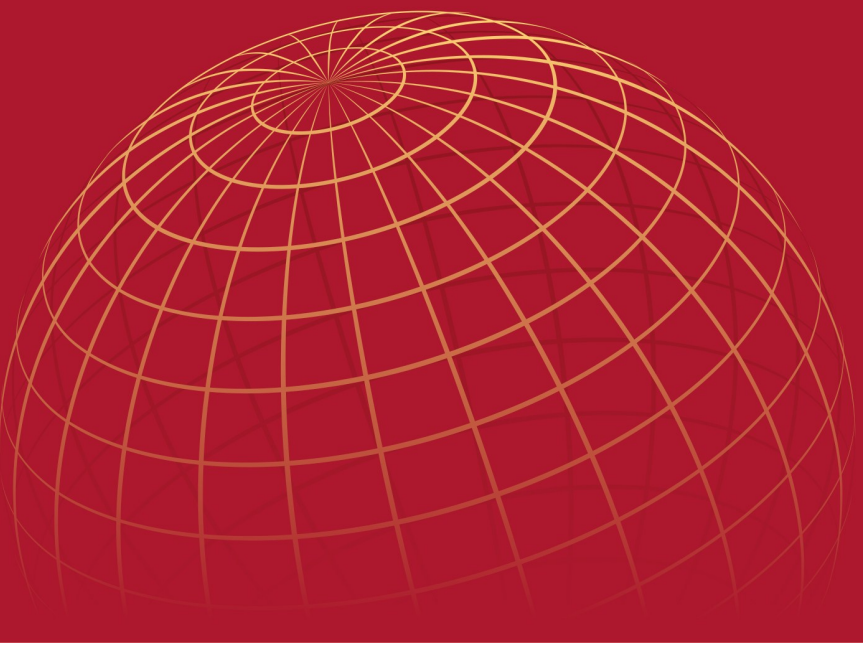


CHAPTER 3

HAVING SPACE AND USING IT:

Fiscal Policy Challenges in Developing Economies

Developing economies face downside risks to growth and prospects of rising financing costs. In the event that these cause a cyclical slowdown, policymakers may need to employ fiscal policy as a possible tool for stimulus. But will developing economies be able to use fiscal policy effectively? This chapter argues that fiscal space is essential for both the availability and the effectiveness of fiscal policy. Developing economies built fiscal space in the runup to the Great Recession of 2008–09, which was then used for stimulus. This reflects a more general trend over the past three decades, where availability of fiscal space has been associated with increasingly countercyclical (or less procyclical) fiscal policy. Wider fiscal space also appears to make fiscal policy more effective. However, fiscal space has shrunk since the Great Recession and has not returned to pre-crisis levels. Thus, developing economies need to rebuild buffers at a pace appropriate to country-specific conditions. For many countries, soft oil prices provide a window of opportunity to implement subsidy reforms that help build fiscal space while, at the same time, removing long-standing distortions. Over the medium-term, credible and well-designed institutional arrangements, such as fiscal rules, stabilization funds, and medium-term expenditure frameworks, can help build fiscal space and strengthen policy outcomes.[1]

Introduction

Growth in developing economies has slowed in recent years and significant downside risks remain, including slowdowns in major trading partners. In addition, financing costs are expected to rise from the current exceptionally low levels when monetary policy normalization gets under way in some advanced economies. Tightening of global financial conditions and bouts of financial market volatility might cause slowdowns or reversals of capital inflows.[2] Since the risk to capital flows can constrain monetary policy in developing economies, the option of fiscal policy as a countercyclical tool becomes particularly important.[3] How effective will fiscal policy be in supporting activity in developing economies in the event of a downturn? This question is the main focus of the chapter.

There are two related prerequisites for fiscal policy to be useful. First, *availability*: governments need to have the necessary fiscal space to implement countercyclical measures. Second, *effectiveness*: countercyclical fiscal policy has to be actually effective in raising the level of economic activity.[4] This chapter draws policy lessons by analyzing the historical experience of developing economies and answering the following questions:

- How has fiscal space evolved over time?
- Have developing economies "graduated" from the procyclicality of fiscal policy during the 1980s?
- Has greater fiscal space supported more effective fiscal policy?
- What institutional arrangements might strengthen fiscal space and policy outcomes, drawing lessons from country experiences?
- What objectives with respect to fiscal space should policymakers pursue in the current environment?

The focus here is on Emerging Market Economies (EMEs) and Frontier Market Economies (FMEs) that are able to tap international capital markets.[5] The chapter also briefly explores the role of fiscal policy in stimulating activity in Low Income Countries (LICs) that depend on concessional finance.

The chapter reports four main findings:

- During the 2000s, in the runup to the Great Recession of 2008–09, EMEs and FMEs built fiscal space by reducing debt and closing deficits (Figure 3.1). To support activity during the Great Recession, this space was used for fiscal stimulus. Deficits rose and have remained elevated as EMEs and FMEs have taken advantage of historically low interest rates.

- Fiscal policy in EMEs and FMEs has become more countercyclical (or less procyclical) since the 1980s, as most clearly demonstrated during the Great Recession.

- Wider fiscal space is associated with more effective fiscal policy in developing economies: fiscal multipliers tend to be larger in countries with greater fiscal space.

[1]This chapter is prepared by a team led by Ayhan Kose and Franziska Ohnsorge, and including S. Amer Ahmed, Raju Huidrom, Sergio Kurlat, and Jamus J. Lim, with contributions from Israel Osorio-Rodarte and Nao Sugawara, as well as consultancy support from Raphael Espinoza, Ugo Panizza, and Carlos Végh.

[2]For a discussion on the potential impact of monetary policy normalization on growth and capital inflows in developing economies, see World Bank (2014a) and IMF (2014a).

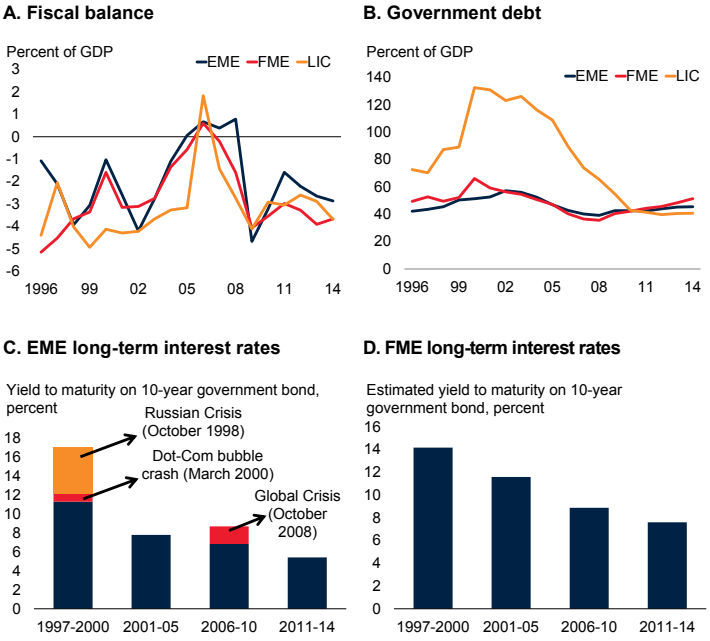
[3]Countercyclicality of fiscal policy refers to an increase in government consumption or cut in taxes during downturns to support economic activity. In the empirical analysis, countercyclicality is defined as a negative and statistically significant response of government consumption to exogenous movements in GDP, as inferred from an econometric model. The chapter also examines countercyclicality in terms of negative and statistically significant correlations between the cyclical components of government consumption and GDP. See Technical Annex for details.

[4]The changing nature of fiscal policy, its availability, and effectiveness in advanced and developing economies have received attention in recent research. Vegh and Vuletin (2013) show how fiscal policy has become increasingly countercyclical in Latin America. Ilzetzki et al (2013) and Auerbach and Gorodnichenko (2012a) explore the effectiveness of fiscal policy in various samples of advanced economies and large emerging markets. Kraay (2012) and Eden and Kraay (2014) examine the impact of fiscal policy in low-income countries.

[5]See Annex 3B for details on country classification.

FIGURE 3.1 Evolution of fiscal space and financing costs

Fiscal space used during the crisis has not been rebuilt and EMEs and FMEs are still taking advantage of historically low financing costs to run deficits.



Source: World Bank estimates.
Note: All figures are based on unweighted averages across the country grouping or time period. The interest rates over a given time period are averages of daily rates. For EMEs, the nominal long-term interest rate is equal to the government 10-year bond yield. In the case of FMEs, the generic bond yield data were sparse for many economies and time periods. Hence, the nominal interest rate is estimated as the sum of 10-year U.S. Treasury yields plus the predicted spreads from a fixed-effect OLS regression of J.P. Morgan's EMBI on the Institutional Investor Rating. For the crisis periods, the interest rates refer to the average of daily rates in that month. EME: emerging market economies; FME: frontier market economies; LIC: low income countries. Details on the fiscal space data and market based country classifications are described in the Annex 3B. Orange and red bars indicate spikes in long-term interest rates during the relevant months.

- Well-designed and credible institutional frameworks, such as fiscal rules, stabilization funds, and medium-term expenditure frameworks, can help build fiscal space and strengthen policy outcomes.

In developing economies, debt stocks on average remain moderate despite being higher than expected immediately after the crisis. Fiscal deficits are substantial and have not yet returned to pre-crisis levels. Many economies will need to reduce their fiscal deficits to more sustainable levels. The appropriate speed of adjustment towards these medium-term goals, however, depends on a range of country-specific factors, in particular the cyclical position of the economy and constraints on monetary policy. With restored space, fiscal policy will be more effective in providing support to activity in developing economies than under the current fiscal conditions.

The rest of the chapter is organized as follows. The next section describes the conceptual framework for defining and measuring fiscal space. It also outlines the evolution of fiscal space and fiscal policy in EMEs and FMEs. Next, using an econometric model, the chapter estimates fiscal multipliers, which depend on fiscal space. It then discusses institutional arrangements designed to implement sound fiscal policy. The next section assesses current risks, and appropriate medium-term operational goals. The chapter concludes with a brief summary of the main findings and policy recommendations.

How Has Fiscal Space Evolved?

Definition of Fiscal Space

A range of definitions for fiscal space is used in the literature. This chapter follows the definition of Ley (2009): "availability of budgetary resources for a specific purpose…without jeopardizing the sustainability of the government's financial position or the sustainability of the economy." This broad definition allows fiscal space to be considered along multiple dimensions.[6] The first is fiscal solvency risk. The second delineates balance sheet vulnerabilities, such as maturity profile and nonresident shares of government debt, which could generate rollover or liquidity risk for sovereign debt. The third dimension involves factors that could stress private sector balance sheets, and eventually lead to the buildup of contingent fiscal liabilities—such as the ratio of external debt-to-GDP or to foreign reserves, the share of short-term debt in external debt, and domestic credit to the private sector relative to gross domestic product (GDP).

In line with the literature, this chapter tracks fiscal space mainly in terms of fiscal solvency. Fiscal solvency risk is measured in three alternative ways to capture different elements: first, the government debt-to-GDP ratio (a stock measure of current debt sustainability); second, the fiscal balance-to-GDP ratio (a flow measure of debt accumulation, indicating future debt sustainability, and also one of the measures of rollover risk); and third, the sustainability gap. The sustainability gap is defined as the difference between the actual primary balance and the

[6]This multidimensional definition helps address the ambiguity of how fiscal space is defined in much of the literature (Perotti, 2007). Heller (2005) describes fiscal space more broadly as the budgetary room that allows a government to provide financial resources for a specific activity without affecting its financial sustainability while Ostry et al. (2010) defines fiscal space specifically as the difference between the current public debt and their estimate of the debt limit implied by the economy's history of fiscal adjustments.

debt-stabilizing primary balance, which depends on the target debt-to-GDP ratio to be achieved in the long run, the interest rate, and growth.[7] This last measure recognizes that debt sustainability depends on output growth and interest rates, as well as on outstanding debt and deficits. In addition to these measures of fiscal solvency risk, the chapter briefly discusses some aspects of balance-sheet vulnerabilities and private-sector debt.

Evolution of Space during the 2000s

Between 2001 and 2007, in the runup to the Great Recession, fiscal space widened for much of the developing world, with government debt ratios falling and fiscal deficits closing (Figures 3.1 and 3.2). Three factors contributed to these changes. First, there was rapid growth, with government revenues in commodity exporting economies bolstered by high and rising prices (Figure 3.3). This coincided with a period of increasing graduation of developing economies' fiscal policy from earlier procyclicality to more recent countercyclicality. Second, debt relief initiatives, such as the Heavily Indebted Poor Countries (HIPC) Initiative and Multilateral Debt Relief Initiative (MDRI), helped to reduce debt sharply in many FMEs and LICs.[8] As a result, most developing economies consolidated their finances in the early 2000s. Third, institutional arrangements in developing economies allowed for improvements in debt management, which also contributed to the reduction in debt-to-GDP ratios (Anderson, Silva and Valendia-Rubiano, 2011; Frankel, Vegh, and Vuletin, 2013).

During the Great Recession, fiscal space narrowed as economies implemented fiscal stimulus.[9] For example, the Republic of Korea boasted wide fiscal space in 2007, when government debt was a third of GDP, and fiscal balance was in surplus. In response to the crisis, the government implemented two fiscal stimulus packages, amounting to 3.6 percent of GDP in 2009 and 1.2 percent of GDP in 2010. Korea's surplus has diminished since then and debt is now almost 38 percent of GDP. Similarly, China had a fiscal surplus in 2007, and government debt that was just one-fifth of GDP. Following a stimulus package equivalent to 12.5 percent of GDP in 2008, China ran fiscal deficits from 2008 to 2010. Government debt rose to more than 50 percent of GDP by 2010.[10] Both economies succeeded in preventing a contraction in real GDP, despite the sharp downturn in the global economy.

Space and Policy during Contractions

China and Korea were particularly pronounced examples of a broader pattern among EMEs and FMEs. Many implemented countercyclical fiscal policy during the Great Recession, but not all avoided GDP contractions. To analyze fiscal policy responses during the Great Recession as well as in past crises, the chapter conducts an event study that identifies 101 episodes of sharp annual GDP contractions in 157 advanced and developing economies since 1990 (see Annex 3A for details). A country is considered to have experienced a contraction event if its GDP growth in a given year fulfills two conditions: first, growth is negative (i.e., a contraction), and second, growth is more than one standard deviation below the average growth that the economy experienced over 1990–2013. These criteria yielded 51 economies in the sample that experienced a contraction during the Great Recession, of which 21 were EMEs or FMEs.[11]

During the Great Recession, EMEs and FMEs used the wider fiscal space they had accumulated during the preceding years to allow automatic stabilizers to operate and to implement larger fiscal stimulus than in earlier contractions. Structural balances, which measure the fiscal policy stance, declined sharply as economies entered severe contractions (Figure 3.4).[12] During both event samples, fiscal space deteriorated following the stimulus, reflected in an increase in government debt. Government debt evolved differently across the two samples, likely as a result of different exchange rate movements and financial sector support programs.

[7]The debt stabilizing primary balance is defined as the primary balance that allows debt to converge to a target debt-to-GDP ratio. This is assumed to be the median stock of public debt as a share of a GDP for a given country grouping. The primary balance is the fiscal balance net of interest expense. Throughout this chapter, government debt refers to gross general government debt unless otherwise specified. See Annex 3B for additional details.

[8]As of 2014, 35 countries have reached the HIPC completion point and are eligible for assistance under the initiative, of which six are FMEs and 22 are LICs (IMF, 2014b). The most recent assessment of debt relief costs by the IMF (2013) determined that $126 billion has been committed under these initiatives to the 35 HIPC completion point countries, with another $442 million committed to Chad (an interim HIPC country), Cambodia, and Tajikistan. The latter two countries are non-HIPC.

[9]See Eskesen (2009), Arbatli et al. (2010), and Fardoust, Lin, and Luo (2012) for a detailed discussion.

[10]The buildup of general government debt reflected a substantial expansion in local government off-balance sheet lending (World Bank, 2013a, 2014b).

