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Fiscal tensions and risk premium

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Abstract

The main goal of the paper is to analyse one-dimensional, isolated impact of particular variables which are used in the literature as explanatory variables for risk premium following fiscal tensions. Using Student's t-tests, supplemented with ANOVA analysis, we study about a hundred likely determinants of the risk premium in 22 OECD countries over 1978–2017. We find that for deeper falls in the risk premium following fiscal tensions, the size of fiscal adjustments matters more than their composition. That said, expenditure-based fiscal adjustments are more effective in lowering the risk premium than tax-based ones. Fiscal adjustments can outweigh the effects of global risk aversion. Otherwise its low level or decline is needed for deep falls in the risk premium, suggesting there are time-breaks in relations between the risk premium and other factors. Supply-side reforms, especially of the labour market, are of help. The risk premium often responds to their very announcements, indicating that fiscal tensions do not necessarily delay payoffs from reform efforts. That said, our results are only of qualitative nature and do not warrant any conclusions as to mechanisms or causality.

Keywords Risk premium · Fiscal crisis · Fiscal adjustments · Reforms

JEL Classification E62 · G01 · H12 · H62 · H63

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1 Introduction

Fiscal tensions are likely to be back. Since the outbreak of the COVID-19 pandemic, more than 50 countries have asked the International Monetary Fund (IMF) and the World Bank to suspend repayment of their loans or at least interest. Sovereign debt is skyrocketing all around the World from already elevated levels. In some countries, inclusive of the United States, it is expected to become higher than ever (even after the Second World War it was not as high). Soon, even more countries may struggle to cover their borrowing needs. This will put pressure on the risk premium they pay. Rising interest payments will add to fiscal tensions. Pandemic costs and efforts to mitigate them may bring off about another wave of crises, the fiscal ones.

Governments may soon face a serious problem of convincing creditors that lending to them is safe. Literature abounds in studies on fiscal adjustments, their sustainability, and impact on growth. The research on the risk premium following fiscal tensions is scarcer. We build on the former strand of the literature, especially as it comes to methodology and reference results, and contribute to the latter.

We investigate what works in lowering the risk premium following fiscal tensions and what doesn't. We put a particular focus on fiscal adjustments' composition and accompanying reforms, or more generally, factors found to sustain fiscal adjustments and reduce their costs in terms of aggregate demand. We examine how those factors work in reducing the risk premium following fiscal tensions. We also check if fiscal tensions delay payoffs from reform efforts. Put it differently, we verify whether these tensions undermine trust in the government so much that creditors become insensitive to its announcements and react only to actions (or their effects).

To identify fiscal tensions we extend Reinhart and Rogoff (2011) definition of fiscal crises by criteria based on Baldacci et al. (2011a), Baldacci et al. (2011b) and Cottarelli (2011). Fiscal crises narrowly defined are very rare among advanced economies. The extension allows us to study these economies and use long time series of both the risk premium and its likely determinants that are available for them. Our sample covers 22 OECD countries in the years 1978–2017. However, being aware of the discretion of the definition of fiscal tensions, we verify how robust our results are if we focus on periods of fiscal adjustments instead. Their identification is (much more) mature. We use the action-based method developed by Alesina and Ardagna (2013), Alesina et al. (2017), and Devries et al. (2011). Besides, we obviously check robustness of our findings to changes in definitions we apply.

Our approach to studying the risk premium builds on the framework often used in studies on fiscal adjustments, e.g. by Alesina and Ardagna (2013), Alesina et al. (2012) and many others. Using the same method, we can easily compare our results to theirs. Recall that we aim at verifying to what extent factors reducing the risk premium following fiscal tensions overlap with those that make fiscal adjustments sustainable and lower their costs.

The approach is very simple. Using Student's t-tests, we compare averages of explanatory variables sub-sets distinguished by the risk premium changes. That is exactly what for example Alesina and Ardagna (2013) or Baldacci et al. (2011a, b) are doing, but we base our analysis on significantly broader set of variables (over 100 variables) and we supplement it with ANOVA analysis. The major drawback of our approach is that it provides only qualitative results. However, quantitative results for periods following fiscal tensions, when economy often does not work as usual, risks being of limited precision (and hence, reliability). Besides, to alleviate this drawback, we recall estimates from many other studies. Although those studies do not focus on fiscal tensions, the estimates allow one to form a view on order of magnitude of the impact of the factors that we find out significant. The strength of the approach is that it allows us to study any number of likely risk premium determinants and is robust to data gaps and non-linearities.

Nonetheless we have to stress that it has serious limitations, on top of only qualitative nature of results obtained. Most importantly, based on it, formulating any conclusions as to mechanisms or, especially, causality of any kind is not warranted. But this is not our goal: we simply aim at indicating which variables, used as explanatory variables in other studies, correlates with carefully identified fiscal stress and relaxation periods with different characteristics expressed in different risk premium dynamics.

The paper makes at least three contributions to the literature.

First, it examines a wide set of likely determinants of the risk premium. We check about a hundred of them, which is the vast majority that has ever been analysed.

Second, the paper focuses on periods of fiscal tensions. Understanding what influences the risk premium over exactly these periods is of particular importance. Success in reducing it may then bring particularly large gains while failure risks extreme pains. Although the literature points to a total of about a hundred risk premium determinants (see above), it does not address which of them play a key role in the periods of fiscal tensions.

Third, the paper combines two strands of the literature: one devoted to the risk premium determinants and the other concerning fiscal adjustments. In particular, it compares in what part risk premium determinants overlap over fiscal tensions with factors behind successful fiscal adjustments. Thus far, these two strands have largely developed in separation, even though they interrelate. Elevated risk premium should encourage fiscal adjustments, while their success or, conversely, failure, but also procrastination should affect the risk premium.

The remainder of the paper is organized as follows. Section two discusses (in more detail than above) the related literature. Section three presents our research strategy and briefly describes the data used. Section four provides the main findings and verifies their robustness. Section five concludes. The appendix, including figures and tables, follows.

2 Related literature

Our research primarily relates to the literature on risk premium determinants. They are very diverse. One can divide them into four main groups that relate to fiscal policy, monetary policy, institutional arrangements and macro environment respectively. Table 1 summarizes them. We briefly discuss them below. We draw from them in the next sections.

Taxes are the main source of government funding. Government's ability to increase tax revenue reduces the risk of its default (Lemmen and Goodhart 1999). Tax law quality and its enforcement also matter as tax avoidance or evasion reduces that ability (von Hagen et al. 2002).

Deficit suggests that government can hardly finance all expenditure through taxes (Dumicic and Primorac 2011). Besides, it consumes domestic savings, as Ricardian equivalence hardly holds (Ardagna et al. 2007). Portfolio effect may also be at play as encouraging creditors to lend a larger part of their savings to the government may require a higher rate of return (Heppke-Falk and Hüfner 2004). Deficits accumulate in sovereign debt. The burden of servicing it crowds out other expenditure and thereby encourages government to default. Moreover, the government continuously rolls over its debt, which is not always easy or even possible (Dumicic and Primorac 2011).

As fiscal adjustments aim at reducing both deficit and debt burden (Guichard et al. 2007), they also reduce the risk premium. However, their effect also depends on how they affect growth (see below). Expenditure based adjustments widen the space to cover interest payments, while tax-based ones merely confirm its existence (Alesina and Perotti 1997). Cuts in social spending come across as more effective than in public investment as they are more likely to be growth-enhancing or, at least, growth-neutral (Agca and Igan 2013). They have also larger potential to signal the government's determination to make public finances sustainable (Giavazzi and Pagano 1990).

As it comes to monetary policy, if inflation is high, it signals limited government's ability to pay its liabilities through taxation or new debt (Cantor and Packer 1996). It reduces their real value while facilitating their repayment, as budget revenue is nominal and increases with inflation.

Given that inflation lowers real profits of creditors, they are likely to pay attention to monetary authorities independence which limits the risk of fiscal dominance (Haugh et al. 2009). Any arrangements that constrain the government's discretion and improve its credibility seem to have similar effect (Kumar et al. 2007). They include the European Union membership (Luengnaruemitchai and Schadler 2007) and the Euro adoption (Kumar et al. 2007), even though the latter fails to strengthen fiscal discipline (Dumicic and Primorac 2011). Inside the euro area, the heterogeneity can be important notably between periphery and core countries (see Afonso et al. 2014). Other factors linked to monetary policy decisions, such as non-conventional monetary policy and its response to fiscal events also play a role (Afonso et al. 2018, 2020 or Afonso and Kazemi 2018).

