GETTING IT RIGHT:
HOW FISCAL RESPONSE CAN SHORTEN CRISIS LENGTH AND RAISE GROWTH

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1 Introduction

Fiscal measures, such as tax cuts and spending increases, have been central to government responses to the recent global financial crisis. All countries in the Group of Twenty (G-20) have adopted discretionary fiscal packages to fight the economic downturn that was set off in mid-2007 by a financial and banking crisis with roots in the U.S. mortgage market. Those programs, enacted specifically to boost aggregate demand during the economic downturn, cost about 2 per cent of the gross domestic product (GDP) of the G-20 countries in 2009 and are projected at 1.6 per cent of GDP in 2010 (IMF, 2009).

These expansionary fiscal policies are beginning to offset the fall in private demand in G-20 countries, but it is too early to tell if they will help shorten the duration of the recession and promote growth in the medium term. Does it matter for the next three to five years whether governments rely on tax cuts or spending increases to combat the recession? Or whether governments cut consumption taxes or income taxes or spend on current consumption or investment? We examine these questions, using historical data from past banking crises, which have caused more severe and protracted recessions than those with their roots in the real economy.

2 Fiscal balances deteriorate

The discretionary programs enacted to combat the global recession contributed to increased government deficits. In addition, declining economic activity and a drop in asset values both lowered government revenues and increased spending for existing social programs, such as unemployment insurance. On average, fiscal balances in the G-20 nations are projected to deteriorate by about 7 per cent of GDP in 2009, compared to the pre-crisis periods. The discretionary measures account for almost half of the increase in deficits. Discretionary fiscal stimulus was larger in emerging market economies, which have limited social programs and lower revenues. By contrast, in advanced G-20 countries, the bigger deficits were mainly caused by automatic increases in spending on such existing social programs as unemployment insurance and social assistance.

Most of the fiscal stimulus has centered on raising public spending. More than two-thirds of the discretionary stimulus came in spending measures in 2009, with the rest in tax cuts. Investment in infrastructure accounts for almost half of the stimulus in emerging G-20 countries, compared to about one-fifth in advanced G-20 countries. Tax reductions, notably corporate and personal income taxes, are a significant share of fiscal stimulus in advanced economies.

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The usual disclaimer applies.

3 Recessions and fiscal policy

The role of fiscal and monetary policy during recessions has been studied extensively. Fiscal and monetary policies counter the effects of shrinking output during recessions, credit contractions and asset price declines (Claessens, Kose and Terrones, 2008). Fiscal policy appears to be particularly effective in shortening the duration of recessions. That suggests that an aggressive countercyclical fiscal stance – one that leans against the direction in which the economy is moving by cutting taxes or increasing spending – is appropriate during recessions and that fiscal stimulus should be large, sufficiently lasting, diversified, contingent, collective and sustainable (Spilimbergo *et al.*, 2008). However, there is little evidence on the effectiveness of fiscal policy during periods of systemic banking crises. This has limited our understanding of how the current stimulus packages will affect the duration of the crisis.

Several factors could hamper the effectiveness of fiscal expansion during the more severe and long-lasting recessions caused by financial crises:

- The dramatic drop in aggregate demand necessitates a larger fiscal stimulus to support the economy than in a standard recession.
- The implementation of fiscal policy is made difficult because the ability of consumers to spend is hampered by financial distress. This causes capital markets to freeze, limiting the scope for private consumers to access credit against the backdrop of severe income losses.
- Governments find it difficult to finance fiscal expansions in a more risk-averse global environment. While this can be particularly important for countries with high initial levels of debt or high credit risk, the across-the-board increase in the perception that it is riskier to lend to governments can affect sovereign bond issuance even in better-rated economies. However, this effect can be offset in part by lower inflationary pressures and financial markets' flight to quality.

4 Systemic banking crisis and fiscal policy

We used new data on financial crisis episodes compiled by Laeven and Valencia (2008) to study the effectiveness of fiscal policy under systematic banking crises. This database comprises 118 episodes of financial crises that occurred in 99 countries during the period 1980-2008. These crises were different from standard recessions as they originated from severe systemic disruptions in the banking system. Under Laeven and Valencia definition, systemic banking crisis occurs when a country's corporate and financial sectors experience a large number of defaults and financial institutions and corporations face difficulties repaying loans on time. They identify 124 systemic banking crises over the period 1970-2007, and estimate that fiscal costs net of recoveries associated with these crises average about 13.3 per cent of GDP while output losses average 20 per cent of GDP.[1, 2, 3]

