

Fiscal consolidation episodes in OECD countries: the role of tax compliance and fiscal space

by

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Abstract

This paper looks at fiscal consolidation episodes in OECD countries from 1978 to 2009, relying on the database of Devries *et al.* (2011). We show that a large proportion of these episodes (41% of the total) occurs during the low phase of the business cycle. As regards their composition, the average consolidation amounts to 1% of GDP, around two-thirds being driven by cuts in public spending and one-third by a rise in taxes. We investigate the drivers of the composition of fiscal consolidation episodes by focusing mainly on the level of fiscal space and fluctuations in tax compliance over the business cycle. We find that when countries have less fiscal space and more pro-cyclical tax compliance, the fiscal consolidation relies more on spending cuts than on tax hikes.

JEL Codes: E02, E62, H26.

Keywords: Fiscal consolidation, Fiscal space, Tax compliance.

** At the time of writing*

1/ Introduction

Since the global financial crisis, central banks in advanced economies have put in place accommodative monetary policies in response to persistently low economic growth and natural interest rates, especially by implementing innovative unconventional tools (like forward guidance or asset purchase programmes). In spite of this monetary stimulus, economic activity has not fully recovered leading to intense economic policy debates among policy circles about the roots of the sluggish global growth since 2011. In this respect, the possibility of a collective fiscal stimulus among G20 countries was recently put forward, especially by international institutions like the IMF, calling for a comprehensive approach to generate growth combining loose monetary policy, fiscal stimulus (including through more growth-friendly fiscal composition) and implementation of relevant structural reforms (see Gaspar, Obstfeld, Sahay, 2016).

The ability for a country to implement a given fiscal policy, either expansionary or contractionary, and the tools adopted – i.e. changes in taxes and/or changes in government expenditure – is constrained by the available fiscal space and the ability of the government to collect taxes, among other factors. In this paper we focus on fiscal consolidation episodes and investigate the impact of fiscal space and the cyclical behaviour of tax compliance on the composition of fiscal consolidations. We first carry out an empirical analysis of fiscal consolidation episodes in OECD countries over the 1978-2009 period and show that (i) contradicting conventional wisdom, 41% of consolidations are carried out during the low phase of the business cycle, and (ii) those fiscal consolidations are generally implemented through cuts in spending instead of rises in taxes. Then, we show that both tax compliance and fiscal space may explain the composition of consolidations. Indeed, when countries have less fiscal space and more pro-cyclical tax compliance, fiscal consolidation relies more on spending cuts than on tax hikes.

Related literature. Our study forms part of a broad body of literature on the role of fiscal tools in stabilising macroeconomic activity. In particular, there has been a significant debate on the size of fiscal multipliers. Ramey (2011) reviews the literature on the size of government spending multipliers and concludes that it probably lies between 0.8 and 1.5, according to the type of government expenditure and the phase of the business cycle. Blanchard and Leigh (2013) investigate the relationship between growth forecast errors and planned fiscal consolidation during the crisis and find that fiscal multipliers were substantially higher than implicitly assumed by forecasters. In this paper we do not investigate the impact of fiscal policy on the aggregate economy but we rather focus on the ability of countries to undertake fiscal consolidations. This issue, which is widely discussed in international policy fora, refers to the fiscal space that countries have, generally calculated as the difference between the current level of public debt and an estimated level of sustainable debt. Obviously, this level cannot be observed and has to be estimated, leading in turn to lively methodological and conceptual debates – see for example Ghosh *et al.* (2013). Finally, while we focus on the impact of fiscal space and pro-cyclical tax compliance on the choice of fiscal tools implemented during fiscal consolidation, several papers focus instead on the consequences of the composition of fiscal consolidation in terms of output losses or debt reduction. For example, Alesina and Ardagna (2013) or Alesina *et al.* (2015) show that fiscal consolidation based upon spending cuts are much less costly in terms of mid-term output losses than tax-based consolidations. They find that spending-based adjustments have been associated with mild and short-lived recessions that in certain situations can generate growth. In an OECD working paper, Cournède *et al.* (2013) show that,

in order to reduce excess debt, it seems preferable to maintain spending on education, childcare and family or social security contributions and to cut subsidies and pensions or to raise property taxes. However, few studies try to explain to what extent a country is likely to use spending cuts or tax hikes in a consolidation phase, which is the objective of this paper.