Table 1 Summary of the results of empirical studies on risk premium determinants

Factor	Publication	Countries	Period	Variable	Impact on risk premium
Government revenue					
Tax hikes	Van Landschoot (2004)	7 EMU	1991–1999	1% increase in tax revenues	−5 bps
	Oliveira et al. (2012)	7 EMU	2000–2005	1p.p. increase in tax revenue as % of GDP	−27 bps
Government spending					
Government spending	Oliveira et al. (2012)	7 EMU	2000–2005	1p.p. increase in government spending as % of GDP	+36 bps
	Van Landschoot (2004)	7 EMU	1991–1999	1% increase in government spending	+12–18 bps
Government consumption	Born et al. (2015)	38 emerging and developed	1990–2014	1% cut in government consumption in fiscal stress	−17 bps (long run) +3 bps (short run)
				1% cut in government consumption in no fiscal stress	−1 bps (long run) +1 bps (short run)
Social expenditure	Dumicic and Primorac (2011)	8 new UE	2000–2010	1% increase in government spending	+6–13 bps
	Oliveira et al. (2012)	7 EMU	2000–2005	1p.p. increase in social spending as % of GDP	+29 bps
Government investment	Van Landschoot (2004)	7 EMU	1988–1999	1% increase in government investment	−6–10 bps
Unemployment	V. Reinhart and Sack (2000)	19 OECD / G7	1981–2000	1% increase in unemployment	+18 bps +36 bps
Debt					

Table 1 (continued)

Factor	Publication	Countries	Period	Variable	Impact on risk premium
Government debt	Van Landschoot (2004)	7 EMU	1991–1999	1% increase in net debt	+ 2–4 bps
	Dumicic and Primorac (2011)	8 new UE	2000–2010	1p.p. increase in debt to GDP ratio	irrelevant
	Oliveira et al. (2012)	7 EMU	2000–2005	1p.p. increase in debt to GDP ratio	+ 49 bps
	Engen and Hubbard (2005)	USA	1976–2003	1p.p. increase in debt to GDP ratio	+ 3 bps
	Laubach (2009)	USA	1980–2009	1p.p. increase in debt to GDP ratio in fiscal projection	+ 3–4 bps
	Ford and Laxton (1995)	9	1977–1997	1p.p. increase in debt to GDP ratio globally	+ 14–49 bps (real 1-year rates)
		World			+ 15–27 bps real 1-year rates
	Codogno et al. (2003)	9 EMU	n/a	Debt to GDP ratio	Small, statistically relevant increases for Austria, Italy and Spain
	Ardagna et al. (2007)	16 OECD	1960–2002	Public debt	Non-linear relationship
	Chinn and Frankel (2003)	G7	1998–2004	1% increase in net debt	+ 5–8 bps
				1% increase in current and projected debt	+ 5–16 bps
	Leigh et al (2010)	17 OECD	1978–2010	1p.p. increase in debt to GDP ratio	− 20 bps
	Aizenman et al. (2013)	121	2005–2010	1 p.p. increase in public debt in relations to tax base	+ 14 bps

Table 1 (continued)

Factor	Publication	Countries	Period	Variable	Impact on risk premium
	Veld and Roeger (2013)	13 EU	2011	10p.p. increase in debt to GDP ratio	Debt/GDP<60%: irrelevant Debt/GDP 60–90%:+10 bps Debt/GDP 90–120%: non-linear Debt/GDP>120%:+200 bps (2011)+60 bps (2013)
	Yuan and Pongsiri (2015)	36 developed	2005–2011	1p.p. increase in debt to GDP ratio	+8bps (CDS)
	Botta and Tori (2017)	28 developed	2007–2016	Debt to GDP ratio and 10-year rate	+4 bps for every 1 p.p. (monetary non-sovereign) +0.7 bps for every 1 p.p. (monetary sovereign)
	De Grauwe and Ji (2013)	Eurozone + 14 developed	2000–2011	1p.p. increase in debt to GDP ratio	+7 bps (Eurozone, spread) +1 bps (monetary stand-alone, spread)

Table 1 (continued)

Factor	Publication	Countries	Period	Variable	Impact on risk premium
Foreign debt	Gruber and Kamin (2010)	G7	1988–2007	Increase in debt in accordance with fiscal projection for 2015	+60 bps (USA) Slightly less for G7
	Dumicic and Primorac (2011)	8 new UE	2000–2010	1p.p. increase in external debt	Irrelevant
	Cantor and Packer (1996)	35	1992–1994	Increase in external debt to exports ratio	Increase in risk premium represented by worsening credit rating
	Aizenman et al. (2013)	121	2005–2010	1p.p. increase in external debt to GDP ratio	+10–57 bps
Budget deficit	Laubach (2009)	USA	1980–2009	1p.p. increase in budget deficit in relation to GDP in budget projection	+25 bps
	Lindé (2001)	Sweden	1982–1996	1% increase in budget deficit	+19–24 bps after 2 years (spread between long and short term interest rates)
	Gale and Orszag (2004)	Literature review		1% increase in projected budget deficit in relation to GDP	+20–60 bps
	Canzoneri et al. (2002)	USA	1960–2001	1% worse fiscal balance in projection for 5 to 10 years	+41–60 bps (spread between 10-year and 3-month rates)
	Dai and Philippon (2005) 1970–2003	USA		1% increase in fiscal deficit sustained for 3 years	+20–60 bps
	Thomas and Wu (2009)	USA	n/a	1% increase in budget deficit in 5-year projection	+30–60 bps
	Orr et al. (1995)	17 OECD	1970–1994	1% increase in budget deficit	+15 bps

Table 1 (continued)

Factor	Publication	Countries	Period	Variable	Impact on risk premium
	V. Reinhart and Sack (2000)	19 OECD	1981–2000	1% better budget balance sustained in following years	−9 bps (spread between 10-year and 3-month rates)
		G7			−12 bps (spread between 10-year and 3-month rates)
	Cantor and Packer (1996)	35	1992–1994	Increase in budget deficit as percent of GDP	Increase in risk premium represented by worsening credit rating
	Aizenman et al. (2013)	121	2005–2010	1 p.p. increase in fiscal balance in relations to tax base	-42–91 bps
	Bernoth et al. (2006 and 2012)	12 EU	1991–2002	1p.p. increase in fiscal deficit in relations to Germany	+3 bps
				1-2p.p. increase in fiscal deficit in relations to Germany	+5 bps
	Yuan and Pongsiri (2015)	36 developed	2005–2010	1p.p. increase in fiscal balance	−18bps
	Cebula (2014)	USA	1960–2013	1p.p. increase in fiscal deficit	+9 bps
Primary deficit	Gale and Orszag (2004)	USA	1950–2003	1% increase in primary deficit in relations to GDP	+40–70 bps
	Ardagna et al. (2007)	16 OECD	1960–2002	1% increase in primary deficit	+10 bps
	Botta and Tori (2017)	28 developed	2007–2016	1p.p. increase in cyclically adjusted primary balance and 10-year rate	+36 bps (monetary non-sovereign)
					−14 bps (monetary sovereign)
	Yuan and Pongsiri (2015)	36 developed	2005–2010	1% increase in primary deficit	irrelevant

Table 1 (continued)

Factor	Publication	Countries	Period	Variable	Impact on risk premium
Monetary policy					
Money supply	Cebula (2014)	USA	1960–2013	1 p.p. increase in M2 money supply in t-1	– 1 bps
Currency					
Exchange rate	Yuan and Pongsiri (2015)	36 developed	2005–2010	1p.p. depreciation of local currency	+ 2 bps (ln(CDS Spread)) low statistical significance
	De Grauwe and Ji (2013)	Eurozone + 14 developed	2000–2011	1 p.p. increase in effective real exchange rate	+ 1 bps (Eurozone, spread) +0.1 bps (monetary stand-alone, spread)
EMU membership	De Grauwe and Ji (2013)	Eurozone + 14 developed	2000–2011	Difference between monetary stand-alone and dependent (EMU) countries	Interest rates in monetary dependent countries are more fragile to global and fundamental variables
Markets and regulations					
Debt market liquidity	Haugh et al. (2009)	10 EMU	2005–2009	Countries with less liquid government bond market	+ 30–60 bps

Table 1 (continued)

