

































emerging countries, given the differences in their respective structural characteristics. Estimations reported in Table 10 show that this is indeed the case: although fiscal consolidations significantly reduce the  $GI/GC$  ratio in both OECD and non-OECD countries, the magnitude of the estimated coefficient can be up to four times higher in the latter group of countries (for example, if we compare columns 3 and 6). This may be related to a stronger political instability in non-OECD countries, making governments not to take electoral risks associated with cutting consumption spending.

### 6.3 Crises

In addition to the fiscal and economic conditions, the decision of governments to implement fiscal consolidations may be determined by the occurrence of crises. We consider five types of crises, namely debt, banking, inflation, currency, and stock market crises, and we are interested in fiscal consolidation episodes that occur between one and four years after the beginning of a crisis. Results reported in column (1) of Table 11 show that fiscal consolidations arising after a crisis significantly reduce the  $GI/GC$  ratio. This overall significant effect is driven by a significant effect of consolidations following stock market crises (column 6), and particularly debt crises (column 2). Indeed, debt and stock market crises put a high pressure on the fiscal balance and increase the risk of a systemic crisis; our results show that the required fiscal space is achieved by a stronger cut in public investment compared with public consumption. Finally, fiscal consolidations occurring after the beginning of banking, inflation, or currency crises were not found to significantly affect the  $GI/GC$  ratio, which may illustrate the fact that the policies required during these crises rest relatively less on government funds.

## 7 The sub-components of government consumption

So far, we focused on aggregate government consumption ( $GC$ ) spending. We now investigate the effects of fiscal consolidations on disaggregated  $GC$  components, expressed in ratio of GDP. First, public wages ( $WAGE$ ) measure the remuneration of public sector employees, and their consolidation may affect the welfare of the population. Second, transfers & subsidies ( $SUB$ ) act as a distributional tool of national income, and their consolidation may affect population's living standards, and particularly the poor population. Third, health spending ( $HEALTH$ ) are related to the healthcare system and social protection. Finally, education spending ( $EDUC$ ) support the development of human capital, and may influence potential economic growth.

Using these variables we look both at the level and the composition effect. Regarding the level effect, Table 12 shows that the decrease of the  $GC$  ratio emphasized in our baseline analysis is mainly driven by the contraction of health and education government spending. On the contrary, fiscal consolidations lead to an increase in public wages, while transfers & subsidies are not significantly affected. Regarding the composition effect, Table 13 shows that the decline in  $GI$  is stronger than the contraction of public wages, education, and health government spending, corroborating our previous results based on aggregate measures of  $GC$ . However, fiscal consolidations are found to increase the ratio between  $GI$  and transfers & subsidies, suggesting a strong decline of the latter, relatively more important than the decline of the former.



Table 11 – The effects of fiscal consolidations on the GI/GC ratio: crises

	(1)	(2)	(3)	(4)	(5)	(6)
$\frac{GI_{it-1}}{GC_{it-1}}$	0.811*** (0.179)	0.790*** (0.053)	0.932*** (0.085)	0.816*** (0.108)	0.817*** (0.129)	0.834*** (0.075)
$CONS_{it}$	-0.419** (0.196)					
$CONS^{DC}$		-0.952** (0.464)				
$CONS^{BC}$			-0.116 (0.387)			
$CONS^{IC}$				0.159 (0.800)		
$CONS^{CC}$					0.071 (0.312)	
$CONS^{SM}$						-0.400** (0.197)
$N$	1151	1151	1151	1151	1151	1151
groups	48	48	48	48	48	48
$N_{instr}$	19	17	19	19	19	20
AR(1)	0.003	0.000	0.000	0.001	0.001	0.000
AR(2)	0.806	0.973	0.646	0.757	0.800	0.628
Hansen	0.685	0.566	0.327	0.599	0.474	0.397

Standard errors are in brackets. Regressions are based on the Blundell-Bond estimator. Lagged  $GI/GC$  is predetermined, lagged debt, government stability and IMF program are exogenous, and the remaining covariates are endogenous.  $CONS^{DC}$ ,  $CONS^{BC}$ ,  $CONS^{IC}$ ,  $CONS^{CC}$ , and  $CONS^{SM}$  design fiscal adjustments occurring within 1 to 4 years after the starting of sovereign debt, banking, inflation, currency, and stock market crises, respectively.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 12 – The effect of fiscal consolidations on the GC sub-components (in GDP ratio)

	(1)	(2)	(3)	(4)
	<i>WAGE</i>	<i>SUB</i>	<i>HEALTH</i>	<i>EDUC</i>
<i>Dep_Var<sub>it-1</sub></i>	0.673*** (0.057)	0.582*** (0.076)	0.909*** (0.120)	0.525*** (0.103)
<i>CONS<sub>it</sub></i>	0.094** (0.044)	0.011 (0.120)	-0.099*** (0.035)	-0.039** (0.018)
<i>N</i>	457	461	451	417
groups	41	41	41	41
<i>N_instr</i>	30	24	33	25
AR(1)	0.054	0.024	0.001	0.043
AR(2)	0.647	0.822	0.358	0.410
Hansen	0.557	0.587	0.136	0.282