2/ Empirical analysis of fiscal consolidation episodes in OECD countries

A major challenge in the literature is to properly identify fiscal consolidation episodes, i.e. discretionary fiscal policy, and differentiate them from cyclical fluctuations in the primary balance. In order to do so, the literature has recently taken a historical approach, also sometimes referred to as a narrative approach, as in Ramey and Shapiro (1998), Romer and Romer (2010) and Devries *et al.* (2011). Relying on historical sources, the objective of this kind of approach is to clearly identify discretionary fiscal policy episodes.

In this paper, we define fiscal consolidation episodes using the methodology put forward by Devries *et al.* (2011).¹ The database contains 173 fiscal consolidation episodes for 17 OECD countries² over the period 1978-2009. Devries *et al.* (2011) adopt a narrative approach focusing on "discretionary changes in taxes and government spending primarily motivated by a desire to reduce the budget deficit and not by a response to prospective economic conditions". We also consider the composition of the fiscal consolidations by looking at the share of tax hikes and spending cuts for a given fiscal consolidation. In our analysis, GDP-related variables are taken from the Penn World Table dataset and the remaining aggregate variables are taken from standard sources such as the OECD database and the World Economic Outlook.

The Devries *et al.* (2011) dataset provides us with useful information on the timing and characteristics of fiscal consolidation episodes. Unsurprisingly, fiscal consolidations are undertaken as debt ratios increase and primary balances run large deficits. In Chart 1, we present the fiscal consolidation episodes in Finland, Canada and France, as examples.

In the early 1990s, the Finnish banking crisis strongly undermined the country's financial sector, pushing the government to intervene. The government ran large deficits and debt more than doubled in three years. Six consolidation episodes were undertaken. The Finnish primary balance was brought back on a sustainable path and the debt ratio progressively decreased. From the early 1980s to the mid-1990s, Canada also ran large deficits mainly for political and social reasons: debt doubled in 15 years. As debt increased, the Canadian government reacted and generated primary surplus through multi-year fiscal consolidation plans. From 1995 onwards, the debt ratio steadily decreased as the country ran primary surpluses. France is another interesting illustrative example, as the country did not manage to actually stabilise its debt ratio and primary balance. Though some fiscal consolidation episodes were attempted, they were not frequent and large enough to reverse the

¹ More specifically, we incorporate the modifications made by Alesina *et al.* (2015). While the Devries *et al.* (2011) dataset only reports year by year fiscal shocks without distinguishing between announced and unanticipated policy shifts, Alesina *et al.* (2015) extend the dataset by clustering individual shifts in taxes or spending into multi-year fiscal plans consisting of announced and unanticipated exogenous fiscal shocks.

² The countries are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Portugal, Spain, Sweden, the United Kingdom and the United States.

fiscal trend. In all three case-studies, there is clearly an abrupt increase of the debt ratio in 2008-2009 due to the subprime economic crisis.

Charts 2 and 3 display respectively the total number of fiscal consolidations and their size, broken down between spending cuts and tax hikes, over the period for each country. Some countries, such as the United Kingdom and France, have consolidated less than 5% of their GDP over the 1978-2009 period. On the other hand, Italy has led numerous fiscal consolidation episodes accounting for 25% of GDP over thirty years. Most fiscal consolidations involve spending cuts and tax hikes simultaneously but the shares are clearly country specific. For example, Finland is an extreme case, as the country almost entirely relied on spending cuts over the period. One should also keep in mind that spending cuts are on average larger than tax hikes. Averaging over the countries and the sample, we find that the size of a typical fiscal consolidation is roughly 1% of GDP. Average spending cuts amount to 0.63% of GDP whereas average tax hikes amount to 0.37% of GDP. Overall, around 60% of fiscal consolidations in the sample are expenditure-based.³

Lastly, we consider fiscal consolidation episodes in conjunction with economic cycles. We define economic cycles as deviations to long-term economic trends. In this respect, the output gap based on real GDP is calculated using the Hodrick-Prescott filter and divided into quartiles. We find that fiscal consolidations are often undertaken during economic downturns as shown in Chart 4, with 41% of fiscal consolidation episodes occurring during the low phase of the business cycle, compared to 24% during economic booms. Such timing is definitely at odds with standard Keynesian policy recommendations and the existing literature on the cyclical nature of fiscal policies that tends to argue that advanced countries ought to implement a-cyclical or counter-cyclical fiscal policies.⁴