Factor	Publication	Countries	Period	Variable	Impact on risk premium
Macro environment					
Output growth	Dumicic and Primorac (2011)	8 new UE	2000–2010	1% increase in GDP	−4–6 bps
	Cantor and Packer (1996)	35	1992–1994	Output growth	Increase in risk premium represented by worsening credit rating
	V. Reinhart and Sack (2000)	19 OECD	1981–2000	Expected output growth higher than 1 p.p	+34 bps (spread between 10-year and 3-month rates)
		G7			+35 bps (spread between 10-year and 3-month rates)
	Yuan and Pongsiri (2015)	36 developed	2005–2011	1p.p. increase in real GDP growth	−14bps
	Botta and Tori (2017)	28 developed	2007–2016	Output growth	positive
	De Grauwe and Ji (2013)	Eurozone + 14 developed	2000–2011	1 p.p. increase in output growth	−7 bps (Eurozone, spread)
					−2 bps (monetary stand-alone, spread)
Output gap	Chinn and Frankel (2003)	G7	1998–2004	1p.p. increase in output gap	+11–44 bps

Table 1 (continued)

Factor	Publication	Countries	Period	Variable	Impact on risk premium
Inflation	Landschoot (2004)	7 EMU	1991–1999	1% increase in logarithm of inflation	+35–42 bps
	Dumicic and Primorac (2011)	8 new UE	2000–2010	1 p.p. increase in inflation	+3–4 bps (CDS)
	Aizenman et al. (2013)	121	2005–2010	1 p.p. increase in inflation	+30–39 bps (CDS)
	Oliveira et al. (2012)	7 EMU	2000–2005	1 p.p. increase in inflation	+93 bps
	Cantor and Packer (1996)	35	1992–1994	Increase in inflation	Increase in risk premium represented by worsening credit rating
	V. Reinhart and Sack (2000)	19 OECD	1981–2000	1 p.p. increase in inflation	+25 bps (spread between 10-year and 3-month rates)
		G7	1981–2000		+28 bps (spread between 10-year and 3-month rates)
	Oliveira et al. (2012)	7 EMU	2000–2005	1p.p. increase in German government bonds yields	−43 bps
	Yuan and Pongsiri (2015)	36 developed	2005–2011	1p.p. increase in inflation	+14–16bps ln(CDS Spread) (low statistical significance)
Reserves	Dumicic and Primorac (2011)	8 new EU	2000–2010	1% increase in currency reserves	−4–8 bps

Table 1 (continued)

Factor	Publication	Period	Countries	Variable	Impact on risk premium
Current account balance	Landschoot (2004)	1991–1999	7 EMU	1% decrease in current account deficit	−13–16 bps
	Oliveira et al. (2012)	2000–2005	7 EMU	Current account balance worse than Germany's in previous year	+136 bps
	Orr et al (1995)	1970–1994	17 OECD	1% increase in current account deficit	+15 bps
	Yuan and Pongsiri (2015)	2005–2011	36 developed	1p.p. increase in current account balance	irrelevant
	Botta and Tori (2017)	2007–2016	28 developed	Cumulated current account balance for 2007–2016	−5 bps. (monetary non-sovereign); −1 bps (monetary sovereign)
	De Grauwe and Ji (2013)	2000–2011	Eurozone + 14 developed	1 p.p. increase in accumulated current account/GDP ratio	−1 bps (Eurozone, spread); −0.1 bps (monetary stand-alone, spread)
EU membership	Luengnaruemitchai and Schadler (2007)	1998–2006	25 developed	UE accession	−50–100 bps
	Dumicic and Primorac (2011)	2000–2010	8 new EU	Signing of Stability and Growth Pact	Irrelevant (ln(CDS Spread))
	Heppke-Falk and Hüfner (2004)		France, Italy, Germany		−3–8 bps (interest rate spread)
Crisis	Bruyckere et al. (2012)	2006–2011	16 European	Fiscal and banking crisis in Europe	Increase in correlation of risk premium between countries and banks, relationship stronger for countries with higher debt to GDP ratio
Industrial production	Oliveira et al. 2012	2000–2005	7 EMU	1% increase in logarithm of industrial production dynamics	−24 bps
Public finances transparency	Peat et al. (2015)	2005–2012	71	No transparency in public finance	+1–5 bps (CDS)

Effects of fiscal rules are found ambiguous. If they are to lower the risk premium, creditors have to believe that the government adhere to the rules. Such a belief is dubious, if the rules result in procyclical fiscal policy, which debt ceilings often do. Besides, governments can circumvent rules of any types (Wyplosz 2002) and fall in public finances' transparency costs (Alesina 2010 and Peat et al. 2015).

Moving on to the macro environment, current account deficit means that domestic sectors depend on foreign savings (Oliveira et al. 2012). It increases a country's vulnerability to external shocks, including the risk of sudden stops (Barrios et al. 2009; Cantor and Packer 1996; Dumicic and Primorac 2011). Hence, current account deficit decrease may be of help even if it results from a fall in import and not export increase (Gros 2013). Government's ability to repay foreign debt depends on the strength of a local currency. If it appreciates, both foreign debt and its servicing costs in local currency fall (Ebner 2009).

All factors affecting economic growth simultaneously influence current and future tax revenue and sovereign debt burden (Oliveira et al. 2012). As the economy grows, so does the contribution of modern sectors to value added that is easier to tax, while the share of the traditional ones where tax evasion is relatively simple falls (Dumicic and Primorac 2011). Besides, growth is accompanied by a rising integration into international markets. This, on the one hand, helps the government cover its borrowing needs, and on the other hand, raises costs of default. The longer the credit history, the more to lose the government has in case of a default (Bulow and Rogoff 1989). Both lack of default and credit events have a very persistent effect on the risk premiums (Haugh et al. 2009).

According to some studies, international factors rather than domestic ones are the key determinants of the risk premium (see, e.g. Caceres et al. 2010). These studies suggest that risk aversion is of global nature and changes in the risk premium are not so much linked to changes in risk itself as to compensation required by creditors for taking it. This better explains contagion. Note that contagion can spread to both countries and sectors, as seen for example during the Global Financial Crisis (GFC; Attinasi et al. 2009).

Our research also relates to studies on fiscal adjustments, as we examine to what extent factors reducing the risk premium after fiscal tensions overlap with those that affect fiscal adjustments' sustainability and their costs in terms of aggregate demand. Note that only a small part of those studies deals with the issue of the risk premium (see, e.g. Ahrend et al. 2006; Bi 2012; Gibert 2016).

Composition of adjustments matters (see, e.g. Barrell et al. 2012; Borys et al. 2014 or Boussard et al. 2012). Expenditure-based ones are more likely to be sustained and less likely to be costly in terms of aggregate demand than tax-based ones (see, e.g. Alesina and Perotti 1997; von Hagen et al. 2002 or Alesina and Ardagana 1998 or 2010).

Among expenditure, spending on wages and salaries has the weakest multiplier (see, e.g. Ardagna 2004). Social transfers go second (Barrell et al. 2012) and government consumption third (Auerbach and Gorodnichenko 2012) on that score. Public investment has the strongest multiplier (Auerbach and Gorodnichenko 2012) and is therefore suggested to be the last to be cut (Hagemann 2012). Note, however, that fiscal adjustments may differ in their effects depending on whether they

are accompanied by an expansionary or a contractionary monetary policy (see, e.g. Afonso and Jalles 2014 or Afonso and Martins 2016).