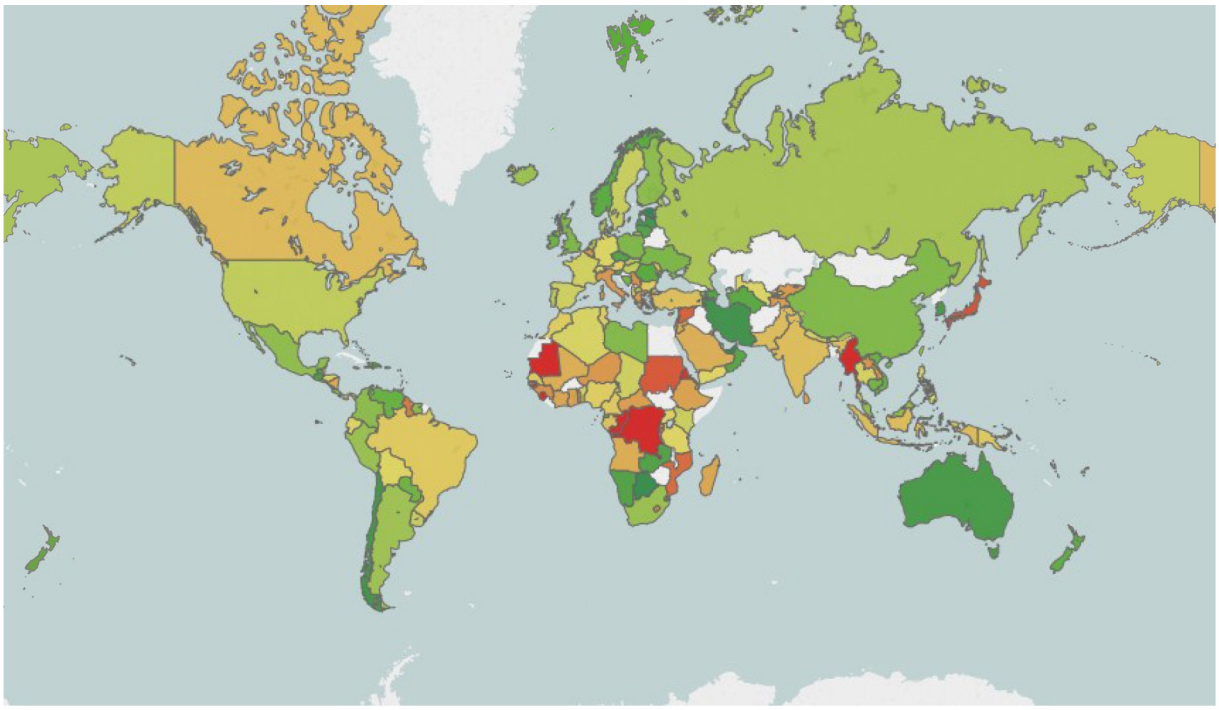
[11]More than 80 percent of advanced market countries (AMEs), a third of EMEs and FMEs, and less than a tenth of LICs experienced a contraction in 2008-09 in the sample of countries considered.

[12]In this chapter, the structural balance is defined as the difference between cyclically-adjusted revenues and cyclically-adjusted expenditures. It thus removes the cycle-induced component of taxes and expenditures, such as social safety nets. See Statistical Annex for additional details.

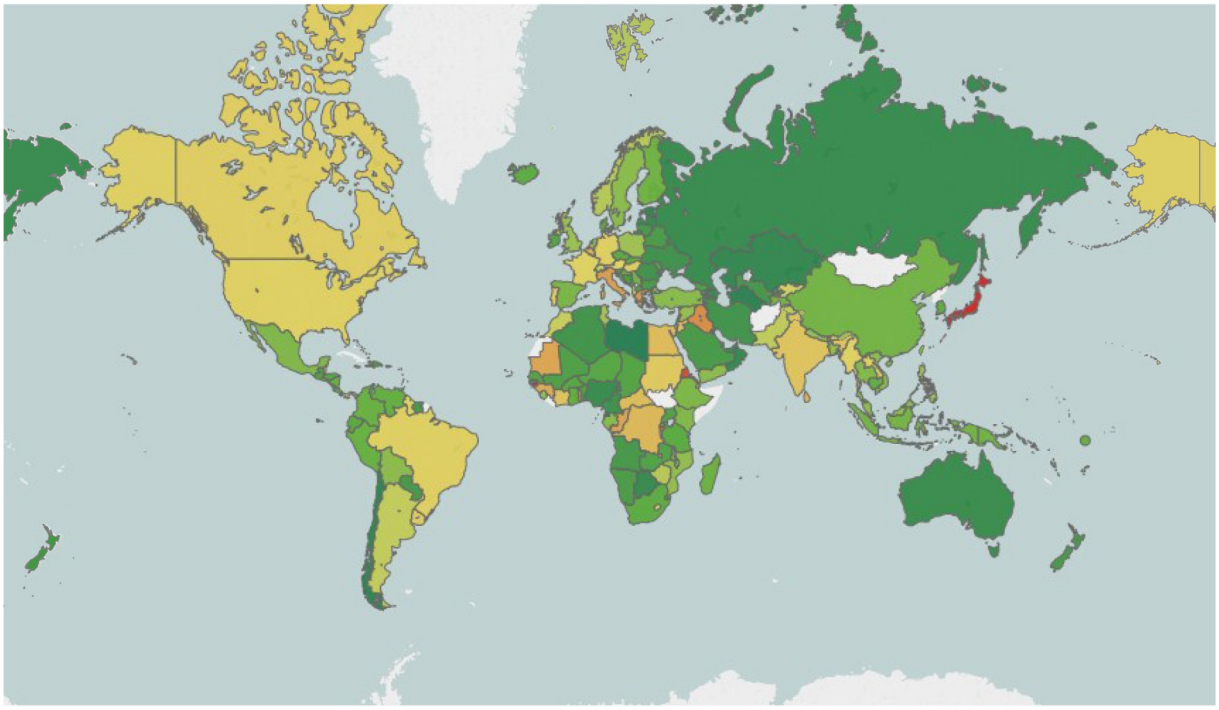
FIGURE 3.2 Government debt in 2001 and 2007

The combination of strong growth, high commodity prices, and debt relief initiatives helped developing economies gain fiscal space in the runup to the Great Recession.

A. 2001



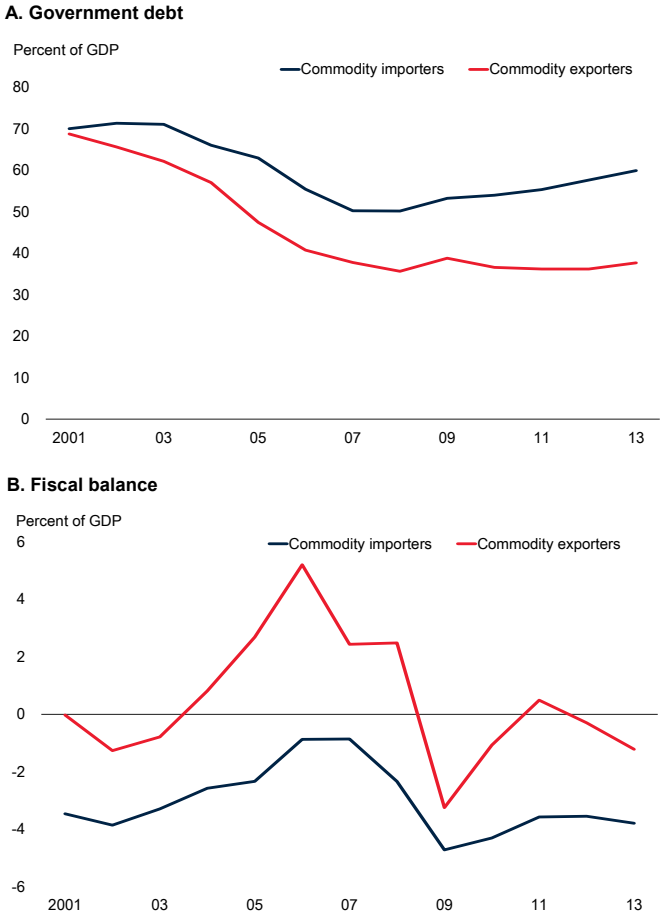
B. 2007



Source: World Bank estimates.
Note: A greener color indicates lower government debt as a percentage of GDP and a redder color indicates higher government debt as a percentage of GDP.

FIGURE 3.3 Fiscal space in commodity exporters and importers

The gains in fiscal space were more pronounced for commodity exporters.

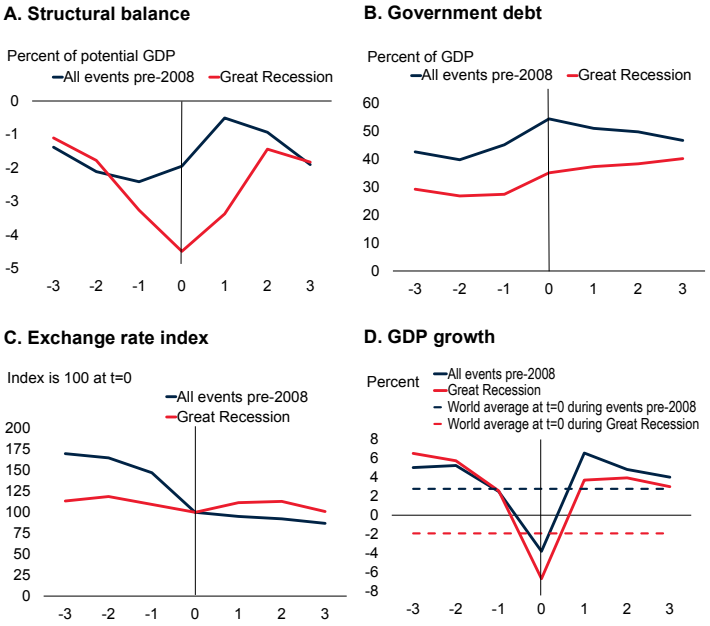


Source: World Bank estimates.

Note: Commodity exporters include all oil and mineral exporting economies that are identified as such by the Global Economic Prospects. Commodity importers are all economies that are not classified as exporters. Figures refer to unweighted averages of commodity importers' and exporters' data.

FIGURE 3.4 Fiscal policy and space during contractions

EMEs and FMEs made greater use of fiscal stimulus during the Great Recession than during earlier contractions.



Source: World Bank estimates.

Note: '*t*=0' is the year of the trough of the contraction episode. All variables refer to the unweighted sample mean. The structural balance is defined as the difference between cyclically adjusted revenues and cyclically adjusted expenditures. The exchange rate index is set to be 100 at '*t*=0' and shows how exchange rates depreciated in pre-2008 contraction episodes but not during the Great Recession. The world average growth during pre-2008 contraction episodes was much higher than during the Great Recession, and so economies experiencing contractions in 2008-09 did so under more difficult global conditions than in previous contractions.

In particular, in pre-2008 contractions, sharp exchange rate depreciations raised the cost of holding foreign currency debt and contributed to steep increases in the debt ratio. Cases in point are the Asian crisis and the Russian crisis of the late 1990s.[13] In comparison, during 2008–09, EME and FME currencies dropped less and rebounded to pre-crisis levels before the Great Recession was over. This partly reflected a different, more difficult, global environment—with a somewhat deeper contraction and weaker global recovery. The risks posed by exchange rate depreciation may be smaller for emerging economies now than in the past, due to deeper domestic financial markets and a policy decision to borrow in domestic currency, thus reducing "original sin."[14]

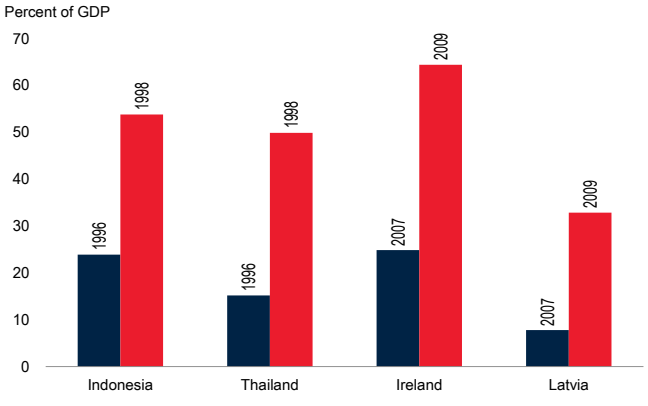
In addition, before 2008, some EMEs suffered systemic banking crises which required governments to provide heavy financial support. Though typically not fully reflected in deficits, such outlays substantially increased public debt above and beyond the increases attributable to the fiscal deficit (Laeven and Valencia, 2013). As these cross-country experiences illustrate, the fiscal space implicit in low debt can shrink rapidly especially during periods of elevated financial stress (Figure 3.5).

[13]Kohler (2010) documents the differences in exchange rate depreciations between the 2008–09 crisis and the Asian and Russian crises. Didier, Hevia, and Schmukler (2012) show that there were structural breaks in policy in EMEs, based on a comparison between policies in the Asian and Russian crises and the Great Recession. EMEs experienced smaller depreciations during the Great Recession. Moreover, EMEs lost substantially less reserves during the 2008–2009 crisis than during the Asian and Russian crises.

[14]Original sin refers to the inability of some developing countries to borrow internationally in their own currency (Eichengreen and Hausmann, 1999). Hausmann and Panizza (2011) analyze the risks posed by original sin.

FIGURE 3.5 Government debt in select crises

Debt can rise very quickly during a crisis episode.



Source: World Bank estimates.
Note: Central government debt is used for Indonesia. The others refer to general government debt.

Have Developing Economies Graduated from Procyclicality?

There are several measures of the stance of fiscal policy. This chapter employs two that are commonly used in the literature: the structural balance and government consumption. The structural balance strips from the overall balance the rise and fall of revenues (such as the cycle-induced component of income taxes) and expenditures (especially social benefits) that can be attributed to the business cycle. The other measure, government consumption expenditures, which are mainly government wages and outlays on goods and services, provides a narrower definition of the fiscal policy stance, but one that is more readily comparable across economies and not subject to the uncertainty surrounding the accuracy of cyclical adjustments, for example the uncertainty about the cyclical income elasticity of tax revenues or the size of the output gap. On either measure, fiscal policy was significantly more expansionary during the Great Recession than during earlier contraction episodes. Structural balances widened, on average among EMEs and FMEs, by 4 percentage points of GDP during the Great Recession, whereas they tightened in earlier contractions.

The buildup of fiscal space during the global expansion of the early 2000s, and its use during the Great Recession suggest that fiscal policy has become less procyclical in developing economies. Estimated responses of government consumption to GDP shocks indeed show that fiscal policy has become less procyclical since the 1990s, and more countercyclical since the Great Recession (Figure 3.6).[15] While the sample is too small to compute estimates for EMEs and FMEs separately, correlations between real GDP and real government consumption also suggest a similarity between the two groups. High procyclicality between 1980 and 1999, broadly turned to acyclicality in EMEs in the early 2000s, and to countercyclicality after the Great Recession. This evolution of fiscal cyclicality can be attributed to several factors, including improvements in policies, institutions, and enhanced financial market access.[16]

The move to less procyclical fiscal policy has also been associated with greater fiscal space. Throughout the 2000s, procyclicality was less pronounced in economies with wide fiscal space (Figure 3.7). During the Great Recession, economies with government debt below 40 percent of GDP (implying wider fiscal space) were able to implement greater fiscal stimulus than more indebted governments (with narrower space) (Figure 3.8). Fiscal policy in LICs has remained mostly acyclical reflecting the severe budgetary constraints they often face (Box 3.1).[17]

Overall, the evidence presented in this section suggests that fiscal space matters for a government's ability to implement countercyclical fiscal policy. The next section explores the importance of space for policy effectiveness.

Does Greater Space Tend to Support More Effective Fiscal Outcomes?

Countries with more ample fiscal space have used stimulus more extensively during the Great Recession than those with tighter space. But has this stimulus been more effective at meeting the goal of supporting activity? Space may affect the effectiveness of fiscal policy through two channels.

- *Interest rate channel:* When fiscal space is narrow, expansionary policy can increase lenders' perceptions

[15]These responses are estimated using a vector autoregressive model (VAR) with a pooled sample of EMEs and FMEs. See Technical Annex for details of the VAR model.

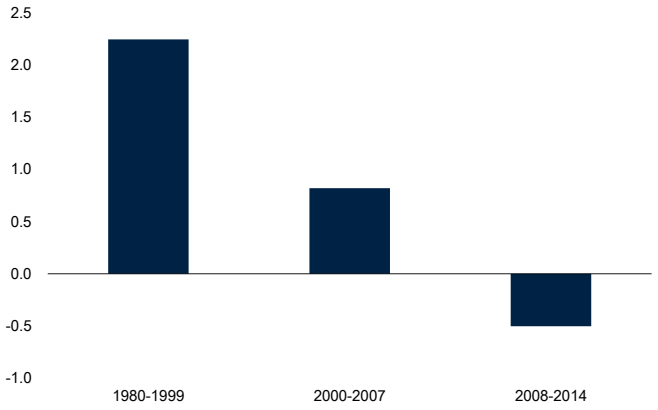
[16]Frankel, Végh, and Vuletin (2013) emphasize the importance of improvements in institutional quality for the changes in cyclicality. Calderon and Schmidt-Hebbel (2008) and World Bank (2013b) discuss the importance of greater credibility of fiscal policies and deepening domestic financial markets.

