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The impact of fiscal consolidations on the functional components of government expenditures☆

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ABSTRACT

This paper analyses how the functional components and sub-components of government expenditures are affected by fiscal consolidations. A fixed-effects estimator is employed over a panel of 15 European Union countries during the period 1990–2012. The results show that spending on public services increases during fiscal consolidations, while spending on defence, public order, health, education and social protection is significantly cut. A more disaggregated analysis proves that fiscal consolidations are harmful for important social expenditures, in particular, for those related to citizens' safety, health assistance, social protection and investment in human capital. This evidence is even stronger in a particular group of countries, known in the literature as PIIGS. Hence, fiscal consolidations can have important implications on the living standards of the more economically vulnerable citizens.

1. Introduction

The consolidation efforts observed in several countries have motivated academics to analyse the characteristics and the empirical determinants of fiscal consolidation programmes. The rising of public deficits and debts in the aftermath of the recent Great Recession have revived the interest on this issue.

The funds transferred by fiscal authorities to rescue the banking sector and the discretionary measures adopted by several European Union (EU) governments, in particular, to boost the economic activity, led to considerable fiscal deficits and pushed government debts to historically high levels. This forced EU countries to abandon those expansionary fiscal policies and to implement austerity programmes. The Greek crisis boosted this process, as countries wanted to convince the markets that they were in a better position. Hence, several consolidations and austerity packages started to be implemented.

While EU institutions emphasize the importance of fiscal consolidations as a requirement for sustainable growth, the US consider that they may hurt short-term growth and longer adjustment periods should be allowed. Assessing the trade-off between consolidation of public finances and economic growth is fundamental for the formulation of effective policies. Several studies look at this relation and try to identify the determinants, impact, timing and the length of fiscal consolidations (Alesina et al., 2008; Alesina and Ardagna, 2010; Barrios et al., 2010; Cimadomo et al., 2010; Sanz, 2011; Cimadomo, 2012; Agnello et al., 2013, 2015, 2016; Ball et al., 2013; Bi et al., 2013; Afonso and Jalles, 2014; Anderson et al. 2014; Agnello and Sousa, 2014; Cafiso and Cellini, 2014; Cugnasca and Rother, 2015; Afonso and Jalles, 2016). Others take into account the kind of consolidation to show that successful consolidations are primarily based on spending cuts rather than increasing taxes (Alesina and Perotti, 1995, 1997, 1998; McDermott and Wescott, 1996; Buti and Sapir, 1998; Forni et al., 2010; Afonso and Jalles 2012; Erceg and Linde, 2013; Heylen et al., 2013, among others).

However, as far as we are concerned, no study on fiscal consolidations looks at their impact on the functional components of public expenditure. Sanz (2011) explores the relationship between the components of government expenditure and the government size, but he does not account for fiscal consolidation spells. A few other papers have also looked at those components but from a political perspective (see, for instance, Potrafke, 2010; Katsimi and Sarantides, 2012; Enkelman and Leibrecht, 2013; Morozumi et al., 2014; Castro and Martins, 2016a, 2016b). They analyse whether and how electoral motives, government ideology and political support affect the components of public expenditures, but they are silent regarding the role of fiscal consolidations.

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The knowledge of how fiscal consolidations affect spending on education, health, social protection, public services, among others, is of the most importance for an adequate design of fiscal consolidation programmes. Knowing their impact on those components allows fiscal authorities to take action to mitigate the negative economic and social effects of fiscal consolidations and to avoid the deterioration of the well-being of the more vulnerable citizens. If the adjustments rely essentially on expenditure cuts in education, health or social protection, for example, – to reduce the public deficit and debt quickly – the middle and lower classes in a society will feel the pinch more intensively than richer citizens. This can lead to higher income inequalities (Agnello and Sousa, 2014), social and political instability (Agnello et al., 2014b) and human development (Agnello et al., 2015b).

This analysis represents an important step forward relatively to the previous literature, as it allows us to identify and understand which items inside the components of public expenditure are being more significantly affected by the fiscal consolidation processes and, as so, infer about the social consequences for the most vulnerable citizens.

A fixed-effects estimator is used in the empirical analysis and the results show that spending on public services increases during fiscal consolidations, while spending on defence, public order, health, education and social protection is significantly cut. A more disaggregated analysis proves that fiscal consolidations are harmful for important social public expenditures, undermining citizens' safety, health assistance, investment in human capital and social protection. Public services are likely to be increased due to a rise in public debt transactions observed during periods of fiscal consolidation. All this evidence has proved to be stronger in a particular group of countries, here called PIIGS.

This article is organized as follows. Section 2 presents a brief review of the relevant literature. Section 3 describes the data and presents the econometric model. The main results are presented and discussed in Section 4 and Section 5 concludes.

2. Literature review

The studies on fiscal consolidations have concentrated the attention on the factors that influence their implementation. The state of public finances and the economic conditions have been regarded in the literature as the most important conditionings of fiscal consolidations (Perotti, 1999; Giavazzi et al., 2000; Blanchard and Perotti, 2002; Alesina et al., 2008; Barrios et al., 2010; Agnello et al., 2013, 2014a; Anderson et al., 2014; Afonso and Jalles, 2016). Fiscal consolidations are usually implemented when the stance of governments is weak, frequently related to large public debts; the domestic economy is not always thriving as expected and ends up being negatively affected by the austerity measures in the short-term. In the long-run, the economy tends to recover, but in some cases/countries and under certain conditions it may take quite a long time (Anderson et al., 2014).

Blanchard and Perotti (2002) show that positive government spending shocks increase output and private consumption and have a crowding-out effect over private investment, while positive tax shocks have a negative effect on output and private spending. On the contrary, Afonso and Jalles (2014) show that during consolidations, lower government consumption increases private consumption. This effect is higher for countries with lower debt levels, implying that more successful consolidations might be associated with reduced crowding-out effects. Nevertheless, this debate is far from reaching an agreement, as some recent studies have shown that several countries are now facing uncertainty about the effects of fiscal measures on the economic activity (Cimadomo, 2012; Cimadomo et al., 2012; Anderson et al., 2014), as well as regarding the duration of such adjustment programs (Agnello et al., 2013).

Other studies focus on the impact of fiscal consolidations on income distribution. Coenen et al. (2008) argue that depending on the fiscal instrument used, fiscal consolidations may have pronounced distributional effects. Furceri et al. (2015) show that fiscal consolidations increase income inequality and lower wage income shares in the short and medium-term. Agnello and Sousa (2014) also uncover a significant widening of the income gap during episodes of fiscal consolidation. Moreover, Mulas-Granados (2005) finds that successful fiscal consolidations are associated with higher income inequality, while Afonso and Jalles (2012) show that the stance of the cyclically adjusted primary balance and the duration of the consolidations can contribute to their success.

The timing, size, and composition of the austerity measures are other important factors that can affect a fiscal consolidation, its likelihood of success and duration (von Hagen and Strauch, 2001; von Hagen et al., 2002; Agnello et al., 2013; Agnello et al., 2015a; Agnello et al., 2016). In terms of timing, gradual consolidations are considered to be more successful than quick adjustments. However, Barrios et al. (2010) show that when public debt is very high and the economy is not growing, quick measures might be the best option. In the same line, von Hagen et al. (2002) also notice that when a fiscal consolidation lasts for a long period of time it can be affected by fatigue and the consolidation process might be reversed. Giavazzi and Pagano (1996) and von Hagen and Strauch (2001) put the emphasis on the size of the fiscal consolidations, which can indicate the extent of the governments' commitment to achieve long-term sustainability in public debt. In addition, Molnár (2012) notices that large consolidations need multiple instruments for the consolidation to succeed.

Regarding the composition, Alesina and Perotti (1995, 1997, 1998), McDermott and Wescott (1996), Buti and Sapir (1998), Forni et al. (2010), Erceg and Linde (2013) and Heylen et al. (2013) show that spending-driven fiscal consolidation programs have better conditions to be successful than fiscal adjustments that rely essentially on tax increases and cuts in investment. Agnello et al. (2013) provide additional evidence that spending-driven consolidations are shorter than tax-driven consolidations and that the size of the consolidation program does not significantly affect the duration of fiscal consolidations. Moreover, Molnár (2012) shows that spending-driven adjustments are more likely to stabilise public debt than revenue-driven ones. In this context, the business cycle literature corroborates the idea that tax-cuts are more effective in stimulating the economic activity than higher government spending, but the importance of tax cuts versus higher government spending has been in debate among policymakers and economists for a long time (see, among others, Garcia and Henin, 1999; Mountford and Uhlig, 2009; Jha et al., 2014; Hur et al., 2014).

However, as far as we are concerned, no study on fiscal consolidations looks at their impact on the functional components of public expenditure. Sanz (2011) explores the relationship between components of government expenditure and government size in 25 developed countries and shows that fiscal discipline affects public spending composition. However, he does not identify fiscal consolidation spells; he only accounts for changes in the size of the government. That is not a suitable approach to understand how the components of public expenditure behave during fiscal consolidations. As the size of the government is measured by dividing total government spending by GDP, it accounts for effects from the level of total government spending and the economic cycle. Hence, we cannot learn much on the actual effect of fiscal consolidations.

Other few papers that look at the behaviour of the functional components of public expenditure take a political perspective. Potrafke (2010) finds that incumbents increase the growth of public health expenditures in election years, while Enkelman and Leibrecht (2013) conclude that election cycles are mainly found in the new democracies of Eastern Europe and in categories such as social welfare, general public services, environmental protection and infrastructures. More recently, Castro and Martins (2016a, 2016b) found political opportunism mainly in health, education, social welfare and general public services.[1] In this paper, we take a step forward and analyse how fiscal consolidations affect the components of public expenditure in a panel of 15 EU countries. We look not only at the first level of the functional components but also at their sub-components. The exploration of effects in the sub-levels of government expenditures is expected to provide a finer understanding of the impact of fiscal consolidations.

We also provide a comparative analysis between a particular group of countries, known in the literature as PIIGS (Portugal, Ireland, Italy, Greece and Spain) and the other ten EU countries considered in this study. The PIIGS are known for being more "relaxed" with their public accounts. They were also recently affected by unfavourable economic and financial conditions and increasing public deficits and debts. The unfavourable conditions that they have faced (recession and unemployment), the high levels of public deficits and debts that they present and the difficulties that they have felt in borrowing money to finance their economies were critical to account for this distinction. Moreover, due to those problems, they were forced to implement severe fiscal packages and some needed external financial assistant to overcome their financial and/or fiscal unbalances. This means that this study must give a special attention to this group of countries.

3. Data and model specification

To analyse the impact of fiscal consolidations on the functional components of government expenditures, we collected annual data for the 15 countries that were members of the European Union in the end of the 1990s. The main reason to consider only those EU countries is that the disaggregated data for other EU countries is of poor quality. Even for the selected countries, the available data provided by the Eurostat database for the functional components of public expenditure covers only the period 1990–2012.[2] Hence, we are forced to restrict our study to that time period.

The analysis developed in this study is based on a break-down of government expenditures as defined by the OECD in its Classification of the Functions of the Government (COFOG).[3] It classifies government expenditure data from the System of National Accounts by the purpose for which the funds are used, also called functional decomposition. The first-level of this classification splits public expenditures into ten components: (i) general public services; (ii) defence; (iii) public order and safety; (iv) economic affairs; (v) environmental protection; (vi) housing and community amenities; (vii) health; (viii) recreation, culture and religion; (ix) education; (x) social protection. The second-level disaggregates each first-level group into up to nine sub-components. The total general government expenditures (*TotExpd*) and each of the ten components (and respective sub-components) are used as dependent variables in this analysis.[4]

Fiscal consolidation episodes were identified using the work of Devries et al. (2011) for the period 1990–2009 and updated from Kataryniuk and Vallés (2015) for the years 2010–2012. Both authors use a narrative approach to identify those consolidations. For the missing data for Greece and Luxembourg, we are consistent with the narrative approach and combine the information provided by Kataryniuk and Vallés (2015), Dellepiane and Hardiman (2015) and OECD (2011a,2011b) country notes on *Restoring Public Finances* to obtain the respective consolidation periods, kind and size. Hence, our fiscal consolidation variable (*Consolidation*) is a dummy variable that takes the value of 1 in the years in which a fiscal consolidation is being implemented (0, otherwise).