3/ The role of fiscal space and tax compliance in the composition of fiscal consolidation episodes

As shown in Chart 3, the composition of fiscal consolidation episodes is characterised by large cross-country heterogeneity (whether they are carried out through spending cuts or tax hikes). The objective of this section is to understand what determines the composition of fiscal consolidations and more specifically to explain the share of spending cuts in total fiscal consolidations. In particular, we focus on the possible constraints that the fiscal space and a government's capacity to collect tax revenues in full put on the available fiscal instruments. In this respect we differ from existing literature – e.g. Alesina *et al.* (2015) – which rather focuses on the different outcome of fiscal consolidation episodes according to their composition.

Fiscal space may be defined as the room for undertaking discretionary fiscal policy without undermining fiscal sustainability. Obviously, this value cannot be directly observed and several measures of fiscal space have been put forward in the literature and are discussed among policy circles.⁵ Measures of fiscal space include various aspects of debt sustainability: monetary policy, interest rates on sovereign debt, growth prospects and the government's discretionary fiscal policy. A structural approach, pioneered by Ghosh *et al.* (2013) and also used by Fournier and Fall (2015)

³ We define fiscal consolidations as expenditure-based if spending cuts are larger than tax hikes.

⁴ See Vegh and Vuletin (2015) on the cyclical properties of tax rates.

⁵ Determining the size of fiscal space is crucial when an international organisation, like the IMF or the OECD, makes economic policy recommendations for a country.

among others, is based on the government's estimated fiscal reaction function. As the debt-to-GDP ratio increases, the government progressively increases its primary balance to service the debt. This works up to a critical level of debt where the government displays fiscal fatigue and is unable to generate larger primary surpluses than the current level. Eventually the government is unable to service its debt, interest rates increase drastically and the country loses market access. Relying on this theoretical framework, fiscal space is defined as the difference between the current level of debt and the debt ceilings measured by Ghosh *et al.* (2013).⁶

Assessing the capacity to collect tax revenues is crucial as governments control tax rates, but do not control tax revenues. In this respect, Pappadà and Zylberberg (2015, 2016) argue that tax compliance and its fluctuations should be taken into account as to a large extent they determine fluctuations in tax revenues. More precisely, they show that when a country raises tax rates, tax compliance decreases, thus mitigating the increase in tax revenues. In order to measure tax compliance, we borrow the VAT compliance indicator from Pappadà and Zylberberg (2015).⁷ Aggregate tax compliance $TC_{t,c}$ is defined as the ratio between tax revenues from total declared transactions and the counterfactual tax revenues from actual transactions. Letting $T_{t,c}$ denote VAT revenues in year t for country c , $\tau_{t,c,j}$ the VAT rate for good j , and $C_{t,c,j}$ the reported consumption of good j , we have that:

$$TC_{t,c} = \frac{T_{t,c}}{\sum_j \tau_{t,c,j} C_{t,c,j}}$$

where the gap between tax revenues and expected tax revenues captures imperfect tax enforcement from tax authorities.

In order to study the determinants of the spending cuts as a share of total fiscal consolidations, we proceed in two steps. In the first step, for each country we estimate the elasticity of tax compliance to the cycle by also controlling for changes both in tax rates and tax base. This is important because tax compliance is sensitive to changes in taxes. Without doing this we would overestimate the effects of the cycle on tax compliance.⁸ For instance, considering the elasticity of tax compliance to the cycle alone might result in a tax hike for a given country being taken into account, thereby overestimating the effects of the cycle on tax compliance.