[17]World Bank (2013b) offers explanations of the procyclical bias of fiscal policy in developing countries. Developing countries have generally procyclical access to capital markets, and governments must therefore make spending cuts during downturns, when they are less able or unable to borrow. During upswings, governments are often under political pressure to spend the higher revenues.

FIGURE 3.6 Changing stance of fiscal policy

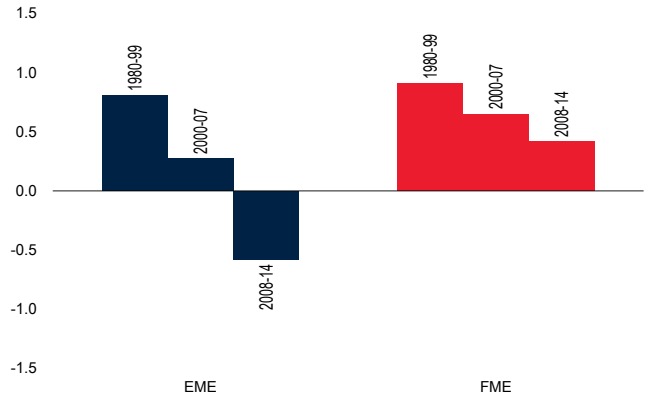
Fiscal policy has become countercyclical (or less procyclical) in EMEs and FMEs since the 1980s.

A. Impulse responses of government consumption to GDP shocks



Source: World Bank estimates.
Note: The cumulative impulse responses of government consumption (in percent) at the one-year horizon following a 1 percent positive shock to GDP. The impulse responses are estimated using a panel SVAR model with a sample of 15 EMEs and FMEs (see Annex 3A for details of the model and Table 3B.2 in Annex 3B for the list of countries).

B. Correlations between government consumption and GDP

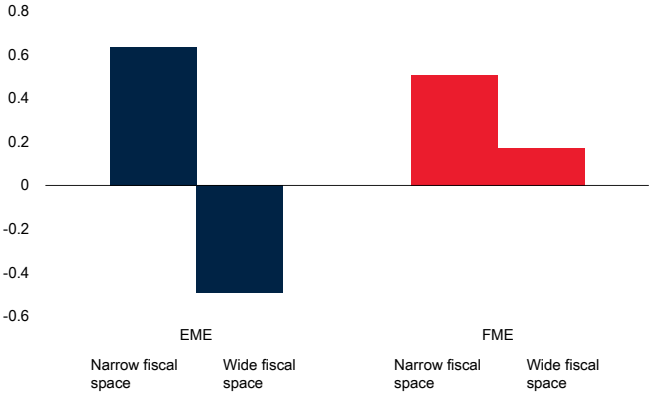


Source: World Bank estimates.
Note: Presents correlations between the cyclical components of government consumption and GDP from an unbalanced panel of annual data for 31 EMEs and 29 FMEs. All correlations are statistically significantly different from zero and differences in correlations across time are also statistically significant. Positive responses (Panel A) and positive correlations (Panel B) suggest procyclicality, while negative responses (Panel A) and negative correlations (Panel B) suggest countercyclicality.

FIGURE 3.7 Cyclicality of fiscal policy and fiscal space

In the 2000s, fiscal policy was countercyclical (or less procyclical) in countries with wider fiscal space.

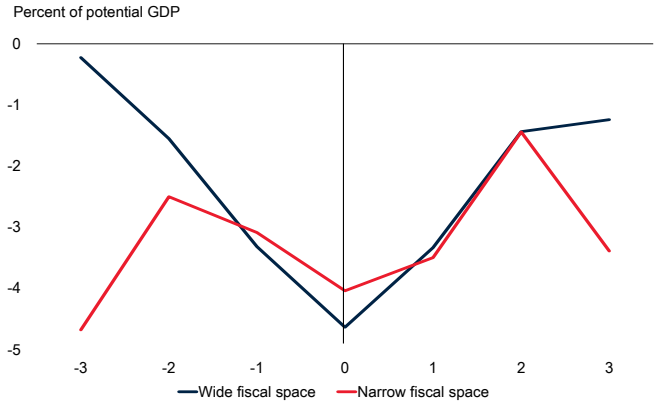
Correlation between government consumption and GDP



Source: World Bank estimates.
Note: The correlations are between the cyclical components of government consumption and GDP with samples divided based on fiscal space from an unbalanced panel of annual data for 31 EMEs and 29 FMEs. The median debt-to-GDP ratio in the full sample is 44 percent. Countries with debt-to-GDP ratios above the median are considered to have narrow fiscal space, while those with debt-to-GDP ratios below the median are considered to have wide fiscal space. All correlations are statistically significantly different from zero and across time. Positive correlations suggest procyclicality, while negative correlations suggest countercyclicality.

FIGURE 3.8 Structural balance during the Great Recession

Countries with wider fiscal space implemented larger stimulus packages during the Great Recession.



Source: World Bank estimates.
Note: '*t*=0' is the year of the trough of the contraction episode. All variables refer to the unweighted sample mean. These results are based on the data sample of the event study which includes the 21 EMEs and FMEs that experienced contractions during the Great Recession. The median debt-to-GDP ratio in the full sample of 63 EMEs and FMEs is 44 percent. Countries with debt-to-GDP ratios above the median are considered to have narrow fiscal space, while those with debt-to-GDP ratios below the median are considered to have wide fiscal space.

BOX 3.1 Fiscal Policy in Low-Income Countries[1]

Fiscal policy in low-income countries (LICs) has been largely acyclical over the past two decades as shown by very low correlations between the cyclical components of government consumption and GDP during this period (Figure B3.1.1, panel A). This suggests that LICs do not systematically use fiscal policy to stabilize the business cycle. But when they do, how effective is fiscal policy? Empirical estimates of the multipliers in LICs are few, partly because the identification of an exogenous fiscal shock imposes stringent data requirements.

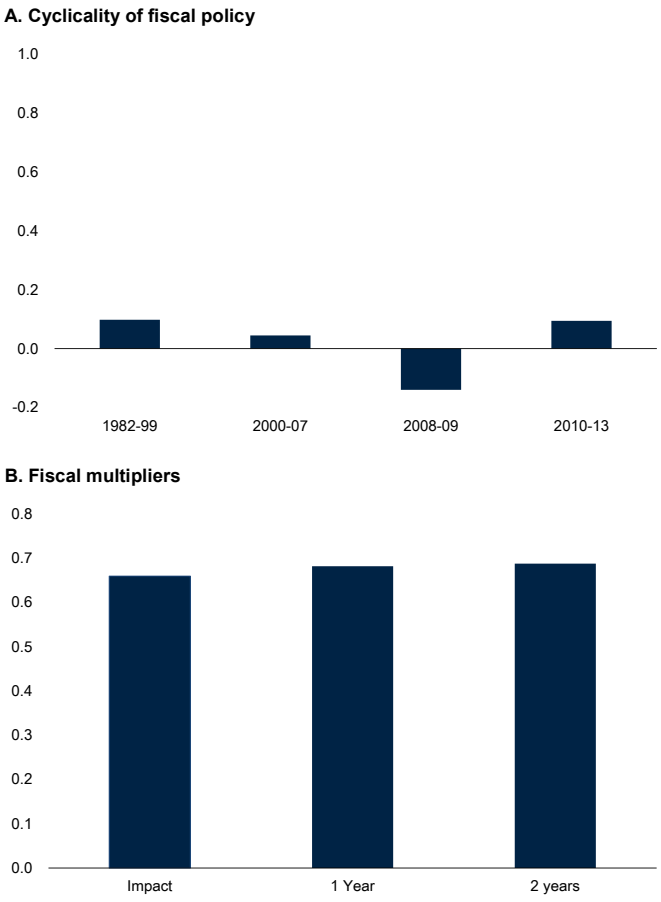
One approach, used in Kraay (2012, 2014), is to identify a fiscal shock using World Bank loan disbursements. First, loans disbursed by the World Bank are a major source of finance for government spending in LICs. Second, the timings of approval and disbursement of such loans are not systematically related to cyclical macroeconomic conditions in recipient countries. This makes World Bank loans a good instrument for exogenous government spending, unrelated to cyclical macroeconomic conditions in LICs. Using this approach, the average (one-year) fiscal multipliers in LICs are estimated to be small at about 0.5.

The second approach is to apply a panel structural vector auto regression (SVAR) model to annual data—the only frequency available for LICs on a comparable cross-country basis—for government consumption and GDP. A fiscal shock is identified by a similar timing assumption used in Blanchard and Perotti (2002) except that now it is assumed that discretionary fiscal policy takes at least a year (and not a quarter) to respond to macroeconomic conditions. Such a prolonged lag in the response of discretionary fiscal policy may be justified in LICs on two grounds. First, LICs often rely on concessional loans to finance government spending and these are disbursed less frequently than every quarter and may discount macroeconomic conditions. Second, GDP data is extensively revised in these economies so that the government would likely take more than just one quarter to gather reliable GDP data (Ley and Misch, 2014). This then implies that discretionary fiscal policy aimed at stabilizing the economy would take more than just one quarter to implement. Fiscal multipliers are estimated using annual data for 34 low income-economies and a panel SVAR following the methodology of Ilzetzki, Mendoza, and Vegh (2013). The multiplier estimates are just above 0.6 (Figure B3.1.1, panel B), closely in line with the results from Kraay (2012, 2014).

Government financing in LICs is mostly concessional and not market based. Hence, market concerns about government solvency that underpin the relationship between fiscal space and multipliers are expected to be less relevant in LICs than in EMEs and FMEs. Therefore, fiscal multipliers likely do not vary significantly with fiscal space in LICs. That said, fiscal space remains important in LICs, because it ensures that countercyclical fiscal policy is available when needed.

FIGURE B3.1.1 Cyclicality and multipliers in LICs

Fiscal policy is acyclical in LICs and multipliers are relatively small.



Source: World Bank estimates.
Note: Panel A shows the correlation between the cyclical components of government consumption and GDP. The correlations are all statistically insignificant which suggest that fiscal policy is acyclical in LICs. Panel B shows the fiscal multipliers based on a panel SVAR model. See Annex 3A for the details.

[1]The main author of this box is Raju Huidrom.

of sovereign credit risk. This raises sovereign bond yields and hence, borrowing costs across the whole economy (Corsetti et al., 2013; Bi, Shen, and Yang, 2014). This, in turn, crowds out private investment and consumption. If the crowding out is sufficiently strong, the net effect of expansionary fiscal policy on output, that is, the size of the fiscal multiplier, may be negligible or even negative.

- *Ricardian channel:* When a government with narrow fiscal space conducts a fiscal expansion, households expect tax increases sooner than in an economy with wide fiscal space (Perotti, 1999; Sutherland, 1997). The perceived negative wealth effect encourages households to cut consumption and save, thereby weakening the impact of the policy on output.[18]

The effectiveness of fiscal policy is usually evaluated in terms of the fiscal multiplier–the change in output for a dollar increase in government consumption. The more positive the multiplier, the more effective is policy. For developing economies, the literature reports multipliers that are small in size, and variable, ranging from -0.4 to 0.9 (Box 3.2). These estimates often refer to average multipliers, over a whole range of macroeconomic conditions. Recent work in the context of advanced economies has found that multipliers vary significantly depending on macroeconomic conditions and country characteristics: they tend to be larger during recessions (Auerbach and Gorodnichenko, 2012a, 2012b), for economies using a fixed exchange rate regime, and for economies with low debt (Ilzetzki, Mendoza, and Vegh, 2013, based on pre-crisis data; Nickel and Tudyka, 2013, for OECD economies).

To estimate fiscal multipliers for developing economies that depend on fiscal space, this section employs an Interacted Panel VAR (IPVAR) model (Towbin and Weber, 2013). This allows model parameters, and hence estimated fiscal multipliers, to interact with fiscal space. Fiscal shocks are identified by assuming that discretionary policy takes at least one quarter to respond to macroeconomic conditions (Blanchard and Perotti, 2002). The variables included in the model are government consumption, GDP, current account balance, and real effective exchange rates.[19] The baseline results are based on an unbalanced panel for 15 EMEs and FMEs (augmented by 19 advanced economies in robustness exercises). The data are quarterly, 1980:1–2014:1. Fiscal policy is proxied by government consumption.[20] The model estimates fiscal multipliers as a function of fiscal space, which is proxied by fiscal balances as percent of GDP, corresponding to a flow measure. To control for endogeneity and to ensure that fiscal balances do not systematically pick up business cycle effects, lagged moving averages of fiscal balances are employed.[21]

The results (Figure 3.9) suggest that the multipliers at the one-year horizon are not much above zero when pre-existing fiscal deficits leading up to the stimulus have been high (narrow fiscal space), but are positive and significant when there have been surpluses (wide fiscal space).[22] The multipliers at the two-year horizon are generally greater than at the one-year horizon, suggesting that the effects peak with some lag. At longer horizons, multipliers remain near zero and statistically insignificant when fiscal space is narrow, but can be as high as 1.8 when fiscal space is wide.

This result is qualitatively robust to alternative measures of fiscal space. For example, the results for the multipliers that use the sustainability gap as the gauge of fiscal space also point to these conclusions (Figure 3.10). The results are similar when government debt as percent of GDP is used as the measure of fiscal space (see Annex 3A).

In addition to the baseline model above, two alternative econometric models are used to examine robustness: a panel Structural VAR (SVAR) as in Ilzetzki, Mendoza, and Vegh (2013), and a local projections model as in Riera-Crichton, Vegh,

[18]While crowding-out effects of fiscal policy, that operate via higher interest rates or future increase in taxes, have long been discussed in the literature, the emphasis in this chapter is that such crowding-out effects can be nonlinear and can depend on fiscal space. In particular, the nonlinearity pertains to investors' perception of sovereign credit risk (interest rate channel) and households' expectation of future tax increases as fiscal space becomes narrow (Ricardian channel). The interest rate channel is less relevant for large advanced economies that are able to issue debt in their own currency (Krugman, 2011).

[19]This follows Ilzetzki, Mendoza, and Vegh (2013).

[20]Since data availability and comparability is limited for the EMEs and FMEs included here, the analysis does not address the issue of spending composition, although this may be important. For instance, government spending on infrastructure and health has been shown to protect and strengthen social safety net programs, and result in long-run growth benefits (Berg et al., 2009; Kraay and Serven, 2013). Public infrastructure investment multipliers are often much larger than the public consumption multipliers (IMF, 2014c). The analysis here also does not cover automatic stabilizers which, at least in the case of OECD countries, has played a strong role in stabilizing output (Fatás and Mihov, 2012).

[21]Indeed, this fiscal space measure is not systematically wider during recessions than expansions in the sample of EMEs and FMEs. For example, the average fiscal deficit during recessions is 2.7 percent of GDP, which is very close to the deficits during expansions, 2.8 percent of GDP. Alternatively, the regression coefficients could be interacted with an additional dummy for recessions. However, this reduces the degrees of freedom significantly and results in imprecise estimates. The fiscal space measure also does not reflect exchange rate regimes—the proportion of fixed and flexible exchange rate regimes in the sample is roughly the same during periods of wide and narrow fiscal space.

[22]The multipliers presented here are the cumulative multipliers that take into account the persistence in the response of government consumption due to a fiscal shock. See Annex 3A for details.

BOX 3.2 What Affects the Size of Fiscal Multipliers?[1]

The size of fiscal multipliers depends on macroeconomic conditions and country-specific features. While the chapter examines how fiscal multipliers depend on fiscal space, especially in the context of developing economies, this box reviews additional aspects that have been important in explaining the size of multipliers.

Conditions affecting multipliers

Fiscal multipliers depend on the phase of the business cycle: they tend to be larger during recessions than during expansions (Auerbach and Gorodnichenko, 2012a, 2012b). In theory, this is attributed to a higher level of economic slack (Rendahl, 2012) and a greater share of liquidity-constrained households (Canzoneri et al., 2012) during economic downturns. The effectiveness of fiscal policy also depends on monetary policy. Monetary contraction, in response to expansionary fiscal policy that increases inflation and output, blunts the effects of the fiscal policy on output. Similarly, the effects of fiscal policy on output are more pronounced when monetary policy is more accommodative, especially when interest rates are at the zero lower bound (Christiano, Eichenbaum, and Rebelo, 2011).