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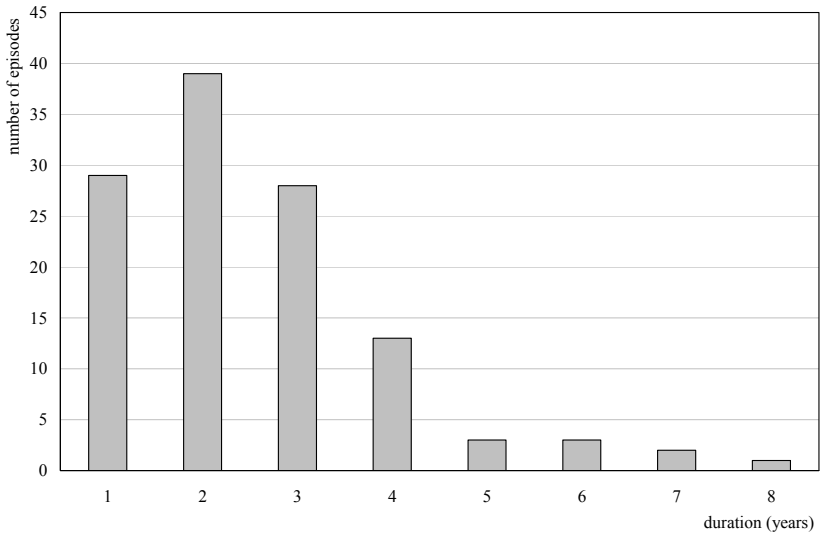
[1] We use the dataset of 124 banking crises and drop 10 of them due to lack of fiscal data. We come up with a sample of 118 cases by adding 4 cases from their other two datasets. These cases were originally classified as other type of financial crisis (currency crisis and debt crisis), but they triggered a banking crisis.

[2] We complement Laven and Valencia's database with additional data from the World Economic Outlook, the Government Financial Statistics, and the Global Financial Database.

[3] This approach differs from the one recently adopted by Reinhart and Rogoff (2009) who define banking crises as two types of events: bank runs that lead to the closure, merger, or takeover by the public sector of one or more financial institutions; and if there are no runs, the closure, merger, takeover, or large-scale government assistance for an important financial institution that marks the start of a string of similar outcomes for other financial institutions. With these criteria, they identify 66 cases that occurred between 1945 and 2007.

Figure 1

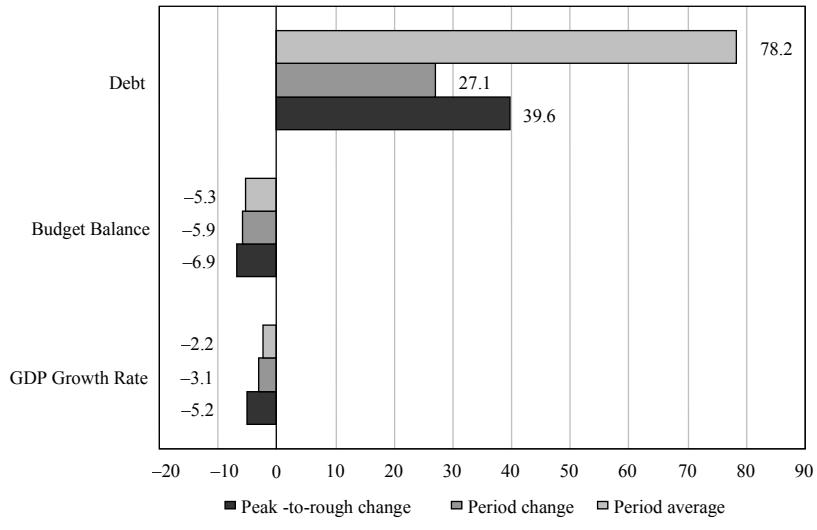
Frequency and Duration of Banking Crises



Source: Author's calculations.

Figure 2

Economic Consequences of Banking Crises
(percent of GDP)



Source: Author's calculations.
Note: Peak-to-trough values are differences between the worst level reached by the variables during the crisis and their pre-crisis value. Period changes denote differences between the last year of the crisis and the pre-crisis year. Period averages show the average value of the variable during the crisis episodes.

Financial crises lasted on average for 2.5 years (Figure 1), with 85 per cent of the episodes lasting between one and four years. One episode, the longest, lasted eight years. These crises also generated large economic costs. Peak-to-trough fall in GDP growth was more than 5 percentage points during the average shock episode. The effects of crises on fiscal aggregates were also significant: during the crisis, public debt increased by about 30 percentage points of GDP (Figure 2) reflecting a significant deterioration in the primary fiscal balance. A drop in revenue collection as well as higher public expenditure contributed to the fiscal deterioration. These results are similar to the estimated impact of the current crisis on output and government debt in G-20 countries and to those reported in other studies on financial crises (Reinhardt and Rogoff, 2009).

To assess the behavior of fiscal variables during crises episodes and in their aftermath, we calculate the overall change in the variables two years prior to the start of the crisis;[4] during the crisis; and in the two years after the crisis. Results are expressed as a percent of GDP (Tables 1 to 3).

[4] As fiscal variables, in particular revenue, may be affected by asset value increase in the run up to the crisis we also estimated the change over a longer time period.