Thus, spending multipliers are not constant (Afonso and Leal 2020 or Favero and Karamysheva 2015). Most generally, they depend on economic conditions although the relationship is hardly unequivocal. They are low when the economy is growing fast (see, e.g. Alesina and Ardagna 2013). However, weak domestic demand in the period preceding fiscal adjustment does not necessarily raise its costs (see, e.g. Alesina and Perotti 1997 or Segura-Ubiergo et al. 2006). That said, spending multipliers generally increase during recessions (see, e.g. Auerbach and Gorodnichenko 2012; Gechert and Rannenberg 2018; Heimberger 2017, Müller 2014a or Müller 2014b). An adjustment can then even raise a sovereign debt burden due to aggregate demand falling faster than the debt (see, e.g. Fatás and Summers 2018). They may be particularly strong where short term interest rates are at the zero lower bound, or more generally, an effective lower bound (ELB), because of large spare capacity (see, e.g. DeLong and Summers 2012) or no crowding out effect (see, e.g. Christiano et al. 2011). The longer the ELB binds, the larger the multipliers (see, e.g. Eggertsson 2010 or Woodford 2011). However, they fall when government expenditure increases rapidly, a change in fiscal stance is perceived to be long-lasting (see, e.g. Cwik and Wieland 2011), sovereign debt affects lending rates via the risk premium (see, e.g. Corsetti et al. 2014) or the ELB binds because of economic agents' pessimism (see, e.g. Mertens and Ravn 2014). Thus, fall in real interest rates is not necessary to avoid a deep aggregate demand contraction after fiscal adjustment (see, e.g. Giudice et al. 2003). Spending multipliers are stronger in large (see, e.g. Barell et al. 2012) or more closed economies (Born et al. 2013) with fixed exchange rate than in small open economies with free floating one. Export growth is a key factor for economic performance during the adjustment (see, e.g. Leigh et al. 2010). If the adjustment changes export via exchange rate, then this change can be partly offset by a change in a foreign currency debt burden. However, the latter effect hardly dominates the former, at least in the OECD countries where FX debt accounts for a small proportion of total debt (see, e.g. Lambertini and Tavares 2005). Spending multipliers fall with debt rising (Ilzetzki et al. 2013) and may even become negative when it exceeds a certain threshold. Some countries may have no choice but to cut expenditure (see, e.g. Padoan et al. 2012). Some claim that the so-called 'expansionary austerity' is then possible (see, e.g. Alesina et al. 2018; for critical view on that see, e.g. Botta and Tori 2018 or Guajardo et al. 2014). That said, during the sovereign debt crisis in the Euro area, they ranged from 1.2 to 1.5 according to some estimates (Gechert et al. 2019) and were much higher than policymakers assumed, at least at the beginning of the crisis (Belke et al. 2015).

Tax multipliers seem to change less than expenditure ones thus making tax hikes relatively more attractive in recessions (Blanchard and Leigh 2013). Indirect taxes have less negative multipliers than direct taxes (Barrell et al. 2012). Hence, an increase in the former may both improve fiscal stance and stimulate aggregate demand if accompanied by an appropriate reduction in the latter. The so-called 'fiscal devaluation' works (see, e.g. Ciżkowicz et al. 2020).

Fiscal devaluation is an option to improve competitiveness especially for members of common currency areas (Mooij and Keen 2012). Elsewhere, especially in

countries with no firmly anchored inflation expectations, prices pushed up by an indirect tax hike can prompt the central bank to raise interest rates in spite of weak aggregate demand (see, e.g. Leigh et al. 2010). That said, the lack of control over monetary policy makes monetary union's members more fragile to various shocks. The members resemble emerging economies issuing FX debt in this respect (see, e.g. De Grauve and Ji 2012).

Some claim (see, e.g. Ardagna 2004; Alesina and Ardagna 2013; Borys et al. 2014; Mertens and Ravn 2014 or Perotti 2011) that supply side policies can mitigate fiscal adjustments costs. In particular, product market deregulation, if properly implemented, can increase consumption. Labour market liberalization can weaken wage pressure, thereby improving domestic firms' competitiveness and their ability and propensity to invest. Restricting various interest groups' rights, given how politically difficult it is, helps convince creditors of the government's determination to sustain fiscal adjustment via so-called 'signalling effect'. Lastly, these policies are devoid of the risk of ingraining pessimism, if it is responsible for aggregate demand weakness.

The literature on fiscal adjustments deals only with the part of fiscal tensions that prompted authorities to respond. It does not refer to the rest of them, i.e. those tensions that the authorities (strive to) ignore, betting for resurrection. We are interested in fiscal tensions at large. Thus our study also relates to the literature on fiscal crises. They are most often defined as events of default on payments of sovereign debt, repudiation, or debt restructuring into terms less favourable to creditors than originally set (Reinhart and Rogoff 2011). One extends the basic definition to cover more cases of sovereign debt unsustainability. The following are especially considered to be symptoms of fiscal crises: use of international financial aid, inflation significantly above average, and a sharp increase in bond yields (see Baldacci et al. 2011a; Baldacci et al. 2011b; and Pescatori and Sy 2007). Cottarelli (2011) adds to this list criteria that relate to sovereign debt, budget and current account deficits, GDP growth, and other types of crisis. In particular, banking crises are found to precede fiscal crises (see, e.g. Claessens and Kose 2013).

3 Research strategy and data

We use the simplest possible measure of the risk premium, that is the spread between the yield on 10-year zero-coupon government bonds and the risk-free rate. We approximate the risk-free rate with the respective yield in Switzerland. This is the only country in our sample without any fiscal tensions identified. It had the lowest yield for most of the period considered and the least volatile, especially between 1978 and 1985, when a large part of identified fiscal tensions occurred. The bonds considered have similar parameters except for currency of issuance. FX issues are mainly denominated in US dollar or euro, account for only a small fraction of global sovereign debt market, are often illiquid, and first of all uncommon among advanced economies that we study (c.f., e.g. Burger and Warnock 2006).

The measure of the risk premium we use is the most common in the literature, as it allows to study a large sample of countries over a long period (see, e.g. Afonso

et al 2015; Haugh et al 2009; Oliveira et al. 2012 or Peter and Grandes 2005). Its weakness is that it covers the whole bunch of risks (that are interrelated and partly overlap). In addition to the three most often discussed, i.e. credit risk (Lemmen and Goodhart 1999), liquidity risk (Fabozzi 2015) and time premium (Bernanke 2013), it contains inflation risk (Hördahl and Tristani 2012), downgrade risk (Fabozzi 2015), rollover risk (Bocola and Dovis 2019) and credit spread risk (Barrios et al. 2009). We cannot use CDS spreads that are devoid of this weakness and due to that have become a more and more popular measure of the risk premium in recent years (see, e.g. Aizenman et al. 2013; Barrios et al. 2009; Caceres et al. 2010; Yuan and Pongsiri 2015). The data on CDS is available since 2005 (at the earliest) and their market gained liquidity only in 2008, that is long after most fiscal tensions we identify occurred.

We consider a given year to be a period of fiscal tensions if the following three criteria are jointly met:

  (i)   long-term interest rates increase by at least one-tenth;
  (ii)   sovereign debt increases by at least 1.5% GDP in at least one year in a four-year period starting a year before the rate increase;
 (iii)   at least one of the following happens:

- in a given, preceding or following year inflation increases by one third and exceeds 2% or exchange rate depreciates by 10%;
- in a given or preceding year a crisis of other types, as defined by Reinhart and Rogoff (2011), breaks out.

As mentioned in the introduction, we extend the definition of fiscal crises by criteria based on Baldacci et al. (2011a), Baldacci et al. (2011b) and Cottarelli (2011). However, we assume much lower numerical values than those studies do. We calibrate the values so that our definition would embrace in particular events in Greece, Ireland, Italy, Portugal and Spain in 2011. If we used typical values, it would cover neither these nor similar events.[1] However, as our definition is less stringent, we prefer a notion of 'fiscal tensions' to one of 'fiscal crisis' that the above studies use. Due to all that discretion, we check how robust our results are, if we study fiscal adjustments instead. We identify them, as mentioned in the introduction, using an action-based method developed by Alesina and Ardagna (2013), Alesina et al. (2017) and Devries et al. (2011).

Once we identify fiscal tensions, we divide the years around them into two types of periods: 'stress' periods and 'relaxation' periods. They cover the years of risk premium sharp increase and its deceleration or fall respectively. The 'stress' period starts up to two years before a year of identified fiscal tensions and lasts until the strongest one-year increase in the risk premium. The 'relaxation' period follows and lasts until the risk premium falls to the initial level or another 'stress' period begins.

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[1] To the periods of fiscal tension identified by our definition we add two, which it does not capture but are discussed in the literature. They occurred in the United States in 1994 and Spain in 1995 (Hauptmeier et al. 2007).

We focus on the latter periods, but we verify the robustness of our findings to a change in the definition of the 'stress' period and, as a result, the 'relaxation' period. Namely, we alternatively assume that the former lasts until the risk premium reaches its local maximum.

Our sample covers 22 OECD countries in years 1978–2017. It is described in more details by figure A in supplementary materials. The figure summarizes fiscal tensions and their sources, presents changes in long term interest rates and sovereign debt, and indicates 'relaxation' periods.