As argued by Devries et al. (2011), the standard statistical approach which focuses on variation in the cyclically adjusted primary budget balance (CAPB) may lead to biased results for two important reasons. First, the CAPB may suffer from measurement error that is potentially correlated with economic developments. Second, it omits periods during which fiscal consolidation programs are followed by adverse shocks and offsetting discretionary measures. For these reasons, we follow the narrative approach, which is based on the examination of accounts and records of what countries were intending to do at the time of publication of different institutional reports, to uncover policy actions that are motivated by deficit reduction.

The reports considered by Devries et al. (2011) and Kataryniuk and Vallés (2015) in their narrative approach are, namely, the Budget Reports, Budget Speeches, the Convergence and Stability Programs submitted to the European Commission, the IMF Recent Economic Developments reports, the IMF Staff Reports or the OECD Economic Surveys, the national central bank reports, as well as sources at the country level such as the Congressional Budget Office (CBO) reports and the Economic Report of the President in the case of the US, the Journal Officiel de la Republique Française for France, and the press releases and publications of the Ministry of Finance, among others. Those documents provide evidence of not only what policymakers believed at the time that decisions were taken, but also the budgetary impact of such measures.

The respective fiscal actions represent a response to past decisions and economic conditions and not to future prospects. Hence, it is unlikely that they are correlated with the economic environment in the short-term. Similarly, in order to avoid selection bias, fiscal consolidations are recorded even if they are followed by an adverse shock and an offsetting countercyclical discretionary stimulus. The budgetary effect of fiscal consolidation is recorded in the year in which it comes into effect. Hence, if the measures were announced but not implemented, they are not included in the database. Moreover, to assess whether measures were implemented and/or to investigate the end of a fiscal consolidation program, the subsequent editions of the historical documents are also analysed.

The kind and size of fiscal consolidations are two related variables that can also influence the behaviour of the components of government spending. In particular, spending-driven consolidations (*SpendConsol*) might have a stronger impact on them than tax-driven consolidations (*TaxConsol*).[5] These dummies will be used separately in the specifications to collect the respective effects. Regarding the size, we consider that the higher the fiscal consolidation package is, as percentage of GDP (*SizeConsol*), the more intense the impact on the components will be.[6] A similar analysis will be provided for the size of spending-driven (*SizeSpendConsol*) and tax driven (*SizeTaxConsol*) consolidations. As longer consolidations might affect the fiscal components differently, we also estimate the effect of the duration of fiscal consolidations (*DurConsol*).

Moreover, in some additional specifications we account for the evolution of public debt (*Debt*), government budget surplus (*GBS*) and the cyclically adjusted budget surplus (*AdjGBS*), as unbalances in those fiscal variables are the ultimate reason for the implementation of fiscal consolidation packages. The data for these fiscal variables come from the Comparative Political Data Set I.

The data for the other economic and political variables also comes from the Comparative Political Data Set I. To control for the role of economic environment – well documented in the literature review – we use the growth rate of real GDP (*RealGDPgr*); the long-term interest

[1] Considering an economic decomposition of public expenditures, Katsimi and Sarantides (2012) and Morozumi et al. (2014) show that elections tend to shift public spending towards current expenditures at the cost of public investment.

[2] The countries (data availability) considered in this study are: Austria (1995–2012), Belgium (1990–2012), Denmark (1990–2012), Finland (1990–2012), France (1995–2012), Germany (1991–2012), Greece (1990–2012), Ireland (1990–2012), Italy (1990–2012), Luxembourg (1990–2012), Netherlands (1995–2012), Portugal (1990–2012), Spain (1995–2012), Sweden (1995–2012), United Kingdom (1990–2012).

[3] See OECD (2009, 2011a,2011b, 2013, 2015), *Government at a Glance*.

[4] See Table A1 in Annex for the definition of each component and sub-component.

[5] See, among others, Molnár (2012), Heylen et al. (2013), Agnello et al. (2013) and the references therein.

[6] In line with the works of Giavazzi and Pagano (1996), von Hagen and Strauch (2001), Molnár (2012) and Agnello et al. (2013), among others.

rate on government bonds (*InterestRate*) accounts for the pressure on the spending components due to an increase in the burden of the public debt.

Following Alesina et al. (1997) and the recent studies by Castro and Martins (2016a, b), two political variables were considered to control for opportunistic and partisan effects: a dummy variable that takes the value of 1 in the year of national legislative elections, and 0 otherwise (*Election*); and a dummy variable that takes de value of 1 when there is hegemony or dominance of left-wing parties in the cabinet, and 0 otherwise (*LeftGov*).[7]

Finally, to control for the impact of the structure of the population (demographic issues) on public spending, two additional variables are considered: the percentage of the population between 0 and 14 years of age (*Young*); and the percentage of the population with 65 or more years of age (*Elderly*). A complete description of the variables and some descriptive statistics can be found in Tables A1 and A2 in Annex.[8]

We employ a fixed-effects estimator to test the following specification:

$$ExpdC_{it} = \beta_0 + \beta_1 Consolidation_{it} + \beta_2 RealGDPgr_{it-1} + \beta_3 \Delta InterestRate_{it} + \beta_4 Election_{it} + \beta_5 LeftGov_{it} + \beta_6 Young_{it} + \beta_7 Elderly_{it} + \delta Trend_{it} + v_i + e_{it} \tag{1}$$

where i=1,...,15, t=1990,...,2012. $ExpdC_{it}$ represents the real growth rate of the respective components (or sub-component) of government expenditures. The coefficient on *Consolidation* (β_1) captures the impact of a fiscal consolidation on each kind of government spending; β_2 to β_7 measure the effect of the economic, political and demographic controllers. A time-trend is also included in the specification to account for the evolution of spending over time and the technological progress. Regarding the last components, v_i is the individual effect of each country i, and e_{it} is the error term. Given the presence of individual effects v_i, the model can be estimated assuming those effects as fixed or random. Hausman tests support the fixed-effects estimator.

4. Empirical results

The results from the estimation of the impact of fiscal consolidations on the components of public expenditures are presented in Table 1. As the fiscal variables and some of the controllers are not stationary in levels, we use the respective growth rates.[9] We start by looking at the impact of fiscal consolidations at the aggregated level of public spending, i.e. in the growth rate of total general government expenditures.

As expected, the results presented in column (1) show that fiscal consolidations (*Consolidation*) have a significant negative impact on total public spending: during periods of fiscal consolidations the growth rate of total public expenditure is, on average, about two percentage points lower than in the other periods. In fact, fiscal consolidations are meant to reduce public spending, so this is not a surprising result. However, what we intend to analyse is what happens inside public spending, at the level of its components.

We consider the ten functional components of government expenditures (as defined by the OECD) to uncover the respective effects. The results are presented in columns (2)–(11) in Table 1 and clearly indicate that spending in most of the components is cut during fiscal consolidations. The ones in which the cuts are statistically more significant are defence, public order, environment, housing, health, education and social protection. Changes in spending on economic affairs and recreation have not proved to be as significant as the others.

However, the growth rate of spending in public services increases during fiscal consolidations. As this category includes public debt transactions, it is possible that increased spending in this sub-category may be happening during consolidations due to the likely rise in interest payments and outlays for underwriting and floating government loans (items inside public debt transactions). This is an issue that we will explore in greater depth below when we look at the items inside of the functional components of public spending.

When we look at the impact of the controllers, a better economic environment – i.e. an increase in real GDP growth rate (*RealGDP_gr*) – has a positive and significant impact on total spending and on most of its components. This means that their behaviour is pro-cyclical and in line with Alesina et al. (2008) findings for public spending. That behaviour is also observed in what concerns to the interest rate effect: when interest rates (*InterestRate*) rise, governments are forced to reduce spending (at aggregated and disaggregated levels) as the cost of financing public expenditures increases. This is more evident in components such defence, public order and social protection.

Regarding the political variables, we find that governments tend to increase total public expenditures during election years (*Election*). These results are in line with the findings of other studies focusing on the EU (Mink and de Haan, 2006; and Efthyvoulou, 2012). The functional components in which expenditures are increased during elections are public services, public order, health, education and social protection. These are the items in which governments tend to spend more in proportion to the total expenditure and with which they can send a stronger sign of competence to the electorate. Moreover, these results confirm Castro and Martins (2016b) conclusions that the bigger and more 'visible' categories of public expenditure are the ones that are especially targeted by opportunistic governments during elections. Additionally, we also observe that despite government orientation (*LeftGov*) has no impact on total spending, left-wing governments are indeed more prone to increase spending on the following expenditure components: defence, public order and education.

The structure of the population (*Young*, *Elderly*) does not seem to matter much for the evolution of public spending or its components in this group of 15 EU countries. This might be the case because these countries share a common demographic structure and other political and economic reasons/motives may play a more important role in the fluctuations of public spending components.

Finally, total government expenditures and most of its components exhibit a decreasing trend, which means that the respective growth rates have decreased over time. This tendency is considerable, in particular, for spending on environment, recreation and education.

The issue of endogeneity is also taken into account in our analysis. In Table A5 in Annex are reported the results from an IV estimator, where fixed effects are controlled for. *Consolidation*, *RealGRPgr* and *InterestRate* are assumed to be endogenous and are instrumented with their first lags, a lag of inflation and a lag of the cyclically adjusted government budget surplus. The results are very similar, in particular in what concerns to the effect of fiscal consolidations on the components of public spending: the ones in which we observe a significant impact are the same that we found in the regressions reported in Table 1. In fact, the Durbin-Wu-Hausman endogeneity test does not reject the null hypothesis that the differences in the coefficients are not systematic. We tried with other instruments, but the results was the same, so endogeneity does not seem to be an issue and we proceed using the fixed effects estimator.

Another aspect that worth to explore is whether and how the kind, size and duration of a fiscal consolidation affect each functional

[7] *LeftGov* was computed from the *gov_party* variable in the CPDS database (it is equal to 1 when *gov_party* is equal to 4 and 5, i.e. when there is dominance or hegemony of left-wing parties).

[8] See also Table A.3, where we report the average growth rates of the components of government expenditures during consolidations periods and normal times. Total public spending and its components grow less, on average, when a fiscal consolidation takes place. The exceptions are *PubServ* and *EconAff*; *Defence*, *Housing* and *Education* present even negative growth rates during consolidations. In the empirical analysis provided next we test the statistical significance of this evidence.

[9] See Im, Pesaran and Shin panel unit root tests in Table A.4 in Annex. The interest rate is in first differences.

Table 1
The impact of fiscal consolidations on the components of government expenditure.