The effectiveness of fiscal policy also depends on country-specific features. Fiscal multipliers tend to be larger in economies with fixed exchange rates than in economies with flexible exchange rates (Ilzetzki, Mendoza, and Vegh, 2013) because, in fixed regimes, expansionary fiscal policy tends to trigger some monetary accommodation. Fiscal multipliers are also larger in less open economies because of lower leakages into import demand.

Finally, the choice of the fiscal instrument matters. Revenue-based fiscal multipliers tend to be lower (especially in the short term) than expenditure-based multipliers. Expenditures tend to affect aggregate demand directly, whereas changes in revenues operate only indirectly and are subject to leakage. For example, households may save a portion of tax cuts intended to stimulate aggregate demand. Some caution is warranted here as recent work has shown that cyclically adjusted tax revenues are not a good proxy for tax policy. Riera-Crichton, Vegh and Vuletin (2012) argue that using tax rates instead of tax revenues yields considerably higher tax multipliers.

Empirical estimates

Empirical estimation of fiscal multipliers requires a strategy to identify exogenous fiscal shocks. The one deployed in the chapter relies on a timing assumption that discretionary fiscal policy takes at least a quarter to respond to macroeconomic conditions (Blanchard and Perotti, 2002). There are alternative identification strategies deployed in the literature: the narrative approach as in Ramey and Shapiro (1998) or Guajardo, Leigh, and Pescatori (2014); forecast errors as in Blanchard and Leigh (2013); or fluctuations in aid-related financing approval used as instruments in Kraay (2012, 2014). Fiscal multipliers can also be obtained from estimated dynamic stochastic general equilibrium (DSGE) models (Coenen et al., 2012). While empirical approaches yield reduced-form estimates of fiscal multipliers, DSGE-based estimates can capture deep structural features of the economy, in particular the interactions between private-sector behavior and policy parameters.

The vast majority of the estimates fall between zero and unity. Multipliers, on average, tend to be somewhat larger in advanced economies relative to developing ones. Recent work, although mostly in the context of advanced economies, has shown that multipliers depend on macroeconomic conditions consistent with the theoretical predictions above. For instance, the size of multipliers tends to be significantly larger during recessions. Estimates place the long-term fiscal multiplier during recessions between 0.6 and 2.7, which is generally several times larger than multipliers during more tranquil economic conditions. These effects are even larger when interest rates are at the zero lower bound. In addition to the phase of the business cycle, evidence for advanced economies suggests that fiscal multipliers are smaller in the presence of narrow fiscal space, and can even turn negative (Table B3.2.1).

[1]The main author of this box is Jamus J. Lim.

[2]Using tax revenues as the fiscal instrument first involves adjusting for the cyclical or the automatic stabilizer component via elasticity estimates. One reason the chapter does not discuss revenue-based multipliers is that elasticity estimates tend to be unreliable for EMEs and FMEs.

BOX 3.2 *(continued)*

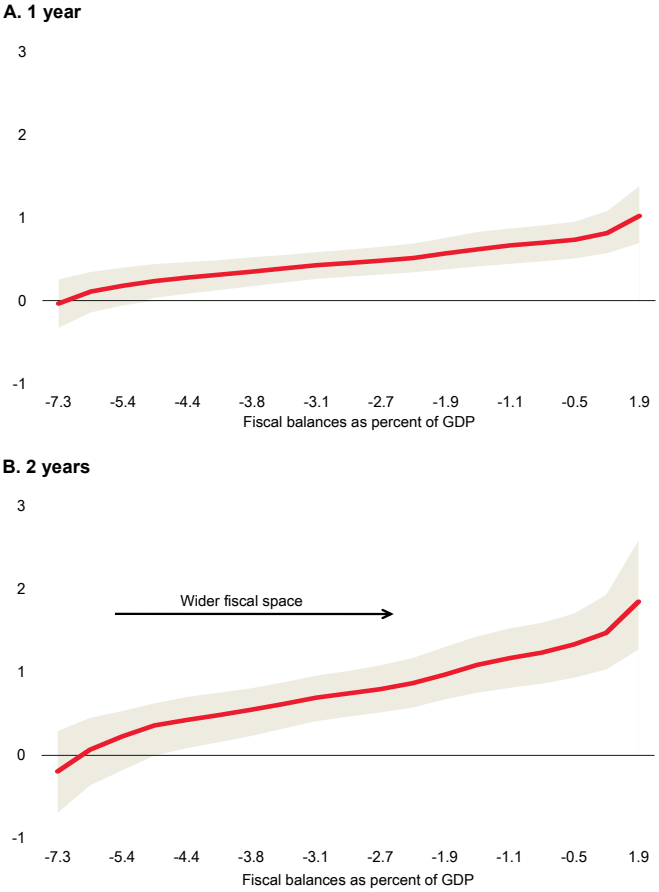
TABLE B3.2.1 Fiscal multipliers: A review of studies

Groups/Features	Short-term multiplier	Long-term multiplier
Income group		
Advanced economies	-0.1 – 1.2	-1.1 – 1.8
Developing economies	-0.4 – 0.6	-0.4 – 0.9
Upper-middle income[1]	0.0 – 0.6	-0.3 – 0.9
Lower-middle income	-0.4 – 0.4	-0.4 – 0.0
Low income	0.2 – 0.5	-0.3 – 0.8
Business cycle		
Expansion	-0.9 – 1.4	-0.5 – 1.1
Recession	0.3 – 2.5	0.6 – 2.7
Zero lower bound[2]	2.3 – 3.7	1.0 – 4.0
Fiscal space		
Wide space[3]	0.0 – 1.1	-0.4 – 1.8
Narrow space	-0.2 – 0.9	-3.0 – 1.3

Sources: World Bank compilation; Batini et al., (2014); Ilzetzki, Mendoza, and Vegh (2013); Mineshima, Poplawski-Ribeiro, and Weber (2014); and Ramey (2011).
Notes: Estimates are for both government consumption and expenditure multipliers. Minimum and maximum estimates may refer to distinct studies and/or economies. Where available, short-term multipliers report the impact multiplier; otherwise the multiplier at the one-year horizon is used. Where available, long-term multipliers report the cumulative multiplier at the horizon of five years; otherwise the longest (generally three-year) horizon is used. The high-income and developing multipliers report linear estimates without state dependency.
[1]The upper-middle income estimates are skewed by the unusually large multiplier of China (2.8). Hence, China was excluded from the computation of the upper bound.
[2]Applies to zero lower bound for monetary policy rates. Multipliers depend heavily on the duration of the period in which the zero lower bound is binding; short-term (long-term) estimates reported here correspond to a zero lower bound of one (twelve) quarters.
[3]Fiscal space in these studies is usually measured in terms of the debt-to-GDP ratio: a high (low) debt-GDP ratio indicates fiscal space is narrow (wide).

FIGURE 3.9 Fiscal multipliers by fiscal space

Fiscal policy in EMEs and FMEs tends to be more effective when fiscal space is wider.



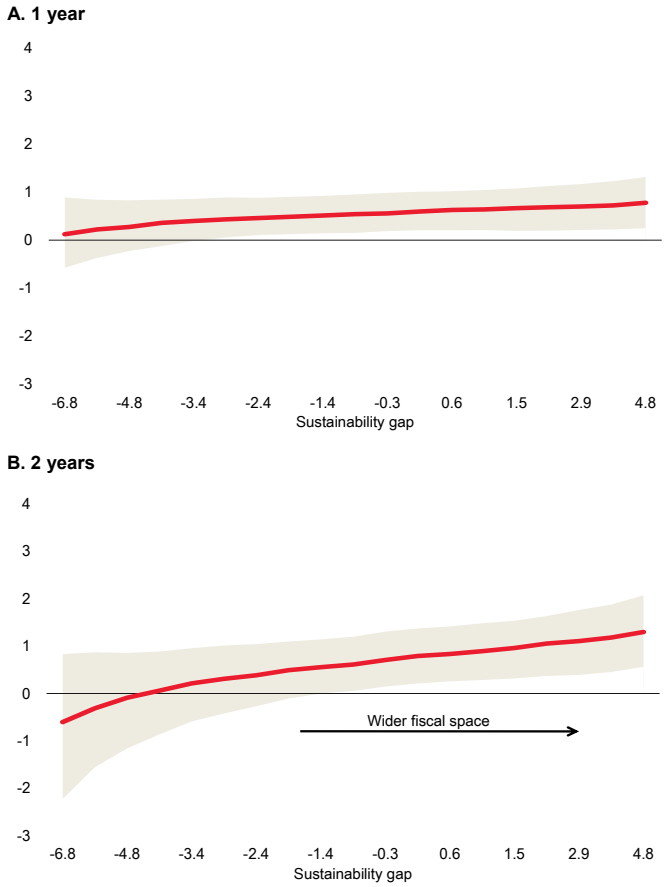
Source: World Bank estimates.
Note: The graphs show fiscal multipliers for different levels of fiscal space at horizons of one and two years. These are based on the estimates from the IPVAR model using a sample of 15 EMEs and FMEs. Fiscal balance as a percentage of GDP is the measure of fiscal space and the values shown on the x-axis correspond to the percentiles from the sample. Fiscal space is narrow (wide) when fiscal balances are low (high). Solid lines represent the median, and shaded areas around the solid lines are the 16-84 percent confidence bands.

and Vuletin (2014).[23] Although the precise estimates of the multipliers differ, the results from the alternative models also suggest that fiscal policy is more effective—fiscal multipliers are higher—when pre-existing fiscal space leading up to the stimulus is wide than when it is narrow (see Annex 3A).

In sum, the empirical evidence presented here suggests that wider fiscal space is associated with more effective fiscal policy in developing economies. This result holds for different types of fiscal space measures using various empirical approaches.

[23]Details of these two models are provided in Annex 3A.

FIGURE 3.10 Fiscal multipliers and sustainability gap



Source: World Bank estimates.
Note: The graphs show fiscal multipliers for different levels of fiscal space at horizons of one and two years. These are based on the estimates from the IPVAR model using a sample of 15 EMEs and FMEs. The sustainability gap, the difference between the actual primary balance and the debt-stabilizing primary balance at current interest and growth rates, is the measure of fiscal space. The values shown on the x-axis correspond to the percentiles from the sample. Fiscal space is narrow (wide) when the sustainability gap is low (high). Solid lines represent the median, and shaded areas around the solid lines are the 16-84 percent confidence bands.

Institutional Arrangements: How Can Fiscal Space Be Strengthened?

The past procyclicality of fiscal policy in developing economies has been attributed in part to political economy pressures.[24] This section discusses how credible and well-designed institutional mechanisms can help mitigate these pressures and support fiscal discipline. In particular, it highlights best practices for three institutional mechanisms—fiscal rules, stabilization funds, and medium-term expenditure frameworks (MTEFs)— along with empirical evidence on the relative success of these institutions in strengthening fiscal space and supporting countercyclical fiscal policy.[25]

Fiscal Rules

Fiscal rules impose lasting numerical constraints on budgetary aggregates—debt, overall balance, expenditures, or revenues. Rules often allow for flexibility in meeting budget targets by taking into account temporary cyclical deviations—such as a large output gap—or structural adjustments, such as changes in the medium-term price of a key export.

Fiscal rules, and in particular cyclically-adjusted or structural balance rules, have become increasingly popular in developing economies (Figure 3.11), especially since the Great Recession (Schaechter et al., 2012). Balanced budget rules have become common in Africa and Eastern Europe, often adopted alongside debt rules.

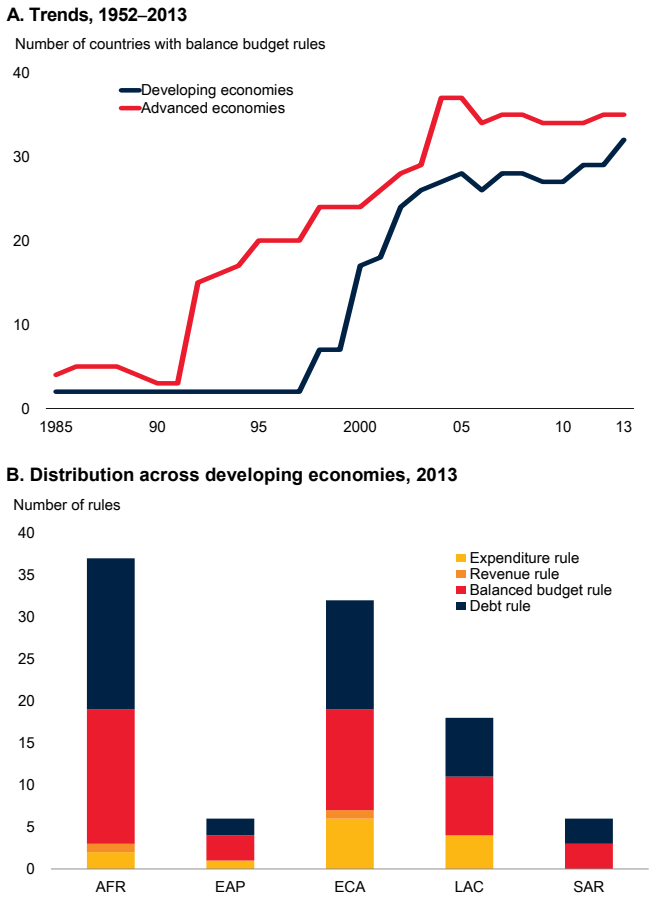
The adoption of rules, *per se*, has had mixed success in limiting procyclicality. Indeed, balanced budget rules that target headline fiscal balances can lead not only to more volatile business cycles but they also tend to be associated with more procyclical fiscal stances (Bova, Carcenac, and Guerguil, 2014). In contrast, budget balance rules that target structural balances tend to be more closely associated with countercyclical fiscal stances. Many countries with budget rules have been transitioning to targeting cyclically-adjusted balance.

Other possible factors that explain the limited success of balanced budget rules to reduce procyclicality include challenges to enforcement such as the off-budget government guarantees (World Bank, 2014b), insufficient flexibility (Snudden, 2013), and the need for greater

[24]See World Bank (2013a) for a more detailed discussion. Volatile foreign capital market access is another constraint discussed in the literature (Cuadra, Sanchez, and Sapriza, 2010).

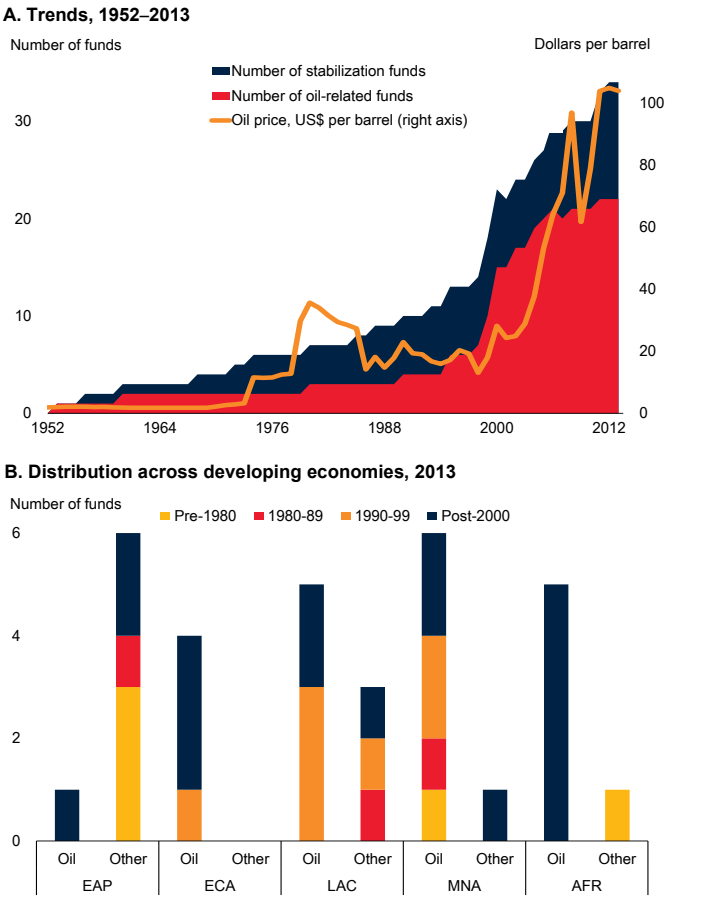
[25]Broadly speaking, the design of an effective budgeting process that ensures that macroeconomic fiscal targets are met depends on the type of governing approaches. A delegation approach, based on clear hierarchical layers between decision makers, tends to be more effective in countries where governments are formed by a single party, or the electoral process is not competitive. A contract approach, based on agreement between decision makers along largely horizontal relationships, tends to be more effective in countries where coalition governments are the norm, and elections are competitive (Buttiglione et al., 2014). Within these two broad approaches, fiscal rules, stabilization funds, and medium-term budgeting frameworks can appropriately constrain discretion, and ensure that budgets are in line with longer-run macroeconomic goals.