Table 1

Fiscal Aggregates
(percent of GDP)

Item	Before Crisis *(t–2; t–1)*	During Crisis *(t)*	After Crisis *(t+1; t+2)*
Debt	–9.2	27.1	–7.2
Budget balance	–0.1	–5.9	1.5
Primary budget balance	0.3	–4.9	2.8
Total revenues	0.8	–3.7	4.9
Total expenditures	0.9	2.3	2.6

Table 2

Budget Composition: Revenues
(percent of GDP)

Item	Before Crisis *(t–2; t–1)*	During Crisis *(t)*	After Crisis *(t+1; t+2)*
Taxes	0.5	–2.3	4.2
Income, profits, capital gains	0.2	–1.2	3.8
Payroll and workforce	0.1	–0.3	0.0
Property	0.0	0.0	0.0
Goods and services	0.1	–0.5	0.4
International trade	0.1	–0.3	0.0
Other taxes	0.0	0.1	–0.1
Social contributions	0.2	–1.2	0.2
Other revenues	0.1	–0.2	0.5

Table 3

Budget Composition: Expenditures
(percent of GDP)

Item	Before Crisis *(t–2; t–1)*	During Crisis *(t)*	After Crisis *(t+1; t+2)*
Current expenditure	–0.9	2.2	0.1
Goods and services	–0.1	0.6	–0.5
Employee compensation	0.1	0.2	0.1
Transfers	0.1	0.6	0.3
Interest payments	0.4	1.0	2.3
Other expenses	0.4	–0.2	–0.1
Public Investment	0.0	0.1	2.5

For the three tables above:
Source: Author's calculations based on data from WEO and GFS.
Note: Figures in (*t*) show the change in the variables between the last year of the crisis period and the pre-crisis year. Figures in (*t–2; t–1*) show the change in the variables during the two years prior to the start of the crisis. Figures in (*t+1; t+2*) show the change in the variables during the two years following the last year of the crisis.

During banking crises, fiscal deficits increased by more than 2 per cent of GDP per year and public debt worsened by about one-third of the preexisting average debt level of about 80 per cent of GDP. Total revenues fell by about 3.5 percentage points of GDP and government expenditures rose by more than 2 percentage points of GDP. Tax revenue fell by more than 2 per cent of GDP, especially from income and profits taxes (Table 2). Social contributions also fell considerably. After the crisis, revenue collection improved, in particular taxes associated improvement in private income. There was also a significant increase in current expenditure (Table 3). Interest payments, transfers and government's purchase of goods rose most. The rise in public sector salaries was weaker and public investment remained stable during the shock, but rose after the crisis.

Did fiscal expansion help in shortening the length of financial crises? Our results based on regression analysis of the factors that affected crisis duration indicate that it did. We use a dummy-variable indicator of large fiscal expansions during the crisis episode to capture major changes in fiscal policy. We create an "expansionary fiscal policy" dummy that takes value equal to 1 if the budget balance worsens by more than 1.5 per cent of GDP in the first three years following the onset of the crisis. The following model is used to determine the effect of fiscal policy and other accompanying measures on the duration of banking crises:

$$Duration(t) = \alpha + \beta_1 FiscalExpansion_t + \beta_2 CreditBoom_{t-1} + \beta_3 Containment(Dep.Guarantee)_t + \beta_4 \mathrm{Re}solution(N.BanksClosed)_t + \beta_4 \mathrm{Re}solution(GovtIntervention)_t + \varepsilon_t \quad (1)$$

where t refers to the time period during the crisis and t–1 refers to the year preceding the onset of the crisis. *Expansion* is the indicator of fiscal expansion; *Credit Boom* is a dummy variable that takes value equal to 1, when the banking crises was preceded by an abnormal expansion of credit; and *Guarantee* is a dummy variable that takes value equal to 1 when there was a freeze of deposits and/or a blanket guarantee in the first phases of banking crises. We include two measures of resolution policies, captured by the total *Number of Banks Closed* during the episode and the degree of *Government Intervention* in the financial sector.[5]

We estimate a baseline model in a truncated sample of 118 episodes of banking crises, using OLS and Ordered Logit. Results are reported in Table 4 and show that fiscal expansions are a decisive factor for reducing the duration of banking crises. Higher government spending and lower taxes boosted aggregate demand by replacing falling private consumption. Public investment also contributed to offsetting the collapse in private investment. Higher deficits led to shorter crisis durations in our sample. An increase of 1 percent of GDP in the fiscal deficit reduced the duration of the crisis by almost two months. This suggests that fiscal expansion of the size similar to the one adopted on average by G-20 countries during the current global financial crisis may cut the length of the recession by almost one year, compared to a baseline situation in which the budget deficits remained the same as in the pre-crisis period.

5 Fiscal policy composition

We also find that the composition of fiscal expansion – how it is distributed as current spending, investment spending, or tax cuts – matters (Table 5). Higher public consumption – government purchases of goods and services and wages – and lower income taxes shorten the duration of financial crises. For example, a 10 per cent increase in the share of public consumption in the budget reduced the crisis length by three to four months more than would have larger fiscal deficits alone. The same cannot be said for capital expenditures. Why? We believe that implementing capital projects generally takes longer than directly injecting demand through

[5] See Laeven and Valencia (2008) for the derivation of these variables.