Dep. Vars.: ***Growth rate of***	**(1)** ***TotExpd***	**(2)** ***PubServ***	**(3)** ***Defence***	**(4)** ***PubOrder***	**(5)** ***EconAff***	**(6)** ***Environm***	**(7)** ***Housing***	**(8)** ***Health***	**(9)** ***Recreat***	**(10)** ***Educ***	**(11)** ***SocProtect***
Consolidation	−1.946**	2.092*	−2.221**	−2.914**	−0.083	−3.932**	−9.776**	−3.438***	−2.618*	−2.602***	−1.831***
	(0.687)	(1.040)	(1.112)	(1.146)	(5.352)	(1.786)	(3.940)	(0.906)	(1.388)	(0.865)	(0.500)
RealGDPgr	0.199**	0.065	0.009	0.590***	−0.924	0.987***	1.043**	0.686***	0.757***	0.420***	−0.034
	(0.101)	(0.179)	(0.483)	(0.133)	(1.053)	(0.216)	(0.428)	(0.134)	(0.211)	(0.125)	(0.076)
InterestRate	−0.458*	0.413	−1.671**	−0.919*	−0.652	−0.039	−1.688	−0.674	−0.606	−0.739	−0.438**
	(0.269)	(0.399)	(0.757)	(0.456)	(1.249)	(0.608)	(1.031)	(0.504)	(0.485)	(0.434)	(0.217)
Election	1.782**	3.016***	1.354	1.637**	−10.605	1.691	1.806	2.616***	1.910	1.579*	1.629***
	(0.679)	(0.748)	(1.437)	(0.711)	(9.979)	(1.531)	(1.772)	(0.635)	(1.166)	(0.845)	(0.428)
LeftGov	0.428	−1.181	3.972**	2.216*	−8.025	1.954	1.481	0.658	0.283	2.049**	−0.419
	(0.778)	(1.065)	(1.527)	(1.252)	(8.027)	(1.898)	(1.973)	(0.559)	(1.483)	(0.956)	(0.723)
Young	−0.515	−0.586	0.191	0.049	−2.193	−2.375**	−1.773	0.462	−1.218*	0.053	−0.554
	(0.535)	(0.446)	(0.556)	(0.524)	(1.494)	(1.178)	(1.088)	(0.572)	(0.740)	(0.487)	(0.479)
Elderly	−0.143	0.058	−0.260	0.262	−4.036**	0.361	0.891	0.044	−0.045	0.305	−0.139
	(0.454)	(0.482)	(0.902)	(0.517)	(1.655)	(1.053)	(2.309)	(0.585)	(0.423)	(0.481)	(0.560)
Trend	−0.046	0.013	0.153	−0.075	0.297	−0.664**	−0.282	0.001	−0.299**	−0.114**	−0.105
	(0.077)	(0.094)	(0.122)	(0.090)	(0.274)	(0.272)	(0.296)	(0.064)	(0.129)	(0.053)	(0.085)
#Observations	295	295	295	295	295	295	295	295	295	295	295
#Countries	15	15	15	15	15	15	15	15	15	15	15
R-squared	0.085	0.098	0.065	0.156	0.021	0.150	0.050	0.251	0.142	0.179	0.092
Hausman test	37.04	23.21	28.78	15.82	23.15	82.24	38.72	16.36	99.58	33.43	56.95
	[0.000]	[0.003]	[0.000]	[0.045]	[0.003]	[0.000]	[0.000]	[0.038]	[0.000]	[0.000]	[0.000]

Notes: See Tables A.1 and A2 in Annex. Robust standard errors are in parentheses; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. The growth rate of the real values of each expenditure component is used as the respective dependent variable in each equation. *RealGDPgr* is lagged one period to avoid simultaneity problems and to account for the usual delay in the release of data for output. The *InterestRate* is in first differences as it is not stationary in levels (see Table A.4 in Annex). The results from the Hausman test-statistic (random versus fixed effects) are reported at the bottom of the table (the respective p-values in square brackets).

Table 2
Kind and size of the fiscal consolidations.

Dep. Vars.: ***Growth rate of***	**(1)** ***TotExpd***	**(2)** ***PubServ***	**(3)** ***Defence***	**(4)** ***PubOrder***	**(5)** ***EconAff***	**(6)** ***Environm***	**(7)** ***Housing***	**(8)** ***Health***	**(9)** ***Recreat***	**(10)** ***Educ***	**(11)** ***SocProtect***
Consolidation	−1.946**	2.092*	−2.221**	−2.914**	−0.083	−3.932**	−9.776**	−3.438***	−2.618*	−2.602***	−1.831***
	(0.687)	(1.040)	(1.112)	(1.146)	(5.352)	(1.786)	(3.940)	(0.906)	(1.388)	(0.865)	(0.500)
SpendConsol	−2.687***	1.112	−1.507	−3.380***	−8.031*	−4.768**	−9.373**	−3.626***	−3.277**	−2.922***	−2.303***
	(0.484)	(1.057)	(1.841)	(1.080)	(4.153)	(2.094)	(3.526)	(0.642)	(1.135)	(0.606)	(0.450)
TaxConsol	0.389	2.324	−1.720	−2.800	13.015	0.350	−7.271**	−1.191	0.089	−0.524	0.030
	(1.108)	(1.665)	(1.234)	(1.147)	(9.382)	(1.775)	(3.062)	(1.176)	(1.718)	(0.825)	(0.764)
SizeConsol	−1.962***	0.062	−3.014***	−2.209***	−4.461**	−3.081***	−6.015***	−2.371***	−2.760***	−2.380***	−1.365***
	(0.413)	(0.584)	(0.559)	(0.358)	(2.115)	(0.632)	(1.652)	(0.408)	(0.563)	(0.337)	(0.206)
SizeSpendConsol	−2.971***	0.341	−3.500***	−3.222***	−7.790**	−4.341***	−7.918**	−3.434***	−3.945***	−3.347***	−2.252***
	(0.937)	(0.934)	(1.119)	(0.841)	(3.706)	(1.401)	(3.207)	(0.692)	(1.145)	(0.738)	(0.378)
DurConsol	−0.369**	0.422	−0.131	−0.725**	0.853	−0.496*	−2.039**	−0.733**	−0.083	−0.473**	−0.352***
	(0.188)	(0.328)	(0.122)	(0.321)	(1.918)	(0.302)	(0.980)	(0.352)	(0.124)	(0.199)	(0.122)
ΔDebt	−0.208**	0.212*	−0.753**	0.041	−0.280	−0.224	−0.899**	−0.253**	−0.147**	−0.245***	−0.182**
	(0.087)	(0.103)	(0.317)	(0.186)	(0.481)	(0.152)	(0.407)	(0.125)	(0.072)	(0.050)	(0.066)
GBS	0.535**	−0.513**	0.467*	0.383***	−1.079	0.351**	1.688***	0.390***	0.509***	0.301***	0.258***
	(0.203)	(0.248)	(0.248)	(0.122)	(2.589)	(0.171)	(0.510)	(0.101)	(0.166)	(0.102)	(0.086)
AdjGBS	0.505**	−0.508**	0.523**	0.394***	−1.615	0.423**	1.729***	0.344***	0.596***	0.275**	0.229**
	(0.233)	(0.247)	(0.229)	(0.132)	(3.257)	(0.180)	(0.533)	(0.123)	(0.116)	(0.118)	(0.106)
#Observations	295	295	295	295	295	295	295	295	295	295	295
#Countries	15	15	15	15	15	15	15	15	15	15	15

Notes: See Table 1 and Tables A.1 and A.2 in Annex. Robust standard errors are in parentheses; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. The results reported for *Consolidation* are replicated from Table 1. The variables *ΔDebt*, *GBS* and *AdjGBS* are lagged one period. The controllers are the same that were used in the regressions shown in Table 1 but they are not reported here for the sack of parsimoniousness of the analysis and to save space.

component of public expenditures. The respective results are reported in Table 2, but only for the consolidation variables. The controllers are the same that were used in the regressions shown in Table 1 but they are not reported here for the sack of parsimoniousness of the analysis and to save space. The results reported for *Consolidation* are replicated from Table 1.

Spending-driven consolidations (*SpendConsol*) have a negative and significant impact on total expenditures and on most of its components. As these consolidations aim at reducing spending, this result is in line with our expectations and the empirical studies on the composition of fiscal consolidations (Molnár, 2012; Heylen et al., 2013; Agnello et al., 2013, among others). For the same reasons, we expected that tax-driven consolidation (*TaxConsol*) will not affect the spending components significantly. In fact, only housing expenditures are significantly decreased during tax-driven consolidations. However, when we look at the effect of the fiscal consolidation size, things change substantially. The size matters not only for total spending and spending-driven consolidations, but also for tax-driven consolidations. The higher the size of the fiscal consolidation package (total, spending- or tax-driven) in percentage of GDP is, the more intense the respective impact on both total spending and on the respective components will be. Only the growth rate of public services is not significantly affected. This might, once again, have to do with the public debt transactions mentioned above. But while a tax-driven consolidation might not have a significant

Table 3
Sub-components analysis (part I).

Dep.Vars.:*Growth rate*	1. Public Services							2. Defence					3. Public Order				
	(1.1) ***ExecAff***	(1.2) ***ForAid***	(1.3) ***GServ***	(1.4) ***BasicRD***	(1.5) ***GServRD***	(1.6) ***OthServ***	(1.7) ***DebtTrs***	(2.1) ***MilDef***	(2.2) ***CivDef***	(2.3) ***FMilAid***	(2.4) ***DefRD***	(2.5) ***OthDef***	(3.1) ***Police***	(3.2) ***Fire***	(3.3) ***Courts***	(3.4) ***Prisons***	(3.5) ***OthPO***
Consolidation	−2.955**	−5.505	−1.037	25.428	−17.414**	2.314	5.706**	−4.437***	−12.026	−13.574**	11.420	−29.785**	−4.604***	−4.893**	−3.666**	−3.331	−6.517
	(1.304)	(8.500)	(2.194)	(33.824)	(7.466)	(6.463)	(1.976)	(1.401)	(9.860)	(5.999)	(11.617)	(13.059)	(1.061)	(1.650)	(1.530)	(1.947)	(6.399)
RealGDPgr	−0.198	1.046	0.159	−50.771	−0.769	2.681**	−0.041	−0.399	−2.542	0.814	−2.102	7.777	0.137	0.155	0.507**	0.339	0.361
	(0.421)	(0.881)	(0.630)	(52.738)	(1.280)	(1.174)	(0.594)	(0.801)	(2.706)	(1.551)	(2.792)	(5.247)	(0.156)	(0.213)	(0.236)	(0.473)	(1.188)
InterestRate	−2.492**	−0.066	0.409	107.072	−3.622	−2.197	2.091	−2.013*	−1.762	1.747	3.174	−14.119	0.033	−2.581	−1.254	−0.933	7.031
	(0.851)	(1.660)	(2.765)	(70.034)	(2.893)	(3.503)	(1.931)	(0.949)	(9.261)	(2.128)	(5.336)	(10.799)	(0.344)	(1.541)	(0.794)	(0.884)	(5.026)
Election	4.723**	3.112	3.707	−106.442	−3.761	11.837	1.902	0.524	−6.883	−0.227	0.103	33.283	2.764	1.072	0.433	−0.529	−6.600
	(1.682)	(4.473)	(2.390)	(107.640)	(5.417)	(9.988)	(1.571)	(1.991)	(22.103)	(6.962)	(9.592)	(33.805)	(1.714)	(1.373)	(1.037)	(2.102)	(7.353)
LeftGov	−0.764	6.056	1.036	232.043	6.602	10.548	−1.287	0.539	−2.534	−11.614	−15.581	5.162	0.060	1.768	−1.015	−0.006	−2.680
	(2.274)	(5.608)	(3.326)	(250.204)	(7.677)	(7.658)	(2.250)	(2.820)	(11.978)	(7.101)	(13.023)	(12.534)	(1.222)	(2.933)	(1.532)	(2.313)	(4.528)
Young	0.402	−0.826	4.520	11.090	−3.071	6.325	−0.702	0.916	14.627	7.509	−21.974	8.419	1.622	2.247	1.525	1.622	7.028
	(0.830)	(5.957)	(3.797)	(44.590)	(5.868)	(8.427)	(2.184)	(1.192)	(10.687)	(4.615)	(12.894)	(10.639)	(1.497)	(1.719)	(1.430)	(1.777)	(5.824)
Elderly	2.543	−1.836	0.416	247.726	1.693	4.439	−4.893***	−0.339	−9.600	−9.371	−22.796	−25.818	2.392	−1.259	−0.316	0.326	14.498*
	(1.623)	(4.873)	(1.809)	(199.939)	(5.347)	(10.504)	(1.628)	(1.518)	(10.838)	(7.358)	(15.525)	(21.285)	(1.550)	(1.378)	(1.458)	(1.173)	(7.091)
#Observations	212	206	212	187	182	204	212	212	140	184	168	169	212	212	212	212	207
#Countries	15	14	15	13	13	14	15	15	11	13	12	12	15	15	15	15	15
R-squared	0.122	0.041	0.028	0.056	0.081	0.022	0.210	0.062	0.016	0.073	0.042	0.046	0.159	0.122	0.116	0.074	0.047