FIGURE 3.11 Fiscal rules: Trends and distribution



Source: World Bank estimates.
Notes: The database includes 87 economies. AFR: Sub-Saharan Africa; EAP: East Asia and Pacific; ECA: Europe and Central Asia; LAC: Latin America and Caribbean; SAR: South Asia. There is no reported fiscal rule for the Middle East and North Africa.

FIGURE 3.12 Stabilization funds: Trends and distribution



Source: World Bank estimates.
Notes: Stabilization funds here are all those listed in Sugawara (2014), together with Panama's fund (established in 2012), but excluding Norway. Oil-related stabilization funds are those whose funding sources include petroleum, the rest are referred to as "Other" in the graph. Only the first fund each country created is included if multiple funds exist (or existed) in a country. AFR: Sub-Saharan Africa; EAP: East Asia and Pacific; ECA: Europe and Central Asia; LAC: Latin America and Caribbean; MNA: Middle East and North Africa.

transparency and improved measurement in the estimation of structural balances. Rules are best when simply defined and supported by surveillance arrangements, respected by the government, yet operated by a non-government agency (Frankel, 2011). Chile's use of a technical fiscal council and a fiscal rule that targets a fixed structural balance is a good example of a well-designed, credible, and successfully operated fiscal rule (Box 3.3). Such agencies have legal guarantees for independence, highly qualified professional staff, and assured financing (Debrun and Schaechter, 2014).

Stabilization Funds

Stabilization funds set aside receipts from significant natural resource revenues such as oil and natural gas. Funds saved during favorable times are released to cushion potential revenue shortfalls and to mitigate negative shocks to government expenditure. Stabilization funds were first set up in Kuwait in 1953, and were adopted widely in the 2000s, when high international oil prices—along with the discovery of oil in a number of economies—facilitated their establishment (Figure 3.12). Many stabilization funds are integrated with the budget, with clear rules to guide the accumulation and withdrawal of fund resources (Bagnall and Truman, 2013).[26] Since

[26]For example, Trinidad and Tobago's Heritage and Stabilization Fund requires that at least 60 percent of total excess petroleum revenues must be deposited into the stabilization fund. Similarly, Timor-Leste's Petroleum Fund Law of 2005 requires all receipts from petroleum-related activities to be transferred to its stabilization fund.

BOX 3.3 Chile's Fiscal Rule—An Example of Success[1]

Political pressures that underlie procyclicality of fiscal policy can be partly mitigated by the design of mechanisms (such as fiscal rules or stabilization funds) that are supported by technically sound and credible institutions (such as fiscal councils) (World Bank, 2013c). Chile presents an example of a well-designed mechanism in an enabling institutional environment.

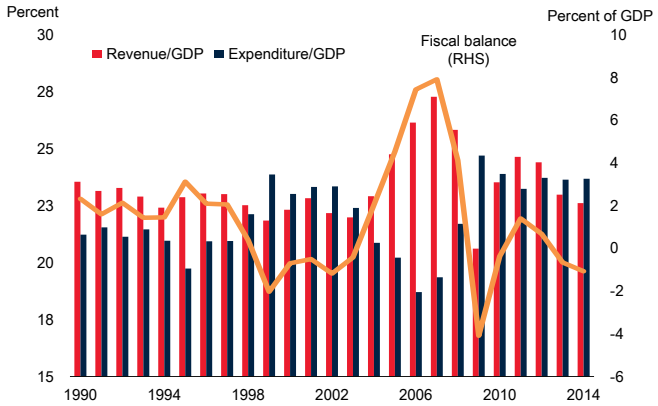
Chile is the world's largest exporter of copper. It has experienced significant macroeconomic volatility for much of its history due to terms-of-trade shocks associated with fluctuations in global copper prices. In 2001, Chile adopted a fiscal regime that was designed to break this pattern. The regime was based on a target for the structurally-adjusted fiscal balance, which adjusted the overall balance for the output gap and commodity prices. Importantly, the determination of both the output gap and the medium-term price of copper is entrusted to two expert panels, comprising representatives from both the private sector and academia, which serve the crucial role of providing unbiased projections of these key variables (Frankel, 2011). The role of the government is limited to adjusting expenditures to meet the structural balance target. The Fiscal Responsibility Law that Chile enacted in 2006 provides an institutional framework that strengthens the link between the fiscal rule, government savings, and two sovereign wealth funds—the Pension Reserve Fund and the Economic and Social Stabilization Fund (Schmidt-Hebbel, 2012a; 2012b). The law also facilitates greater transparency and disclosure in the conduct of fiscal policy.

The introduction of the fiscal regime coincided with a global copper boom, which led to steadily increasing fiscal surpluses, peaking at 7.4 percent of GDP on the eve of the global crisis (Figure B3.3.1). By the end of 2007, the government debt-to-GDP ratio had fallen to single digits. As surpluses rose, the council of technical experts stood firm against political pressures to assume that copper prices would remain permanently high and to maintain higher spending levels. Copper prices fell sharply during the Great Recession. The significant fiscal space built up over the preceding years allowed Chile to implement a stimulus package amounting to 2.9 percent of GDP. It included increases in public investment; temporary reductions in a range of taxes; and subsidies for housing, transportation, and low-income households (IMF, 2009). In part because of this fiscal stimulus, growth resumed the following year. While the recovery of the global economy was also accompanied by a rebound in copper prices, they did not return to pre-crisis levels.

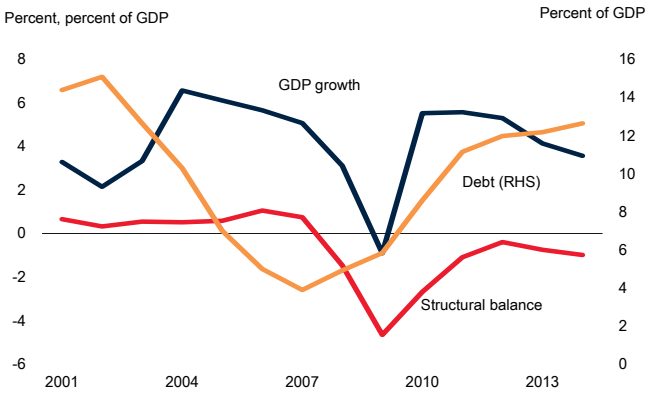
Chile's fiscal rule and its use of fiscal policy during the crisis illustrate an important limitation of the rule. Chile's rule specifically calls for a zero structural balance, and thus does not allow the implementation of countercyclical fiscal stimulus. The stimulus of 2009 was only implemented with a change in the rule after much deliberation by country authorities. Escape clauses in fiscal rules that accommodate such circumstances can thus provide valuable flexibility in dealing with low probability events and are included in recent fiscal rules (Schaechter et al., 2012).

FIGURE B3.3.1 Chile's fiscal indicators and economic performance

A. Fiscal balance, 1990-2014



B. Structural fiscal balance, government debt, and growth 2001-14



Source: World Bank estimates.
Notes: Fiscal and structural balance data are from the database described in Annex 3B. GDP data are from the World Development Indicators.

[1]The main author for this box is Jamus J. Lim.

stabilization funds separate government expenditure from fluctuations in the availability of revenues, they can be important institutional mechanisms for improving fiscal space, while mitigating fiscal procyclicality.

Although the empirical evidence is somewhat mixed, a number of studies find that stabilization funds can help improve fiscal discipline (Fasano, 2000) and expand fiscal space (Bagattini, 2011). Stabilization funds do appear to smooth government expenditure, reducing their volatility by as much as 13 percent compared to economies without such funds (Sugawara, 2014).

While a stabilization fund can be a powerful fiscal tool to manage fiscal resources and create fiscal space, the establishment itself does not guarantee its success. Cross-country evidence even suggests that the effectiveness of a particular stabilization fund in shielding the domestic economy from commodity price volatility depends largely on government commitment to fiscal discipline and macroeconomic management, rather than on just the existence of the instrument itself (Gill et al., 2014). Proper designs and strong institutional environments that support their operations are crucial factors for the success of stabilization funds.

Among resource-rich economies, Norway and Chile are often treated as examples of economies with stabilization funds that are based on specific resource revenues and associated with good fiscal management (Schmidt-Hebbel, 2012a, 2012b). Norway's Government Pension Fund and Chile's Economic and Social Stabilization Fund are ranked highest and third, respectively, in a scoring of 58 sovereign wealth funds and government pension funds (Bagnall and Truman, 2013). The main characteristics that distinguish Norway's and Chile's funds from those with lower scores are governance and transparency and accountability of fund operations.

Medium-Term Expenditure Frameworks (MTEF)

MTEFs were first introduced to facilitate modern public financial management in pursuit of long-run policy priorities in OECD economies. Among developing economies, they gained prominence in the late 1990s, as annual budgets were perceived to create uncertainty about future budgetary commitments. International financial agencies, such as the World Bank, have also sought to encourage stable allocations toward poverty reduction targets. More than two-thirds of all economies have adopted MTEFs of some form (World Bank, 2013c).

The objective of MTEFs is to establish or improve credibility in the budgetary process. They seek to ensure a transparent budgetary process, where government agencies establish credible contracts for the allocation of public resources toward agreed strategic priorities, over an average of three years. The most common design of MTEFs translates macroeconomic objectives into budget aggregates and detailed spending plans; less sophisticated approaches target either aggregate fiscal goals, or micro-level costs and outcomes.

Empirical evidence suggests that credible MTEFs can significantly improve fiscal discipline (World Bank, 2013c). Furthermore, the results tend to be more positive for more sophisticated frameworks (Grigoli et al., 2012). Significant heterogeneity exists, however, and certain studies limited to smaller regional samples have been unable to find conclusive evidence, possibly reflecting shortcomings in the practical implementation of MTEFs.[27]

Keys to robust implementation are coordination with broader public sector reform, and sensitivity to country characteristics (World Bank, 2013c). For example, Jordan's MTEF was a component of major public financial management reforms in 2004 and part of the national development strategy. The MTEF's specific objective was to improve fiscal discipline through realistic revenue projections, followed by better expenditure prioritization and the identification of fiscal space. In the case of South Africa, the MTEF was introduced in the context of high government debt and a combination of underspending by the central government and overspending by provincial governments. Underspending and overspending were both reduced following the introduction of the MTEF. One of the lessons from the experiences of South Africa, Tanzania, and Uganda is the need for realistic expectations during the preparation of the budget, without which even well-designed MTEFs cannot succeed (Holmes and Evans, 2003).

Risks and Medium-Term Objectives

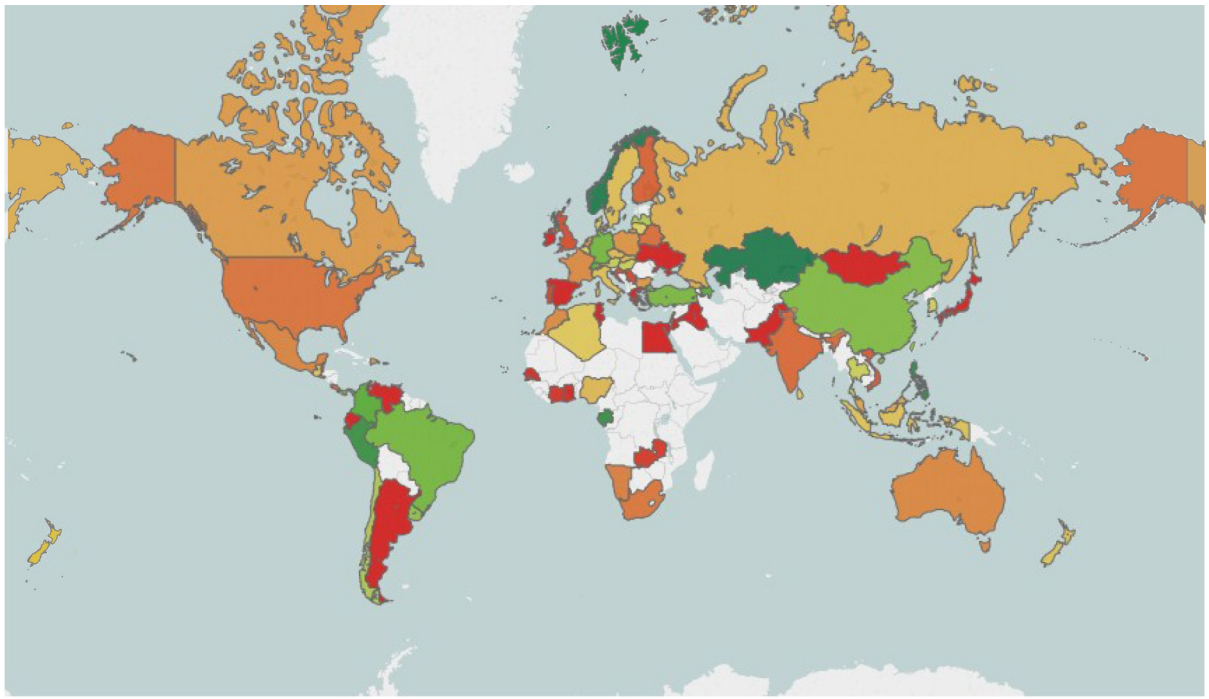
While debt stocks in many developing economies remain moderate, primary deficits are wider than they were before the crisis. Although debt has grown slowly under the current benign market conditions, especially low interest rates, the debt-to-GDP ratios could increase much more rapidly if domestic growth slows and global interest rates rise (Figure

[27]For example, Le Houerou and Taliercio (2002) examine the design and implementation of MTEFs in a sample of African economies.

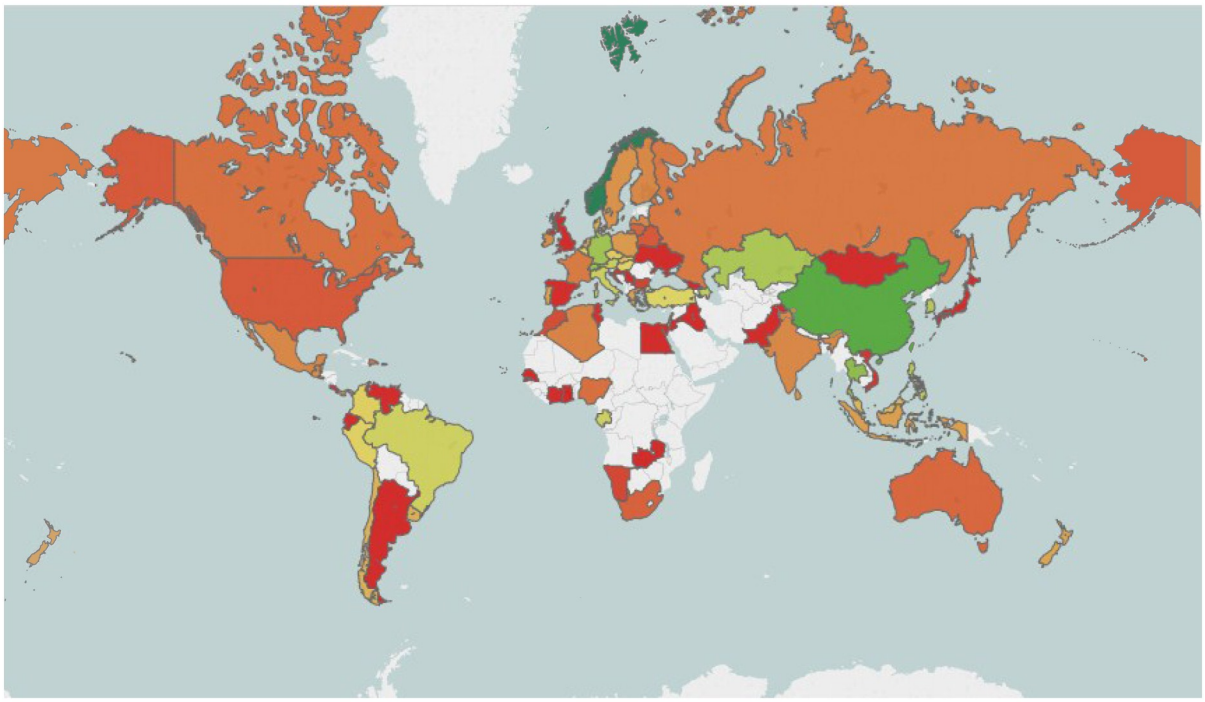
FIGURE 3.13 Sustainability gaps under different conditions in 2013

In some EMEs and FMEs, fiscal risks would increase under historic market conditions.

