatic stabilizers, the discretionary fiscal stimulus measures, as well as other economic factors not captured by the cyclical adjustment—for example, revenue declines associated with the sharp drop during the crisis in financial asset, housing, and commodity prices. Interestingly, fiscal stimuli were not the most important factor explaining the accumulation of debt. It was the decline in revenues, which was largely structural, that explains near half of the debt accumulation, particularly in G7 countries. The impact of slower growth and higher interest payments contributed

Figure 10.7

G20 economies' fiscal impulse and change in output gap, 2008 to 2011 (annual changes in percentage point of potential GDP). Bold dot countries are in positive (negative) output gap. The fiscal impulse is defined as the change in the cyclically adjusted primary balance. The following categories apply: first quadrant (output gap improving, fiscal balance improving), second quadrant (output gap deteriorating, fiscal balance improving), third quadrant (output gap deteriorating, fiscal balance deteriorating), fourth quadrant (output gap improving, fiscal balance deteriorating). Fiscal data for the United States reflect the structural primary balance.

Sources: *World Economic Outlook (WEO)*; *Fiscal Monitor*, April 2012; IMF staff estimates

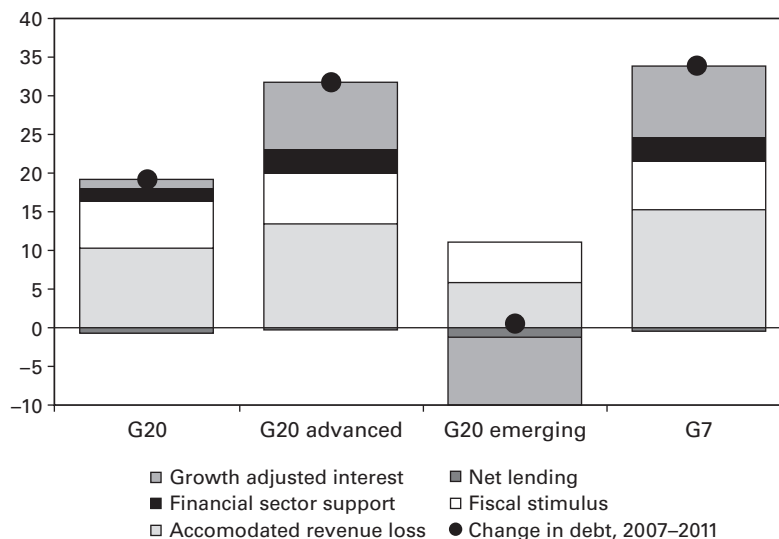


Figure 10.8

G20 economies' decomposition of the increase in government debt, 2007 to 2011

Sources: Country authorities; IMF staff estimates

about a quarter of the increase in debt levels. Financial sector support as well as net lending and other stock-flow adjustments played a lesser role.

The average hides significant differences across countries for the relative contribution to the higher debt of automatic stabilizers and discretionary stimulus measures. For instance, in France, United Kingdom, and Italy, the automatic stabilizers were relatively more important, whereas in Canada, Japan, and the United States, both the automatic stabilizers and discretionary stimulus mattered in explaining the increase in debt. In Germany, Australia, and Korea, the contribution from discretionary stimulus was relatively larger. All advanced countries, with the exception of Korea and Australia, had a significant contribution from adverse growth adjusted interest rate dynamics.

In emerging G20 economies, fiscal stimulus measures and revenue losses contributed to increase the debt level. However, in contrast to advanced economies, the interest growth dynamics actually reduced debt, almost offsetting the impact of discretionary fiscal measures and the loss of revenues. This reflected both the much faster recovery in economic growth, but also the historically favorable debt dynamics from growth and interest rates in many emerging economies.⁷ This does not mean that these favorable debt dynamics will persist for ever (see discussion in chapter 1, section 1.2). Again the individual country experience was more diverse. While Saudi Arabia and Russia implemented large fiscal stimulus measures, these were offset

by the revenue boost from higher oil prices. In China, favorable interest growth dynamics helped to partially offset the impact of large fiscal discretionary measures. In South Africa and Mexico stimulus measures were also large, contributing to an increase in their debt levels by about 7.4 and 2.5 percent of GDP, respectively, with less favorable interest growth dynamics.

10.3 Were the Fiscal Stimulus Measures Appropriate?

The crisis and the unprecedented fiscal measures implemented generated an active policy debate on the appropriate fiscal response to the crisis, the size of fiscal multipliers and the effectiveness of fiscal policy in general. Should governments have implemented a stronger fiscal policy response, or did they do too much? Part of the debate has become politicized, whereas other contributions have a more academic nature. This chapter will not undertake a review of the literature, but will include some references to key contributions that provide context.⁸

The issue of the appropriate fiscal response to the crisis ignited a heated debate. In broad terms, there were two main positions. On the one hand, there was the view that a fiscal expansion was needed, including some mix of expenditure increases and tax cuts. This view stressed the dominance of Keynesian propagation channels, including the possibility of coordination failure among consumers and investors that could result in a downward spiral of declining growth and deflation. The opposite view argued that a fiscal consolidation was the appropriate policy response, emphasizing supply-side effects and non-Keynesian propagation channels. According to this second view, a fiscal stimulus could be counterproductive and reduce investment and employment. The deterioration in government creditworthiness could increase sovereign premia that would spread to domestic interest rates. Growth expectations and investment would therefore decline, also from a possible increase in tax pressure (including the inflation tax) and credit crowding out at a later stage. This was compounded by the governments' bailout of private debts, particularly the banking sector's, of uncertain recovery value. This concern affected in particular some countries in the euro area under financing stress, which could not cushion the shock with currency depreciation.

A good example of the various views is a May 2009 debate in the *American Economic Review* on the role of fiscal policy in responding to the crisis. Auerbach (2009) argued that there are compelling circumstances for renewed fiscal policy activism, although for this to be effective more attention was needed to policy design. Taylor (2009), in contrast, found no empirical rationale for a revival of countercyclical discretionary fiscal policy. Feldstein (2009) cautiously accepted that rethinking the role of fiscal policy may be warranted in the exceptional crisis circumstances. More recently DeLong and Summers (2012) presented a framework contrasting fiscal

policy in normal times—where fiscal policy should be determined more by supply-side rather than demand-side considerations—against fiscal policy in a severely depressed economy, with space for expansionary fiscal policy as a stabilization tool.

To this day, there is no consensus about which of the two views above is correct, either in academic or in policy makers' circles. The difficulties to reach a consensus are explained mainly by the mutual causation between growth and fiscal policy, which makes the identification of the impact of fiscal policy a complicated task. An existing strand of empirical literature finds evidence of expansionary fiscal contractions, notably Giavazzi and Pagano (1990 and 1996), Alesina and Perotti (1995 and 1997), and Alesina and Ardagna (1998).⁹ In general, these studies argue that a fiscal consolidation can have a positive impact on growth if it is concentrated on politically sensitive expenditure categories, such as wages, transfers to households, and goods and services.