Table 4

Fiscal Policy, Resolution Policies and Crisis Length

Item	Duration (OLS)		Duration (Ord.Logit)	
	Model 1	Model 2	Model 3	Model 4
Budget Balance *(percent of GDP)*	0.072***	-	0.122***	-
	(3.73)	-	(3.22)	-
Expansionary fiscal policy	-	–0.626***	-	–1.023***
	-	(–2.86)	-	(–2.62)
Previous credit boom	0.690***	0.637***	1.036***	0.927**
	(3.40)	(3.04)	(2.82)	(2.53)
Deposit freeze or guarantee	–0.522**	–0.610***	–0.814**	–0.806**
	(–2.53)	(–2.94)	(–2.25)	(–2.23)
Number of banks closed	–0.168***	–0.165***	–0.519***	–0.496***
	(–3.53)	(–3.37)	(–4.91)	(–4.72)
Government intervention	–0.721***	–0.825***	–1.207***	–1.329***
	(–3.52)	(–3.94)	(–3.12)	(–3.46)
Constant	3.514***	3.876***	-	-
	(14.76)	(14.31)	-	-
Observations	118	118	118	118
Adj. R-squared / Pseudo R-squared	0.435	0.407	0.211	0.198

*** significant at 1 percent; ** significant at 5 per cent; * significant at 10 per cent.
Dependent variable: length of banking crisis.
Source: Authors' estimates.

government purchases of goods and services. This picture seems consistent with the pace of disbursement of current fiscal packages. Tax cuts and increases in government consumption and transfers were implemented rapidly in many G-20 economies. However, procedures for budget allocation, transfers to subnational governments, procurement and payments to contractors slowed down the disbursement of some capital projects (Horton, Kumar and Mauro, 2009).

The composition of tax measures is also important: cutting consumption taxes was more effective than cutting income taxes. That is because cuts in levies such as a value added or sales taxes quickly stimulate private consumption while income tax reductions can in part be saved. Consumption tax cuts help support domestic demand particularly when dropping asset values, income losses and rising unemployment dent households' ability to spend.

Other factors played a significant role. Crises that were preceded by a credit boom tended to last longer. Those in which a guarantee for bank deposits was provided (or expanded) by the government were shorter than crises in which governments did not provide this financial safety net. Closing failed banks and a strong government intervention in financial markets was also beneficial to resolving crises in the last three decades.

The analysis also found that how fiscal expansion is constructed affects whether it creates conditions that promote economic growth five years after a crisis (Table 6). Fiscal responses that had a greater share of public investment may not have helped shorten the recessions as much as

Table 5

Fiscal Policy Composition, Resolution Policies and Crisis Length

Item	Duration of Crisis (OLS)				Duration of Crisis (Ord. Logit)			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Expansionary fiscal policy	–0.522**	–0.572**	–0.581**	–0.601**	–0.945**	–0.974**	–0.937**	–1.049**
	(–2.45)	(–2.61)	(–2.74)	(–2.85)	(–2.41)	(–2.48)	(–2.39)	(–2.67)
Public consumption *(percent of total expenditures)*	–0.035***				–0.041**			
	(–3.12)				(–2.11)			
Public investment *(percent of total expenditures)*		–0.027*				–0.027		
		(–1.82)				(–1.13)		
Income tax revenue *(percent of total revenues)*			0.076***				0.111**	
			(3.07)				(2.31)	
Goods & services tax revenue *(percent of total revenues)*				0.119***				0.180**
				(3.19)				(2.71)
Previous credit boom	0.568**	0.621**	0.590**	0.592**	0.874**	0.936**	0.927**	0.960**
	(2.80)	(2.99)	(2.91)	(2.93)	(2.37)	(2.55)	(2.51)	(2.58)
Deposit freeze or guarantee	–0.555**	–0.563**	–0.461**	–0.568**	–0.782**	–0.752**	–0.664*	–0.803**
	(–2.76)	(–2.72)	(–2.24)	(–2.84)	(–2.16)	(–2.06)	(–1.81)	(–2.20)
Number of banks closed	–0.137**	–0.152***	–0.143**	–0.135**	–0.459***	–0.480***	–0.449***	–0.440***
	(2.86)	(–3.09)	(–2.99)	(–2.82)	(–4.31)	(–4.54)	(–4.24)	(–4.15)
Government intervention	–0.713***	–0.781***	–0.841***	–0.837***	–1.244***	–1.304***	–1.386***	1.408***
	(–3.48)	(–3.74)	(–4.16)	(–4.16)	(–3.21)	(–3.38)	(–3.56)	(–3.61)
Constant	3.737***	3.854***	3.917***	3.731***				
	(14.12)	(14.36)	(14.98)	(14.12)				
Observations	118	118	118	118	118	118	118	118
Adj. *R*-squared / Pseudo *R*-squared	0.451	0.419	0.449	0.452	0.211	0.202	0.213	0.219

*** significant at 1 percent; ** significant at 5 per cent; * significant at 10 per cent.
Dependent variable: length of banking crisis.