A. Current market conditions



B. Historic market conditions



Source: World Bank estimates.

Note: The sustainability gap is the difference between the primary balance and an estimated debt-stabilizing primary balance, which depends on assumptions about interest rates and growth rates. For a given country, current market conditions refer to 2013 interest and growth rates, while historic conditions refer to the sample average during 1980–2013. A negative value suggests that the balance is debt-increasing, a value of zero suggests that the balance holds debt constant, and positive values suggest that the balance is debt-reducing. A redder color indicates a more negative sustainability gap; a greener color a more positive gap. If the data was updated to 2014, some countries would show more benign sustainability gaps (e.g. Spain) while others would show lower ones.

3.13).[28] This is especially relevant for some FMEs that have placed sovereign bonds in international markets recently and have increased their exposure to risks linked to global financing conditions.[29] Some economies could thus become more vulnerable to sharp increases in borrowing cost. The historical experience discussed earlier also highlights several instances in recent decades when debt ratios rose sharply.

Private sector vulnerabilities are another source of risk that EMEs and FMEs should monitor since they have been associated with debt crises in the past (Box 3.4). Corporate and household debt in EMEs and FMEs has risen since the crisis (Figure 3.14). This rise has been substantial in some EMEs, with aggregate non-financial corporate debt growing by 39 percent over 2007–13. Moreover, in some countries, rising private sector debt has been accompanied by deteriorating fiscal sustainability. Some countries have already taken measures to restrain private credit growth.[30] Rapid currency depreciations can be another source of risk in some countries, where nonfinancial firms have been borrowing substantially in international markets in foreign currencies, but depositing the proceeds in local currencies in domestic financial systems (IDB, 2014). Sharp depreciations could thus strain the solvency of domestic firms and weaken the soundness of domestic financial sectors.

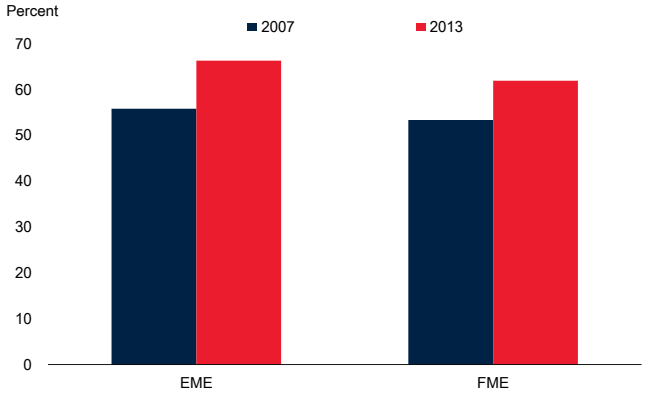
The recent slump in oil prices presents both risks and opportunities for developing countries. For oil exporters, the slump could result in loss of oil revenues, eroding their fiscal space. At the same time, many countries have substantial food and fuel subsidies. Continued soft commodity prices (as projected for 2015-16) would offer an opportunity to implement subsidy reform which would both help rebuild fiscal space and lessen distortions associated with these subsidies.

Over the medium term, in view of these risks as well as the desirability of strengthening fiscal space, developing economies will need to return their fiscal positions to more sustainable levels. The appropriate speed of adjustment, however, depends on a host of country-specific factors, including the cyclical position of the economy and constraints on monetary policy. If monetary policy normalization in advanced economies results in higher interest rates, a sharp drop in or reversal of capital flows could constrain monetary policy responses to weakening growth. Fiscal space would help ensure that fiscal policy remains available as a countercyclical policy tool. A wider fiscal space would not only increase the likelihood that fiscal stimulus is a feasibly policy option, but would also improve its effectiveness. This implies that adhering to an appropriate medium-term program of deficit reduction offers the prospect of a much more effective fiscal policy when it is needed most. For instance, the estimates from the baseline model suggest that fiscal multipliers would be reduced by one-third from pre-crisis levels (Figure 3.15).

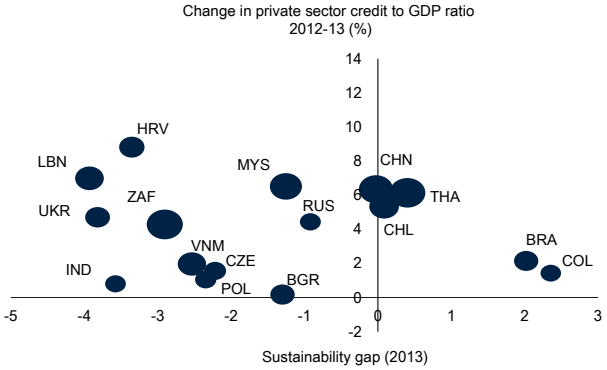
FIGURE 3.14 Private sector vulnerabilities

Credit to the private sector has expanded since 2007 in EMEs and FMEs. In some countries this expansion has been rapid and also associated with fiscal sustainability challenges.

A. Private sector credit evolution



B. Credit growth and sustainability gaps in 2013



Source: World Bank estimates.

Note: Panel A shows domestic private sector credit as percent of GDP in EMEs and FMEs. In Panel B, the size of the circle is proportional to domestic private credit-to–GDP ratio. The sustainability gap is the difference between the primary balance and an estimated debt-stabilizing primary balance based on interest rates and growth rates in 2013. A negative value suggests that the balance is debt increasing, a value of zero suggests that the balance holds debt constant, and positive values suggest that the balance is debt reducing. All economies in the figure are EMEs and FMEs with domestic private credit-to-GDP ratios greater than 50 percent. Sustainability gap data are from the database described in Annex 3B; private-sector credit data from World Development Indicators.

[28]The relationship between primary balances and debt is characterized by the sustainability gap. The sustainability gap measure here is based on long rates, and as such does not take into account the fact that developing economies also hold short term debt. However, to the extent that the average maturity of bond issuances in developing economies is lengthening (Chapter 1), the bias from using the long rates is likely small.

[29]See Chapter 1 for discussion on Cote d'Ivoire and Kenya, and IMF (2104d) for the cases of Ghana and Zambia.

[30]World Bank (2014b) describes recent efforts to reduce vulnerabilities in China, Malaysia, Thailand, and Vietnam.

BOX 3.4 Narrow Fiscal Space and the Risk of a Debt Crisis[1]

This chapter has examined how fiscal space had been built and used in the course of the Great Recession. Although in most countries it remains significantly wider than in the early 2000s, it has yet to be rebuilt to pre-crisis levels. Severely depleted fiscal space may become a contributor to possible future stresses, such as a debt crisis. This box reviews some of the key indicators that have been associated with debt crises.[2]

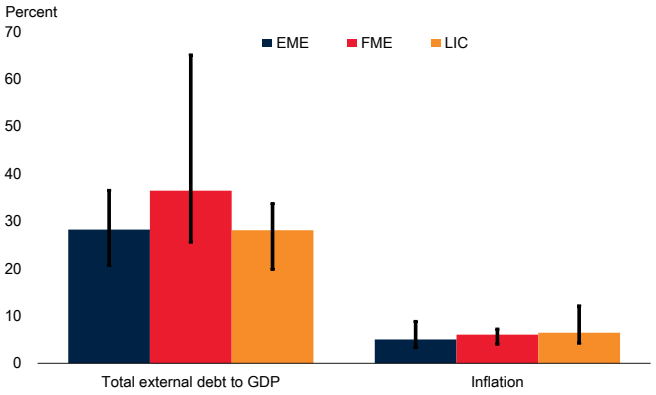
The implications of high public debt or high external debt have been extensively explored in the debt intolerance literature. Debt intolerance is often associated with the extreme stress that developing economies experience at levels of external debt that would be easily managed by advanced economies. Empirical studies of debt intolerance and serial default suggest that the likelihood of an external debt crisis rises substantially when external debt of an emerging economy is above 30-35 percent of GDP (Reinhart and Rogoff, 2009; Reinhart, Rogoff, and Savastano, 2003). Later estimates building on the early warning systems literature find a somewhat higher threshold: external debt as a share of GDP in emerging markets could be as high as 50 percent before a debt crisis becomes likely (Bandiera, Cuaresma, and Vinclette., 2010; Manasse and Roubini, 2009).

The literature on the determinants of debt crises has considered a range of different indicators.[3] However, for liquidity crisis-prone and solvency crisis-prone economies, four indicators can be identified as being particularly relevant: total external debt-to-GDP ratios, inflation, short-term external debt-to-reserve ratios, and public external debt-to-revenue ratios. These variables have threshold values (although always conditional on other factors) at which they indicate elevated debt crisis likelihoods.

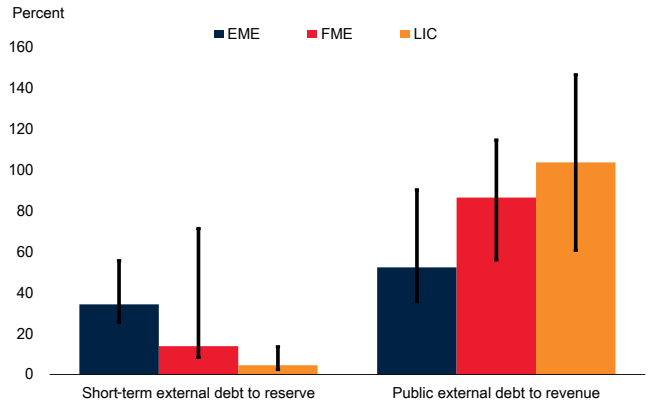
The threshold values are 31–50 percent for external-debt-to GDP ratios; 11 percent for inflation rates; 134 percent for short-term external debt-to reserve ratios; and 300 percent for public external debt-to-revenue ratios.[4] With these thresholds in mind, most emerging market economies (EMEs), frontier market economies (FMEs), and low-income countries (LICs) do not appear to be at imminent risk of a debt crisis (Figure B3.4.1).

FIGURE 3.4.1 Indicators of resilience in 2013

A. Total external debt-to-GDP and inflation



B. Short-term external debt to reserve and government external debt to revenue



Source: World Bank estimates.
Note: All statistics refer to the sample medians. Error bars indicate the range from the 25th to the 75th percentile within each country sample.

[1]This main author of this box is S. Amer Ahmed.

[2]Aside from the broader macroeconomic environment, the composition of debt can also matter, as excessive amounts of short-term debt can threaten liquidity (Detragiache and Spilimbergo, 2004). Eichengreen, Hausmann, and Panizza (2009) and Dell'Erba, Hausmann, and Panizza (2013) also show that foreign currency debt and large foreign liabilities can exacerbate debt vulnerabilities. For example, EMEs with low levels of foreign currency debt are characterized by lower correlations between debt levels and spreads.

[3]Jedidi (2013), Reinhart and Rogoff (2011) and Bandiera, Cuaresma, and Vinclette (2010) offer extensive reviews of the literature, describing the ranges of methodologies and variables considered.

[4]IMF (2002) reports that the relevant threshold for external debt-to-GDP ratios (excluding heavily indebted poor countries) was between 31 and 39 percent. Similarly, Reinhart, Rogoff, and Savastano (2003) find that, on average, an external debt-to-GDP ratio of 35 percent increases the likelihood of a debt crisis, although they caution that this threshold could be lower if the economy has a poor institutional investor rating. Manasse and Roubini (2009) and Bandiera, Cuaresma, and Vinclette (2010) find an elevated likelihood of debt crisis risk if total external debt is greater than 50 percent of GDP. Manasse and Roubini (2009) note that external debt-to-GDP ratios greater than 50 percent can contribute to debt crisis risk especially if inflation rates are greater than 11 percent and public external debt-to-revenue ratios are greater than 300 percent. If external-debt-to-GDP ratios are less than 50 percent, then other key indicators must reach threshold values for a crisis to become likely: short-term external debt-to-reserve ratios must be greater than 134 percent, public external debt-to-revenue ratios must be greater than 215 percent and inflation must be greater than 11 percent. Kraay and Nehru (2006) also find that inflation rates in excess of 40 percent could contribute to greater debt crisis risk while a cross-country event study of debt crises between 1980 and 2002 (Ciarlone and Trebeschi, 2006) finds that short-term external debt-to-reserve ratios surge from 220 percent to 383 percent in the year before a crisis.

Conclusions

This chapter has examined whether fiscal policy in emerging and frontier market economies will be able to provide effective support to activity in the event of a renewed global contractionary shock. Two conditions-fiscal space and policy effectiveness—are crucial. Fiscal space implies a lack of binding constraints from financing requirements, such as a large pre-existing deficit, a heavy debt burden, or excessive short-term liabilities.

Over the past two decades, a growing number of EMEs and FMEs have graduated from procyclical policies, towards more countercyclical policies. In large part, the earlier procyclicality had been the result of weak fiscal sustainability, which constrained policymakers' options, and political pressures to spend during times of good revenues.

The chapter has presented evidence that fiscal policy is more effective when supported by wider space. In EMEs and FMEs, estimated fiscal policy multipliers—the increase in GDP for a given exogenous increase in government spending—are considerably larger from a starting point with a strong budget position than from a starting point with a weak one. Since 2009, deficits have remained unexpectedly large, and fiscal space has not been restored to its pre-crisis level. While the technical analysis in this chapter, due to data constraints, has focused on fiscal debt and deficits, other dimensions of fiscal space, including a small share of short-term or foreign-currency debt, can add to fiscal space by reducing rollover or other risks.

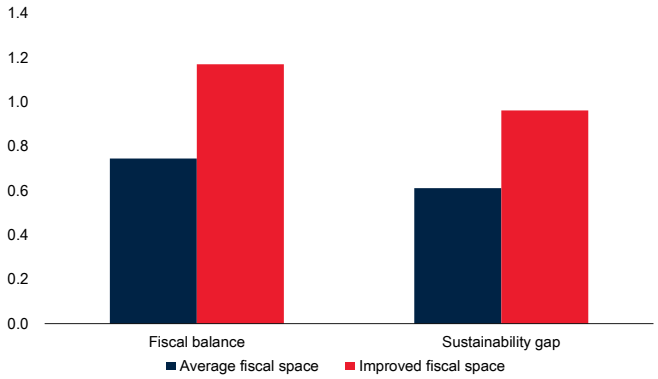
Three institutional mechanisms for strengthening fiscal governance have been examined: fiscal rules, stabilization funds, and medium-term expenditure frameworks. Developing economies have increasingly adopted these institutions over recent decades. While the experience has been mixed, each mechanism has seen success in cases where the mechanism has been well-designed and credible and its implementation steadfast.

While the chapter has discussed fiscal space and policy from the perspective of short-term output stabilization, they both have important implications for poverty reduction. Diminished fiscal space in the aftermath of the Great Recession has been associated with constrained social spending, which directly affects poverty reduction and equity (UN, 2011). Restoring fiscal space would allow more budgetary resources for these programs. Fiscal policy also has significance for poverty reduction and greater equity. First, an increase in growth due to fiscal stimulus can imply a positive mean shift in a county's income distribution. Second, fiscal policy targeted to increase or preserve social spending (such as social safety net and conditional cash transfer programs) can reduce inequality, i.e., the shape of the income distribution. These changes in the mean and the shape of the income distribution are key dimensions of poverty reduction (World Bank, 2014c, 2014d).

Even under the current global environment, with historically low interest rates, fiscal deficits in some developing economies seem sizeable. Under a less benign environment, with domestic growth and world interest rates at historical norms, the picture could worsen. Given the risks, there is a need to rebuild fiscal space over the medium term. For many developing countries, the expected soft commodity prices are an opportunity to implement subsidy reforms to help rebuild fiscal space while, at the same time, removing longstanding distortions to economic activity. The appropriate path of deficit reduction would depend on a variety of factors, notably the phase of the domestic business cycle and country-specific characteristics. For example, it would not be appropriate to aim inflexibly at reduced deficits during years of recession. The pace at which fiscal space is restored would also depend on the degree to which monetary stimulus is constrained by concerns over financial system soundness. At the end of the process, with restored space, fiscal policy would be a more reliable and effective countercyclical tool.

FIGURE 3.15 Fiscal multipliers – prospects

Fiscal policy in EMEs and FMEs would be more effective with restored space.



Source: World Bank estimates.
Note: The graph shows the fiscal multipliers at the two-year horizon for an average fiscal space and a (hypothetical) wide fiscal space. The average fiscal space corresponds to the cross-sectional median in 2013 from a sample of EMEs and FMEs while the wide fiscal space corresponds to the 75th percentile which is close to the pre-crisis level. These are based on the estimates from the IPVAR model using the sample of EMEs and FMEs. The results are shown for two alternative measures of fiscal space: fiscal balance as percent of GDP and the sustainability gap.