More recent empirical results, however, provide evidence supporting the view that a fiscal stimulus was crucial to aid growth under the conditions prevailing in 2008 to 2010. Based on a sample of advanced economies spanning the last thirty years, a study presented in the September 2010 *World Economic Outlook* (WEO) indicates that countercyclical fiscal policies have in general been expansionary.¹⁰ Moreover this study also shows that a discretionary fiscal stimulus is more effective when the room for monetary policy is severely constrained, as it was the case in most of the advanced world at the onset of the crisis where policy rates were near zero. These results are consistent with those in Romer and Romer (2010) for the United States. In addition there was also evidence indicating that fiscal multipliers are positive and larger during recessions (see April 2010 *Fiscal Monitor*). Under such conditions fiscal adjustment could be delayed to support short-term growth.¹¹ Also too-fast adjustment can result in an increase in interest rates. Evidence from short-term credit default swap (CDS) spreads revealed that, if the fiscal multiplier is sufficiently large, fiscal consolidation would increase short-term spreads, even if the fiscal deficit declines, as a result of a decline in growth leading to an increase in the debt ratio.¹² In such a scenario, a fiscal consolidation could end up being self-defeating.

10.3.1 Assessment for an Appropriate Fiscal Stimulus

Some of the evidence reported above support the view that a fiscal stimulus was appropriate in broad terms. However, a more comprehensive assessment requires as well an analysis of its characteristics.¹³ This subsection focuses on three main characteristics that are considered important: size, composition, and international coordination. The assessment of the appropriate size and composition of fiscal stimulus revived an old debate about the size of fiscal multipliers for the alternative revenue and expenditure policies and instruments. Policy reports published by the OECD argued that as tax multipliers were uncertain, appropriately designed spending measures

with positive spillovers for long-term growth were desirable. The need for collective action and the importance of avoiding international trade protectionism, or other noncompetitive practices, were also highlighted in policy recommendations from international organizations such as the IMF and the OECD. Other considerations included the need to address employment and social protection needs.¹⁴ This section provides a broad assessment of the application of fiscal stimulus in G20 economies.¹⁵

Size

In both advanced and emerging economies, the output gap remained large and protracted despite the fiscal stimulus. Based on this, in some larger advanced economies with initial fiscal space, more sizable initial fiscal stimulus packages could have better contributed to contain the decline in aggregate demand, at least at the margin, provided this were supported by low sovereign borrowing interest rates. However, it is not clear that significantly larger stimulus would have improved upon the observed results. Concerns about supply-side effects and also about debt sustainability mentioned above should not be underestimated. In emerging economies, output gaps were relatively smaller than in advanced economies while the applied relative fiscal stimulus was comparable in magnitude.

Figure 10.9 also shows how the size fiscal stimulus packages changed over time. Advanced G20s, on average, increased the size of the stimulus in 2010 relative to 2009 despite some recovery of output in that year. This could have been an outcome of implementation lags rather than policy design per se. Notable exceptions, however, are the cases of Italy, where there were no stimulus packages, and France and the United Kingdom, where the stimulus were reduced while output gaps remained negative. In the case of emerging G20s there was some reduction in the size of the stimulus packages in 2010 on average, possibly reflecting concerns about fiscal space in the face of uncertainty regarding the persistence of the global economic slowdown.

Fiscal sustainability was also taken into consideration in deciding the size of the fiscal stimulus and its intertemporal allocation. Countries with larger fiscal space (as indicated by a lower public debt and relatively lower fiscal deficits) and better access to financing in general opted for relatively larger fiscal stimulus packages (figure 10.11). The earlier withdrawal of stimulus packages in emerging G20s mentioned above relates in part to the need to preserve sovereign creditworthiness, as their sovereign spreads tend to be more volatile. In European countries under financial pressure, mainly Greece, Portugal, Ireland, Italy, and Spain, fiscal policy planning focused mainly on fiscal consolidation. In some countries, political opposition resulted in delays and limited the size of the stimulus relative to the government's intentions. One such example is the United States where fiscal stimulus execution was in part the responsibility of state and local administrations.

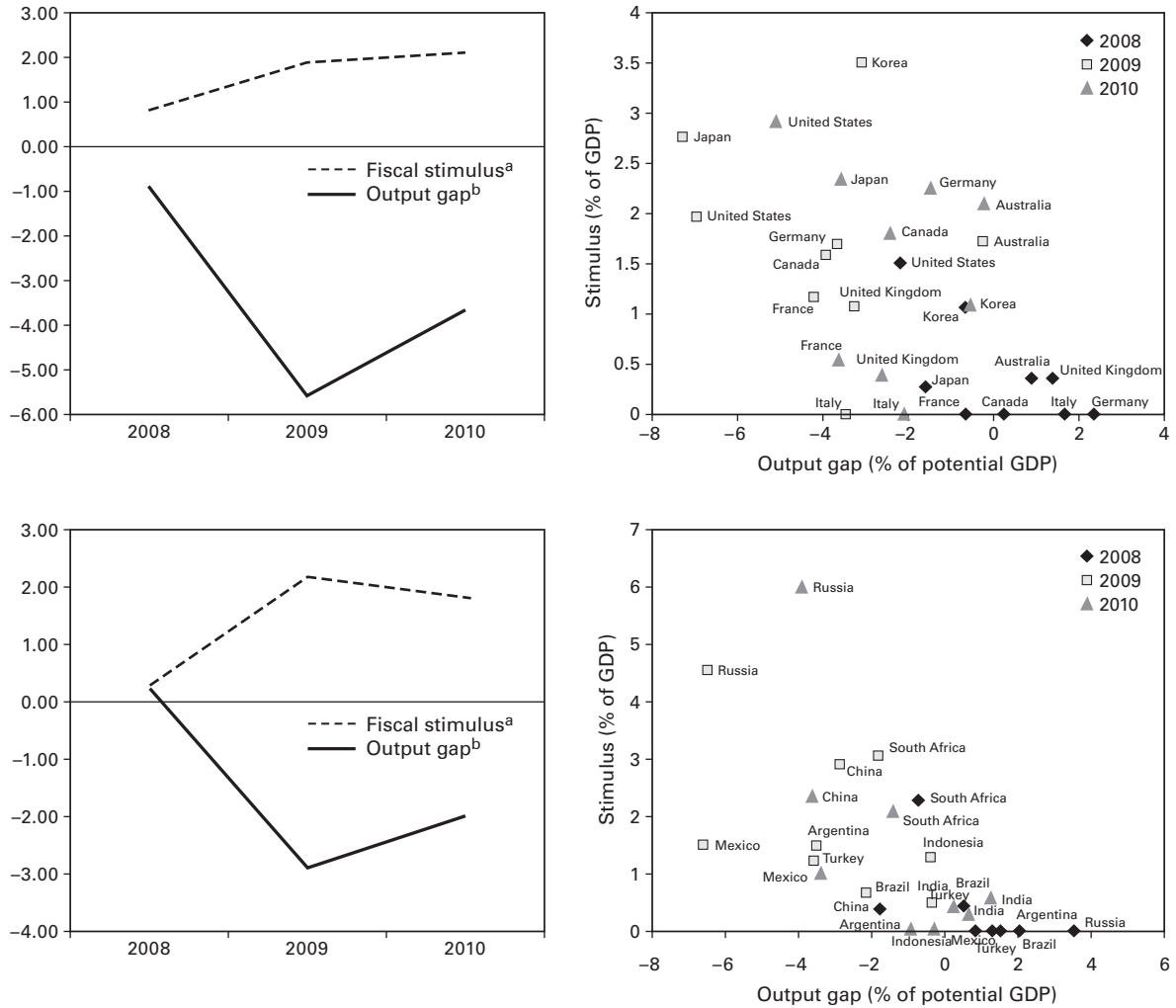


Figure 10.9

Fiscal stimulus and output gap (in percent of actual and potential GDP). (a) In percent of GDP, PPP-GDP weighted; (b) in percent of potential GDP, PPP-GDP weighted.