Table 6

Fiscal Policy Composition, Resolution Policies and Post-crisis Growth

Item	Average Growth (*t*–*t*+5) OLS)				Average Growth (*t*–*t*+5) (Robust)			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Expansionary fiscal policy	0.262	0.251	0.144	0.218	0.262	0.251	0.144	0.218
	(0.38)	(0.40)	(0.21)	(0.34)	(0.39)	(0.45)	(0.2)	(0.36)
Public consumption *(percent of total expenditures)*	–0.010				–0.010			
	(–0.28)				(–0.36)			
Public investment *(percent of total expenditures)*		0.229***				0.229***		
		(4.94)				(4.98)		
Income tax revenue *(percent of total revenues)*			–0.177**				–0.177**	
			(–2.20)				(–2.48)	
Goods & services tax revenue *(percent of total revenues)*				0.402***				0.402***
				(3.44)				(3.57)
Previous credit boom	0.033	0.242	0.183	–0.101	0.033	0.242	0.183	–0.101
	(0.05)	(0.40)	(0.28)	(–0.16)	(0.05)	(0.45)	(0.30)	(–0.17)
Deposit freeze or guarantee	1.413**	0.895	1.030	1.529**	1.413**	0.895	1.030	1.529**
	(2.18)	(1.47)	(1.54)	(2.42)	(2.19)	(1.68)	(1.62)	(2.51)
Number of banks closed	0.181	0.094	0.129	0.279*	0.181	0.094	0.129	0.279**
	(1.15)	(0.67)	(0.84)	(1.85)	(1.49)	(0.93)	(1.07)	(2.45)
Government intervention	0.450	–0.004	0.449	0.353	0.450	–0.004	0.449	0.353
	(0.67)	(0.01)	(0.69)	(0.56)	(0.67)	(0.01)	(0.71)	(0.58)
Private investment *(percent of total investment)*	7.530**	4.803*	7.220**	6.557*	7.530**	4.803**	7.220***	6.557***
	(2.50)	(1.75)	(2.47)	(2.31)	(2.76)	(2.14)	(2.87)	(3.14)
Cost of financing (a)	–0.121***	–0.074**	–0.109**	–0.122***	–0.121**	–0.074	–0.109**	–0.122**
	(–2.87)	(–1.95)	(–2.71)	(–3.13)	(–1.81)	(–1.20)	(–1.71)	(–1.99)
Fresh capital injections into financial sector	1.453**	0.866	1.246**	1.415**	1.453**	0.866	1.246**	1.415**
	(2.18)	(1.43)	(1.92)	(2.27)	(2.02)	(1.52)	(1.91)	(2.22)
Constant	1.486	2.145**	1.541*	1.149	1.486	2.145**	1.541*	1.149
	(1.57)	(2.56)	(1.71)	(1.31)	(1.44)	(2.44)	(1.60)	(1.25)
Observations	118	118	118	118	118	118	118	118
Adj. R-squared	0.142	0.299	0.178	0.226	0.208	0.353	0.241	0.286

*** significant at 1 percent; ** significant at 5 per cent; * significant at 10 per cent.
Dependent variable: average GDP growth in the 5 years following the end of the crisis.
Note (a): the cost of financing variable is the difference between the lending interest rates and the interbank interest rates.
Source: authors' estimates.

consumption spending but had a positive effect on output growth in the medium term. A 1 percent increase in the share of capital outlays in the budget raised post-crisis growth by about 1/3 of 1 percent per year in our regression analysis of crisis episodes. It appears that capital investment promotes medium-term growth by removing infrastructure bottlenecks and by enhancing private sector competitiveness. Income tax reductions were also associated with positive growth effects. Trimming income taxes removed distortions that hurt long-run economic performance.

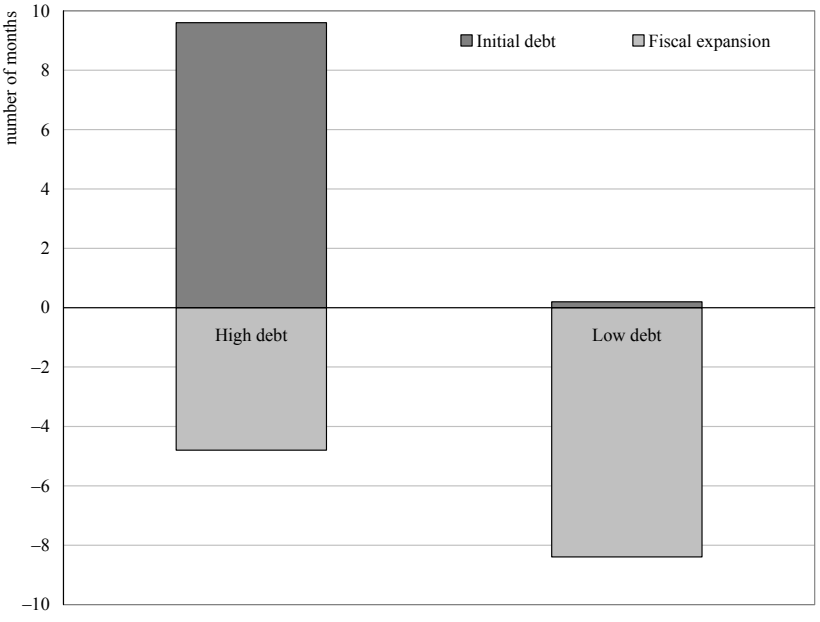
These results highlight the potential trade off between fiscal policy's role in supporting aggregate demand in the short term and its contribution to productivity growth in the medium term. They point to the need to evaluate the composition of fiscal stimulus packages before their implementation, as different short-term and medium-term fiscal multipliers can affect fiscal policy performance during the crisis and in its aftermath.