Annex 3A: Technical Information[1]

A. Fiscal Multipliers

This annex provides further details regarding the methodology used in the estimation of the fiscal multipliers as discussed in the main text. In particular, it describes the econometric models, identification strategies, estimation, and database. It also presents additional results that serve as robustness checks.

Models

1. *Interacted Panel VAR:* The model is written as:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ \alpha_{0,it}^{21} & 1 & 0 & 0 \\ \alpha_{0,it}^{31} & \alpha_{0,it}^{32} & 1 & 0 \\ \alpha_{0,it}^{41} & \alpha_{0,it}^{42} & \alpha_{0,it}^{43} & 1 \end{bmatrix} \begin{bmatrix} gc_{i,t} \\ gdp_{i,t} \\ ca_{i,t} \\ reer_{i,t} \end{bmatrix} = \gamma X_{i,t} + \sum_{l=1}^{L} \begin{bmatrix} \alpha_{l,it}^{11} & \alpha_{l,it}^{12} & \alpha_{l,it}^{13} & \alpha_{l,it}^{14} \\ \alpha_{l,it}^{21} & \alpha_{l,it}^{22} & \alpha_{l,it}^{23} & \alpha_{l,it}^{24} \\ \alpha_{l,it}^{31} & \alpha_{l,it}^{32} & \alpha_{l,it}^{33} & \alpha_{l,it}^{34} \\ \alpha_{l,it}^{41} & \alpha_{l,it}^{42} & \alpha_{l,it}^{43} & \alpha_{l,it}^{44} \end{bmatrix} \begin{bmatrix} gc_{i,t-l} \\ gdp_{i,t-l} \\ ca_{i,t-l} \\ reer_{i,t-l} \end{bmatrix} + U_{i,t} \quad (1)$$

where *gc* represents real government consumption; *gdp*, real gross domestic product (GDP), *ca*, current account as percent of GDP; *reer*, real effective exchange rates. Real government consumption and real GDP (in logs) are detrended. Real effective exchange rates are in growth rates while the current account is in levels. Details of the database are described in Section B of Annex 3B.

Note the panel structure of the model where the variables are indexed for each country by *i*. The vector $U_{i,t}$ represents uncorrelated independent, identically distributed "structural" shocks. The shock corresponding to the equation of government consumption is the fiscal shock and is the main shock of interest in the context of the chapter. The vector $X_{i,t}$ denotes controls which are the country-specific intercepts. L denotes the maximum lag length in the vector auto regression (VAR), set at 4 in line with Ilzetzki, Mendoza, and Vegh (2013).

The impact matrix, that is, the matrix of coefficients on the left-hand side of Equation 1, is lower-triangular. This, along with the ordering of the variables in the VAR, is related to the recursive identification scheme used in the chapter, which is that government consumption does not react to GDP within the quarter.[2] The impact matrix and the corresponding matrices in the right-hand side of the equation determine the effects of structural shocks on the dynamics of endogenous variables in the VAR system. The coefficients in these matrices are time varying, and hence indexed by time *t*. The coefficients evolve according to a measure of fiscal space. That is,

$$\alpha_{l,it}^{jk} = \beta_{l,1}^{jk} + \beta_{l,2}^{jk} fspace_{i,t} \quad (2)$$

where *fspace* denotes fiscal space, which in the baseline scenario is taken to be the fiscal balance. As noted in the main text, the section takes lagged moving averages of fiscal balance to control for any endogeneity issues. The model is estimated equation by equation using ordinary least squares (OLS). The coefficients are then evaluated at specific values of fiscal space (taken to be the percentiles in the sample) for computing the impulse responses and the fiscal multipliers. Confidence bands are calculated by bootstrapping methods with 300 samples. The section reports the medians and the 16-84 percent confidence bands.

The cumulative fiscal multiplier at horizon T is defined as the discounted cumulative change in output until horizon T when the discounted cumulative government consumption increases by 1$. That is,

$$Cumulative\ multiplier(T) = \frac{\sum_{t=0}^{T}(1+r)^{-t}\Delta gdp_t}{\sum_{t=0}^{T}(1+r)^{-t}\Delta gc_t}$$

where, *r* denotes the interest rate which is taken to be the median short-term nominal rate in the sample.

From the multiplier equation above, the impact multiplier is obtained when $T = 0$ and the long-run multiplier when T is some large number that is taken to be 5 years. In the text, the multipliers are reported for $T = 1$ year and $T = 2$ years that are the horizons when fiscal policy generally has maximum effects on the economy. To calculate the fiscal multiplier from the estimates from the IPVAR, the discounted impulses of output and government

[1]The main authors of this Annex are Raju Huidrom and S. Amer Ahmed.

[2]In addition, the ordering implies that GDP does not respond to the current account within one quarter and that the current account does not move within one quarter when the real effective exchange rate is shocked.

consumption are cumulated at different horizons. Then, the ratio of the two impulses is scaled by the average government consumption to GDP ratio.

2. Panel SVAR: The model is written as:

$$\begin{bmatrix} 1 & 0 & 0 & 0 \\ \alpha_0^{21} & 1 & 0 & 0 \\ \alpha_0^{31} & \alpha_0^{32} & 1 & 0 \\ \alpha_0^{41} & \alpha_0^{42} & \alpha_0^{43} & 1 \end{bmatrix} \begin{bmatrix} gc_{i,t} \\ gdp_{i,t} \\ ca_{i,t} \\ reer_{i,t} \end{bmatrix} = C_0 + \sum_{l=1}^{L} \begin{bmatrix} \alpha_l^{11} & \alpha_l^{12} & \alpha_l^{13} & \alpha_l^{14} \\ \alpha_l^{21} & \alpha_l^{22} & \alpha_l^{23} & \alpha_l^{24} \\ \alpha_l^{31} & \alpha_l^{32} & \alpha_l^{33} & \alpha_l^{34} \\ \alpha_l^{41} & \alpha_l^{42} & \alpha_l^{43} & \alpha_l^{44} \end{bmatrix} \begin{bmatrix} gc_{i,t-l} \\ gdp_{i,t-l} \\ ca_{i,t-l} \\ reer_{i,t-l} \end{bmatrix} + U_{i,t}$$

where the notations closely follow the IPVAR. The vector C_0 captures the intercept terms. The set of variables included in the VAR is also the same as before, and so is the identification scheme. Thus, the impact matrix retains the lower triangular structure. Unlike the IPVAR, the law of motion of the coefficients in Equation (2) is absent in this model. Accordingly, the VAR coefficients are no longer indexed by country *i* and time *t*. In other words, the panel SVAR (structural vector auto regression) only estimates a single set of coefficients from the pooled sample. The sample is split by episodes of wide and narrow fiscal space at an exogenous cut-off point, determined by judgment, to calculate estimates that vary by fiscal space. The IPVAR, on the other hand, estimates fiscal multipliers for continuous levels of fiscal space, thereby avoiding the cut-off choice. The confidence bands are based on 1000 Monte Carlo draws. Country fixed effects are taken into account by removing means and trends country by country. As in the IPVAR, a maximum lag length of 4 is used.

The model is also used to infer the evolution of the cyclicality of fiscal policy in developing economies. To that end, the model is estimated during three sub-samples (1980–1999, 2000–2007, and 2008–2014) and the response of government consumption to GDP shocks is calculated for each sub-sample. Fiscal policy is procyclical when that response is positive and statistically significant.

3. Local Projections Model: The model is written as:

$$\begin{aligned} \Delta Y_{i,t+h} &= \alpha_{i,h} + \left(1 - I(x_{i,t})\right)\beta_{surplus,h} FE_{i,t}^{G} \\ &+ I(x_{i,t})\beta_{deficit,h} FE_{i,t}^{G} \\ &+ \left(1 - I(x_{i,t})\right)\lambda_{surplus,h}(L)\Delta Y_{i,t-1} \\ &+ I(x_{i,t})\lambda_{deficit,h}(L)\Delta Y_{i,t-1} \\ &+ \left(1 - I(x_{i,t})\right)\Psi_{surplus,h}(L)\Delta G_{i,t-1} \\ &+ I(x_{i,t})\Psi_{deficit,h}(L)\Delta G_{i,t-1} + \varphi_1 T_{t,h} + \varphi_2 T_{t,h}^2 + \mu_{i,t}, \end{aligned}$$

with

$$I(x_{i,t}) = \frac{\exp(-\gamma x_{i,t})}{1 + \exp(-\gamma x_{i,t})}, \gamma > 0$$

where x indicates fiscal space normalized to have zero mean and unit variance. Like the previous models, fiscal space is measured by lagged moving averages of fiscal balances as percent of GDP. The parameter γ is calibrated as 2.5. $\Delta Y_{i,t+h}$ denotes the growth rate of output of country *i* at horizon *h*, FE^G is the forecast error of government consumption. The parameter captures country fixed effects and the time trend. The indicator function *I* pins down the probability that the economy is in a regime of narrow fiscal space.

The local projections model is a single equation model unlike the multivariate framework of the IPVAR and the panel SVAR. In this model, fiscal shocks are defined as fiscal surprises constructed outside the model as the forecast errors of government consumption. The forecast errors proxy unanticipated fiscal shocks in that they represent any surprises in government consumption over and above what private agents expect them to be given their available information set. The forecast errors of government consumption (in growth rates) are compiled from various OECD publications.[3]

The effects of fiscal policy on output are then traced out by regressing output on the fiscal surprises, taking into account country fixed effects. Those effects are dependent on whether the economy is in a regime of wide or narrow fiscal space, as pinned down by the indicator function. Lags of government consumption and GDP are included as controls to purge any effects that they may have had on the forecasts of government consumption. The model is separately estimated for each horizon, which is then used to *project* the dynamic effects of fiscal shocks on output.

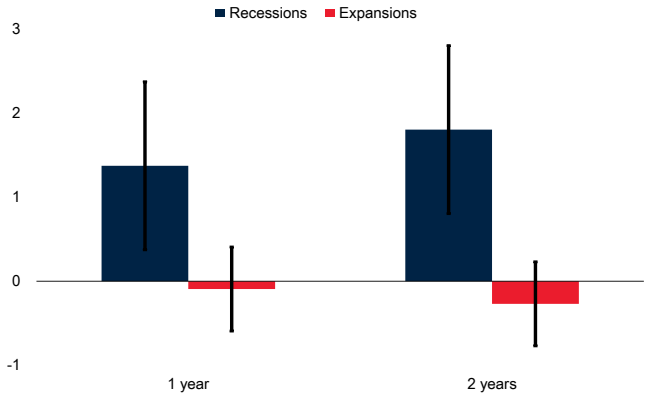
Additional results

This section presents additional results that serve as robustness checks.

- Fiscal multipliers during recessions and expansions: Annex 3A.1 shows that fiscal multipliers are larger during periods of recessions than expansions – a result consistent with standard macroeconomic

[3]The forecast error series is only available at the semi-annual frequency and accordingly, the model is estimated only at that frequency. The series is available for only 29 countries (22 AMEs and 7 EMEs and FMEs) and during the period 1987-2013. See Section B of the Annex 3B for the details of this database.

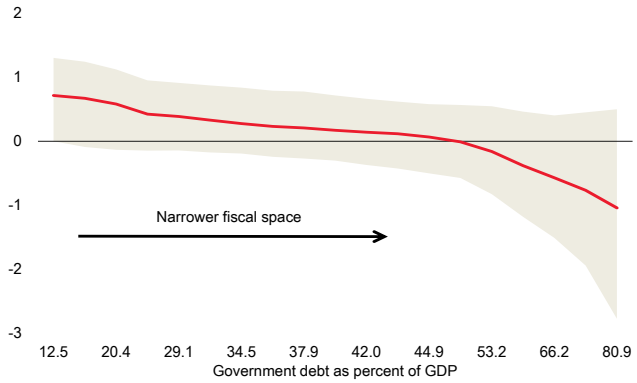
FIGURE 3A.1 Fiscal multipliers by business cycle phase



Source: World Bank estimates.

Note: The graph shows fiscal multipliers during recessions at different horizons. Recessions are defined as the peak-to-trough periods as determined by the Harding-Pagan (2002) business cycle dating algorithm. Solid bars represent the median and error bars represent the 16-84 percent confidence bands. These are from the baseline model with the pooled sample.

FIGURE 3A.2 Fiscal multipliers in EMEs and FMEs by government debt



Source: World Bank estimates.

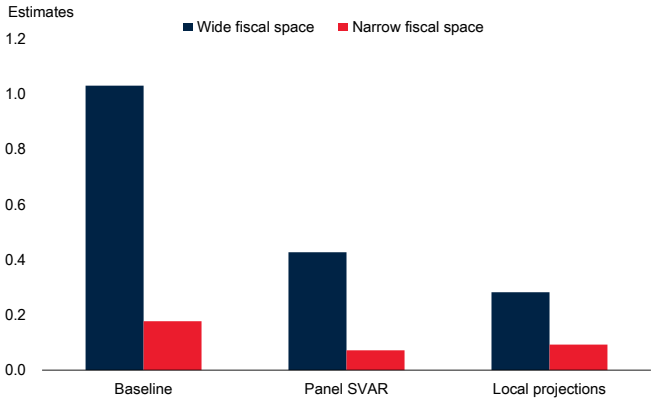
Note: The graph shows long run fiscal multipliers (i.e. at the five-year horizon) for different levels of fiscal space. These are based on the estimates from the IPVAR model using a sample of EMEs and FMEs. Government debt as percent of GDP is used as the measure of fiscal space. The values shown on the *x* axis correspond to the percentiles from the sample. Fiscal space is narrow (wide) when government debt is high (low). Solid lines represent the median, and shaded areas around the solid line are the 16-84 percent confidence bands.

theory. For this, the IPVAR model is estimated by conditioning on the phase of the business cycles, as determined by the Harding-Pagan (2002) business cycle dating algorithm.

- Fiscal multipliers by government debt: Figure 3A.2 shows that the result in the main text—fiscal multipliers are larger with a wider fiscal space—is robust when the government debt-to-GDP ratio is used as an alternative measure of fiscal space. The graph underlines that fiscal policy can be counterproductive, especially in the long run (i.e. at the five-year horizon), when fiscal space is narrow.

- Alternative methodologies yield results that are similar to the baseline (Figure 3A.3). In the panel SVAR model as in Ilzetzki, Mendoza and Vegh (2013), the multiplier at the two-year horizon is about 0.5 during episodes of high fiscal balance, whereas it is very close to zero during episodes of low fiscal balance. In the local projections model as in Riera-Crichton, Vegh, and Vuletin (2014), the output responses to a positive fiscal shock are again larger during periods of high fiscal balance than low balance. The differences between the estimates for the narrowest and widest fiscal space are statistically significant.

FIGURE 3A.3 Fiscal multipliers: Alternative econometric models



Source: World Bank estimates.

Note: The graph shows fiscal multipliers at the two-year horizon across alternative econometric models: IPVAR model of Towbin and Weber (2013) which is the baseline, a panel SVAR model as in Ilzetzki, Mendoza, and Vegh (2013), and a local projections model as in Riera-Crichton, Vegh, and Vuletin (2014). To maintain enough degrees of freedom, the latter two models are estimated from a pooled sample of AMEs, EMEs, and FMEs. Fiscal balance as a percentage of GDP is the measure of fiscal space. For the baseline model, the fiscal multipliers are averaged over fiscal deficits below and above 4 percent of GDP cutoff. In the sample, 4 percent of GDP for deficits roughly corresponds to the percentile position of a 60 percent of GDP cutoff for debt used in Ilzetzki, Mendoza, and Vegh (2013) to define episodes of wide and narrow fiscal space. Wide (narrow) fiscal space refers to episodes where fiscal deficits are above (below) this cutoff. The figures shown for the local projections model are the output responses (growth rates, in percent) to a fiscal shock.

B. Identifying Contraction Events

This chapter uses an event study to examine how fiscal space and fiscal policy in EMEs and FMEs changes in the runup to, during, and immediately after a contraction episode. Three sets of comparisons are made. The first set is between EMEs and FMEs in a particular contraction episode to highlight their differences within the same episode. The second set is between economies with differing levels of fiscal space within the same contraction episode. The third set is between economies' contraction episodes during the Great Recession and during pre-2008 contraction episodes.