In the second step, we then embed the elasticity of tax compliance to the cycle in the following panel regression:

$$Share_G_{t,c} = \alpha + \beta D_{t,c} + \gamma \xi_c + \delta \xi_c D_{t-1,c} + \sigma X_{t-1,c} + \rho_t + \mu_c + \varepsilon_{t,c}$$

where t stands for years and c stands for the country. $Share_G_{t,c}$ is the share of spending cuts in the fiscal consolidation. $D_{t,c}$ is the government debt as a percentage of GDP, and ξ_c is the average elasticity of tax compliance to the cycle in country c , estimated in the previous step. The vector X will include controls, such as the economic cycle, a dependency ratio to account for the ageing of the population and the average expenditure as a percentage of GDP over the period to account for the

⁶ In contrast with Ghosh *et al.* (2013), Collard *et al.* (2015) estimate maximum sustainable debt levels and argue that countries can go beyond these thresholds without necessarily defaulting, but with the risk of seeing their probability of default strongly increase.

⁷ The dataset covers an unbalanced panel of 36 (European and non-European) countries between 1990 and 2012.

⁸ Estimates are based on fiscal consolidation episodes for 15 countries over the 1978-2009 period. The United States and Australia are taken out of the sample, because there is no VAT in the United States and the value of the elasticity of tax compliance for Australia is an outlier.

size of the government. The regression is weighted by fiscal consolidation size as a percentage of GDP. μ_c captures the country-specific components, ρ_t controls for year-fixed effects and $\varepsilon_{t,c}$ is the error term. The interest coefficient is δ and can be interpreted as the influence of the elasticity of tax compliance on the share of spending cuts in fiscal consolidation as fiscal space increases.

The empirical results are presented in Table 1. We first investigate whether the elasticity of tax compliance and the level of debt ratio have a direct impact on the composition of fiscal consolidation episodes. Columns (1) and (2) show that this is not the case: countries with a high debt ratio or more sensitive tax compliance do not necessarily design their fiscal consolidations based on government expenditure cuts. Instead, as shown in column (3), it is the interaction between the elasticity of tax compliance and the level of debt ratio that matters: when countries have high levels of debt – thus a reduced fiscal space – and a high elasticity of tax compliance, they cut expenditure rather than increase taxes when implementing a fiscal consolidation.⁹ The intuition is straightforward: as the government cannot increase its debt further, it will generate a primary surplus by cutting spending rather than increasing taxes because the response of tax compliance to a tax hike could hinder the increase in tax revenues. This result is robust to the addition of control variables such as the output gap, the dependency ratio or the average level of government expenditure as reported in column (4).

4/ Conclusions

This article focuses on fiscal consolidation episodes in OECD countries from 1978 to 2009. Using a standard definition of fiscal consolidations, we first show that 41% of fiscal consolidations occur during the low phase of the business cycle, which stands at odds with benchmark textbooks suggesting that fiscal policy should be counter-cyclical. We also show that the average fiscal consolidation plan amounts to 1% of GDP, around two-thirds being driven by spending cuts and one-third by rises in taxes.

We then investigate the determinants of the composition of fiscal consolidations. Relying on a VAT compliance indicator put forward by Pappadà and Zylberberg (2015), we argue that both the fiscal space and the elasticity of tax compliance to the cycle influence the composition of consolidation episodes. When fiscal space is low, fiscal consolidation implemented in a country with highly elastic tax compliance is likely to rely more heavily on spending cuts than on tax hikes to bring a deficit back on a sustainable path.

These findings have important policy implications. First, more reliable real-time evaluations of the business cycle have to be developed in order to put in place a true contra-cyclical fiscal policy. Implementing fiscal consolidations during the low phase of the business cycle is likely to damage short-term growth (see e.g. Blanchard and Leigh, 2013), as well as long-term growth through hysteresis effects (see Fatas and Summers, 2016).

Second, countries should reinforce tax compliance to avoid excessive elasticity to the business cycle. Lower elasticity enables governments to exercise greater freedom in choosing the tools that compose their fiscal policy: spending cuts and rises in taxes.

⁹ The results are robust to (i) replacing the debt to GDP ratio with fiscal space estimates, by Ghosh *et al.* (2013), or Fournier and Fall (2015), and (ii) considering episodes of fiscal consolidations implemented in booms and recessions, separately.

Third, we point out the role of fiscal space in the composition of fiscal policy. However, the jury is still out about fiscal space measurement. It seems important that the economic literature and policy discussions come to a consensus on this sensitive issue.

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Charts and tables

Chart 1.