6 Fiscal policy and debt sustainability

However, insufficient fiscal space – that is, the capacity to spend more – and concerns about the sustainability of public debt along with low initial per capita income can limit the effectiveness of fiscal expansions during crises (Tables 7-10). The lack of fiscal space in countries with high public sector debt-to-GDP ratios before the crisis not only constrains the government's ability to implement countercyclical policies, but also undermines the effectiveness of fiscal stimulus and the quality of fiscal performance. For example, in countries with relatively high debt, crises lasted almost one year longer; the beneficial effects of fiscal expansions were negated by the high public debt. Our simulation (Figure 3) shows that high initial levels of public debt make it more difficult to exit a crisis and also limit the ability of expansionary fiscal policy to support output growth. Similar results are found for countries with lower per capita income, because those nations' limited fiscal space, lower technical capacity to implement fiscal stimulus plans and higher exposure to macroeconomic risks, including to external shocks, reduce the scope and the effects of fiscal expansions during crises.

Figure 3

Impact of Fiscal Expansions on Crisis Length by Level of Debt



Source: Author's calculations.

7 Robustness

The robustness of the above results has been assessed to control for alternative definitions of crisis' length, index of discretionary fiscal policy and endogeneity. In the baseline model, the

Table 7

Explaining Crisis Length Controlling for Initial Fiscal Conditions

Item	Duration of Crisis (OLS)			
	Model 1	**Model 2**	**Model 3**	**Model 4**
Expansionary fiscal policy	–0.676**	–0.907***	–0.791**	–0.947***
	(–2.20)	(–2.92)	(–2.55)	(–3.13)
Expansionary fiscal policy* Highly Indebted (*t*–1)	0.273	0.564	0.397	0.522
	(0.66)	(1.33)	(0.95)	(1.26)
Public consumption *(percent of total expenditure)*	–0.055***			
	(–3.22)			
Public consumption* Highly Indebted (*t*–1)	0.019			
	(0.84)			
Public investment *(percent of total expenditure)*		–0.029*		
		(1.91)		
Public Investment* Highly Indebted (*t*–1)		–0.010		
		(–0.34)		
Income tax revenue *(percent of total revenues)*			0.110**	
			(2.72)	
Income tax revenue* Highly Indebted (*t*–1)			–0.064	
			(–1.26)	
Goods & services tax revenue *(percent of total revenues)*				0.090*
				(1.88)
Goods &services tax revenue * Highly Indebted (*t*–1)				0.057
				(0.71)
Previous Credit boom	0.420**	0.549**	0.531**	0.504**
	(2.03)	(2.60)	(2.53)	(2.42)
Deposit freeze or guarantee	–0.628***	–0.619***	–0.559***	–0.651***
	(–3.15)	(–2.93)	(–2.63)	(–3.15)
Number of banks closed	–0.145***	–0.162***	–0.157***	–0.145***
	(–3.10)	(3.31)	(–3.28)	(2.96)
Government intervention	–0.737***	–0.801***	–0.876***	–0.896***
	(3.62)	(–3.78)	(–4.25)	(–4.33)
Highly Indebted (*t*–1)	0.798**	0.837**	0.844***	0.672**
	(2.52)	(2.48)	(2.54)	(1.99)
Constant	3.877***	3.907***	3.932***	3.843***
	(11.17)	(10.86)	(11.12)	(11.15)
Observations	118	118	118	118
Adj. *R*-squared	0.503	0.453	0.475	0.471

Table 8

Explaining Crisis Length Controlling for Initial Economic Conditions

Item	Duration of Crisis (OLS)			
	Model 1	**Model 2**	**Model 3**	**Model 4**
Expansionary fiscal policy	–0.676**	–0.907***	–0.791**	–0.947***
	(–2.20)	(–2.92)	(–2.55)	(–3.13)
Expansionary fiscal policy* High GDP per Capita (*t*–1)	–0.876**	–0.805***	–0.881***	–0.987***
	(–2.39)	(–3.12)	(–2.99)	(–3.63)
Public consumption *(percent of total expenditure)*	–0.075***			
	(–3.42)			
Public consumption* High GDP per Capita (*t*–1)	0.122***			
	(4.84)			
Public investment *(percent of total expenditure)*		–0.129*		
		(1.92)		
Public Investment* High GDP per Capita (*t*–1)		–0.210***		
		(–2.94)		
Income tax revenue *(percent of total revenues)*			0.122**	
			(2.72)	
Income tax revenue* High GDP per Capita (*t*–1)			–0.264***	
			(–3.26)	
Goods & services tax revenue *(percent of total revenues)*				0.190*
				(1.98)
Goods & services tax revenue * High GDP per Capita (*t*–1)				0.157**
				(2.71)
Previous Credit boom	0.411**	0.439**	0.331**	0.404**
	(2.33)	(2.60)	(2.63)	(2.32)
Deposit freeze or guarantee	–0.618***	–0.619***	–0.629***	–0.621***
	(–3.15)	(–3.02)	(–3.63)	(–3.45)
Number of banks closed	–0.155***	–0.156***	–0.158***	–0.155***
	(–3.14)	(3.39)	(–3.29)	(2.97)
Government intervention	–0.707***	–0.802***	–0.872***	–0.825***
	(3.63)	(–3.79)	(–4.15)	(–4.13)
High GDP per capita (*t*–1)	–0.345***	–0.322***	–0.455***	–0.667***
	(–3.02)	(–4.07)	(–4.19)	(–4.31)
Constant	3.017***	3.008***	3.032***	3.033***
	(11.87)	(11.86)	(11.02)	(11.22)
Observations	118	118	118	118
Adj. *R*-squared	0.501	0.471	0.462	0.485