A country is considered here to have experienced a contraction event if its growth in a given year fulfills two conditions. The first is that the growth is negative (i.e., a contraction), and the second is that the growth is more than one standard deviation below the average that the country experienced in the 1990–2013 period. The year of the event, as defined, is then 't=0.' If there are two or more contractionary episodes within a five-year period, the year with the greatest growth contraction is taken as 't=0.' This is a variation of the censoring rule applied by IMF (2012a) in its application of the Harding and Pagan (2002) quarterly business cycle dating methodology to annual data. If key fiscal space data, such as gross government debt, are not available in the database for the country in the event year, then the event is dropped.[4] This approach identifies 101 contraction events, 50 in the pre-2008 period and 51 in 2008–09 for the full sample of all countries including AMEs, EMEs, and FMEs. These events, along with their associated real GDP contraction can be seen in Annex Tables 3A.1 and 3A.2 for EMEs and FMEs. Episodes identified as crises but not included in the event study because of data constraints are noted in Annex Table 3A.3.

This definition of events considers output contractions only. The comprehensive financial crisis database of Laeven and Valencia (2013) has been considered a source for event dates. However, it focuses on financial crises, and thereby excludes episodes in many economies, such as those in Sub-Saharan Africa. Also, some of the episodes it considers do not necessarily have output contractions associated with them.

[4]To ensure that the crisis of 1995 in Mexico is included, the database is augmented the IMF's Global Data Source.

TABLE 3A.1 Contraction events between 1990 and 2007

Country	Year	Country Group	Real GDP Growth (%)
Argentina	2002	EME	-10.9
Bahrain	1994	EME	-0.3
Chile	1999	EME	-0.8
Côte d'Ivoire	2000	FME	-3.7
Colombia	1999	EME	-4.2
Korea, Rep.	1998	EME	-5.7
Sri Lanka	2001	EME	-1.5
Morocco	1993	EME	-1.0
Malaysia	1998	EME	-7.4
Oman	1999	EME	-0.1
Philippines	1998	EME	-0.6
Mexico	1995	EME	-5.8

Note: EME: Emerging Market Economy.

TABLE 3A.2 Contraction events in 2008 and 2009

Country	Year	Country Group	Real GDP Growth (%)
Bulgaria	2009	FME	-5.5
Botswana	2009	FME	-7.8
Chile	2009	EME	-1.0
Cyprus	2009	FME	-1.7
Czech Republic	2009	EME	-4.5
Estonia	2009	FME	-14.1
Honduras	2009	FME	-2.4
Hungary	2009	EME	-6.8
Latvia	2009	FME	-18.0
Mexico	2009	EME	-4.7
Malaysia	2009	EME	-1.5
Romania	2009	FME	-6.8
Russian Federation	2009	EME	-7.8
Slovak Republic	2009	EME	-4.9
Slovenia	2009	FME	-8.0
Thailand	2009	EME	-2.3
Trinidad and Tobago	2009	FME	-4.4
Turkey	2009	EME	-4.8
Ukraine	2009	FME	-14.8
South Africa	2009	EME	-1.5
Zimbabwe	2008	EME	-17.7

Note: EME: Emerging Market Economy; FME: Frontier Market Economy.

TABLE 3A.3 Contraction events between 1990 and 2007 excluded because of data constraints

Country	Year	Country Group	Real GDP Growth (%)
Bulgaria	1992	FME	-7.3
Bulgaria	1996	FME	-9.0
Brazil	1990	EME	-4.3
Czech Republic	1991	EME	-11.6
Ecuador	1999	FME	-4.7
Estonia	1994	FME	-1.6
Honduras	1994	FME	-1.3
Honduras	1999	FME	-1.9
Hungary	1992	EME	-3.1
Indonesia	1998	EME	-13.1
Israel	2002	EME	-0.6
Kenya	1992	FME	-0.8
Latvia	1992	FME	-32.1
Macedonia, FYR	1993	FME	-7.5
Macedonia, FYR	2001	FME	-4.5
Mongolia	1993	FME	-3.2
Mongolia	2009	FME	-1.3
Peru	1990	EME	-5.1
Philippines	1991	EME	-0.6
Poland	1991	EME	-7.0
Romania	1992	FME	-8.8
Romania	1998	FME	-4.8
Russian Federation	1994	EME	-12.6
Rwanda	1994	FME	-50.2
Senegal	1990	FME	-0.7
Senegal	1994	FME	0.0
Serbia	1993	FME	-30.5
Serbia	1999	FME	-11.2
Slovak Republic	1993	EME	-3.7
Slovenia	1992	FME	-5.5
Thailand	1998	EME	-10.5
Turkey	1994	EME	-4.7
Turkey	2001	EME	-5.7
Venezuela, RB	2003	EME	-7.8
South Africa	1992	EME	-2.1
Zambia	1992	FME	-1.7
Zambia	1998	FME	-1.9
Zimbabwe	1992	EME	-9.0
Zimbabwe	2003	EME	-17.0

Note: EME = emerging market economy; FME = frontier market economy.

Annex 3B: Statistical Information[1]

A. Database for Fiscal Space

The database contains annual data for up to 196 countries from 1980 to the present, with greater coverage starting from 1990s.[2] Economies are classified according to gross national income (GNI) per capita (as in the World Bank's official documents) as well as according to market access. Following this classification, economies are divided into Advanced Market Economies (AMEs), Emerging Market Economies (EMEs), Frontier Market Economies (FMEs), Other Developing Countries (ODs), and Other Low Income Countries (LICs). This grouping captures financial market participants' perceptions of fiscal vulnerabilities, and aligns well with standard definitions used by financial market investors for index construction and portfolio allocation. EMEs include economies that currently are, or have been for most of their recent history, middle-income countries with a long-established record of access to international financial markets. FMEs include economies that are usually smaller and less developed than EMEs and, in the view of investors, considerably riskier (although economies undergoing extreme economic or political instability are excluded). Technically, the EME and FME lists consolidate the ones independently developed by FTSE and S&P. The AME category follows the IMF classification.

Data sources

In order to address quality and consistency concerns, most series are sourced from databases maintained by international organizations, in cooperation with national statistical agencies using harmonized methodologies. World Bank and IMF staff also perform adjustments and contribute their own estimates, so data series may ultimately differ slightly across and also within organizations. Much of the data are drawn from the IMF's most recent World Economic Outlook database, the World Bank's World Development Indicators (WDI) and International Debt Statistics (IDS), and the Quarterly External Debt Statistics (QEDS). For a few specific data series, information is gathered from the Joint External Debt Hub (JEDH, a joint initiative by the World Bank, BIS, IMF, and the Organisation for Economic Co-operation and Developement), the Bank for International Settlements (BIS), and from Bloomberg.

Debt sustainability indicators

Two variables within this group are readily available in or can be computed from WEO data: general government gross debt and general government (primary and overall) net lending/borrowing in percent of GDP.

The structural balance is defined here as the difference between cyclically-adjusted revenues (assuming an output-gap elasticity of one for revenues) and cyclically-adjusted expenditures (assuming an elasticity close to zero).

$$Structural\ balance = revenues(1 + output\ gap)^{-1} - expenditures(1 + output\ gap)^{0.1}$$

This definition typically defines the cyclically adjusted balance. The more commonly used definition of structural balance takes into account one-off, discretionary expenditures and changes in commodity and assets prices (IMF, 2012; Bornhorst et al., 2011). Since the goal of the database is to provide comparable definitions for as broad a set of countries as possible, these country-specific, one-off adjustments are not taken into account.

Fiscal sustainability gaps are calculated following Ley (2009) to capture the pressures on sustainability that emerge from large fiscal balances accumulating over time to unsustainable debt stocks, even when initial debt stocks are modest. The overall balance sustainability gap is given by:

$$overall\ sustainability\ gap = b - \left(\frac{-\gamma}{1+\gamma}\right) d^*$$

where γ represents the nominal GDP growth rate, b the overall fiscal balance (in percent of GDP), and the last term the overall fiscal balance that stabilizes the stock of debt (in percentage of GDP) at d^*. The stock of debt d^* is the target debt-to-GDP ratio that is taken to the median in a given country group.[3]

The primary balance sustainability gap is the difference between the primary balance and the debt-stabilizing primary balance:

[1] The main authors of this Annex are Sergio Kurlat, Raju Huidrom, and S. Amer Ahmed.

[2] Fifty-seven small countries (defined as those with a population of less than a million) and dependent territories were excluded from most samples in the analytical sections. This chapter uses the term country interchangeably with economy, referring to territories for which authorities report separate statistics.

TABLE 3B.1 Descriptive statistics

	Quartile		
Variable	0.25	0.5	0.75
Government debt (percent of GDP)			
AMEs	42	59	84
EMEs, FMEs, ODs	25	43	68
LICs	35	56	106
Primary balance (percent of GDP)	-2.5	-0.3	2.1
Structural balance (percent of potential GDP)	-4.4	-2.2	0
Overall fiscal balance (percent of potential GDP)	-4.6	-2.3	0.2
Government debt (percent of revenues)			
AMEs	91	137	208
EMEs, FMEs, ODs	87	163	259
LICs	203	331	575
Overall deficit (percent of revenue)	-17.8	-8.2	0.6
Sustainability gap (overall balance)	-3.5	1	5.7
Sustainability gap (primary balance)	-3.6	-1	1.5
Sustainability gap under current conditions (primary balance)	-3.6	-0.6	2.2
Total external debt/GDP (%)			
AMEs	117	183	282
EMEs, FMEs, ODs	28	45	73
LICs	34	66	98
External private debt/GDP (%)			
AMEs	76	132	244
EMEs, FMEs, ODs	0	1	6
LICs	0	0	0.1
Domestic credit to private Sector/GDP (%)			
AMEs	84	106	148
EMEs, FMEs, ODs	17	30	51
LICs	6	11	17
Short-term external debt/ Total external debt (%)			
AMEs	31	39	58
EMEs, FMEs, ODs	5	12	20
LICs	2	5	10
Short-term external debt/reserves (%)			
AMEs	527	1029	2349
EMEs, FMEs, ODs	11	37	87
LICs	12	32	88
Total external debt/reserves (%)	212	421	1261
Total external debt/reserves (without gold) (%)	216	440	1397

$$primary\ balance\ sustainability\ gap = p - \frac{i-\gamma}{1+\gamma}d^* = p - \frac{r-g}{1+g}d^*$$

where p is the primary balance (in percent of GDP), i is the nominal long-term interest rate[4], γ is the nominal GDP growth, r is the real interest rate (defined as the nominal interest rate deflated by the U.S. GDP deflator), g is the real growth rate, and d^* is the target stock of debt. The primary balance sustainability gap is calculated using (i) average growth and interest rates over the entire sample period, and (ii) current growth and interest rates.

Private sector debt indicators

Private-sector debt has the potential to impact fiscal sustainability if governments respond to a shock by assuming some of the private sector liabilities. The costs associated with such interventions rise with the overall size of the private sector obligations and maturity or currency mismatches.

The share of total external debt over GDP is calculated using QEDS and WEO data. Gaps in the series are filled with IDS data. The share of external private debt over GDP is calculated using QEDS and WEO data in the case of AMEs, and IDS and WEO for all other countries. The share of short-term over total external debt is drawn from QEDS. Gaps in the series are filled with IDS data.

Reserve adequacy is calculated as the ratio of short-term external debt over reserves and the ratio of total external debt over reserves (from QEDS and WDI; gaps in the series are filled with IDS data; see Bianchi et al., 2013).[5]

[3]The median debt levels are 58 percent of GDP for AMEs; 43 percent of GDP for the combined EMEs, FMEs, and ODs; and 56 percent for LICs. If only the post-2001 sample is considered the median for LICs would be lower. As such, the sustainability gap estimated in this chapter is more optimistic for LICs than would be suggested if the post-2001 median debt were considered.

[4]The nominal long-term interest rate is proxied by the 10-year government bond yield for a group of 42 economies that have data available (through Bloomberg) over a reasonably long period. For another group of 43 countries, the rate is estimated as the sum of U.S. dollar Libor plus the predicted spreads from a fixed-effect OLS regression of J. P. Morgan's EMBI on the Institutional Investor Rating.

[5]The Greenspan-Guidotti rule prescribes, as a rule of thumb, full short-term debt coverage for Emerging Markets (IMF, 2011).

TABLE 3B.2 List of economies in quarterly database

Advanced		Emerging and Frontier	
Code	Economy	Code	Economy
AUS	Australia	ARG	Argentina
BEL	Belgium	BGR	Bulgaria
CAN	Canada	BRA	Brazil
DEU	Germany	CHL	Chile
DNK	Denmark	COL	Colombia
ESP	Spain	CZE	Czech Republic
FIN	Finland	HRV	Croatia
FRA	France	HUN	Hungary
GBR	United Kingdom	ISR	Israel
ISL	Iceland	MEX	Mexico
ITA	Italy	POL	Poland
LTU	Lithuania	ROM	Romania
NLD	Netherlands	SVK	Slovak Republic
NOR	Norway	ZAF	South Africa
PRT	Puerto Rico	TUR	Turkey
SVN	Slovenia		
SWE	Sweden		
USA	United States		

The share of domestic credit to the private sector in percentage of GDP is available through WDI. It refers to the sum of financial corporations' claims on the non-financial private sector (and, for some countries, on public enterprises too).

B. Database for Fiscal Multipliers

The main database is an unbalanced panel that covers 34 economies (19 AMEs, and 15 EMEs and FMEs) at the quarterly frequency during the period 1980:1–2014:1 (Annex Table 3B.2). Real government consumption and real GDP are based on the quarterly database in Ilzetzki, Mendoza, and Vegh (2013), which ends around 2008. These two series are extended until 2014:1 by splicing from the OECD Economic Outlook database and Haver Analytics. Real effective exchange rates are the narrow

(wherever available) and the broad indices from BIS at the end of each quarter. The current account to GDP series is drawn from the WEO.

Government consumption and GDP series are in logs and detrended using a linear quadratic trend as in Ilzetzki, Mendoza, and Vegh (2013). The real effective rate is transformed into quarter-to-quarter growth rates. The current account-to-GDP ratio series is seasonally-adjusted using the X11 routine. All four series are detrended and demeaned on a country by country basis so as to control for country fixed effects in the regressions. The median short term interest rate used for discounting in the multiplier calculation is computed from the original Ilzetzki, Mendoza, and Vegh (2013) database.

A second database is an unbalanced panel with the same cross sectional and time series coverage as before but at an annual frequency. This includes variables that are not explicitly required for the identification scheme to be valid in the IPVAR and Panel SVAR models but are necessary for the conditioning and the multiplier calculation. Annual data are used for fiscal balance, government debt-to-GDP ratio, and government consumption-to-GDP—all drawn from the October 2014 World Economic Outlook database.

A third database is for the Local Projections model. The crucial variable here is the forecast error of government consumption. This is constructed using OECD forecasts, publicly available at a semi-annual frequency. Forecast errors of government consumption were constructed for 29 economies (22 advanced and 7 developing economies), during the period 1988-2013. The list of economies is in Annex Table 3B.3. This database has a much smaller sample than those in the IPVAR and Panel SVAR models.

TABLE 3B.3 List of economies in semiannual database

Advanced		Emerging and Frontier
Australia	Japan	Chile
Austria	Luxembourg	Czech Republic
Belgium	Netherlands	Hungary
Canada	New Zealand	Korea, Rep
Denmark	Norway	Mexico
Finland	Portugal	Poland
France	Spain	Slovak Republic
Germany	Sweden	Turkey
Greece	United Kingdom	
Ireland	United States	
Italy		

C. Database for the Event Study

Structural balances and sustainability gaps are taken from the database described in Section A, while other macroeconomic variables are taken from publicly available databases shown in Annex Table 3B.4.

The aggregated database for the event study covers up to 196 economies, spanning 1990–2013, although coverage for any given variable varies by country. First, starting in 1990 prevents the results from being driven by the transition in former centrally planning economies. Second, starting in 1990 allows for the capture of complete time series for the largest number of economies and key variables while also allowing for time series long enough to include multiple events.

TABLE 3B.4 Data sources and variables

Source	Variables
GDP (constant 2005 USD)	WDI, WBG
GDP (current USD);	WDI, WBG
GDP (current LCU);	WDI, WBG
Government consumption (constant 2005 USD)	WDI, WBG
Private household consumption (constant 2005 USD)	WDI, WBG
Domestic credit to the private sector (as share of GDP)	WDI, WBG
Gross capital formation (constant 2005 USD)	WDI, WBG
Gross government debt as a share of GDP	WEO, IMF
Exchange rate index (1995=100)	IFS, IMF
Brent crude oil price per barrel (2010 USD)	GEM Commodities Database, WBG

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