Sources: Country authorities; staff estimates

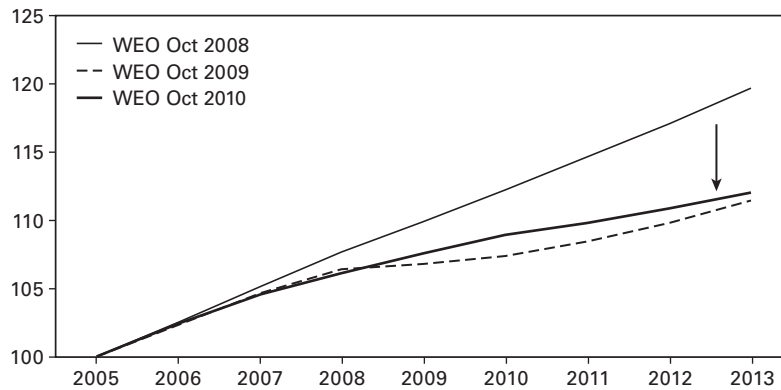


Figure 10.10

Potential GDP in advanced economies (median; 2005 = 100)

Sources: Country authorities; staff estimates

The uncertainty about the extent of decline in potential output and the corresponding permanent loss of revenues complicated an assessment of the appropriate size of the fiscal stimulus in real time. Potential GDP estimates were in fact reduced significantly since the crisis started (figure 10.10). Several countries introduced multiple stimulus packages, as policy makers continued to reassess the severity of the situation while the crisis unfolded. In particular, the processes of deleveraging and asset price deflation were likely to influence long-term revenue potential, a key input to assess the space for fiscal stimulus.

Composition

The composition of the stimulus packages was diversified across revenue and expenditure measures, especially in advanced economies. Given the uncertain nature of the global slowdown, the allocation of fiscal stimulus across various instruments was broadly appropriate. In the aggregate, more than three-fourths of the stimulus was based on expenditure measures, with a direct impact on aggregate demand. Moreover a large part of the expenditure stimulus was allocated to infrastructure investment and to safety nets. Many measures were targeted at credit-constrained households with a higher propensity to consume. Execution lags may have affected the effectiveness of infrastructure stimulus in the short term, but with a potentially protracted economic slowdown this is less problematic, particularly considering the long-term growth impact. Moreover expenditure measures have in most cases been designed to be transitory or self-unwinding, possibly given the need to address fiscal sustainability concerns. Increases in public wages have in general been avoided, appropriately so, as these are not well targeted and are difficult to reverse.

While tax measures provided diversification, better targeted measures may have had a stronger impact. Many measures focused on direct taxes on personal and corporate income. If growth expectations are low, income tax reductions would be less likely to stimulate consumption as precautionary savings would tend to increase.¹⁶ Firms would also be less likely to pursue investments out of income tax reductions if they take a “wait-and-see” approach in an uncertain environment. In general, tax reductions targeted at households and firms that are more likely to be credit constrained, as opposed to across-the-board tax cuts, can be expected to better stimulate consumption and investment.

International Coordination

Especially in 2009, most countries contributed to the aggregate stimulus. However, this was followed by more divergent policy approaches. In the aggregate, G20 economies reacted concurrently and in synchronicity to the shock (figure 10.9). By 2009, G20s were already implementing fiscal stimulus packages of about 2 percent of GDP (PPP GDP-weighted), with median stimulus packages for advanced G20s at about 1.5 percent of GDP. The extent to which this synchronicity was due to international coordination, however, is difficult to assess. On the one hand, there were concrete efforts at coordination. The Group of Twenty (G20) cemented its role during the crisis as a key multilateral economic forum.¹⁷ Through early 2012, six G20 summits¹⁸ and more ministerial level meetings had been held, in which members committed to sustained fiscal stimulus to support growth and employment, and also to an exit strategy that ensures fiscal sustainability. On the other hand, the application of stimulus appears correlated with country-specific fundamentals (see the next subsection), including financing constraints and political willingness. This makes it difficult to assess if at least part of the fiscal stimulus responded to developments in the rest of the world. On the one hand, it is possible that large economies would have incentives to stimulate the global economy, as each economy’s own growth could have a measurable impact on global output and result in a positive growth feedback effect. On the other hand, there was a potential for a “free-rider” problem: each economy would benefit from others’ stimulus without incurring the costs related to increasing its own fiscal deficit and public debt.

10.3.2 Assessment against Cross-country Differences in Economic Fundamentals

Cross-country differences in fiscal stimulus were broadly consistent with country differences in economic fundamentals. Figure 10.11 shows that G20 countries with larger cumulative output gaps in general applied larger stimulus (measured as the cumulative stimulus through 2008 to 2010). The fiscal stimulus was larger in economies with more fiscal space (captured by a relatively lower pre-crisis public debt stock and stronger overall fiscal balance). More open economies applied less stimu-