Dep.Vars.:*Growth rate*	4. Economic Affairs									5. Environmental Protection					
	(4.1) ***GenAff***	(4.2) ***Agric***	(4.3) ***Energy***	(4.4) ***Constr***	(4.5) ***Transp***	(4.6) ***Communic***	(4.7) ***OthInd***	(4.8) ***EAffRD***	(4.9) ***OthEAff***	(5.1) ***Waste***	(5.2) ***WastWater***	(5.3) ***Pollut***	(5.4) ***Protect***	(5.5) ***EnvirRD***	(5.6) ***OthEnvir***
Consolidation	6.595	−10.123**	−2.235	−7.057	−9.589***	−46.467*	−3.200	−9.030***	−39.572	−10.557*	−9.732	180.620	−11.408*	−8.710	−2.101
	(15.140)	(4.078)	(11.325)	(6.063)	(2.764)	(26.287)	(3.589)	(2.143)	(24.924)	(5.672)	(14.966)	(165.717)	(6.039)	(9.131)	(2.341)
RealGDPgr	−9.091	1.089**	3.932*	4.567*	0.343	14.797	2.361*	−1.039	2.945*	0.351	0.675	3.169	0.244	−0.573	−0.122
	(7.670)	(0.396)	(1.821)	(2.232)	(0.575)	(13.693)	(1.243)	(0.638)	(1.604)	(0.890)	(2.965)	(12.464)	(1.482)	(2.089)	(0.675)
InterestRate	28.561	−6.201	−1.616	−8.177*	−2.552**	19.697	−5.243	1.754	13.303	−2.042*	5.236	258.269	−0.657	6.156	−1.763
	(18.328)	(5.763)	(9.488)	(4.235)	(0.932)	(22.480)	(3.393)	(0.995)	(16.342)	(0.960)	(3.909)	(195.082)	(2.429)	(4.554)	(1.575)
Election	−8.344	12.642	−15.495	10.092	5.004	85.610	−4.459	−5.674	−19.535	0.403	−20.659	26.995	−10.461	−14.848	−3.815
	(17.175)	(9.091)	(17.014)	(9.700)	(5.295)	(125.526)	(3.817)	(3.232)	(11.724)	(3.660)	(18.210)	(30.091)	(7.203)	(16.019)	(2.272)
LeftGov	−23.002	−10.754	21.540	−2.314	3.850	−142.275	−2.545	0.958	−16.215	4.783	−26.051	−98.671	3.188	4.525	5.754**
	(29.646)	(6.361)	(14.590)	(4.662)	(4.107)	(90.365)	(5.708)	(3.944)	(16.422)	(3.624)	(24.068)	(81.210)	(5.190)	(7.117)	(2.487)
Young	9.310	−3.785	−10.269	−6.681	−0.096	−83.735	−2.642	−0.565	34.727	4.238**	20.730	−31.945	7.437	−7.149*	6.006
	(18.262)	(2.171)	(7.364)	(5.267)	(3.157)	(120.543)	(4.807)	(3.138)	(23.209)	(1.786)	(13.666)	(42.267)	(4.834)	(3.972)	(3.846)
Elderly	4.217	−2.109	−1.874	−8.500	2.521	−10.752	0.265	7.395**	16.742	5.297	−4.276	91.033*	11.290	13.029	5.364
	(19.602)	(2.833)	(14.786)	(5.249)	(3.319)	(97.236)	(6.087)	(2.534)	(14.486)	(4.335)	(7.798)	(44.357)	(7.609)	(7.879)	(3.910)
#Observations	212	212	206	212	212	212	206	206	212	212	197	203	205	200	206
#Countries	15	15	14	15	15	15	15	14	15	15	14	14	14	14	14
R-squared	0.091	0.137	0.025	0.111	0.062	0.028	0.108	0.069	0.040	0.049	0.058	0.133	0.085	0.043	0.108

Notes: See Table 1 and Table A.1 in Annex. Robust standard errors are in parentheses; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. A time-trend is included in all regressions. Data for *TransfGen*, (in Public Services) and *PubOrdRD* (in Public Order) are missing for most of the countries; the lack of variability makes impossible to run the model for the respective equations. The growth rate of the real value of each expenditure sub-component is used as dependent variable in the respective equation. *RealGDPgr* is lagged one period and the *InterestRate* is in first differences.

Table 4
Sub-components analysis (part II).

Dep.Vars.:*Growth rate*	6. Housing Amenities						7. Health						8. Recreation					
	(6.1) ***HousDev***	(6.2) ***ComDev***	(6.3) ***WatSup***	(6.4) ***StrLight***	(6.5) ***HousRD***	(6.6) ***OthHous***	(7.1) ***MedProd***	(7.2) ***OutPServ***	(7.3) ***HospServ***	(7.4) ***PubHlth***	(7.5) ***HlthRD***	(7.6) ***OthHlth***	(8.1) ***Sports***	(8.2) ***Culture***	(8.3) ***Broadcast***	(8.4) ***Religious***	(8.5) ***RecrRD***	(8.6) ***OthRecr***
Consolidation	−17.043**	−11.739*	2.945	−2.029	−89.126	−18.643**	−26.232	−13.763	−2.042***	−7.197***	−7.687***	6.390	−5.164**	−1.744	−28.648	−11.597	−23.752	−30.029
	(6.067)	(5.490)	(6.921)	(1.986)	(58.719)	(8.549)	(20.728)	(10.617)	(0.593)	(2.274)	(1.898)	(7.955)	(1.996)	(1.936)	(33.850)	(7.222)	(21.194)	(21.003)
RealGDPgr	1.195	0.949	1.525**	−0.323	−1.035	1.890	1.090	0.750	0.321***	−0.202	0.335	2.945	0.998	0.451	18.439	−1.520	−1.721	−0.099
	(1.844)	(1.006)	(0.541)	(1.246)	(3.846)	(1.976)	(1.493)	(0.699)	(0.101)	(0.545)	(0.362)	(1.857)	(0.595)	(0.292)	(22.567)	(2.210)	(1.956)	(2.823)
InterestRate	3.676	−0.862	−3.790	0.997	−20.839	7.168	−1.128	−1.657*	−1.293***	−0.355	0.766	−4.525	−1.316	−0.476	59.737	1.657	0.369	3.830
	(3.196)	(2.923)	(2.787)	(3.570)	(15.960)	(5.396)	(1.780)	(0.937)	(0.406)	(0.903)	(0.787)	(4.000)	(0.799)	(1.058)	(38.461)	(2.945)	(2.365)	(7.471)
Election	−16.986	−1.753	9.443*	1.527	−22.547	16.835	46.712	22.678	2.830**	6.280	7.595*	−4.242	1.417	1.115	89.183	4.498	6.378	−14.037
	(13.644)	(6.892)	(5.049)	(5.621)	(22.645)	(16.911)	(47.705)	(22.658)	(1.278)	(3.685)	(3.651)	(5.938)	(1.646)	(1.737)	(137.063)	(4.647)	(16.956)	(14.239)
LeftGov	−11.545	−12.986	7.535	2.061	−74.249	7.014	20.240	11.756	−0.728	−7.152	6.026***	−5.452	2.763	2.356	−165.850	3.363	17.559	6.478
	(12.079)	(10.038)	(4.313)	(3.135)	(44.346)	(9.752)	(19.985)	(9.358)	(0.987)	(6.741)	(1.513)	(4.993)	(2.523)	(2.504)	(107.399)	(5.127)	(17.602)	(9.016)
Young	−24.104	−2.576	−9.611**	−12.601	72.584	5.045	20.441	7.437	0.944	−0.355	3.072	13.347	−0.046	0.573	97.763	5.521	27.430	20.682
	(23.770)	(8.428)	(3.581)	(8.032)	(56.592)	(12.948)	(24.877)	(10.427)	(1.210)	(2.696)	(2.520)	(10.478)	(1.688)	(2.490)	(68.927)	(10.850)	(35.408)	(18.940)
Elderly	−10.010	5.061	1.487	−4.702	−25.869	11.691	31.071	13.138	0.009	0.788	7.921***	−2.349	2.693	1.304	−66.912	11.660	40.491	23.089
	(5.972)	(3.948)	(3.332)	(6.833)	(21.113)	(9.078)	(33.682)	(14.246)	(0.663)	(2.943)	(2.069)	(9.193)	(1.611)	(1.738)	(64.960)	(15.807)	(36.583)	(21.782)
#Observations	211	189	195	148	138	168	212	212	195	206	212	212	212	212	212	208	169	183
#Countries	15	13	14	11	10	13	15	15	14	14	15	15	15	15	15	15	12	13
R-squared	0.032	0.046	0.032	0.027	0.044	0.040	0.038	0.038	0.225	0.074	0.154	0.038	0.258	0.089	0.036	0.026	0.066	0.037

Dep.Vars.:*Growth rate*	9. Education								10. Social Protection								
	(9.1) ***Prim***	(9.2) ***Second***	(9.3) ***PosSec***	(9.4) ***Tert***	(9.5) ***Genr***	(9.6) ***SubServ***	(9.7) ***EducRD***	(9.8) ***OthEduc***	(10.1) ***SickDis***	(10.2) ***Olders***	(10.3) ***Survivors***	(10.4) ***Family***	(10.5) ***UnemPrt***	(10.6) ***HousPrt***	(10.7) ***SocExcl***	(10.8) ***SocPrtRD***	(10.9) ***OthSocP***
Consolidation	−2.818***	−2.377**	−57.689	−4.435*	−5.432*	−7.674*	−24.999*	−8.256**	−4.407***	−1.371**	−4.233**	−5.099***	−6.500**	−23.995	−5.980*	−1.953	−3.173
	(0.729)	(0.937)	(41.062)	(2.090)	(2.727)	(4.104)	(12.401)	(3.544)	(0.944)	(0.543)	(1.804)	(1.271)	(2.239)	(45.942)	(2.983)	(17.534)	(2.498)
RealGDPgr	0.027	0.084	1.392	0.250	−1.088	−0.253	0.403	−0.208	0.000	−0.039	−0.444	0.760***	−1.870***	3.015	0.427	5.666**	−0.149
	(0.114)	(0.157)	(1.978)	(0.220)	(1.017)	(0.585)	(2.637)	(0.653)	(0.159)	(0.122)	(0.280)	(0.240)	(0.319)	(14.813)	(0.434)	(2.448)	(0.567)
InterestRate	−0.591*	−1.488***	52.984	−0.024	1.238	−0.522	−12.660	0.813	−0.599**	−0.915***	−0.145	−1.784*	−2.698**	102.750	−7.269*	−3.828	−1.682
	(0.316)	(0.413)	(62.364)	(1.222)	(1.576)	(1.089)	(7.299)	(2.218)	(0.258)	(0.263)	(0.588)	(0.948)	(0.953)	(80.611)	(3.837)	(2.827)	(1.591)
Election	1.944**	1.257	82.280	1.290	−5.704	1.423	3.012	−3.016	2.722*	0.874**	1.302	1.797	0.709	9.100	−6.520	20.906	3.605
	(0.729)	(0.728)	(105.392)	(1.541)	(6.966)	(3.511)	(10.776)	(2.644)	(1.425)	(0.327)	(1.462)	(1.561)	(1.542)	(54.857)	(4.858)	(22.234)	(4.479)
LeftGov	0.935	2.352	−96.775	0.767	1.383	3.252	−8.273	0.239	1.004	−0.840	1.926	−0.958	4.421	−115.185	2.246	16.921	0.079
	(0.823)	(1.486)	(100.164)	(1.400)	(10.240)	(3.656)	(6.745)	(2.341)	(2.134)	(0.804)	(2.552)	(0.944)	(2.959)	(86.918)	(3.413)	(21.079)	(3.169)
Young	−0.412	0.444	−75.596	2.408	−12.985	−3.272	12.328	−4.393	−0.228	1.327**	1.654	−2.715	−0.250	−12.477	0.227	−35.452	−0.945
	(1.497)	(1.068)	(50.833)	(2.017)	(14.245)	(1.946)	(8.197)	(2.829)	(2.163)	(0.604)	(1.323)	(2.120)	(2.126)	(23.463)	(2.160)	(25.226)	(1.691)
Elderly	0.625	0.643	35.982	−0.074	1.670	1.610	8.742*	1.131	0.959	0.376	1.435	−1.233	−1.004	104.983	−2.109	−44.776*	0.135
	(1.036)	(0.515)	(42.722)	(1.871)	(4.208)	(2.863)	(4.697)	(2.027)	(1.032)	(0.510)	(1.137)	(1.850)	(2.040)	(69.116)	(2.367)	(22.825)	(1.863)
#Observations	212	212	147	212	206	206	205	212	212	212	212	212	212	195	212	170	212
#Countries	15	15	10	15	14	14	15	15	15	15	15	15	15	14	15	13	15
R-squared	0.255	0.223	0.062	0.044	0.042	0.065	0.066	0.067	0.126	0.038	0.053	0.272	0.197	0.085	0.036	0.055	0.065

Notes: See Table 1, Table 3 and Table A.1 in Annex. Robust standard errors are in parentheses; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. A time-trend is included in all regressions. The growth rate of the real value of each expenditure sub-component is used as dependent variable in the respective equation. *RealGDPgr* is lagged one period and the *InterestRate* is in first differences.