Table 9

Explaining Post-Crisis Growth Controlling for Initial Fiscal Conditions

Item	Average Growth (*t*–*t*+5) (OLS)			
	Model 1	**Model 2**	**Model 3**	**Model 4**
Expansionary fiscal policy	0.363	0.563	0.032	0.201
	(0.44)	(0.86)	(0.14)	(0.29)
Expansionary fiscal policy* Highly Indebted (*t*–1)	–0.845	–0.042	–0.448	–0.772
	(–0.76)	(–0.05)	(–0.43)	(–0.81)
Public consumption *(percent of total expenditure)*	(–0.020)			
	(–0.42)			
Public consumption* Highly Indebted (*t*–1)	0.017			
	(0.27)			
Public investment *(percent of total expenditure)*		0.259***		
		(5.94)		
Public Investment* Highly Indebted (*t*–1)		–0.071		
		(–1.02)		
Income tax revenue *(percent of total revenue)*			–0.237**	
			(–2.28)	
Income tax revenue* Highly Indebted (*t*–1)			0.028	
			(0.22)	
Goods & services tax revenue *(percent of total revenue)*				0.558***
				(4.94)
Goods & services tax revenue * Highly Indebted (*t*–1)				–0.407**
				(2.07)
Previous Credit boom	0.023	0.421	0.466	0.204
	(0.41)	(0.89)	(0.86)	(0.40)
Deposit freeze or guarantee	1.140**	0.631	0.633	1.010
	(2.03)	(1.33)	(1.15)	(2.01)
Number of banks closed	0.187	0.104	0.129	0.320**
	(1.43)	(0.96)	(1.05)	(2.69)
Government intervention	0.063	0.349	0.067	0.146
	(0.11)	(0.74)	(0.13)	(0.29)
Private Investment *(percent of total investment)*	6.647**	3.755*	5.919**	5.220**
	(2.60)	(1.74)	(2.44)	(2.30)
Cost of financing (a)	–0.069**	–0.018	–0.053	–0.059*
	(–1.90)	(–0.59)	(–1.59)	(1.89)
Fresh capital injections into financial sector	0.955*	0.417	0.787	0.612
	(1.68)	(0.88)	(1.45)	(1.22)
Highly Indebted (*t*–1)	–0.188	–0.301	–0.014	–0.965
	(–0.22)	(–0.50)	(.0.02)	(–1.23)
Constant	2.621**	3.332**	2.701**	2.774***
	(2.55)	(3.95)	(2.63)	(3.10)
Observations	112	112	112	112
Adj. *R*-squared	0.298	0.353	0.262	0.342

Table 10

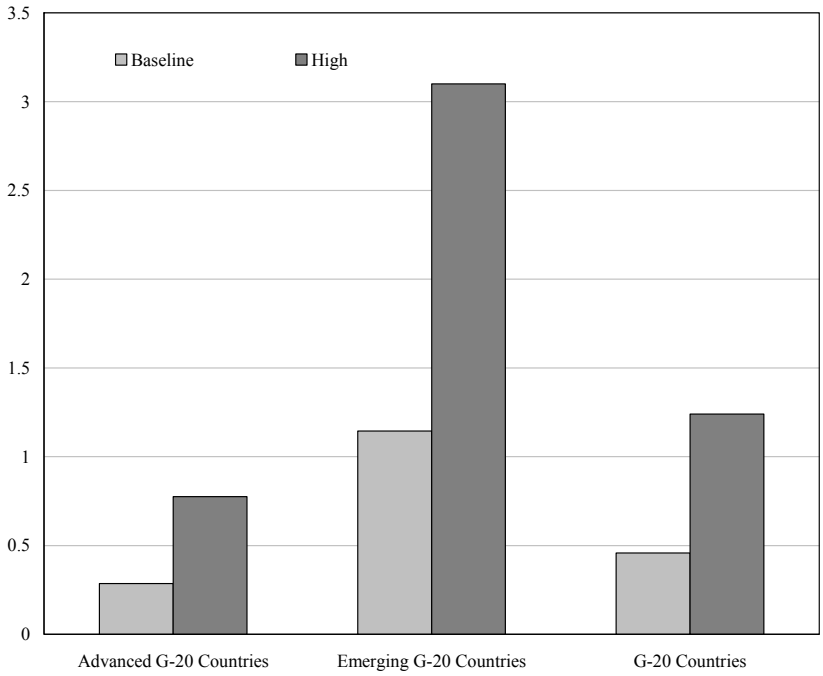
Explaining Post-Crisis Growth Controlling for Initial Economic Conditions