The method we use to establish factors influencing the risk premium following fiscal tensions is fairly simple. It is similar to that often used in studies on fiscal adjustments (see, e.g. Alesina and Ardagna 2013 or Alesina et al. 2012), as we want to compare our results with theirs. Namely, using the Student's t-tests, we compare averages of explanatory variables sub-sets distinguished by risk premium changes in 'relaxation' periods below and above median respectively. Note that risk premium changes below median stand for its deeper falls. We compare three pairs of averages corresponding to three groups of years: a year before, of and after deeper falls in the risk premium respectively. This allows us to examine whether factors that favour or, conversely, counteract the falls in the risk premium over 'relaxation' periods work with a lag, instantaneously or in advance. Seen from a different angle, we study initial conditions, deeper falls themselves, as well as possible signalling effects of factors announced but not yet introduced.

Based on previous studies (discussed in Section two), we examine about a hundred likely determinants of the risk premium. Table 2 contains the full list of variables studied and their data sources, while Table 3 presents their descriptive statistics.

As it comes to main fiscal variables, we adjust them for the cyclical component. We use the procedure proposed by Blanchard (1993), as many studies on fiscal adjustments do (see, e.g. Alesina and Perotti 1997 or Alesina et al. 2012). Since cyclical adjustment truncates the sample due to missing data, we report results for both raw and cyclically adjusted data (the latter are marked as 'c.a.')[2] However, we treat the conclusions based on unadjusted data with great caution.

We check the robustness of our findings in several ways. First, we tighten the definition of deeper falls in the risk premium. We define them as changes from the first quartile. Second, we examine to what extent our findings result from a possible presence of outliers. Although for advanced economies such observations do not reflect poor data quality and their removal could, therefore, be questioned (High 2000), it would also not be justified to generalize results which are only valid in extreme cases. We consider a given observation as an outlier if it deviates from the mean by not less than three standard deviations (c.f. Osborne and Overbay 2004). Third and fourth, as mentioned above, we modify the definition of 'stress' period and – as a

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[2] To make sure that links between the risk premium and the fiscal variables are not spurious and merely reflect a dependence of both on economic activity, we additionally carry out two-way factorial ANOVA analysis. We analyse the risk premium in four possible combinations of economic activity and a given fiscal variable. We can provide the results upon request.
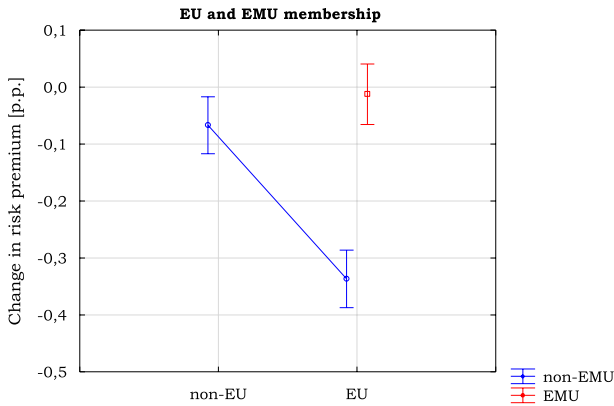
Fig. 1 Results of two-way factorial ANOVA analysis showing the impact of EU and EMU membership on risk premium dynamics after fiscal tensions. Country-years were divided along with membership in the EU and EMU. There were no EMU members that were not EU members, so the non-EU/EMU quadrant is empty. Vertical lines represent 90% confidence intervals. EU membership is associated with statistically significantly stronger reductions in risk premia after fiscal tensions. This relationship holds only for countries that were EU members and did not implement the Euro. Countries that also belonged to the eurozone performed slightly worse than even non-EU members, though the difference is not statistically significant

result – 'relaxation' period; we also verify whether factors shaping the risk premium change, if one studies periods of fiscal adjustments instead, as defined by Alesina and Ardagna (2013), Alesina et al. (2017) and Devries et al. (2011). Fifth, we alter the examination of the role of initial conditions. For this purpose, we assign to each year of 'relaxation' period the value of the variable considered from the last year of the relevant 'stress' period.[3]

4 Results and their robustness

Table 4 provides the baseline results. It follows that the risk premium after fiscal tensions fell more in countries with lower government revenue, especially from taxes on goods and services, including VAT, and lower government expenditure, including social spending, which is particularly difficult to cut. Deeper falls in the risk premium were preceded by VAT increases, which cause relatively little distortions, and cuts in primary expenditure, resulting in an improvement in the primary balance. In case of remaining changes in the risk premium, VAT receipts decreased, primary expenditure increased, and the primary balance deteriorated.

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[3] We are aware that such an approach overestimates the statistical significance of the results obtained, for it overstates the number of observations. Otherwise, however, the sample would be severely truncated. Any missing data on the risk premium would eliminate a given 'relaxation' period instead of just one annual observation. Before deciding, we weighed up both these problems.

Table 2 Variable definitions

Variable	Description	Source	Comment
Fiscal adjustment			
Fiscal adjustment	1 for adjustment year,	Devries et al. (2011); Alesina et al. (2017)	No data for Greece, Norway and New Zealand
	0 in remaining cases		
Beginning of the adjustment	1 for first year of adjustment,		
	0 for the rest		
Size of adjustment	% GDP,		
Spending cuts	0 for years with no consolidation		
Tax hikes			
Share of spending cuts in consolidation	The size of expenditure cuts to the size of consolidation		Consolidations with more than 50% of their value achieved by tax increases were considered tax-based. Remaining consolidations were classified as expenditure-based
Revenue			
Government revenue	% GDP	Mauro et al. (2013)	To 2011; total general government revenue
		Eurostat	From 2012; total general government revenue
VAT revenue		OECD Statistics	Value added taxes
Goods and services taxation			All taxes on goods and services
Income taxation			All taxes on income and profits
CIT			Corporate income tax
Capital gains taxation			Taxes on capital gains of individuals
Property taxation			Taxes on property
Financial transaction taxation			Taxes on financial and capital transactions
Social contributions			Social security contributions

Table 2 (continued)

Variable	Description	Source	Comment
Expenditure			
Government expenditure	% GDP	Mauro et al. (2013)	To 2011; total general government expenditure
		Eurostat	From 2012; total general government expenditure
Primary expenditure		Mauro et al. (2013)	To 2011
		Own calculations	From 2012; difference between government expenditure and debt servicing cost
Government consumption	% GDP	WDI	General government final consumption expenditure
Government investment	Current prices LCU	OECD Statistics	Gross fixed capital formation; used to calculate government investment to GDP ratio
Government payroll	% GDP	Eurostat	From 1990; general government compensation of employees
		Cusack (1998)	To 1996, fills gaps in Eurostat data
Transfers	% government expenditure	WDI	From 1990; subsidies and other transfers
Social spending	% GDP	OECD Statistics	General government social expenditure
		Samanni et al. (2012)	To 2009, used to fill in gaps in OECD data
Sovereign debt			
Fiscal rules	Indicator, higher value means stricter fiscal rules	European Commission	European countries from 1990; standardized fiscal rules index
Debt	% GDP	Reinhart and Rogoff (2011)	To 2010
		WDI	From 2011; central government debt
Primary balance		Mauro et al. 2013	To 2011; general government primary balance

Table 2 (continued)

Variable	Description	Source	Comment
		IMF WEO	From 2012; general government primary balance
Debt servicing cost	% GDP	IMF WEO	From 2012; interest paid on sovereign debt calculated as difference between balance and primary balance
		Mauro et al. (2013)	To 2011; interest paid on sovereign debt
Monetary policy			
Short term interest rate	3 M interest rate	OECD Statistics	
M3	Index: 2010 = 100		Broad Money (M3)
Central bank independence	Indicator, higher means stronger independence	Garriga (2016)	From 1979 To 2012
Exchange rate			
Exchange rate	Effective exchange rate *vs* basket of currencies	BIS	BIS effective exchange rate (EER); narrow indices
Exchange rate regime	3-way classification used (float, fix, intermediate)	Levy-Yeyati and Sturzenegger (2016)	Index 3-Way Classification
EMU	1 for European monetary Union Members, 0 for the rest of countries	Own calculations	
Markets and regulations			
Degree of economic globalization	Indicator, higher means more integrated	Teorell et al. (2018)	To 2014; Economic Globalization Index
Unemployment	% labor force	OECD Statistics	Unemployment rate
Unit labor cost	Index: 2005 = 100		
Employment protection	Indicator, higher means stronger protection		From 1985 to 2015; strictness of employment protection – individual and collective dismissals (regular contracts)
Union density	% workers belonging to labor unions		

Table 2 (continued)