Table 5
Fiscal consolidation effects in the ratios between the public expenditure components.

	PubServ	*Defence*	*PubOrder*	*EconAff*	*Environm*	*Housing*	*Health*	*Recreat*	*Educ*	*SocProtect*	*TotExpd*
PubServ	–	48.270*	87.332*	22.715*	260.84**	81.108	12.379**	153.73	15.440**	0.734	0.661*
	–	(25.874)	(45.816)	(16.102)	(114.32)	(98.111)	(5.611)	(97.817)	(7.007)	(1.323)	(0.354)
Defence		–	10.444	5.108	35.334	−6.906	0.239	11.827	0.191	−0.727**	−0.168**
		–	(7.163)	(6.444)	(25.998)	(13.699)	(0.572)	(10.967)	(0.484)	(0.308)	(0.080)
PubOrder			–	3.547	8.527	−11.704	−1.405**	−7.653	−1.373*	−1.005**	−0.261**
			–	(5.408)	(15.228)	(13.893)	(0.674)	7.017	(0.750)	(0.386)	(0.091)
EconAff				–	118.02*	35.720	5.442*	74.677*	8.172**	0.196	0.281
				–	(64.403)	(42.781)	(3.013)	(39.815)	(3.795)	(1.142)	(0.263)
Environm					–	−0.424	−0.307	3.064	−0.123	−0.223*	−0.062
					–	(7.164)	(0.294)	(2.935)	(0.366)	(0.118)	(0.042)
Housing						–	−0.171	1.369	−0.242	−0.412	−0.094
						–	(1.241)	(3.889)	(1.165)	(0.362)	(0.125)
Health							–	15.526	0.046	−1.631**	−0.374**
							–	(20.929)	(1.370)	(0.769)	(0.179)
Recreat								–	−0.308	−0.377*	−0.091
								–	(0.651)	(0.213)	(0.068)
Educ									–	−1.839***	−0.410**
									–	(0.675)	(0.168)
SocProtect										–	0.509
										–	(0.359)
TotExpd											–
											–

Notes: Robust standard errors are in parentheses; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. Each line presents the consolidation effect (*Consolidation* coefficient, where each regression was estimated with the same covariates as in the baseline model – see Table 1) for the ratio of the respective component (in line) to each of the other components that are indicated in each column. The estimates for the coefficients on the other controllers are not reported here to save space, but they are available upon request.

impact on government expenditure components, its size ends up affecting spending in the same direction as spending-driven fiscal consolidations.

The results with the duration of consolidations (*DurConsol*) are slightly weaker, but they are in line with the previous ones as they show that longer consolidations end up being detrimental to spending on public order, housing health, education and social protection (besides total spending).

As the main reason for countries to implement austerity measures is related to increasing debts and deficits, we also replace the consolidation variables by these fiscal variables to show the consistency and robustness of our results. We start by considering the lag of the change in public debt ($\Delta Debt$) as percentage of GDP (it is its first-difference that is stationary; see Table A4 in Annex), then the fiscal variable is replaced in the model by lag of the government budget surplus (*GBS*) as percentage of GDP. To account for the business cycle, we also use the lag of the cyclically adjusted budget surplus (*AdjGBS*). The results are consistent with the ones obtained with the consolidation variables, confirming our conclusions: total spending and spending in most of its components are significantly cut when public debt and deficit increase; the exception is, once again, public services.[10]

To understand the increase in the growth rate of spending in public services during fiscal consolidations and to check how those consolidations affect each particular item inside the ten components of public expenditures, we collect data on the sub-components of each component of public expenditures. Those data are available from the Eurostat database. Even though they present a shorter time span (1995–2012) than the previous data and also some missing data for a few countries/components, we ended up with reasonably good datasets for each sub-component. This allows us to proceed with a more fine-tuned empirical analysis.

[10] We also estimated some specifications where we replaced some controllers by other proxies like output gap, growth rate of real GDP per capita, and population growth. In other case, time dummies were used instead of the time trend. However, the conclusions of this study remain unaffected. Additionally, interaction effects between *Consolidation*, *Election* and *LeftGov* were also analysed, but no significant effects were found. These sensitivity analyses are not reported here to save space, but they are available upon request.

The results are presented in Tables 3 and 4. The structure of the model used in these estimations remains identical to the analysis for the first-level components, in the sense that each equation is related to the respective sub-component and estimated using the fixed-effects estimator over the same set of independent variables. We report the coefficients for all variables, except for the time-trend. For the sack of parsimoniousness of the analysis, we will only focus on the results for *Consolidation*.

A primary interest regarding these results is to check the origin of the increase in public services spending during fiscal consolidations. The results show that the source of that increase might be the public debt transactions. This is the only item for which the coefficient on *Consolidation* is positive and statistically significant. When we look at the expenditures lodged inside this sub-item (see Eurostat, 2011), we can conjecture that the increased spending in this sub-category might be due to the likely rise in interest payments and outlays for underwriting and floating government loans. As countries also intend to reduce public debt during fiscal consolidations, they can be using the reduction in the other components to finance the reduction of public debt (via the increase in public debt transactions), which ends up increasing spending in the public services component. Regarding the other items, we only find a significant decrease in executive affairs and general services research and development (R & D) expenditures, which ends up being unable to mitigate the strong positive effect of public debt transactions.

Military defence and foreign military aid are the items inside defence targeted more intensively during fiscal consolidations. We also observe significant cuts in public order items like police, fire and courts, but the spending with prisons is not significantly affected. Despite the expenditure on economic affairs does not change significantly, when we dig deeper inside this component, some of its items are indeed (significantly) negatively affected during fiscal consolidations: public spending on agriculture, transports and R & D. A different picture is obtained when we look inside spending in environmental protection: the statistical significance regarding their items is weak (see Table 3), in comparison with the overall effect of fiscal consolidations on this component identified in Table 1.

Changes in spending on housing amenities due to fiscal consolida-

Table 6
PIIGS versus the other EU countries.

***Growth rate of* PIIGS**	***TotExpd* (1)**	***PubServ* (2)**	***Defence* (3)**	***PubOrder* (4)**	***EconAff* (5)**	***Environm* (6)**	***Housing* (7)**	***Health* (8)**	***Recreat* (9)**	***Educ* (10)**	***SocProtect* (11)**
Consolidation	−4.461***	−0.089	−1.878	−5.488*	−6.777**	−4.328***	−18.199**	−6.866***	−8.203***	−5.816***	−3.819***
	(1.409)	(1.534)	(2.517)	(3.188)	(3.458)	(1.089)	(8.181)	(1.098)	(1.613)	(1.419)	(1.173)
RealGDPgr	0.112	0.358	0.515	0.793*	−1.610	1.598***	0.699	0.782**	0.562*	0.478**	0.022
	(0.157)	(0.416)	(0.417)	(0.418)	(3.175)	(0.271)	(1.623)	(0.380)	(0.328)	(0.197)	(0.254)
InterestRate	−0.529	0.345	−2.027**	−1.187**	−1.604	0.376	−2.208	−0.521	−0.186	−0.666	−0.561*
	(0.624)	(0.576)	(0.878)	(0.567)	(1.966)	(0.970)	(2.148)	(0.952)	(0.837)	(0.810)	(0.288)
Election	1.689	3.945***	4.075*	0.873	−0.610	1.715	−0.663	2.947**	2.950	2.166*	2.018***
	(1.149)	(1.223)	(2.379)	(1.346)	(7.678)	(3.669)	(2.680)	(1.174)	(2.189)	(1.255)	(0.615)
LeftGov	1.332	−1.044	7.311***	5.245**	−2.243	0.518	3.486*	2.188*	1.500	4.388***	0.447
	(1.518)	(1.785)	(1.895)	(2.308)	(7.871)	(2.190)	(1.788)	(1.133)	(2.987)	(1.057)	(1.046)
Young	−0.922	0.759	0.150	−0.480	−1.595	−0.822	−2.882	−0.105	−3.006*	−0.435	−0.309
	(1.472)	(0.622)	(1.638)	(1.044)	(5.291)	(1.051)	(3.860)	(0.939)	(1.802)	(0.927)	(0.708)
Elderly	−0.376	−1.447*	0.458	0.470	−4.081*	−0.256	4.306	−0.287	−0.088	0.182	−0.887
	(0.854)	(0.760)	(1.453)	(0.831)	(2.363)	(1.365)	(4.367)	(1.393)	(1.795)	(1.270)	(0.538)
Trend	−0.049	0.778**	0.057	−0.037	0.474	−0.320	−0.938	−0.079	−0.855	−0.208	0.173
	(0.522)	(0.312)	(0.604)	(0.350)	(2.144)	(0.296)	(1.107)	(0.223)	(0.556)	(0.270)	(0.287)
#Observations	99	99	99	99	99	99	99	99	99	99	99
#Countries	5	5	5	5	5	5	5	5	5	5	5
R-squared	0.163	0.226	0.204	0.273	0.043	0.366	0.072	0.455	0.341	0.355	0.185
Other Countries	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Consolidation	−0.815	2.552*	−1.707**	−1.528**	2.316	−2.599	−2.949	−1.643*	0.303	−0.911	−1.179**
	(0.626)	(1.470)	(0.716)	(0.729)	(8.919)	(2.837)	(2.903)	(0.762)	(1.226)	(0.624)	(0.439)
RealGDPgr	0.097	0.022	−0.568	0.266	−0.805	0.672**	0.849**	0.375*	0.382	0.155	−0.122
	(0.133)	(0.222)	(0.757)	(0.154)	(1.036)	(0.258)	(0.400)	(0.177)	(0.288)	(0.196)	(0.090)
InterestRate	0.269	0.169	0.437	0.665	0.405	0.069	0.335	0.355	0.569	0.262	0.135
	(0.421)	(0.903)	(0.488)	(0.658)	(1.935)	(1.998)	(1.992)	(0.705)	(1.075)	(0.791)	(0.451)
Election	2.010**	2.572**	−0.155	2.285***	−14.817	1.415	4.476**	2.526***	1.487	1.445	1.529**
	(0.746)	(1.030)	(1.856)	(0.813)	(14.108)	(1.377)	(1.707)	(0.703)	(1.378)	(1.014)	(0.581)
LeftGov	0.060	−1.842***	2.501	0.275	−10.696	3.287	1.426	0.363	1.209	1.140	−1.086
	(0.984)	(0.631)	(1.671)	(1.589)	(10.892)	(3.459)	(2.839)	(0.812)	(1.849)	(1.617)	(0.705)
Young	0.251	−0.084	0.247	1.479*	−3.885	−4.702*	−5.624**	1.294	−0.113	0.597	0.237
	(0.743)	(0.233)	(1.332)	(0.772)	(5.914)	(2.359)	(1.828)	(0.721)	(1.205)	(0.820)	(0.913)
Elderly	0.321	0.380	−0.056	0.823	−4.690	−0.829	−3.320*	0.624	0.759	0.667	0.474
	(0.628)	(0.561)	(1.325)	(0.584)	(4.299)	(1.420)	(1.739)	(0.644)	(0.857)	(0.617)	(0.901)
Trend	−0.047	−0.071	0.101	−0.093*	0.188	−0.691**	−0.119	0.017	−0.191*	−0.105	−0.153
	(0.084)	(0.076)	(0.126)	(0.048)	(0.225)	(0.274)	(0.250)	(0.061)	(0.099)	(0.076)	(0.108)
#Observations	196	196	196	196	196	196	196	196	196	196	196
#Countries	10	10	10	10	10	10	10	10	10	10	10
R-squared	0.060	0.086	0.035	0.117	0.024	0.096	0.071	0.125	0.047	0.068	0.082

Notes: See Table 1. Robust standard errors are in parentheses; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. In the first block of estimations are used only the group of countries named as PIIGS (Portugal, Ireland, Italy, Greece and Spain); in the second block are considered only the other ten countries.

tions are mainly driven by housing developments, while health expenditures tend to be lower due to decreases of spending in hospital services, public health services, and R & D. Spending cuts in recreation seem to be driven by cuts in one item: sport activities. A different scenario is found when we look at what happens inside education and social protection expenditures: almost all items are negatively affected during processes of fiscal consolidations. One important outcome of these disaggregated results is that they reinforce the idea that fiscal consolidations are harmful for important social (public) expenditures.