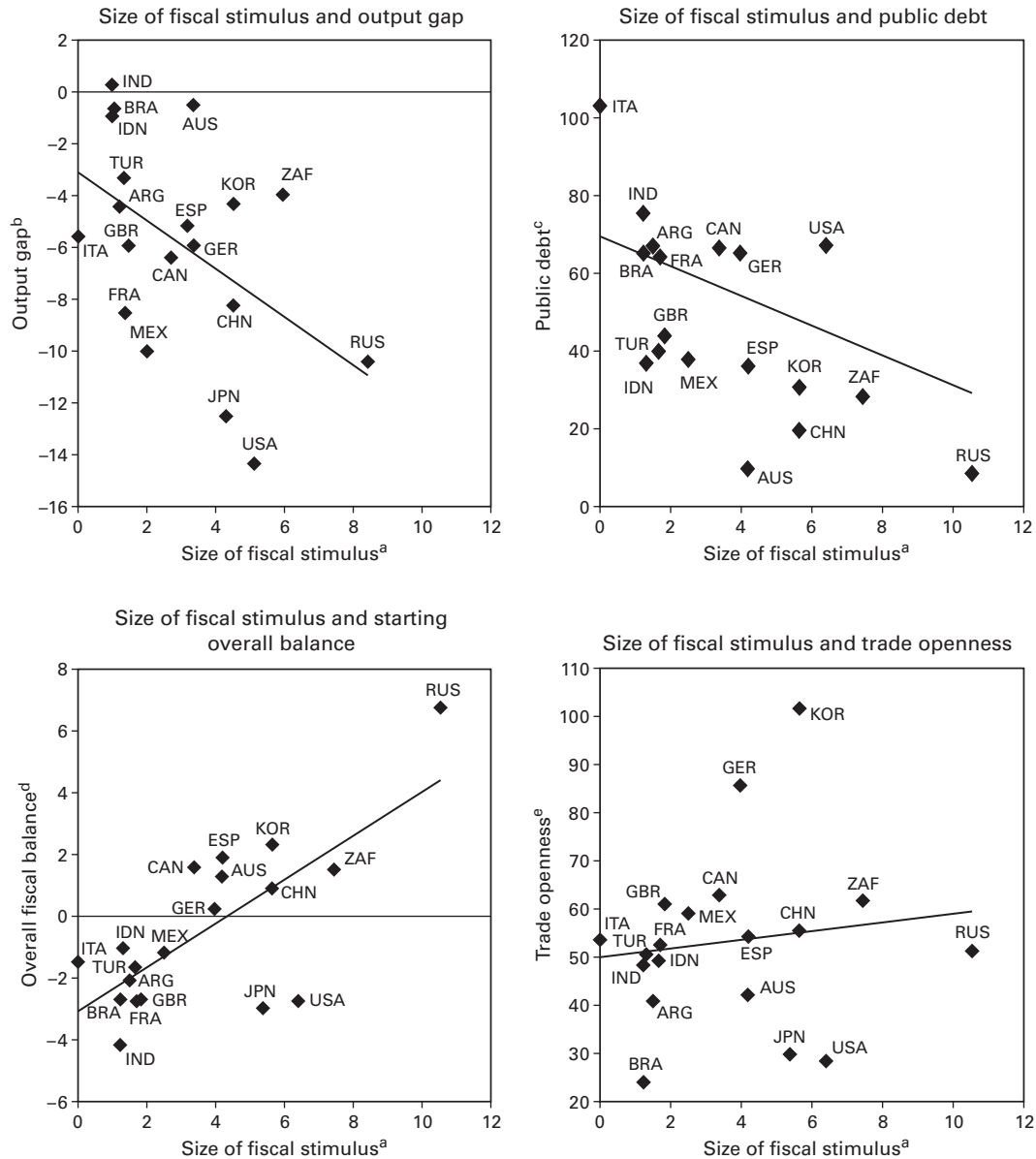


Figure 10.11

G20 economies' fiscal stimulus and economic fundamentals. (a) Cumulative fiscal stimulus from 2008 to 2010, in percent of GDP; (b) distance between nominal GDP and potential GDP accumulated through 2008 to 2010; (c) overall fiscal balance in 2007, in percent of GDP; (d) average of exports plus imports from 2008 to 2010, in percent of GDP.

Sources: Country authorities; staff estimates

Table 10.1
G20 Economies: Explaining country differences in fiscal stimulus

Variables	(1)	(2)	(3)
	OLS	RE	FE
Output gap (interaction with advanced economies)	-0.650*** (0.140)	-0.569** (0.232)	-0.468* (0.273)
Output gap (interaction with emerging economies)	-0.300*** (0.0787)	-0.317*** (0.113)	-0.355*** (0.124)
Automatic stabilizers (interaction with advanced economies)	-0.890*** (0.331)	-0.688 (0.457)	-0.705 (0.522)
Automatic stab. (interaction with emerging economies)	0.0417 (0.423)	-0.00522 (0.317)	-0.280 (0.367)
Lagged debt (interaction with advanced economies)	-0.00640*** (0.00216)	-0.00659 (0.00417)	0.0291 (0.0198)
Lagged debt (interaction with emerging economies)	-0.0137* (0.00819)	-0.0157* (0.00937)	-0.0871** (0.0432)
Openness	-0.00400 (0.00617)	-0.00664 (0.00961)	-0.0647* (0.0336)
Constant	1.341** (0.617)	1.524** (0.759)	4.785** (1.905)
Observations	71	71	71
R-squared	0.414		0.480
Number of countries	18	18	18

Sources: Country authorities; staff estimates

Note: Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

lus, possibly reflecting the lower effectiveness of a given stimulus effort due to leakage compared to more closed economies.

A simple regression analysis supports the conclusion that the application of fiscal stimulus across countries was broadly in line with fundamentals. Table 10.1 shows the results of panel regressions that explain fiscal stimulus for G20 economies over 2008 to 2011, as a function of the output gap, the size of the automatic stabilizers, the lagged value of the debt-to-GDP ratio, and the degree of openness measured by the sum of imports and exports to GDP.¹⁹ Interaction terms capture differences between advanced and emerging G20 economies.

The size of the fiscal stimulus was larger in countries with larger output gaps, with the response in advanced economies about twice as large compared to emerging economies (with significant coefficients in all regressions).²⁰ The relation between fiscal stimulus and the automatic stabilizers differs between the two country groups.

For advanced countries, a 1 percent of GDP increase in the deficit due to automatic stabilizers is associated with a decline in discretionary stimulus of between three-quarters to one percentage point (although the coefficient on automatic stabilizers is significant only for the OLS regression). For emerging markets, there is no clear relation between the automatic stabilizers and stimulus. Countries that had higher initial debt levels adopted smaller stimulus packages, with a larger impact for emerging economies. Finally, the effect of openness on the size of stimulus measures, albeit only significant for the fixed effects estimator, suggests that more open countries adopted smaller stimulus packages. These empirical results are consistent with Aizenman and Jinjark (2010) which finds that across a larger sample of countries, “de facto fiscal space,” which is measured by the inverse of the tax-years it would take to repay the public debt, is positively associated with fiscal stimulus. Their paper also finds higher trade openness was associated with lower fiscal stimulus and a higher level of depreciation during 2009 and 2010.

There was also a link between the fiscal and the monetary policy response. As mentioned above, central banks’ policy rates in advanced G20s were already very close to the zero lower bound, and therefore there was limited room for action using traditional monetary policy instruments (indeed providing the key rationale for an activist fiscal policy). However, quantitative easing still allowed central banks to support aggregate demand.²¹ Several advanced and emerging G20s significantly expanded their central bank balance sheets, most notably (but not exclusively) in the United States, but this has not been even across countries (figure 10.12). Several emerging G20s also relied on exchange rate depreciation to accommodate the economic slowdown (with the exception of China and Brazil), an instrument that was not available to several advanced G20 economies.

10.4 Selected Public Sector Asset and Liability Management Issues

The crisis resulted in a significant expansion of government balance sheets in advanced economies. In the advanced G20 economies, total liabilities averaged 90 percent of GDP at end-2010, an increase of almost 25 percentage points of GDP over 2007. However, one-quarter of the increase in liabilities was offset by the acquisition of financial assets, which reached about 40 percent of GDP on average at the end of 2010 (figure 10.13).

Governments used their balance sheets to limit the impact of the crisis, especially by supporting the financial sector. Examples of support for financial institutions were asset swaps/purchases (in Australia, Canada, Japan, Korea, Spain, United States, and Russia), bank recapitalization (in France, Italy, Japan, Korea, United Kingdom, United States, and Russia), and direct lending or crisis liquidity facilities (in Canada, Japan, Korea, United Kingdom, United States, Brazil, Russia, and Saudi Arabia).²²