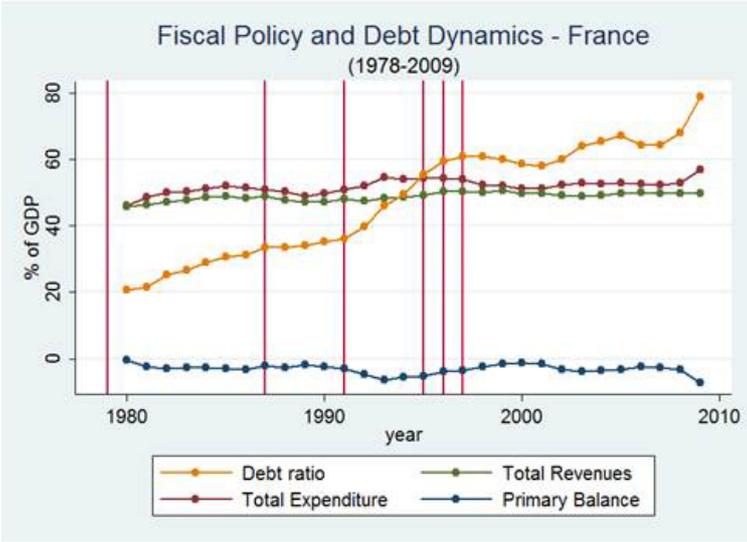
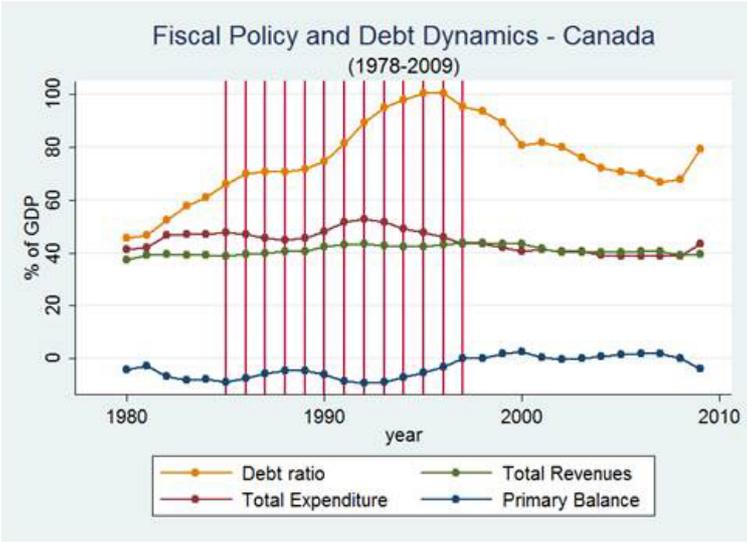
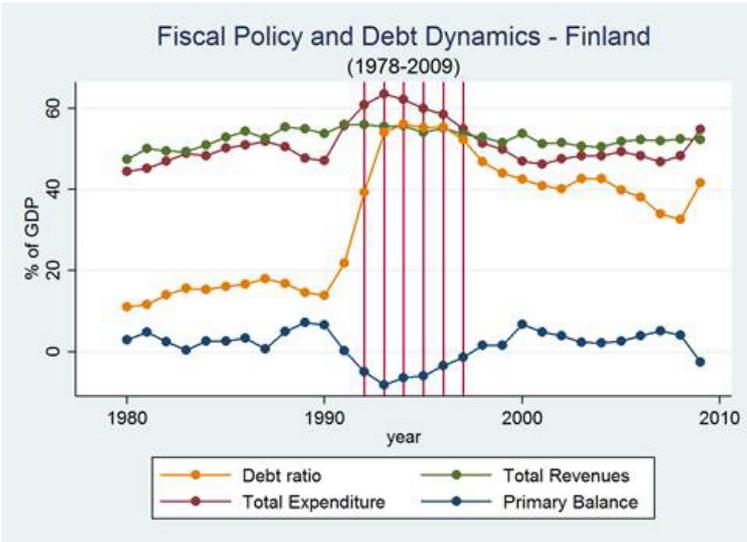


Chart 2.