However, none of the previous analyses tells anything about how consolidations change the share of each component relatively to total expenditure or relatively to the other components. Thus, next we test the cross-effects between the expenditure components. We replaced the dependent variable in our econometric specification by the ratio of each component relatively to the others (and to total expenditures). This means that now we are measuring the relative effects between the components when the covariates change. The results are presented in Table 5, but only for the coefficient on *Consolidation*.[11]

Each line presents the consolidation effect for the ratio of each component to each of the other components that are indicated in each column. The results clearly show that expenditures in public services increase significantly during periods of fiscal consolidations relatively to almost all the other components of public expenditures, and inclusive relatively to total expenditures.[12] Once again, the increase in public debt transactions during those periods might be driving these results.

As already mentioned, countries intending to reduce public debt during fiscal consolidations can be using the spending cuts in the other components to finance the reduction of public debt via the increase in public debt transactions, which ends up increasing spending in public services relatively to the other components.

Spending in economic affairs is another component that rises significantly relatively to environment, health, recreation and education; in the other cases, the effect is not relevant. This increase during fiscal consolidations might be due to the intensification of general affairs related to the efforts needed to control public deficit and debt.

Defence and public order are significantly cut relatively to total expenditures during fiscal consolidation processes, but when compared with the other components, besides public services, spending on

[11] Each regression was estimated using a fixed-effects estimator and the same covariates considered in our baseline model, but the estimates on their coefficients are not reported here to save space; however, they are available upon request.

[12] The exceptions are housing, recreation and social protection (positive coefficients, but insignificant).

Table A1
Description of the variables.

Variable	Description
TotExpd	Total general government expenditure.
PubServ	General public services, which comprises the following items: (i) Executive and legislative organs, financial and fiscal affairs, and external affairs (*ExecAff*); (ii) Foreign economic aid (*ForAid*); (iii) General services (*GServ*); (iv) Basic research (*BasicRD*); (v) R & D general public services (*GServRD*); (vi) Other general public services (*OthServ*); (vii) Public debt transactions (*DebtTRS*); (viii) Transfers of a general character between different levels of government (*TransfGen*).
Defence	Defence expenditures, which comprises the following items: (i) Military defence (*MilDef*); (ii) Civil defence (*CivDef*); (iii) Foreign military aid (*FMilAid*); (iv) R & D defence (*DefRD*); (v) Other defence expenditures (*OthDef*).
PubOrder	Public order and safety, which comprises the following items: (i) Police services (*Police*); (ii) Fire-protection services (*Fire*); (iii) Law courts (*Courts*); (iv) Prisons (*Prisons*); (v) R & D public order and safety (*PubOrdRD*); (vi) Other public order and safety expenditures (*OthPO*).
EconAff	Economic affairs expenditures, which comprises the following items: (i) General economic, commercial and labour affairs (*GenAff*); (ii) Agriculture, forestry, fishing and hunting (*Agric*); (iii) Fuel and energy (*Energy*); (iv) Mining, manufacturing and construction (*Constr*); (v) Transport (*Transp*); (vi) Communication (*Communic*); (vii) Other industries (*OthInd*); (vii) R & D economic affairs (*EAffRD*); (ix) Other economic affairs expenditures (*OthEAff*).
Environm	Environmental protection expenditures, which comprises: (i) Waste management (*Waste*); (ii) Waste water management (*WastWater*); (iii) Pollution abatement (*Pollut*); (iv) Biodiversity and landscape protection (*Protect*); (v) R & D environmental protection (*EnvirRD*); (vi) Other environmental protection expenditures (*OthEnvir*).
Housing	Housing and community amenities, which comprises the following items: (i) Housing development (*HousDev*); (ii) Community development (*ComDev*); (iii) Water supply (*WatSup*); (iv) Street lighting (*StrLight*); (v) R & D housing and community amenities (*HousRD*); (vi) Other housing and community amenities expenditures (*OthHous*).
Health	Health expenditures, which comprises the following items: (i) Medical products, appliances and equipment (*MedProd*); (ii) Outpatient services (*OutPServ*); (iii) Hospital services (*HospServ*); (iv) Public health services (*PubHlth*); (v) R & D health (*HlthRD*); (vi) Other health expenditures (*OthHlth*).
Recreat	Recreation, culture and religion expenditures, which comprises the following items: (i) Recreational and sporting services (*Sports*); (ii) Cultural services (*Culture*); (iii) Broadcasting and publishing services (*Broadcast*); (iv) Religious and other community services (*Religious*); (v) R & D recreation, culture and religion (*RecrRD*); (vi) Other recreation, culture and religion expenditures (*OthRecr*).
Educ	Education expenditures, which comprises the following items: (i) Pre-primary and primary education (*Prim*); (ii) Secundary education (*Second*); (iii) Post-secundary non-tertiary education (*PosSec*); (iv) Tertiary Education (*Tert*); (v) General education expenditures not defined by level (*Genr*); (vi) Subsidiary services to education (*SubServ*); (vi) R & D education (*EducRD*); (viii) Other education expenditures (*OthEduc*).
SocProtect	Social protection expenditures, which comprises the following items: (i) Sickness and disability (*SickDis*); (ii) Old age (*Olders*); (iii) Survivors (*Survivors*); (iv) Family and children (*Family*); (v) Unemployment protection (*UnemPrt*); (vi) Housing protection (*HousPrt*); (vii) Social exclusion (*SocExcl*); (viii) R & D social protection (*SocPrtRD*); (ix) Other social protection expenditures (*OthSocP*).
Consolidation	Dummy variable that takes the value of 1 in the years in which a fiscal consolidation is implemented; 0 otherwise.
SpendConsol	Dummy variable that takes the value of 1 in the years during which a spending-driven fiscal consolidation is implemented; and 0 otherwise; this is defined as the change in the primary expenditure (as percentage of GDP) that is larger than 50% of the overall change in the CAPB (as percentage of GDP).
TaxConsol	Dummy variable that takes the value of 1 when a tax-driven fiscal consolidation is implemented; 0 otherwise.
SizeConsol	Size of the fiscal consolidation package in percentage of GDP.
SizeSpendConsol	Size of the spending-driven fiscal consolidation in percentage of GDP.
SizeTaxConsol	Size of the tax-driven fiscal consolidation in percentage of GDP.
DurConsol	Duration of the fiscal consolidation programme (in years).
Debt	Government debt as percentage of GDP.
GBS	Government budget surplus before interest payments (primary balance) as percentage of GDP.
AdjGBS	Cyclically adjusted government budget surplus before interest payments (primary balance) as percentage of GDP.
RealGDPgr	Growth rate of real GDP.
InterestRate	Long-term nominal interest rate on government bonds.
Election	Dummy variable that takes de value of 1 in the year of legislative elections; 0 otherwise.
LeftGov	Dummy variable that takes de value of 1 when there is hegemony or dominance of left-wing parties; 0 otherwise.
Young	Percentage of the population between 0 and 14 years of age.
Elderly	Percentage of the population with 65 or more years of age.

Sources: OECD (2009, 2011a,2011b, 2013, 2015), *Government at a Glance*; Eurostat (http://ec.europa.eu/eurostat/data/database); Comparative Political Data Set I (http://www.cpds-data.org/). The data for fiscal consolidations were obtained from Devries et al. (2011) for the period 1990–2009 and updated from Kataryniuk and Vallés (2015) for the years 2010–2012 (both follow a narrative approach). For Greece and Luxembourg, we are consistent with the narrative approach and combine the information provided by Kataryniuk and Vallés (2015), Dellepiane and Hardiman (2015) and OECD (2011a,2011b) country notes on *Restoring Public Finances* to obtain the respective consolidation periods, kind and size.

defence only decreases significantly relatively to social protection; public order also decreases relatively to social protection, education and health. In fact, public order seems to be one of the components that suffers the most during fiscal consolidations. Health and education decrease relatively to total expenditures and social protection. Finally, spending on environmental issues and housing amenities do not change significantly relatively to either total expenditures or the other components.

In sum, public services is the component that increases more significantly during fiscal consolidations, relatively to the other components and to total spending. The other components behave differently between them, but relatively to total spending we find that spending in defence, public order, health, and education is significantly cut during periods of fiscal consolidations. Thus, contrary to what is argued by Sanz (2011) – that fiscal adjustments protect functions that have both a social and productive character, such as education and health spending – our findings show that citizens' safety, health assistance, and investment in human capital are harmed when governments decide to stabilize public accounts, which can undermine the living standards and human development of a country.[13]

As a final and complementary exercise, we account for the heterogeneity. Since in the sample of countries used in this analysis we have a group known for unbalances in (or for being more "relaxed" with) their public accounts – Portugal, Ireland, Italy, Greece and Spain, also known as PIIGS – we will split the analysis in two groups: PIIGS versus the other countries. The PIIGS have faced economic difficulties, high

[13] Similar conclusions are obtained when regressions with per capita values for total public expenditure and respective functional components are considered. In Table A.6 in Annex, we report the respective results with per capita values. These results are obtained from a dynamic model, as in this case we have to control for the observed persistency in the dependent variables (not always stationary). The results show that public services expenditure per capita also increases during fiscal consolidations while spending per capita on citizens' safety, health assistance, investment in human capital decrease significantly. Moreover, we also corroborate the results for the growth rates as we observe additional decreases in environment, housing, recreation and social protection spending per capita.

Table A2
Descriptive statistics.

	Obs	Mean	Std.Dev.	Min.	Max.
TotExpd	304	1.927	5.470	−26.934	34.653
PubServ	304	0.748	6.338	−20.380	29.341
Defence	304	-0.003	10.920	−70.082	78.868
PubOrder	304	18.312	272.288	−28.437	474.367
EconAff	304	0.771	49.520	−68.114	279.137
Environm	304	3.883	17.288	−73.078	210.175
Housing	304	2.118	29.849	−93.373	397.462
Health	304	4.282	19.388	−17.679	321.667
Recreat	304	3.668	16.316	−36.217	235.357
Educ	304	2.114	6.088	−19.062	45.758
SocProtect	304	2.566	4.772	−4.449	21.271
Consolidation	345	0.351	0.478	0.000	1.000
SpendConsol	345	0.214	0.411	0.000	1.000
TaxConsol	345	0.125	0.331	0.000	1.000
SizeConsol	345	0.465	0.976	−0.200	7.800
SizeSpendConsol	345	0.281	0.616	−0.290	3.800
SizeTaxConsol	345	0.193	0.491	−0.740	4.100
DurConsol	345	0.878	1.532	0.000	8.000
Debt	345	71.466	31.322	4.638	179.868
GBS	345	0.107	3.689	−28.030	8.113
AdjGBS	345	0.093	3.336	−23.165	7.899
RealGDPgr	345	2.094	2.776	−8.539	11.272
InterestRate	337	6.020	3.164	1.403	22.498
Election	345	0.264	0.441	0.000	1.000
LeftGov	344	0.259	0.439	0.000	1.000
Young	345	17.476	2.227	12.809	27.319
Elderly	345	15.834	2.090	10.767	21.080

Notes: See Table A.1. All government expenditures are in growth rates of the respective real values (base year: 2005). Time period: 1990–2012 (annual data); Countries and respective years of fiscal consolidations: Austria (1996–1997, 2001–2002, 2011–2012), Belgium (1990, 1992–1994, 1996–1997, 2010–2012), Denmark (1995, 2011–2012), Finland (1992–1997, 2010–2012), France (1991, 1995–1997, 1999–2000, 2011–2012), Germany (1991–1995, 1997–2000, 2003–2004, 2006–2007, 2011–2012), Greece (1991–1992, 1994–2000, 2010–012), Ireland (2009–2012), Italy (1991–1998, 2004–2007, 2011–2012), Luxembourg (1996–1997), Netherlands (1991–1993, 2004–2005, 2011–2012), Portugal (2000, 2002, 2005–2007, 2010–2012), Spain (1992–1997, 2010–2012), Sweden (1993-1998), United Kingdom (1994–1999, 2010–2012).