Item	Average Growth (*t*–*t*+5) (OLS)			
	Model 1	**Model 2**	**Model 3**	**Model 4**
Expansionary fiscal policy	0.163	0.463	0.132	0.241
	(0.64)	(0.36)	(0.44)	(0.39)
Expansionary fiscal policy* High GDP per Capita (*t*–1)	0.545*	0.442	0.456	0.572*
	(1.86)	(1.55)	(1.34)	(1.91)
Public consumption *(percent of total expenditure)*	–0.234			
	(–0.52)			
Public consumption* High GDP per Capita (*t*–1)	0.117*			
	(1.57)			
Public investment *(percent of total expenditure)*		0.259***		
		(5.94)		
Public Investment* High GDP per Capita (*t*–1)		0.371***		
		(6.52)		
Income tax revenue *(percent of total revenue)*			–0.037	
			(–0.88)	
Income tax revenue* High GDP per Capita (*t*–1)			0.028***	
			(2.22)	
Goods & services tax revenue *(percent of total revenue)*				0.358***
				(4.94)
Goods & services tax revenue * High GDP per Capita (*t*–1)				0.407***
				(5.07)
Previous Credit boom	0.123	0.321	0.326	0.324
	(0.51)	(0.92)	(0.89)	(0.60)
Deposit freeze or guarantee	0.610**	0.631	0.637	0.910*
	(2.03)	(1.53)	(1.56)	(2.01)
Number of banks closed	0.227	0.214	0.219	0.213**
	(1.43)	(0.96)	(1.05)	(2.69)
Government intervention	0.333	0.359	0.337	0.316
	(0.14)	(0.75)	(0.17)	(0.19)
Private Investment *(percent of total investment)*	4.647**	3.701*	5.034**	5.330**
	(2.64)	(1.94)	(2.24)	(2.20)
Cost of financing (a)	–0.089**	–0.088	–0.083	–0.089*
	(–2.90)	(–1.59)	(–1.62)	(1.99)
Fresh capital injections into financial sector	0.905*	0.407	0.707*	0.602*
	(1.98)	(0.98)	(1.95)	(1.92)
High GDP per capita (*t*–1)	0.237*	0.215*	0.219*	0.233**
	(1.86)	(1.96)	(2.05)	(2.71)
Constant	2.600**	3.302**	2.700**	2.704***
	(2.56)	(3.99)	(2.69)	(3.19)
Observations	112	112	112	112
Adj. *R*-squared	0.382	0.397	0.363	0.373

end of the banking crises is registered when output growth resumes. However, this definition may be inappropriate if the banking sector problems are resolved quickly, but GDP growth lags. As an alternative, the end of the crisis is defined as the first year in which the stock market index returns to its precrisis level. Under this definition, episodes' duration is shorter than in the baseline. Results are robust to alternative definitions of duration.[6]

Figure 4

Impact of the Fiscal Stimulus Composition on Post-crisis Growth
(percent)



Source: Author's calculations.

The index of fiscal expansion used in the baseline model is incapable of differentiating between fiscal expansions which are discretionary and those which are the unintended result of a dramatic collapse of GDP growth. We calculated an indicator of discretionary fiscal policy.[7] Results are are consistent with the baseline. Finally, we controlled for potential endogeneity between crisis duration and fiscal policy: Since fiscal policy and output growth are correlated, baseline results could be biased as GDP growth enters the definition of crisis length. In order to control for this factor, we used a Two-Stage Least Square (TSLS) estimator, employing all other independent variables and a measure of liquidity support as instruments. Results confirm that the main findings hold.

8 Conclusion

This paper has assessed the effects of fiscal policy response during 118 episodes of systemic banking crisis in advanced and emerging market countries during 1980-2008. The results show that timely countercyclical fiscal measures can help shorten the length of crisis episodes by stimulating aggregate demand. Fiscal expansions based on measures to support government consumption are more effective than those based on public investment or income tax cuts. But these results do not

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6 The details are available in Baldacci, Gupta, and Mulas-Granados (2009).

7 We take the value of the primary surplus which would have prevailed, were unemployment at the same value as in the previous year, minus the value of the primary surplus in the previous year. Both variables are expressed as a percent of GDP. When this change was greater than –1.5 per cent of GDP, we labeled the year as a fiscal expansion (value 1), and zero otherwise.

hold for countries with limited fiscal space where fiscal expansions are prevented by funding constraints or limited access to markets. The composition of countercyclical fiscal responses matters also for post-crisis growth recovery, with public investment yielding the strongest impact on growth. These results suggest a potential trade off between short-run aggregate demand support and medium-term productivity growth objectives in fiscal stimulus packages adopted in distress times.

They also suggest that fiscal stimulus packages by G-20 countries may have reduced crisis length by up to one year and could have stimulated post-crisis growth by up 1 percent of GDP, compared to a scenario where fiscal policy response was not implemented. Figure 4 shows that based on the composition of the fiscal stimulus implemented by G-20 countries in 2009 and the regression results presented in the paper, post-crisis real growth rate could be higher by almost ½ percentage point for these countries. Results can be larger for emerging market economies that devoted a higher share of the stimulus to infrastructure. In these countries, the baseline impact is estimated at more than 1 percent, compared to less than ¼ of one percent in advanced economies that made larger use of tax cuts and increases in transfers. These results are higher if one uses the regression coefficients for countries with low initial fiscal vulnerabilities and high per capita income as discussed in the previous sections.

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