Variable	Description	Source	Comment
Retirement age	Average effective retirement age	OECD Statistics	
Government bond market capitalization	% GDP	Beck et al. (1999)	To 1999; public bond market capitalization
Barriers to entry	Value between 0 and 3, higher means lower barriers	Detragiache et al. (2008)	To 2005
Degree of privatization	Value between 0 and 3, higher means lower percentage of banks owned by the government		
Degree of financial market reform	Financial Reform Index, normalized to be between 0 and 1; higher means higher degree of reforms		
Quality of government	Indicator with values between 0 and 1 taking into account corruption, quality of the law and bureaucracy	Teorell et al. (2018)	From 1984; ICRG indicator of Quality of Government
Financial markets openness	Indicator, higher means more opened financial markets	Chinn and Ito (2006)	Updated to 2015; Chinn-Ito index
Macro environment			
GDP	In current prices, LCU	WDI	For calculation purposes
Output gap	% potential output	OECD Statistics	Output gap of the total economy
Exports	% GDP	WDI	Exports of goods and services
Savings			Gross savings
Investment			Gross fixed capital formation
Consumption			Final consumption expenditure
Inflation	% (year on year)		Consumer prices
Industrial production	Index, 2010 = 100	OECD Statistics	
Current account balance	% GDP	WDI	

Table 2 (continued)

Variable	Description	Source	Comment
Crisis	1 for crisis years, 0 for the rest	Reinhart and Rogoff (2011)	To 2010; inflation, currency crash, currency debasement, banking crisis
UE membership	1 for members, 0 for non-members	Own calculations	
VIX	Implied market volatility	Bloomberg Professional	From 1990; CBOE Volatility Index
Memo: Long term interest rates	Average yield on 10-years government bond or other described as long-term	WDI	

Table 3 Descriptive statistics

	N	Min	Max	Mean	SD
Fiscal consolidation					
Fiscal consolidation (dummy)	819	0.00	1.00	0.25	0.43
Size of consolidation (% GDP)	819	−0.75	4.74	0.26	0.67
Spending cuts (% GDP)	819	−0.29	3.71	0.16	0.44
Tax hikes (% GDP)	819	−0.75	3.40	0.11	0.36
Share of spending cuts in total consolidation (%)	206	0.00	1.00	0.53	0.36
Revenue					
Government revenue (% GDP)	798	12.59	60.55	42.11	8.98
VAT (% GDP)	789	0.00	10.01	5.62	2.86
Goods and services taxation (% GDP)	798	3.57	16.89	10.53	2.88
Income taxation (% GDP)	717	2.07	26.27	10.83	4.57
CIT (% GDP)	788	0.00	12.60	2.83	1.48
Capital gains taxation (% GDP)	731	0.00	1.70	0.10	0.26
Property taxation (% GDP)	798	0.30	7.33	1.93	0.97
Financial transactions taxation (% GDP)	801	0.00	1.95	0.48	0.35
Social contributions (% GDP)	719	0.01	19.17	9.74	4.32
Expenditure					
Government expenditure (% GDP)	787	12.83	71.72	45.16	8.51
Primary expenditure (% GDP)	787	12.68	66.04	41.39	8.17
Government consumption (% GDP)	719	12.01	27.94	20.03	3.17
Government investment (% GDP)	383	1.50	5.90	3.50	0.90
Government Payroll (% GDP)	654	7.00	20.45	12.37	2.58
Transfers (% expenditure)	488	12.20	82.22	56.95	16.48
Social spending (% GDP)	787	6.77	34.20	20.24	5.52
Debt					
Fiscal rules (indicator)	364	−0.95	3.41	0.04	0.89
Debt (% GDP)	779	4.48	218.32	55.59	34.81
Primary Balance (% GDP)	819	−28.18	20.57	0.72	4.09
Debt servicing cost (% GDP)	819	−2.47	12.66	3.67	2.49
Monetary policy					
Short term interest rate (p.p.)	688	0.00	23.31	6.12	4.76
M3 (index)	354	2.15	170.89	57.37	40.43
Central bank independence (indicator)	720	0.08	0.80	0.49	0.21
Exchange rate					
Exchange rate (dummy)	819	32.72	763.65	108.89	54.27
Fixed regime (dummy)	779	0.00	1.00	0.28	0.45
Intermediate regime (dummy)	779	0.00	1.00	0.13	0.34
Floating regime (dummy)	779	0.00	1.00	0.57	0.50
EMU (dummy)	819	0.00	1.00	0.28	0.45
Markets and regulations					
Degree of economic globalization (indicator)	745	34.63	97.25	73.11	13.20
Unemployment (%)	745	1.46	27.47	7.77	4.09

Table 3 (continued)

	N	Min	Max	Mean	SD
Unit labour cost	765	23.19	161.05	79.29	26.54
Employment protection (indicator)	575	0.26	5.00	2.15	0.93
Union density (%)	753	0.00	87.40	38.55	20.70
Retirement age	778	56.70	70.66	62.79	2.58
Government bond market capitalization (% GDP)	437	4.24	218.86	45.56	27.77
Barriers to entry (indicator)	580	0.00	3.00	2.24	0.97
Degree of privatization (indicator)	580	0.00	3.00	1.85	1.14
Degree of financial market reform (indicator)	580	0.10	1.00	0.73	0.25
Quality of government (indicator)	819	0.00	1.00	0.72	0.35
Financial markets openness (indicator)	779	− 1.90	2.37	1.66	1.10
Macro environment					
Change in GDP (%)	798	− 11.70	35.00	2.30	3.30
Output gap (%)	657	− 18.43	9.84	− 0.53	3.19
Exports (% GDP)	799	6.98	124.64	33.37	18.48
Savings (% GDP)	663	4.87	41.69	23.11	5.17
Investment (% GDP)	799	11.52	37.22	22.85	3.52
Consumption (% GDP)	779	45.32	91.67	75.66	5.62
CPI (%)	798	− 4.48	28.78	4.40	4.79
Change in industrial production (%)	816	− 21.00	36.90	1.90	4.50
Current account balance (% GDP)	663	− 14.65	16.19	− 0.13	4.48
Crisis (dummy)	578	0.00	1.00	0.42	0.49
EU (dummy)	819	0.00	1.00	0.61	0.49
VIX	559	11.04	31.79	19.51	5.84
Memo: Long term interest rate (%)	742	− 0.07	27.55	6.97	4.54

While VAT increases helped to lower the risk premium, increases in other taxes, including income taxes, did not. No signalling effect was associated with changes in fiscal variables. As governments under pressure of fiscal tensions did not differ in their promises to alleviate them, it was only the implementation of the promises that reduced the risk premium.

Fiscal adjustments, as defined by Alesina and Ardagna (2013), Alesina et al. (2017), and Devries et al. (2011), preceded most of the deeper falls in the risk premium and a minority of the remaining changes. Those adjustments were also on average more than twice as strong in the former case as in the latter. The composition of the adjustments was similar. In both cases, expenditure cuts outweighed tax increases. However, the deeper falls in the risk premium were preceded and accompanied by twice as large expenditure cuts.

Sovereign debt did not differ significantly between periods of deeper falls in the risk premium and its remaining changes. Fiscal rules did not play any role either, which is understandable given that they did not prevent fiscal tensions. However, tightening fiscal rules in response to fiscal tensions helped to lower the risk

Table 4 Determinants of changes in the risk premium following fiscal tensions. Baseline results