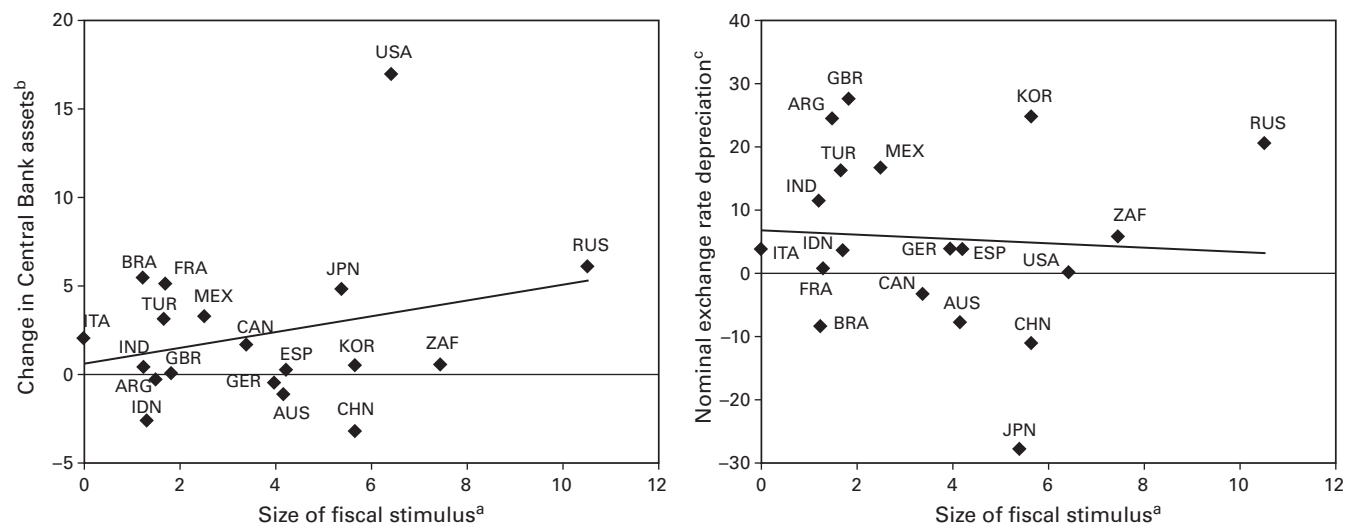


Figure 10.12

G20 economies' fiscal stimulus and monetary policy. (a) Cumulative fiscal stimulus from 2008 to 2010, in percent of GDP; (b) change in central bank total assets as a percent of GDP between 2008 and 2010; (c) cumulative increase in nominal effective exchange rate from 2008 to 2010.

Sources: Country authorities; staff estimates

Financial sector interventions were important to stabilize the financial markets and to prepare the ground for a credit-led recovery. For example, Laeven and Valencia (2013) find that for a sample of advanced and emerging economies, government support to bank capital during a crisis (when banks tend to be capital-crunched) has a positive effect on lending and contribute to the growth of firms that depend on financing. In addition there are both theoretical and empirical evidence that the economic recovery following significant growth decelerations can be protracted based on the extent to which financial sector frictions affect credit recovery (Bernanke and Gertler 1989; Greenwald and Stiglitz 1993; Kiyotaki and Moore 1997; Reinhart and Rogoff 2008b).²³ If balance sheet interventions protect financial institutions' ability to lend, then they could help not only to moderate the extent of output decline but also encourage the recovery afterward.

A critical caveat to keep in mind, however, is that fiscal sustainability also depends on the recovery value of the assets. Therefore there will be an increase in the public sector's exposure to risk going forward, given the uncertain recovery value of these assets. As sovereign creditworthiness is also an important determinant of economic growth (as it can affect interest rates), the recovery value of these assets is relevant for a full assessment of their impact on growth. This makes it important to set up appropriate asset-liability management (ALM) strategies to protect sovereign cred-

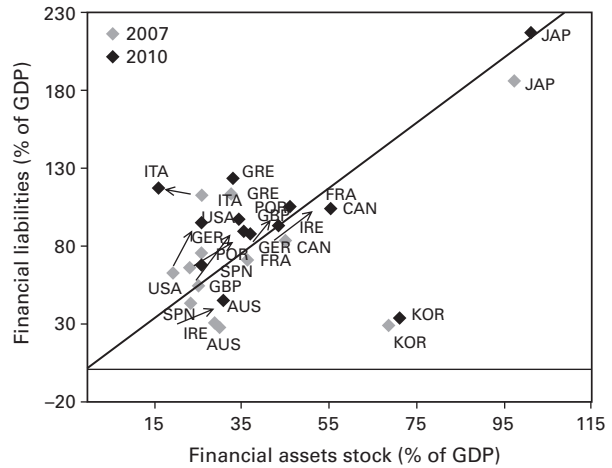
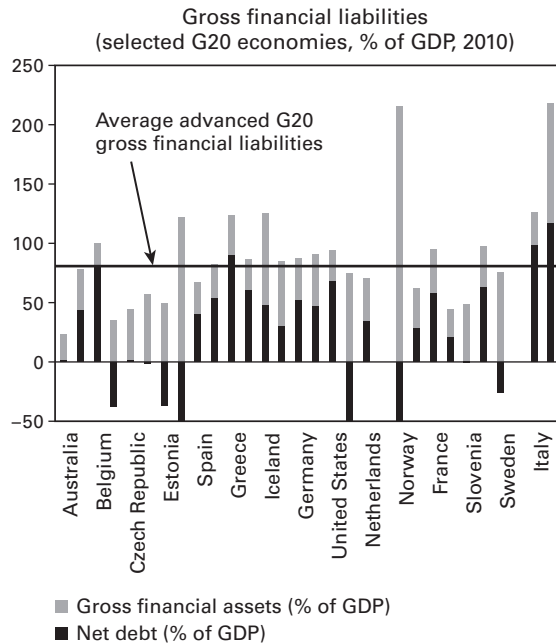


Figure 10.13
G20 economies’ government assets and liabilities
Sources: Country authorities; staff estimates

itworthiness. An ALM should (1) be specified within a medium-term budget framework; (2) seek to maximize recovery rates through an orderly unwinding, timed according to the normalization of market conditions; (3) appropriately account and plan for the minimization and possible realization of contingent liabilities; and (4) identify and resolve risks from institutional deficiencies.

The expansion of government liabilities in most cases was in the form of bonds, but the increase in assets had a more diversified instrument base (figure 10.14). A large proportion of the governments’ financial sector support took the form of purchase of bonds and issuance of loans. This allocation, other things constant, reduced the government’s liquid position. Some governments might have compensated for this by increasing the holdings of liquid deposits. Some examples where this could have been the case are Germany, Italy, Mexico, and the United States.

Central banks’ balance sheets have also expanded significantly in most G20s, including via holdings of government debt as part of a “quantitative easing” policy. This supported stabilization of asset prices in the face of possible sharp asset deflation processes, containing balance sheets’ damage. Such interventions also provided time to develop fiscal plans seeking to improve sovereigns’ creditworthiness and