Table A4
Panel unit root tests: Im, Pesaran and Shin test.

	Level		Growth rate/1st-Diff.	
	Stat.	*p*-value	Stat.	*p*-value
TotExpd	1.6606	0.9516	−8.3716	0.0000
PubServ	0.7933	0.7862	−6.0609	0.0000
Defence	−0.3946	0.3466	−6.8883	0.0000
PubOrder	0.7690	0.7791	−6.9157	0.0000
EconAff	−0.2080	0.4176	−9.6827	0.0000
Environm	−0.5905	0.2774	−6.1128	0.0000
Housing	0.1144	0.5455	−6.4122	0.0000
Health	2.8627	0.9979	−6.1401	0.0000
Recreat	−0.7601	0.2236	−4.4237	0.0000
Educ	0.6114	0.7295	−7.1947	0.0000
SocProtect	3.1508	0.9992	−8.0413	0.0000
Debt	2.1822	0.9855	−3.7738	0.0001
GBS	−2.8064	0.0025	−9.4788	0.0000
AdjGBS	−2.9966	0.0014	−8.1028	0.0000
RealGDP	1.4257	0.9230	−5.1036	0.0000
InterestRate	−0.6388	0.2615	−5.5852	0.0000
Young	−4.0402	0.0000	−1.4457	0.0741
Elderly	−7.0569	0.0000	−15.2489	0.0000

Notes: See Table A.1. The tests in the last column for the variables *Debt*, *GBS*, *AdjGBS* and *InterestRate* are in first differences while for the other variables are in growth rates.

Table A3
Average growth rates of government expenditures during consolidations and normal times.

	Consolidation periods					Normal times				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
TotExpd	107	−0.026	7.040	−26.934	34.653	197	2.988	4.030	−12.036	14.090
PubServ	107	1.197	7.429	−15.067	29.341	197	0.505	5.664	−20.380	18.174
Defence	107	−1.940	12.861	−70.082	44.139	197	1.049	9.578	−46.600	78.868
PubOrder	107	17.547	259.071	−19.015	474.367	197	19.063	7.795	−28.437	69.622
EconAff	107	1.398	42.819	−68.939	279.137	197	0.431	52.907	−68.114	140.088
Environm	107	1.256	23.702	−73.078	210.175	197	5.310	12.346	−19.232	71.116
Housing	107	−3.139	22.108	−52.758	164.587	197	4.974	33.011	−93.373	397.462
Health	107	2.981	31.891	−17.679	321.667	197	4.988	5.447	−10.064	33.618
Recreat	107	2.553	24.632	−36.217	235.357	197	4.274	9.074	−33.502	65.866
Educ	107	−0.453	6.811	−19.062	21.949	197	3.508	5.163	−11.079	45.758
SocProtect	107	0.913	4.737	−11.738	20.173	197	3.464	4.558	−14.449	21.271

Notes: See Tables A.1 and A.2. Government expenditures are in real growth rates (base year: 2005).

levels of public deficits and debts that forced them to implement severe fiscal packages. Thus the aim of this analysis is to find whether they have behaved differently from the others or not. The results from this separate analysis are presented in Table 6. We use the same specifications as in Table 1, however, in this case, at the top of the table are reported the results for the PIIGS and at the bottom the results for the other ten countries.[14]

The evidence is clear in showing that fiscal consolidations have a more intense and significant impact in the PIIGS than in the other countries. Consolidations measures reduce spending in total expenditures and in almost all its components (except public services and defence). The economic environment also seems to play a more important role in that specific group of countries. In general, the other results do not change much relatively to the ones we obtained with the whole sample.

These findings might mean that to offset the fiscal unbalances in the PIIGS, fiscal consolidations ended up being even more harmful there. This can have an important negative impact on the well-being of their most vulnerable citizens and undermine not only their economic growth, but also jeopardize their economic, social and human development.

5. Conclusions

This paper analyses the impact of fiscal consolidations on the

[14] We also estimated the model considering only EMU countries and excluding one country at a time from the sample, but the conclusions remained identical to the ones we got with the analysis reported in Table 1. As no significant new findings were obtained from those experiments, the respective results are not reported here to save space but they are available upon request.

Table A5
Endogeneity: IV estimator.

Dep. Vars.: *Growth rate of*	**(1)** ***TotExpd***	**(2)** ***PubServ***	**(3)** ***Defence***	**(4)** ***PubOrder***	**(5)** ***EconAff***	**(6)** ***Environm***	**(7)** ***Housing***	**(8)** ***Health***	**(9)** ***Recreat***	**(10)** ***Educ***	**(11)** ***SocProtect***
Consolidation	−2.294**	2.524*	−-2.848**	−2.869*	0.550	−7.910**	−12.034*	−3.430*	−2.099	−4.135**	−2.988*
	(1.113)	(1.526)	(1.304)	(1.644)	(7.014)	(3.584)	(6.510)	(2.083)	(2.484)	(1.995)	(1.677)
RealGDPgr	0.957**	−0.009	0.743	1.542**	−1.548	0.421	3.034*	0.978**	1.538**	0.466	0.011
	(0.458)	(0.424)	(0.743)	(0.611)	(4.462)	(1.000)	(1.832)	(0.496)	(0.742)	(0.534)	(0.369)
InterestRate	−0.339	2.547*	−1.160	0.040	−1.515	−1.215	0.326	−1.914**	−-1.725	−1.410***	−2.395**
	(0.665)	(1.407)	(1.440)	(0.636)	(8.356)	(1.203)	(1.733)	(0.808)	(1.132)	(0.283)	(1.207)
Election	1.875**	2.403**	1.022	1.682	−10.866	1.819	0.759	3.167***	2.481*	1.884**	2.222***
	(0.890)	(0.972)	(1.809)	(1.075)	(8.988)	(1.625)	(3.068)	(0.934)	(1.322)	(0.876)	(0.786)
LeftGov	0.085	−1.400	3.717*	1.622	−7.491	2.996	0.551	0.864	−0.061	2.441*	0.282
	(0.988)	(1.016)	(1.907)	(1.224)	(4.993)	(2.158)	(2.200)	(0.833)	(2.052)	(1.301)	(1.216)
Young	−0.323	−0.849	0.304	0.236	−3.404	−1.948**	−0.124	0.522	−1.370*	−0.075	−0.668
	(0.489)	(0.627)	(0.612)	(0.436)	(3.995)	(0.981)	(1.877)	(0.622)	(0.746)	(0.584)	(0.788)
Elderly	−0.207	−0.119	−0.388	−0.044	−4.062**	0.724	0.263	0.390	0.115	0.678	0.214
	(0.726)	(0.572)	(1.316)	(0.561)	(1.894)	(0.674)	(2.264)	(0.667)	(0.388)	(0.495)	(0.835)
Trend	0.098	−0.132	0.305	0.054	0.169	−0.617**	0.225	0.085	−0.170	−0.149	−0.001
	(0.137)	(0.133)	(0.280)	(0.146)	(0.692)	(0.284)	(0.685)	(0.139)	(0.157)	(0.121)	(0.127)
#Observations	286	286	286	286	286	286	286	286	286	286	286
#Countries	15	15	15	15	15	15	15	15	15	15	15
Endog.Test	13.79	13.90	6.41	6.99	1.39	5.75	4.82	7.32	7.85	12.60	15.63
	[0.087]	[0.084]	[0.601]	[0.538]	[0.994]	[0.676]	[0.776]	[0.503]	[0.448]	[0.126]	[0.048]

Notes: Robust standard errors are in parentheses; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. The growth rate of the real values of each expenditure component is used as the respective dependent variable in each equation. *RealGDP* is lagged one period and the *InterestRate* is in first differences. An IV estimator controlling for fixed effects is used. *Consolidation*, *RealGRPgr* and *InterestRate* are assumed to be endogenous and are instrumented with their lags, the lag of inflation and the lag of the cyclically adjusted deficit. The results of the Durbin-Wu-Hausman chi-square test-statistic are reported at the bottom of the table (the respective *p*-values in square brackets).

Table A6
The impact of fiscal consolidations on the real per capita values of each component.

Dep. Vars.:	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**
Growth rate of	***TotExpd***	***PubServ***	***Defence***	***PubOrder***	***EconAff***	***Environm***	***Housing***	***Health***	***Recreat***	***Educ***	***SocProtect***
Consolidation	−0.015**	0.022***	−0.029**	−0.031***	−0.024	−0.048***	−0.039*	−0.035***	−0.029***	−0.027***	−0.014**
	(0.007)	(0.008)	(0.014)	(0.009)	(0.029)	(0.017)	(0.023)	(0.007)	(0.011)	(0.007)	(0.006)
RealGDPgr	0.001	0.001	0.000	0.005***	−0.005	0.010***	0.008	0.006***	0.007***	0.004***	−0.002*
	(0.001)	(0.001)	(0.002)	(0.001)	(0.006)	(0.003)	(0.006)	(0.001)	(0.002)	(0.001)	(0.001)
InterestRate	−0.002	0.006*	−0.016***	−0.006*	−0.013	0.006	−0.024*	−0.006**	−0.005	−0.005*	−0.002
	(0.003)	(0.003)	(0.006)	(0.004)	(0.012)	(0.007)	(0.013)	(0.003)	(0.005)	(0.003)	(0.002)
Election	0.017***	0.029***	0.011	0.015**	0.008	0.011	0.048	0.025***	0.021**	0.016**	0.015***
	(0.006)	(0.007)	(0.012)	(0.007)	(0.027)	(0.015)	(0.030)	(0.006)	(0.010)	(0.006)	(0.005)
LeftGov	0.014	−0.010	0.039**	0.018	0.016	0.028	0.050	0.012	0.011	0.025**	0.006
	(0.010)	(0.011)	(0.020)	(0.012)	(0.039)	(0.024)	(0.045)	(0.010)	(0.015)	(0.010)	(0.008)
Young	−0.011*	−0.002	−0.003	0.003	−0.056***	-0.058***	-0.091***	0.003	−0.014*	−0.000	−0.005
	(0.006)	(0.006)	(0.011)	(0.006)	(0.018)	(0.013)	(0.026)	(0.006)	(0.008)	(0.006)	(0.005)
Elderly	−0.011**	0.003	−0.002	0.001	−0.093***	−0.046***	−0.070***	0.002	−0.002	0.000	−0.003
	(0.005)	(0.005)	(0.008)	(0.005)	(0.022)	(0.012)	(0.019)	(0.005)	(0.006)	(0.005)	(0.004)
Trend	0.003**	−0.000	0.000	0.001	0.013***	0.004	0.001	0.001	−0.001	0.000	0.000
	(0.001)	(0.001)	(0.002)	(0.001)	(0.005)	(0.003)	(0.005)	(0.001)	(0.002)	(0.001)	(0.001)
LagDepVar	0.847***	0.960***	0.849***	0.940***	0.475***	0.751***	0.525***	0.970***	0.951***	0.949***	0.924***
	(0.047)	(0.033)	(0.037)	(0.030)	(0.057)	(0.040)	(0.048)	(0.038)	(0.031)	(0.035)	(0.037)
#Observations	295	295	295	295	293	295	295	295	295	295	295
#Countries	15	15	15	15	15	15	15	15	15	15	15

Notes: Bootstrapped standard errors are in parentheses; significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. The logarithm of the real value of each expenditure component per capita is used as dependent variable in each equation. A bias-corrected least squares dummy variable (LSDVC) estimator for dynamic panel data models is employed (for details, see Bruno 2005a, b). The Blundell and Bond (1998) procedure is used as the initial estimator. Following Bloom et al. (2007), we undertake 50 repetitions of the procedure to bootstrap the estimated standard errors. The results do not qualitatively change with more repetitions (100, 200 or 500) or when the Arellano and Bond (1991) or Anderson and Hsiao (1982) estimator are chosen as initial estimators. *RealGDP* is lagged one period and the *InterestRate* is in first differences.

functional components and sub-components of public expenditures using data for 15 EU countries over the period 1990–2012. The empirical analysis shows that government spending slows down during periods of fiscal consolidations. But, more importantly, our results unveil that the components in which those decreases are more significant are defence, public order, environment, housing, health, education and social protection, especially if they are spending-driven and the higher their size is. This evidence is even stronger in a particular group of countries, known in the literature as PIIGS.