Standard errors are in brackets. Regressions are based on the Blundell-Bond estimator. Lagged *Dep\_Var<sub>t-1</sub>* is predetermined, lagged debt, government stability and IMF program are exogenous, and the remaining covariates are endogenous. For each sub-component, we also control by the other sub-components of government consumption.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 13 – The effect of fiscal consolidations on the ratio GI/GC-sub-components

	(1)	(2)	(3)	(4)
	<i>GI_WAGE</i>	<i>GI_SUB</i>	<i>GI_HEALTH</i>	<i>GI_EDUC</i>
<i>DepVar<sub>it-1</sub></i>	0.778*** (0.098)	0.490*** (0.013)	0.997*** (0.017)	0.769*** (0.045)
<i>CONS<sub>it</sub></i>	-0.864* (0.479)	13.676** (6.804)	-0.655** (0.273)	-0.808** (0.400)
<i>N</i>	167	223	732	711
groups	17	17	48	48
<i>N_instr</i>	16	16	26	29
AR(1)	0.107	0.266	0.036	0.020
AR(2)	0.320	0.594	0.274	0.599
Hansen	0.312	0.681	0.318	0.415

Standard errors are in brackets. Regressions are based on the Blundell-Bond estimator. Lagged *Dep\_Var<sub>t-1</sub>* is predetermined, lagged debt, government stability and IMF program are exogenous, and the remaining covariates are endogenous.

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 8 Conclusion

Existing studies emphasize a negative effect of fiscal consolidations on government investment and consumption as ratios of GDP (Balassone and Franco (1999); Castro (2017); De Haan et al. (1996); Jonakin and Stephens (1999); Turrini (2004); Väililä and Mehrotra (2005)). This paper looked at the effect of fiscal consolidations on the ratio between government investment and consumption. System-GMM estimations performed on a sample of 53 developed and emerging countries during the period 1980-2011 revealed that the contraction of government investment is more important than that of government consumption, i.e. a *composition* effect is at work, robust to a wide range of alternative specifications.

Given the large impact of both government consumption and investment on the economy documented by the existing literature, we investigated more in detail this composition effect. In particular, we found that public investment may be particularly affected by fiscal consolidations (i.e. its contraction may be stronger than that of public consumption) when debt is high, for spending-based fiscal consolidations, in the low phase of the economic cycle, and following debt and stock market crises. Consequently, our findings suggest that caution should be at work in such contexts, during which fiscal consolidations aimed at short-run stabilization may hurt the economy in the long-run through their detrimental effect on public investment. Future work could be devoted to exploring possible mechanisms in the design of fiscal consolidations that may allow avoiding such undesirable consequences.

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Table 14 – Episodes of fiscal consolidations

Countries	Adjustment periods	number
Argentina	1984-1985; 1991-1993; 2002-2004	3
Australia	1983-1988; 1993-1997	2
Austria	1996-1997; 2000-2001	2
Belgium	1984-1987; 1993-1995	2
Bolivia	2003-2006	1
Brazil	1999-2000	1
Bulgaria	2000-2001; 2010-2011	2
Canada	1981-1982; 1990-1997	2
Chile	1987-1989; 1994-1995; 2003-2006; 2010-2011	4
China	2004-2007	1
Colombia	1985-1987; 2000-2001; 2003-2004	3
Costa Rica	1981-1982; 1991-1992; 1995-1997	3
Denmark	1983-1986; 2003-2005	2
Dominican Republic	2004-2007	1
Finland	1984-1985; 1988-1989; 1993-1994; 1996-1998	4
France	1994-1999 ; 2010-2011	2
Germany	1982-1985; 1996-2000; 2004-2007	3
Greece	1986-1987; 1990-1991; 2005-2006	3
Honduras	1985-1989, 1995-1996; 2003-2004	3
Hong kong	2006-2007; 2009-2010	2
Hungary	1999-2000; 2003-2004; 2007-2008	3
Iceland	1990-1992; 2004-2006	2
Indonesia	1989-1990	1
Iran	2003-2004	1
Ireland	1986-1989	1
Israel	1993-1995; 1997-2000; 2004-2007	3
Italy	1982-1983; 1988-1992; 1995-1997; 2006-2007	4
Japan	1981-1987	1
Mexico	1983-1984; 1986-1989	2
Netherlands	1981-1985; 2004-2006	2
New Zealand	1985-1988; 1992-1995; 2000-2005	3
Nicaragua	1991-1992; 1997-1998; 2010-2011	3
Norway	1981-1985; 1988-1990; 1993-1996; 1999-2000; 2004-2006	5
Pakistan	1988-1990 ;1993-1994; 1998-1999; 2006-2007	4
Panama	1985-1986; 1989-1990; 2005-2007	3
Paraguay	1985-1986; 1989-1990; 1993-1994; 2003-2004	4
Peru	1984-1985; 1988-1989; 2004-2007; 2010-2011	4
Portugal	1981-1984; 2002-2003; 2006-2007; 2010-2011	4
Romania	1997-1998; 2010-2011	2
Russia	2003-2005; 2010-2011	2
South Africa	1994-1995; 1998-1999; 2004-2007	3
South Korea	1995-2000	1
Spain	1983-1988; 2010-2011	2
Sweden	1981-1987; 1993-1998; 2004-2005	3
Switzerland	1992-1996; 2005-2006	2
Turkey	1981-1983; 1994-1995; 1998-1999; 2002-2005	4
United Kingdom	1981-1986 ; 1995-2000; 2010-2011	3
United States	1981-1982	1
Uruguay	1985-1986; 1990-1991; 2000-2005	3
Venezuela	2002-2005	1
	Total	123