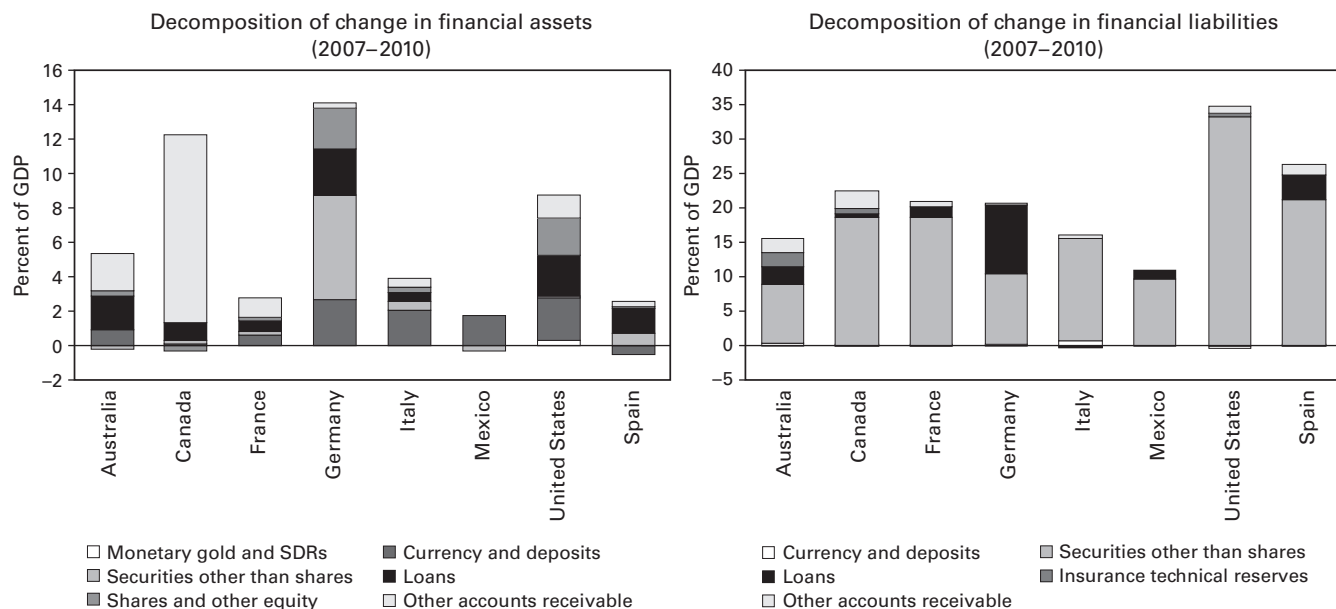


Figure 10.14
G20 economies' decomposition of government balance sheets
Sources: Country authorities; staff estimates

restore markets' confidence. The rationale was that such plans, if credible and comprehensive, would allow a decline in sovereign spreads, and in this way avoid unleashing the costs of a deterioration in the financial sector capital base, which could trigger a downward spiral on credit and growth.

Larger central bank interventions have taken place in the United States, Japan, France, and the United Kingdom, and also in Europe (by the European Central Bank). This is important as it implies that to the extent there is no need for sterilization,²⁴ the consolidated public sector debt including the central bank did not increase as much as that of the nonfinancial public sector (see April 2012 *Fiscal Monitor*, table 10.5). However, caution should be exerted in taking comfort from such financing operations, as the consolidated liabilities of the government (including bonds and also other liabilities such as deposits at the central bank or money base) have indeed increased. To the extent these cash and deposit holdings are demanded during periods of uncertainty as a store of value to protect balance sheets, it is to be expected that once economic recovery (and fiscal sustainability) have been established these government bonds would return to private balance sheets.

Several advanced G20 economies increased short-term debt financing through 2008 to 2010, unlike most emerging G20s. As figure 10.15 shows, Germany and France increased their short-term debt exposure, which is significant considering

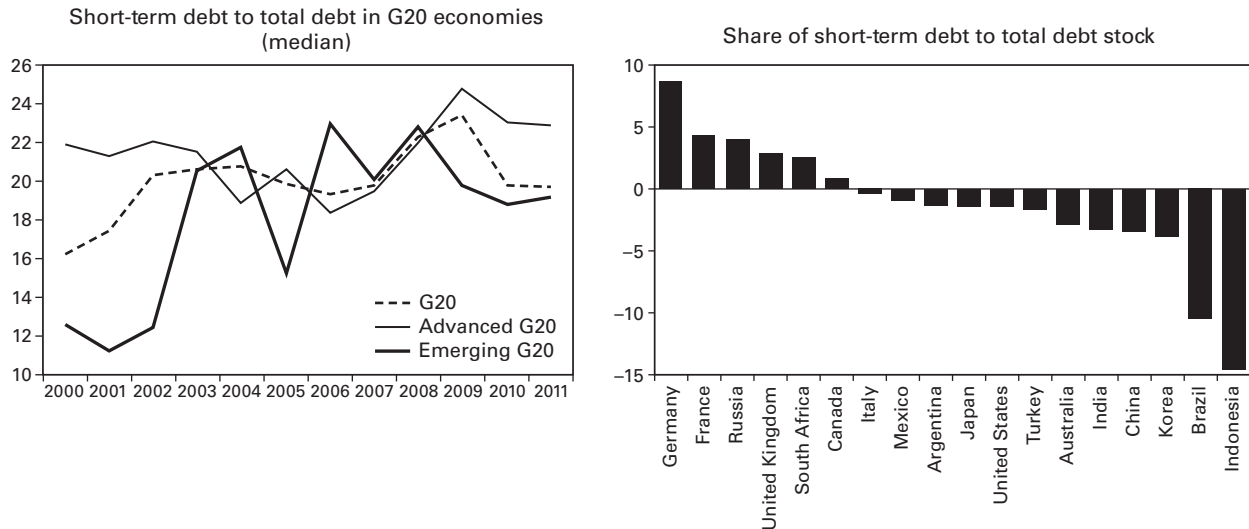


Figure 10.15

G20 economies' short-term government debt

Source: Bank of International Settlement

their high levels of gross debt and also the longer maturity of the acquired financial assets in the case of Germany. On the opposite end, several emerging G20s reduced their short-term debt share, especially Asian G20s, possibly as a result of better market liquidity conditions.

10.5 Conclusion

The fiscal policy response during the crisis was unprecedented. This reflected the exceptional nature of the financial crisis and the economic recession as well as the limited room for further monetary policy action.

The crisis opened a passionate policy debate about the role and effectiveness of fiscal policy. In broad terms, this debate focused on the appropriateness of a fiscal stimulus vs. a fiscal consolidation as a way out of the crisis. The empirical evidence, and a review of outcomes, indicates that some form of stimulus was critical to stop a downward spiral in growth and financial instability. But a deeper look at the fiscal responses presented in this chapter also shows that the response actually took into account the economic forces recognized in both positions. There was indeed a stimulus of close to 2 percent of GDP per year in 2009 to 2010, and it was diversified across various policy instruments. In most cases stimulus packages included a larger share of expenditure measures (particularly infrastructure investment which are generally associated with relatively high multipliers), but also a nontrivial share

of revenue measures. The emphasis on the preservation of fiscal sustainability, however, was not absent at the time the stimulus was designed, and also later during the stimulus withdrawal phase. Fiscal stimuli size was contained, given the requirement to balance the need to avert a growth collapse vis-à-vis the risks involved in excessive borrowing. Stimuli typically included significant self-reversing (or easier-to-reverse) and transitory elements. Also, as the cross-country differences indicate, the stimulus was larger in countries in which the recession was deeper, had more fiscal space, and had less financial pressure. Finally, stimuli were larger in countries with less room for a monetary policy response, and less developed automatic stabilizers.

Arguably, the timing of the withdrawal of stimulus also took into account fiscal sustainability considerations. The stimulus was gradually withdrawn starting in 2011, as gross public debts reached about 70 percent of world GDP (and over 100 percent in advanced economies) and fiscal sustainability concerns took more preeminence. At that stage, given some signs of growth stability and financing constraints permitting, countries focused on managing the pace of fiscal consolidation. It became important to identify the delicate fiscal consolidation path that would ensure fiscal sustainability over the medium term while minimizing its negative near-term impact on growth. This withdrawal of stimulus was also broadly consistent with cross-country differences in economic fundamentals. Advanced economies, which had a more lasting decline in growth but also more fiscal space, maintained fiscal stimulus longer, while emerging economies potentially more susceptible to financing pressures withdrew stimulus earlier.