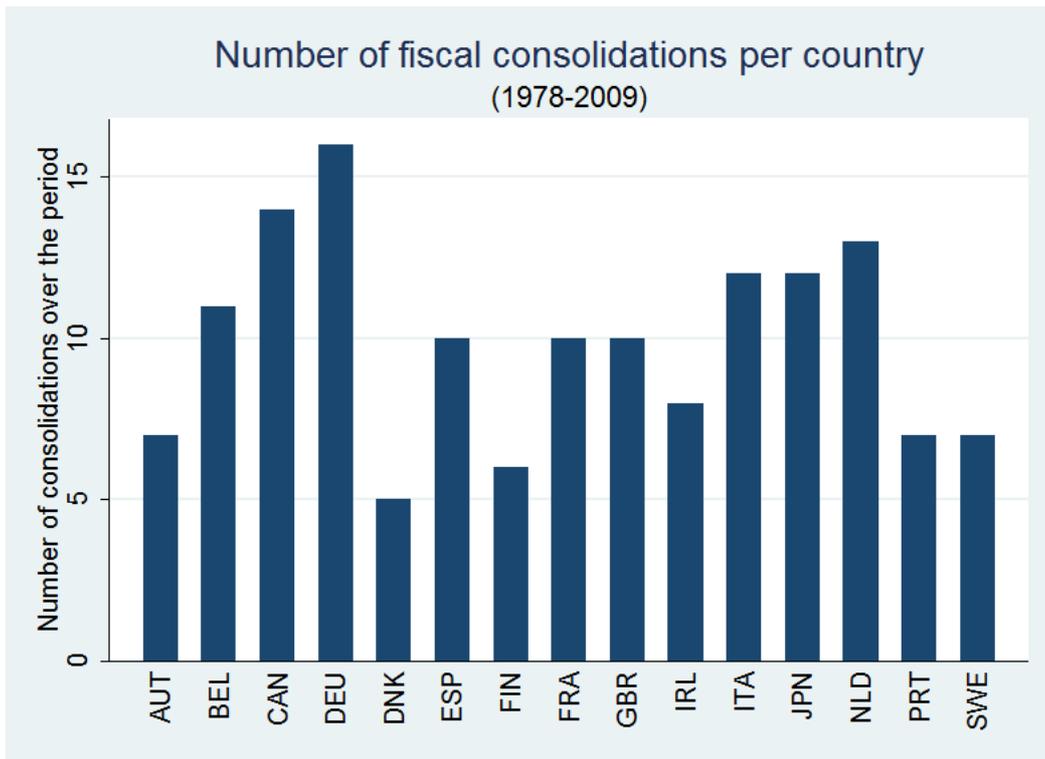


Chart 3.