	T_{-1}					T					T_{+1}				
	Δs<M	Δs>M	p-val	N<M	N>M	Δs<M	Δs>M	p-val	N<M	N>M	Δs<M	Δs>M	p-val	N<M	N>M
Fiscal consolidation	**0.18**	**0.08**	**0.06**	**77**	**84**	0.09	0.18	0.12	74	83	0.10	0.14	0.37	72	83
Start of consolidation	**0.56**	**0.38**	**0.02**	**77**	**84**	0.57	0.45	0.13	74	83	0.54	0.53	0.89	72	83
Consolidation (% GDP)	**0.73**	**0.32**	**0.00**	**76**	**82**	0.66	0.48	0.2	72	82	0.53	0.60	0.67	68	82
Size of expenditure cuts (% GDP)	**0.41**	**0.18**	**0.01**	**76**	**82**	**0.47**	**0.23**	**0.02**	**72**	**82**	0.40	0.39	0.90	68	82
Size of tax hikes (% GDP)	**0.32**	**0.14**	**0.02**	**76**	**82**	0.19	0.25	0.47	72	82	0.13	0.21	0.27	68	82
Share of expenditure cuts in total consolidation (%)	0.52	0.55	0.78	42	30	0.61	0.51	0.23	40	36	0.69	0.58	0.14	35	43
Budget revenue (% GDP)	**41.52**	**44.60**	**0.01**	**93**	**93**	**41.77**	**44.63**	**0.02**	**92**	**93**	**41.63**	**44.71**	**0.01**	**91**	**93**
Change in government revenue (% GDP)	**0.52**	**0.00**	**0.01**	**93**	**93**	**0.35**	**0.03**	**0.06**	**92**	**93**	−0.05	0.08	0.42	91	93
Budget revenue c.a. (% GDP)	**40.10**	**43.43**	**0.00**	**74**	**81**	**40.38**	**43.39**	**0.01**	**76**	**80**	**40.10**	**43.40**	**0.00**	**77**	**83**
Change in budget revenue c.a. (% GDP)	0.29	0.02	0.21	73	77	−0.02	−0.07	0.81	73	80	−0.31	−0.13	0.41	76	80
VAT revenue (% GDP)	**4.86**	**5.61**	**0.10**	**92**	**93**	**4.89**	**5.63**	**0.10**	**92**	**93**	5.03	5.67	0.16	92	92
Change in VAT (% GDP)	**0.16**	**−0.04**	**0.03**	**92**	**93**	0.12	0.03	0.27	91	93	0.14	0.05	0.35	91	92
Revenue from VAT c.a. (% GDP)	**4.79**	**5.63**	**0.08**	**74**	**81**	4.98	5.66	0.16	76	80	**5.02**	**5.82**	**0.08**	**77**	**83**
Change in VAT c.a. (% GDP)	**0.14**	**−0.05**	**0.04**	**73**	**77**	0.07	0.02	0.57	73	80	0.04	0.09	0.69	76	80
Taxation of goods and services (% GDP)	10.17	10.59	0.30	93	93	10.2	10.64	0.28	92	93	10.22	10.66	0.28	91	93
Change in the tax of goods and services (% GDP)	**0.09**	**−0.06**	**0.05**	**93**	**93**	0.08	0.05	0.63	92	93	0.08	0.02	0.44	91	93
Taxation of goods and services c.a. (% GDP)	**9.66**	**10.37**	**0.10**	**74**	**81**	9.76	10.34	0.18	76	80	9.81	10.48	0.13	77	83
Change in the tax of goods and services c.a. (% GDP)	0.01	−0.07	0.21	73	77	−0.04	0.02	0.43	73	80	−0.01	0.00	0.93	76	80
Income tax revenues (% GDP)	10.87	10.80	0.90	90	92	10.74	10.78	0.95	90	92	10.64	10.77	0.84	90	91
Change in income tax (% GDP)	0.04	0.02	0.79	90	92	−0.07	−0.02	0.54	89	92	−0.10	−0.07	0.68	89	91
Income tax revenue c.a. (% GDP)	9.87	10.50	0.31	72	80	10.08	10.47	0.53	74	79	10.05	10.54	0.42	75	82
Change in income tax c.a. (% GDP)	0.01	0.03	0.86	71	76	−0.05	−0.04	0.92	71	79	−0.03	−0.12	0.32	74	79
CIT (% GDP)	2.57	2.72	0.52	90	92	2.48	2.61	0.56	90	92	2.53	2.57	0.86	90	91
Change in CIT (% GDP)	−0.06	−0.05	0.91	90	92	−0.06	−0.1	0.55	89	92	0.05	−0.04	0.21	89	91
CIT c.a. (% GDP)	2.69	2.56	0.41	72	80	2.60	2.5	0.53	74	79	2.61	2.44	0.28	75	82
Change to CIT c.a. (% GDP)	−0.01	−0.09	0.22	71	76	−0.07	−0.07	0.92	71	79	0.01	−0.04	0.41	74	79
Capital gains tax (% GDP)	0.11	0.07	0.26	84	85	0.11	0.08	0.35	84	85	0.12	0.08	0.31	84	84

Table 5 Determinants of changes in the risk premium following fiscal tensions. Robustness check: tightened definition of deeper falls in the risk premium

	T_{-1}					T					T_{+1}				
	$\Delta s < Q_1$	$\Delta s > Q_1$	p-val	$N_{>Q1}$	$N_{<Q1}$	$\Delta s < Q_1$	$\Delta s > Q_1$	p-val	$N_{>Q1}$	$N_{<Q1}$	$\Delta s < Q_1$	$\Delta s > Q_1$	p-val	$N_{>Q1}$	$N_{<Q1}$
Fiscal consolidation	0.13	0.13	0.98	38	123	0.09	0.16	0.30	35	123	0.13	0.12	0.96	32	123
Start of consolidation	0.55	0.44	0.22	38	123	0.54	0.49	0.60	35	123	0.56	0.53	0.73	32	123
Consolidation (% GDP)	0.91	0.40	0.00	37	121	0.74	0.52	0.20	33	121	0.67	0.54	0.48	29	121
Size of expenditure cuts (% GDP)	0.44	0.25	0.05	37	121	0.44	0.32	0.33	33	121	0.47	0.38	0.51	29	121
Size of tax hikes (% GDP)	0.46	0.15	0.00	37	121	0.30	0.20	0.29	33	121	0.20	0.17	0.66	29	121
Share of expenditure cuts in total consolidation (%)	0.43	0.57	0.15	20	52	0.43	0.60	0.08	17	59	0.53	0.65	0.23	15	63
Budget revenue (% GDP)	40.49	43.93	0.01	47	139	40.55	44.09	0.01	46	139	40.48	44.09	0.01	46	138
Change in government revenue (% GDP)	0.68	0.13	0.02	47	139	0.27	0.16	0.57	46	139	−0.07	0.04	0.55	46	138
Budget revenue c.a. (% GDP)	38.76	42.77	0.00	36	119	39.01	42.86	0.00	38	118	38.54	42.83	0.00	38	122
Change in budget revenue c.a. (% GDP)	0.20	0.14	0.81	36	114	−0.22	0.01	0.33	36	117	−0.47	−0.14	0.17	38	118
VAT revenue (% GDP)	5.00	5.31	0.55	46	139	5.06	5.34	0.59	47	138	5.33	5.36	0.96	46	138
Change in VAT (% GDP)	0.18	0.02	0.13	46	139	0.17	0.04	0.17	46	138	0.16	0.07	0.42	46	137
Revenue from VAT c.a. (% GDP)	4.84	5.35	0.38	36	119	5.17	5.38	0.70	38	118	5.26	5.49	0.67	38	122
Change in VAT c.a. (% GDP)	0.11	0.02	0.41	36	114	0.15	0.01	0.12	36	117	0.10	0.05	0.73	38	118
Taxation of goods and services (% GDP)	10.67	10.29	0.42	47	139	10.65	10.34	0.51	46	139	10.76	10.34	0.37	46	138

Table 6 Determinants of changes in the risk premium following fiscal tensions. Robustness check: outliers removed