Government balance sheets were also impacted by the interventions during the crisis. The expansion of government liabilities has been partially matched by a corresponding increase in assets as a result of financial sector interventions. Still these operations have increased risks and uncertainty affecting government balance sheets. This calls for strengthening the management of public sector assets and liabilities in the coming years. A distinctive feature of interventions during the crisis was the widespread use of government (and in some cases also central banks) balance sheets to support financial markets, particularly the banking sector.

The crisis also highlighted the importance of building up fiscal space in good times to enable a response in bad times. On the positive side, the crisis improved policy coordination within the G20 group. Institutional progress was made in designing a framework for coordination and monitoring of macroeconomic and financial policies (the so-called G20 Mutual Assessment Process).

The road ahead remains challenging, and the need to secure fiscal sustainability is likely to continue to assume greater importance over time. In addition to additional fiscal consolidation needed to make public debt sustainability more stable and less vulnerable to shocks, key structural fiscal reforms remain critical, including reforms of health and pension schemes.

Appendix: Some Fiscal Policy Terminology and Definitions

Table A10.1
Fiscal indicators, 2007 to 2012
(Percent of GDP, except where otherwise noted)

	2007	2008	2009	Estimates	Projections	
				2010	2011	2012
Overall fiscal balance^a						
World	-0.4	-2.0	-6.7	-5.5	-4.4	-4.0
Advanced economies	-1.3	-3.8	-9.0	-7.6	-6.6	-5.8
United States	-2.7	-6.7	-13.0	-10.5	-9.5	-8.2
Euro area	-0.7	-2.1	-6.4	-6.2	-4.2	-3.3
France	-2.7	-3.3	-7.6	-7.1	-5.4	-4.6
Germany	0.2	-0.1	-3.2	-4.3	-1.0	-0.8
Italy	-1.5	-2.7	-5.3	-4.5	-3.9	-2.8
Spain	1.9	-4.2	-11.2	-9.3	-8.5	-6.2
Japan	-3.0	-4.7	-10.8	-9.3	-10.1	-10.2
United Kingdom	-2.7	-4.9	-10.4	-9.9	-8.6	-7.9
Canada	1.6	0.1	-4.9	-5.6	-4.8	-4.2
Emerging economies	0.2	-0.4	-4.8	-3.6	-2.5	-2.6
China	0.9	-0.4	-3.1	-2.3	-2.0	-2.0
India	-4.2	-7.2	-9.7	-9.0	-8.3	-7.8
Russia	6.8	4.9	-6.3	-3.5	0.5	-0.8
Brazil	-2.7	-1.4	-3.1	-2.8	-2.6	-2.4
Mexico	-1.2	-1.1	-4.7	-4.3	-3.0	-2.6
South Africa	1.5	-0.5	-5.3	-5.1	-5.0	-4.8
Low-income economies	-1.7	-1.3	-4.0	-2.9	-2.5	-2.9
G20 economies	-1.0	-2.7	-7.6	-6.2	-5.1	-4.7
G20 advanced	-1.9	-4.4	-9.6	-8.2	-7.2	-6.3
G20 emerging	0.4	-0.2	-4.8	-3.5	-2.5	-2.6
General government cyclically adjusted balance (percent of potential GDP)						
World	-1.5	-2.6	-4.6	-4.4	-3.6	-3.1
Advanced economies	-2.1	-3.6	-5.9	-6.0	-5.1	-4.3
United States ^b	-2.8	-5.0	-7.5	-7.8	-7.0	-5.9
Euro area	-2.2	-3.1	-4.6	-4.7	-3.4	-2.0
France	-3.1	-3.0	-5.3	-5.2	-4.1	-3.4
Germany	-1.2	-1.3	-1.3	-3.5	-1.2	-0.4
Italy	-3.4	-3.6	-3.5	-3.4	-2.9	-0.8

(continued)

Table A10.1
(continued)

	2007	2008	2009	Estimates	Projections	
				2010	2011	2012
Spain	0.1	-5.4	-9.8	-7.8	-7.0	-4.0
Japan	-3.1	-4.1	-7.7	-7.8	-8.0	-8.6
United Kingdom	-4.0	-6.5	-9.0	-7.8	-6.3	-5.1
Canada	0.6	-0.5	-2.5	-4.0	-3.7	-3.1
Emerging economies	-0.8	-1.9	-4.1	-3.5	-2.6	-2.4
China	1.1	0.0	-2.4	-1.5	-0.7	-0.6
India	-5.8	-9.3	-10.8	-9.6	-8.7	-8.2
Russia	6.1	3.9	-3.3	-2.1	0.7	-1.1
Brazil	-3.1	-2.2	-2.2	-3.3	-2.7	-2.2
Mexico	-1.5	-1.3	-3.8	-3.8	-2.7	-2.4
South Africa	0.0	-2.0	-4.9	-4.6	-4.5	-4.1
G20 economies	-1.7	-3.0	-5.2	-5.1	-4.2	-3.7
G20 advanced	-2.4	-3.8	-6.0	-6.3	-5.5	-4.6
G20 emerging	-0.5	-1.7	-4.1	-3.4	-2.5	-2.5
General government gross debt						
World	57.4	59.3	65.7	69.9	70.0	70.8
Advanced economies	76.1	82.0	93.7	99.7	103.6	107.8
United States	67.2	76.1	89.9	98.5	102.2	108.0
Euro Area	66.4	70.1	79.8	85.6	88.5	91.0
France	64.2	68.3	79.0	82.4	86.3	89.1
Germany	65.2	66.7	74.4	83.2	81.5	81.5
Italy	103.1	105.8	115.5	118.4	121.0	124.9
Spain	36.1	39.9	53.6	60.8	70.6	78.2
Japan	188.6	196.2	216.3	219.0	233.4	241.0
United Kingdom	43.9	52.5	68.4	75.1	82.2	88.5
Canada	66.5	71.1	83.6	85.1	85.4	86.3
Emerging economies	35.8	34.6	36.6	40.7	37.7	36.2
China	19.6	17.0	17.7	33.5	26.6	23.3
India	75.4	74.7	74.4	68.1	66.6	66.1
Russia	8.5	7.9	11.0	11.7	10.6	10.7
Brazil	64.5	63.1	66.7	64.5	65.5	64.0
Mexico	37.8	43.1	44.7	42.9	44.1	43.4
South Africa	28.3	27.4	31.5	35.3	37.9	39.8
Low-income economies	41.8	38.6	41.9	39.7	38.7	39.2
G20 economies	63.9	66.4	73.2	78.1	77.8	78.5

Table A10.1
(continued)

	2007	2008	2009	Estimates	Projections	
				2010	2011	2012
G20 advanced	81.3	87.6	100.1	106.4	110.3	114.8
G20 emerging	36.3	34.6	35.8	40.7	37.1	35.2
<i>Memorandum:</i>						
<i>World growth (percent)</i>	5.4	2.7	-0.6	5.2	3.8	3.4

Source: IMF staff estimates and projections

Note: All country averages are PPP-GDP weighted using rolling weights and calculated based on data availability. Projections are based on IMF staff assessment of current policies.

a. For overall fiscal balance and cyclically adjusted balance, + indicates a smaller fiscal deficit; for gross debt, + indicates a larger debt.

b. Excluding financial sector support.

The overall balance in nominal terms (*OB*) can be written as the primary balance ($PB = T - E$) minus net interest expenditures (*INT*),

$$OB = PB - INT.$$

The distinction of the primary balance is important in that it identifies government policies, given that interest expenditures are in general out of the government control.