Nevertheless, spending in public services has consistently proved to increase during fiscal consolidations. Digging deeper in the data, we find that the cause for that increase is the public debt transactions: when we look at the expenditures lodged inside this item, we realise that the boost in this item can be due to the likely rise in interest payments and outlays for underwriting and floating government loans. As countries also intend to reduce public debt during fiscal consolidations, they can use the cuts in the other components to finance the reduction of public debt (via the increase in public debt transactions), which ends up increasing spending in the public services component.

We also look at the behaviour of the items inside each of the other components and conclude that one important outcome of that very disaggregated analysis is that they reinforce the idea that fiscal consolidations end up being very harmful for important social public expenditures like health, education and social protection.

Additionally, we test the cross-effects between the expenditure components and relatively to total expenditure. Expenditures in public services increase significantly during fiscal consolidations relatively to the other components of public expenditures, and inclusive relatively to total expenditures. The increase in public debt transactions during those periods might be driving these results. The other components behave differently between them, but relatively to total spending we find that spending in defence, public order, health, and education is significantly cut during periods of fiscal consolidations.

Overall, the findings of this paper call the attention to the fact that citizens' safety, health assistance, and investment in human capital can be harmed when governments decide to stabilize public accounts. This behaviour can undermine the living standards, boost income inequalities, affect social and political stability, and put human development in danger. Governments should take this information into account when designing consolidation packages, as a way of promoting a fair distribution of the consolidation efforts by all economic agents. Otherwise, the more vulnerable citizens will suffer the most.

Appendix

See Tables A1–A6.

References

Afonso, A., Jalles, J., 2012. Measuring the success of fiscal consolidations. Appl. Financ. Econ. 22 (13), 1053–1061.
Afonso, A., Jalles, J., 2014. Assessing fiscal episodes. Econ. Model. 37, 255–270.
Afonso, A., Jalles, J., 2016. Economic performance, government size, and institutional quality. Empirica 43 (1), 83–109.
Agnello, L., Caporale, G., Sousa, R., 2013. Fiscal adjustments and business cycle synchronization. CESifo Working Paper Series, WP4505.
Agnello, L., Castro, V., Sousa, R., 2013. What determines the duration of a fiscal consolidation program? J. Int. Money Financ. 37, 113–134.
Agnello, L., Sousa, R., 2014. How does fiscal consolidation impact on income inequality? Rev. Income Wealth 60 (4), 702–726.
Agnello, L., Castro, V., Jalles, J., Sousa, R., 2014a. Fiscal adjustments, labour market flexibility and unemployment. Econ. Lett. 124 (2), 231–235.
Agnello, L., Castro, V., Jalles, J., Sousa, R., 2014b. Income inequality, fiscal stimuli and political (in)stability. In: Proceedings of the Symposium on Business and Economics in Times of Crisis, vol. 2. Lupcon Center for Business Research.
Agnello, L., Castro, V., Jalles, J., Sousa, R., 2015a. Fiscal consolidation and financial reforms. Appl. Econ. 47, 3740–3755.
Agnello, L., Castro, V., Jalles, J., Sousa, R., 2015b. The Hidden face of fiscal consolidation: human development is hurt! In: Conference Proceedings of the Finance and Economics Conference. Lupcon Center for Business Research.
Agnello, L., Fazio, G., Sousa, R., 2016. National fiscal consolidations and regional inequality in Europe. Camb. J. Regions, Econ. Soc. 9 (1), 59–80.
Alesina, A., Cohen, G., Roubini, N., 1997. Political Cycles and the Macroeconomy. The MIT Press, Cambridge, MA, London.
Alesina, A., Campante, F., Tabellini, G., 2008. Why is fiscal policy often procyclical? J. Eur. Econ. Assoc. 6, 1006–1036.
Alesina, A., Ardagna, S., 2010. Large changes in fiscal policy: taxes versus spending. In: Brown, J.R. (Ed.), Tax Policy and the Economy vol. 24. National Bureau of Economic Research, NBER, The University of Chicago Press, 35–68.
Alesina, A., Perotti, R., 1995. Fiscal expansions and adjustments in OECD countries. Econ. Policy 21, 205–248.
Alesina, A., Perotti, R., 1997. Fiscal adjustments in OECD countries: composition and macroeconomic effects. IMF Staff Papers 44 (2), 210–248.
Alesina, A., Perotti, R., 1998. Economic risk and political risk in fiscal unions. Econ. J. 108 (449), 989–1008.
Anderson, D., Hunt, B., Snudden, S., 2014. Fiscal consolidation in the Euro Area: how much pain can structural reforms ease? J. Policy Model 36 (5), 785–799.
Anderson, T., Hsiao, C., 1982. Formulation and estimation of dynamic models using panel data. J. Econom 18 (1), 47–82.
Arellano, M., Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Rev. Econ. Stud. 58, 277–297.
Ball, L., Furceri, D., Leigh, D., Loungani, P., 2013. The distributional effects of fiscal austerity. United Nations DESA Working Paper No, 129.
Barrios, S., Langedijk, S., Pench, L., 2010. EU fiscal consolidation after the financial crisis: lessons from past experiences. Eur. Econ. Econ Pap., 418.
Bi, H., Leeper, E., Leith, C., 2013. Uncertain fiscal consolidations. Econ. J. 123, F31–F63.
Blanchard, O., Perotti, R., 2002. An empirical characterization of the dynamic effects of changes in government spending and taxes on output. Q. J. Econ. 117, 1329–1368.
Bloom, D., Canning, D., Mansfield, R., Moore, M., 2007. Demographic change, social security systems, and savings. J. Monet. Econ. 54 (1), 92–114.
Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. J. Econom. 87 (1), 115–143.
Bruno, G., 2005a. Estimation and inference in dynamic unbalanced panel-data models with a small number of individuals. Stata J. 5 (4), 473–500.
Bruno, G., 2005b. Approximating the bias of the LSDV estimator for dynamic unbalanced panel data models. Econ. Lett. 87 (3), 361–366.
Buti, M., Sapir, A., 1998. Economic Policy in EMU. Oxford University Press, Oxford.
Cafiso, G., Cellini, R., 2014. Fiscal consolidations and public debt in Europe. Int Tax Public Financ. 21 (4), 614–644.
Castro, V., Martins, R., 2016a. Political cycles and government expenditures: evidence from Portugal. Appl. Econ. Lett. 23 (1), 34–37.
Castro, V., Martins, R., 2016b. Politically driven cycles in fiscal policy: In depth analysis of the functional components of government expendituresNIPE Working Paper, WP 02/2016. University of Minho, Portugal.
Cimadomo, J., 2012. Fiscal policy in real time. Scand. J. Econ. 114 (2), 440–465.
Cimadomo, J., Kirchner, M., Hauptmeier, S., 2010. Transmission of government spending shocks in the euro area: time variation and driving forcesECB Working Paper No. 1219. European Central Bank.
Coenen, G., Mohr, M., Straub, R., 2008. Fiscal consolidation in the euro area: Long-run benefits and short-run costs. Econ. Model. 25, 912–932.
Cugnasca, A., Rother, P., 2015. Fiscal multipliers during consolidation: evidence from the European Union. ECB Working 1863.
Dellepiane, S., Hardiman, N., 2015. Fiscal politics in time: pathways to fiscal consolidation in Ireland, Greece, Britain, and Spain, 1980–2012. Eur. Polit. Sci. Rev. 7(2), 189–219.
Devries, P., Guajardo, J., Leigh, D., Pescatori, A., 2011. A new action based dataset of fiscal consolidation. International Monetary Fund, IMF Working Paper No. 128.
Efthyvoulou, G., 2012. Political budget cycles in the European Union and the impact of political pressures. Public Choice 153, 295–327.
Enkelman, S., Leibrecht, M., 2013. Political expenditure cycles and election outcomes: evidence from disaggregation of public expenditures by economic functions. Econ. Lett. 121, 128–132.
Erceg, C., Linde, J., 2013. Fiscal consolidation in a currency union: spending cuts vs tax hikes. J. Econ. Dyn. Control 37 (2), 422–445.
Eurostat, 2011. Sources and methods for the compilation of COFOG statistics. Eurostat Working papers.
Forni, L., Gerali, A., Pisani, M., 2010. The macroeconomics of fiscal consolidations in Euro area countries. J. Econ Dyn. Control 34 (9), 1791–1812.
Furceri, D., Jalles, J., Loungani, P., 2015. Fiscal consolidation and inequality in advanced economies: how robust is the link? Paper presented at the 17th Conference on Public Finances "Beyond the austerity dispute: New priorities for fiscal policy". Banca d'Italia, Perugia, 9–11 April 2015 ⟨http://www.bancaditalia.it/pubblicazioni/altri-atti-convegni/2015-beyond-austerity/Furceri_TovarJalles_Loungani.pdf⟩.
Garcia, S., Henin, P.Y., 1999. Balancing budget through tax increases or expenditure cuts: is it neutral? Econ. Model. 16, 591–612.
Giavazzi, F., Pagano, M., 1996. Non-Keynesian Effects of Fiscal Policy Changes: International Evidence and the Swedish Experience. Swedish Economic Policy Review 3, 67–103.
Giavazzi, F., Jappelli, T., Pagano, M., 2000. Searching for non-linear effects of fisal policy: evidence for industrial and developing countries. Eur. Econ. Rev. 44, 1269–1289.
Heylen, F., Hoebeeck, A., Buyse, T., 2013. Government efficiency, institutions, and the effects of fiscal consolidation on public debt. Eur. J. Polit. Econ. 31, 40–59.
Hur, S.K., Mallick, S., Park, D., 2014. Fiscal policy and crowding out in developing Asia. Environ. Plann. C: Gov. Policy 32 (6), 1117–1132.
Jha, S., Mallick, S., Park, D., Quising, P., 2014. Effectiveness of countercyclical fiscal policy: evidence from developing Asia. J of Macroecon 40, 82–98.
Kataryniuk, I., Vallés, J., 2015. Fiscal consolidation after the Great Recession: the role of composition. Bank of Spain Working-Paper 1515.
Katsimi, M., Sarantides, V., 2012. Do elections affect the composition of fiscal policy in developed, established democracies? Public Choice 151, 325–362.
McDermott, C., Wescott, R., 1996. An empirical analysis of fiscal adjustments. IMF Staff Papers 43 (4), 725–753.
Mink, M., De Haan, J., 2006. Are there political budget cycles in the Euro area? Eur. Union Polit. 7, 191–211.
Molnár, M., 2012. Fiscal consolidation: What factors determine the success of consolidation efforts? OECD J.: Econ. Stud. 2012/1.
Morozumi, A., Veiga, F., Veiga, L., 2014. Electoral effects on the composition of public spending and revenue: evidence from a large panel of countries. NIPE Working Paper 23/2014.
Mountford, A., Uhlig, H., 2009. What are the effects of fiscal policy shocks? J. Appl. Econom. 24 (6), 960–992.
Mulas-Granados, C., 2005. Fiscal adjustments and the short-term trade-off between economic growth and equality. Hacienda Pública Española/Revista Econ Pública 172 (1), 61–92.
OECD, 2009. Government at a Glance. OECD Publishing, Paris, 2009.
OECD, 2011a. Government at a Glance. OECD Publishing, Paris, 2011.
OECD, 2013. Government at a Glance. OECD Publishing, Paris, 2013.
OECD, 2015. Government at a Glance. OECD Publishing, Paris, 2015.
OECD, 2011b. Restoring Public Finances. Special Issue of the OECD Journal on Budgeting, Volume 2011/2, OECD Publishing, Paris.
Perotti, R., 1999. Fiscal policy in good times and bad. Q. J. Econ 114, 1399–1436.
Potrafke, N., 2010. The growth of public health expenditures: do government ideology and electoral motives matter? J. Health Econ. 296, 797–810.
Sanz, I., 2011. What do OECD countries cut first when faced with fiscal adjustments? South. Econ. J. 77 (3), 753–775.
von Hagen, J., Hallett, A.H., Strauch, R., 2002. Budgetary consolidation in Europe: quality, economic conditions and persistence. J. Jpn. Int. Econ. 16, 512–535.
von Hagen, J., Strauch, R., 2001. Fiscal consolidations: quality, economic conditions and success. Public Choice 109, 327–346.