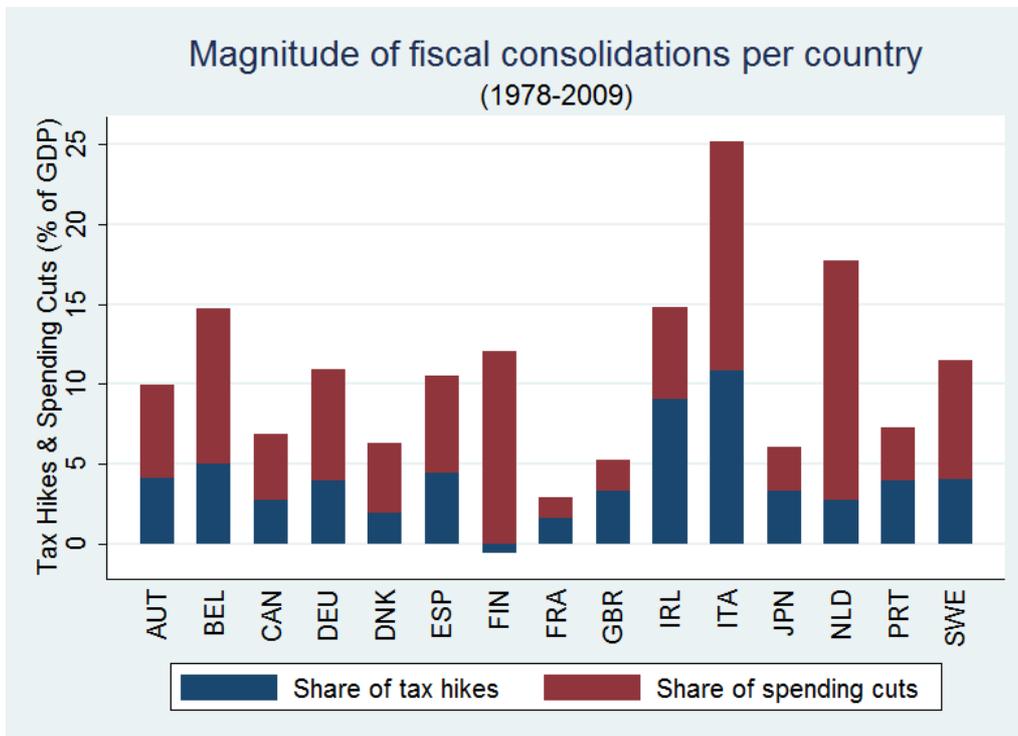


Chart 4.

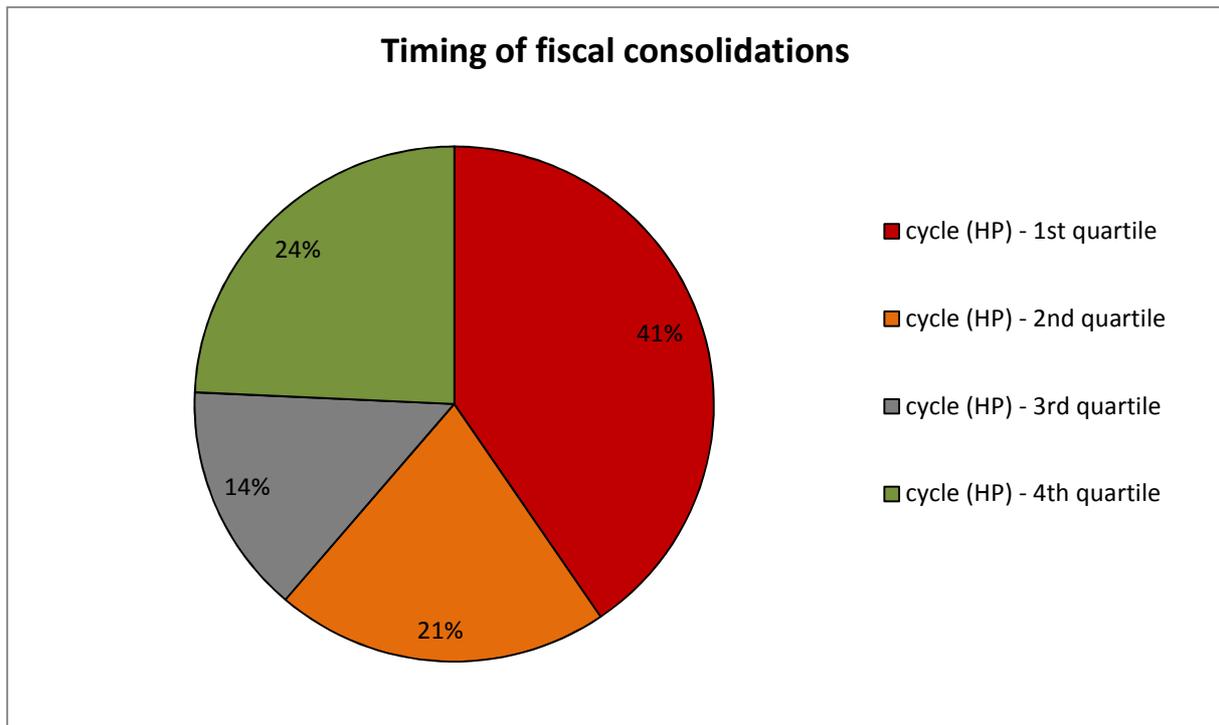


Table 1: Share of spending cuts in fiscal consolidation episodes

Share of spending cuts	(1)	(2)	(3)	(4)
Elasticity ξ_c	-3.757 (5.969)	-4.812 (6.061)	-130.8 (180.9)	-373.4* (218.2)
Debt ratio		-0.0456 (0.113)	-0.481 (0.441)	-0.683 (0.494)
Elasticity ξ_c * Debt ratio			0.592** (0.273)	0.567** (0.269)
Observations	121	118	118	118
Year-fixed effects	Yes	Yes	Yes	Yes
Country-fixed effects	No	No	Yes	Yes
Controls	No	No	No	Yes

Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$