A **fiscal expansion (contraction)** is a decline (increase) in the *PB*. Notice that if a fiscal expansion is computed in percent of GDP (as opposed to computation in nominal terms), then it also captures changes in GDP.

The primary balance reflects a combination of factors, including from either the automatic budget responses (e.g., a decline in tax revenues during recessions, without a change in tax rates) or policy actions (e.g., a change in policy). To better identify these components, some specific indicators can be computed. The **cyclical primary balance (CPB)** is the share of the primary balance that results from cyclical economic developments. This is in general calculated by computing the component of revenues and expenditures that respond to the business cycle (see Fedelino et al. 2009). The **automatic stabilizers** are computed as the annual change in the *CPB*,²⁵

$$AS = dCPB.$$

Removing the *CPB* from the *OB* results in the **cyclically adjusted primary balance (CAPB)**,²⁶

$$CAPB = PB - CPB.$$

The CAPB can be used to characterize fiscal policy: the **fiscal policy stance** is *procyclical* if the CAPB is in deficit (surplus) when the output gap is positive (negative) (Blejer and Cheasty 1993). A fiscal policy stance is *countercyclical* if the CAPB is in deficit (surplus) when the output gap is negative (positive).

Another important indicator to describe fiscal policy is the **fiscal impulse** (*FI*), which captures the impact of fiscal policy on aggregate demand relative to the past, as opposed to in relation to the state of the cycle as in the CAPB level. This is defined as the (negative of the) change in the CAPB,

$$FI = -dCAPB.$$

A fiscal impulse can be *procyclical* if *FI* is of the same sign as the output gap (e.g., a decrease in the CAPB when the output gap is positive, meaning the government is introducing an expansionary impulse during an economic boom), or *countercyclical* when *FI* has the opposite sign than the output gap.

A different concept is that of **fiscal stimulus** (*FS*). This terminology is used to refer to discretionary crisis-related fiscal policy actions introduced to support economic activity. These are in general a subset of the fiscal impulse, which might also include other measures that are either structural in nature or reflect the fiscal impact of other cyclical developments not captured by the economic cycle.

Notes

1. It is beyond the scope of this chapter to settle this debate.
2. The part of the primary deficit attributed to other structural or discretionary effects captures the underlying structural deficit (e.g., as a result of a change in the output gap from a decline in potential GDP, or arising from demographic pressures related to aging), financial sector support measures, and any additional fiscal impact of the crisis that is not captured by the cyclical adjustment. An example of the latter is revenue declines attributed to lower asset or housing prices (for a conceptual discussion, see *Fiscal Implications of the Global Economic and Financial Crisis*, app. V, IMF, 2009b).
3. The expenditure increase of Saudi Arabia mainly accelerated the implementation of existing development plans.
4. See Spilimbergo et al. (2009).
5. The output gap is defined as actual GDP minus potential GDP relative to potential GDP.
6. The change in debt is decomposed into the change in primary deficit, interest payments, the effects of growth dynamics (we report the effects of growth dynamics together with interest payments), net lending and other stock-flow adjustments, and financial sector support. This decomposition follows the methodology that has been applied in the September 2011 *Fiscal Monitor* for advanced G20 economies.
7. The differential between the effective interest rate and growth in emerging economies has historically been negative from 1990 to 2007 (*Fiscal Monitor*, April 2012).
8. A review of the size of fiscal multipliers would be provided in the next chapter.

9. A key reason that explains the opposing results is the difference in strategies used to identify discretionary fiscal consolidation episodes. The study in WEO identifies discretionary fiscal policy as the execution of announced stimulus packages. Most of the studies in the literature that argued that fiscal consolidation can increase growth use the change in the cyclically adjusted primary balance (i.e., a statistical concept) to estimate the magnitude of discretionary fiscal policy.
10. Exceptions occur typically in countries with high risks to fiscal sustainability.
11. See Baum, Poplawski-Ribeiro, and Weber (2012).
12. See Cottarelli (2012).
13. While there is no one definitive guideline for designing appropriate fiscal stimulus packages, some papers tried to identify guiding principles. One example is Spilimbergo et al. (2008). This paper proposes that to maximize the impact of discretionary fiscal policy, a stimulus package should be *timely* (given the urgent need for action), *large* (given the significant decline in demand), *lasting* (as the recession was expected to endure), *diversified* (given the uncertainty regarding which measures would be most effective), *contingent* (to ensure that further action would be taken if needed), *collective* (for all countries with fiscal space to contribute given the global nature of the shock), and *sustainable* (to avoid debt sustainability concerns triggering contractionary adverse effects in the short run).
14. See Khatiwada (2009) for a detailed discussion of labor market measures that were adopted.
15. Analyzing the appropriateness of stimulus packages at an individual country basis and with respect to considerations paid to social protection and labor market policies is beyond the scope of this chapter.
16. In the case of the United States, however, the fact that the payroll tax is capped might have resulted in a more stimulating impact as the cuts tend to benefit relatively more low- to middle-income earners.
17. The G20 comprises 19 countries (9 from advanced countries and 10 from emerging countries) and the European Union. To ensure global economic institutions work together, the International Monetary Fund, the World Bank, the Organisation for Economic Co-operation and Development (OECD), and others also participate in the G20 meetings.
18. Washington (November 2008), London (April 2009), Pittsburgh (September 2009), Toronto (June 2010), Seoul (November 2010), and Cannes (November 2011).
19. The results are robust to different estimation methods, including OLSs with panel-corrected standard errors, random effects estimator, and fixed effects estimator. Although, given the limited degrees of freedom, the evidence should only be considered indicative.
20. In principle, the application of stimulus would be correlated with lags of the output gap, but the regression results showed no statistically significant results under such specification. The reason is possibly that stimulus packages were applied with a lag of less than one year. As the shock took place in September 2007, the growth impact is observed in full in 2008, when fiscal stimulus started.
21. In Europe, the quantitative easing also included the ECB's balance sheet interventions, which are not included in figure 10.12.
22. See IMF Board paper SM/09/210.

23. Calvo, Izquierdo, and Talvi (2006a, b) provide evidence showing that, in the specific case of crisis or sharp output decelerations in the context of capital flow reversals (“sudden stops”), output recovery after crises in emerging economies has not been accompanied by a commensurate recovery in the stock of credit, a phenomenon they call “phoenix miracles.” This result has been confirmed for industrial economies by Claessens, Kose, and Terrones (2008). Biggs, Mayer, and Pick (2009), however, argue that credit recovery does matter in order to explain output recovery, focusing on the distinction that what is required for growth to resume is that credit *flow* (new credit) recovers, even if the credit *stock* does not.
24. For example, in the United Kingdom the purchase by the Bank of England of government bonds from banks had an increase in banks’ deposits at the central bank as a counterpart.
25. This equality holds in nominal terms. However, it is common to express the CPB as a share of potential GDP, and the PB as a share of GDP. As a result computing the difference above as share of the GDP under the usual conventions results in an (usually small) error, given the different denominators.
26. Given that the CPB measure is usually calculated based on the cyclical behavior of GDP, this measure includes the possibility of error if the cyclical components of revenues and expenditures respond to other variables that are not fully captured in GDP, such as terms of trade. Adjusting for other potential cycles (e.g., for commodity or asset prices) and for one-off measures give the structural balance (see Fedelino et al. 2009).

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