Table 15 – Description of the variables

<b>Variables</b>	<b>Descriptions</b>	<b>Sources</b>
<b>GI</b>	Public investment in % of GDP	Authors' estimations based on (IMF, 2017)
<b>GC</b>	Current spending in % of GDP	Authors' estimations based on (IMF, 2017)
<b>CONS</b>	Change in CAPB in fiscal consolidation stance and zero otherwise	Authors' estimations
<b>DEBT</b>	Total debt in % of GDP	Mauro et al. (2015)
<b>GROWTH</b>	Real GDP growth rate	World Development Indicators
<b>IPRIV</b>	Private investment in % of GDP	(IMF, 2017)
<b>FDI</b>	Foreign direct investment in % of GDP	World Development Indicators
<b>AID</b>	Total aid in % of GNI	World Development Indicators
<b>REMIT</b>	Remittances in % du GDP	World Development Indicators
<b>TRADE</b>	Imports plus exports in % du GDP	World Development Indicators
<b>TOT</b>	Terms of trade in % du GDP	World Development Indicators
<b>POP<sub>r</sub></b>	Population growth	World Development Indicators
<b>POP65</b>	Share of population with 65 years old and above in % of total population	World Development Indicators
<b>URB</b>	Share of urban population in % of total population	World Development Indicators
<b>LPOP</b>	Logarithm of total population number	World Development Indicators
<b>EXECL</b>	Dummy variable equal to 1 if it is a left-wing government and zero otherwise	World Development Indicators
<b>PCOL</b>	Dummy variable equal to 1 if legislature and government are led by different parties and zero otherwise	World Development Indicators
<b>EXELEC</b>	Dummy variable equal to 1 in the electoral period and zero otherwise	World Development Indicators
<b>IMFP</b>	Dummy variable equal to 1 if the country is under IMF program and zero otherwise	World Development Indicators
<b>NATR</b>	Natural resources to GDP ratio	World Development Indicators
<b>CONS_L</b>	Interactive term between fiscal consolidations and the left-wing government dummy	Authors' estimations

Table 16 – Summary statistics

	count	mean	sd	min	max
<b>GI</b>	1455	4.1	2.5	0.2	21.9
<b>GC</b>	1333	16.2	4.8	3.0	43.5
<b>GI/GC</b>	1333	28.7	22.2	1.4	203.7
<b>CONS</b>	1393	0.5	1.1	0	13.5
<b>TRADE</b>	1340	63.4	31.7	11.5	190.1
<b>IPRIV</b>	1455	15.8	5.5	0.4	36.2
<b>REMIT</b>	1250	1.2	2.3	0.0	21.6
<b>AID</b>	609	1.7	4.8	-0.7	72.1
<b>GROWTH</b>	1449	3.2	3.5	-13.4	18.3
<b>DEBT</b>	1438	54.9	32.6	4.1	231.0
<b>NATR</b>	1451	2.6	4.3	0	33.8

Table 17 – The effect of fiscal consolidations on the GI/GC ratio: other controls

	(1)	(2)	(3)	(4)	(5)	(6)
$\frac{GI_{it-1}}{GC_{it-1}}$	0.822*** (0.202)	0.830*** (0.122)	0.717*** (0.085)	0.824*** (0.043)	0.788*** (0.031)	0.728*** (0.092)
$CONS_{it}$	-0.408** (0.200)	-0.815*** (0.305)	-0.515*** (0.150)	-0.800*** (0.242)	-0.436** (0.221)	-0.508*** (0.153)
$FDI$	0.020 (0.031)					
$AID$		0.191*** (0.047)				
$DEBT_{it-1}$			-0.019 (0.018)	-0.002 (0.015)	-0.009 (0.020)	-0.018 (0.018)
$TOT$			0.394*** (0.055)			0.384*** (0.069)
$PCOL$				0.747 (0.588)	1.059* (0.629)	
$EXECL$				-0.431 (0.425)	-0.366 (0.425)	
$EXELEC$				-0.310 (0.852)	0.038 (0.711)	
$CONS\_L$				0.646** (0.294)		
$GROWTH$						0.098 (0.076)
$NATR$						0.148 (0.226)
$N$	1254	528	1191	982	982	1191
groups	48.000	22.000	47.000	41.000	41.000	47.000
$N\_instr$	10.000	8.000	11.000	14.000	20.000	15.000
$AR(1)$	0.006	0.002	0.000	0.001	0.001	0.001
$AR(2)$	0.307	0.373	0.358	0.037	0.027	0.312
Hansen	0.360	0.455	0.732	0.609	0.171	0.865

Standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$