	T_{-1}					T					T_{+1}				
	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M
Fiscal consolidation															
Start of consolidation	**0.45**	**0.32**	**0.07**	**93**	**93**	0.43	0.39	0.55	93	93	0.38	0.46	0.26	92	93
Consolidation (% GDP)	**0.37**	**0.24**	**0.10**	**86**	**91**	0.31	0.31	0.96	86	89	0.28	0.35	0.36	88	87
Size of expenditure cuts (% GDP)	0.18	0.14	0.40	85	92	0.21	0.15	0.27	86	90	0.16	0.21	0.40	86	86
Size of tax hikes (% GDP)	**0.13**	**0.07**	**0.08**	**86**	**90**	**0.09**	**0.12**	**0.38**	**90**	**87**	0.10	0.12	0.53	92	90
Share of expenditure cuts in total consolidation (%)	0.52	0.55	0.78	42	30	0.61	0.51	0.23	40	36	0.69	0.58	0.14	35	43
Budget revenue (% GDP)	**41.52**	**44.60**	**0.01**	**93**	**93**	**41.77**	**44.63**	**0.02**	**92**	**93**	**41.63**	**44.71**	**0.01**	**91**	**93**
Change in government revenue (% GDP)	**0.37**	**0.00**	**0.03**	**91**	**93**	**0.35**	**0.03**	**0.06**	**92**	**93**	0.03	0.08	0.70	90	93
Budget revenue c.a. (% GDP)	**40.31**	**43.96**	**0.00**	**86**	**87**	**40.44**	**43.88**	**0.00**	**88**	**86**	**40.10**	**43.91**	**0.00**	**88**	**89**
Change in budget revenue c.a. (% GDP)	0.26	0.01	0.19	83	83	0.01	-0.10	0.55	84	86	-0.29	-0.10	0.34	87	86
VAT revenue (% GDP)	**4.86**	**5.61**	**0.10**	**92**	**93**	**4.89**	**5.63**	**0.10**	**92**	**93**	5.03	5.67	0.16	92	92
Change in VAT (% GDP)	**0.06**	**-0.04**	**0.06**	**90**	**93**	0.03	0.03	0.95	89	93	0.05	-0.01	0.16	89	91
Revenue from VAT c.a. (% GDP)	5.07	5.78	0.12	85	87	5.17	5.82	0.14	87	86	5.26	5.93	0.12	88	88
Change in VAT c.a. (% GDP)	**0.07**	**-0.06**	**0.02**	**81**	**83**	-0.01	0.04	0.48	81	86	0.00	0.01	0.87	85	84
Taxation of goods and services (% GDP)	10.17	10.59	0.30	93	93	10.20	10.64	0.28	92	93	10.22	10.66	0.28	91	93
Change in the tax of goods and services (% GDP)	0.02	-0.04	0.31	90	92	0.00	0.03	0.66	87	92	0.03	-0.01	0.48	87	91
Taxation of goods and services c.a. (% GDP)	9.84	10.44	0.13	86	87	9.90	10.43	0.18	88	86	9.94	10.56	0.12	88	89
Change in the tax of goods and services c.a. (% GDP)	0.01	-0.09	0.13	83	83	-0.04	0.03	0.31	83	86	0.00	0.01	0.96	86	86
Income tax revenues (% GDP)	10.87	10.64	0.70	90	91	10.74	10.62	0.85	90	91	10.64	10.61	0.96	90	90
Change in income tax (% GDP)	0.04	0.02	0.79	90	92	-0.07	-0.02	0.54	89	92	-0.10	-0.07	0.68	89	91
Income tax revenue c.a. (% GDP)	10.29	10.32	0.96	83	85	10.59	10.30	0.62	85	84	10.54	10.45	0.88	86	86
Change in income tax c.a. (% GDP)	0.00	0.03	0.82	81	82	-0.08	-0.03	0.57	81	85	-0.04	-0.11	0.42	85	84

Table 6 (continued)

	T₋₁					T					T₊₁				
	Δs<M	Δs>M	p-val	N<M	N>M	Δs<M	Δs>M	pval	N<M	N>M	Δs<M	Δs>M	p-val	N<M	N>M
CIT (% GDP)	2.41	2.40	0.95	88	88	2.31	2.33	0.91	88	88	2.38	2.27	0.38	88	87
Change in CIT (% GDP)	−0.06	−0.07	0.94	90	90	−0.06	−0.07	0.85	89	91	**0.09**	**−0.04**	**0.05**	**88**	**91**
CIT c.a. (% GDP)	2.75	2.59	0.32	81	82	2.68	2.55	0.39	83	81	2.72	2.47	0.11	84	83
Change to CIT c.a. (% GDP)	0.01	−0.06	0.34	80	80	−0.01	−0.04	0.64	81	84	0.07	−0.00	0.28	84	84
Capital gains tax (% GDP)	0.09	0.05	0.16	82	83	**0.10**	**0.04**	**0.04**	**83**	**82**	**0.09**	**0.03**	**0.02**	**82**	**80**
Change in capital gains tax (% GDP)	0.00	0.00	0.88	83	83	0.01	0.01	0.87	82	83	0.00	0.01	0.73	82	83
Capital gains tax c.a. (% GDP)	0.12	0.07	0.15	76	77	0.13	0.07	0.13	78	76	0.12	0.09	0.32	78	79
Change in capital gains tax c.a. (% GDP)	−0.00	0.01	0.20	74	74	0.01	0.01	0.53	74	77	0.01	0.01	0.83	79	76
Tax on property (% GDP)	**2.00**	**1.78**	**0.07**	**93**	**93**	**2.01**	**1.77**	**0.05**	**93**	**93**	**2.02**	**1.80**	**0.07**	**92**	**93**
Change in tax on property (% GDP)	−0.01	−0.03	0.50	93	93	**0.04**	**−0.01**	**0.07**	**92**	**93**	0.02	0.02	0.81	91	93
Tax on property c.a. (% GDP)	**1.99**	**1.78**	**0.09**	**86**	**87**	**2.02**	**1.79**	**0.07**	**88**	**86**	**2.03**	**1.81**	**0.07**	**88**	**89**
Change in tax on property c.a. (% GDP)	0.01	−0.01	0.37	83	83	0.03	0.01	0.41	84	86	0.02	0.02	0.83	87	86
Financial transaction tax (% GDP)	0.45	0.46	0.70	92	92	0.44	0.45	0.83	92	93	0.44	0.45	0.81	92	92
Change of the financial transaction tax (% GDP)	−0.02	−0.03	0.66	92	92	−0.00	−0.02	0.16	91	92	0.00	0.00	0.99	91	92
Financial transaction tax c.a. (% GDP)	0.54	0.51	0.58	85	86	0.54	0.52	0.76	87	86	0.54	0.53	0.85	88	88
Change in tax on financial transactions c.a. (% GDP)	−0.01	−0.02	0.80	83	82	0.00	0.00	0.96	83	85	0.00	0.02	0.28	87	85
Social contributions (% GDP)	**8.43**	**9.96**	**0.06**	**93**	**93**	**8.44**	**10.08**	**0.05**	**93**	**93**	**8.49**	**10.17**	**0.04**	**92**	**93**
Change in social contributions (% GDP)	0.12	0.06	0.24	93	93	0.13	0.12	0.81	92	93	0.07	0.09	0.70	91	93
Social contributions c.a. (% GDP)	**8.59**	**10.03**	**0.06**	**86**	**87**	**8.46**	**10.15**	**0.03**	**88**	**86**	**8.37**	**10.01**	**0.03**	**88**	**89**
Change in social contributions c.a. (% GDP)	0.05	0.03	0.80	84	83	0.04	0.05	0.89	84	86	−0.00	0.01	0.84	87	86
Government expenditure (% GDP)	**45.81**	**47.49**	**0.15**	**92**	**93**	**46.25**	**48.31**	**0.08**	**91**	**92**	**46.13**	**48.50**	**0.05**	**91**	**92**

Table 6 (continued)

	T_{-1}					T					T_{+1}				
	Δs < M	Δs > M	p-val	N_{<M}	N_{>M}	Δs < M	Δs > M	p val	N_{<M}	N_{>M}	Δs < M	Δs > M	p-val	N_{<M}	N_{>M}
Change in government expenditure (% GDP)	0.54	0.75	0.52	90	91	0.59	0.81	0.49	89	93	0.11	0.17	0.86	89	91
Government expenditure c.a. (% GDP)	43.29	45.72	0.04	85	87	43.34	45.91	0.04	87	86	42.87	46.02	0.01	88	88
Change in government expenditure c.a. (% GDP)	0.22	0.48	0.44	81	83	−0.16	0.26	0.22	83	86	−0.58	−0.19	0.24	87	85
Primary expenditure (% GDP)	41.37	43.77	0.03	92	93	41.66	44.49	0.01	91	93	41.54	44.73	0.01	91	92
Change in primary expenditure (% GDP)	0.33	0.63	0.34	89	91	0.36	0.72	0.24	88	93	0.10	0.22	0.68	89	91
Primary expenditure c.a. (% GDP)	39.71	42.72	0.01	85	87	39.70	43.06	0.00	87	86	39.30	43.23	0.00	88	88
Change in Primary expenditure c.a. (% GDP)	0.39	0.46	0.85	82	83	−0.12	0.37	0.14	83	86	−0.48	0.02	0.12	87	85
Government consumption (% GDP)	20.05	20.77	0.09	81	87	20.09	21.07	0.03	80	87	20.02	21.22	0.01	79	87
Change in government consumption (% GDP)	0.02	0.31	0.02	81	87	0.05	0.30	0.04	80	87	−0.07	0.14	0.10	79	87
Government investment (% GDP)	0.03	0.04	0.61	34	55	0.03	0.04	0.45	33	59	0.03	0.03	0.83	32	61
Change in government investment (% GDP)	−0.00	0.00	0.21	30	53	−0.00	−0.00	0.67	33	55	0.00	−0.00	0.13	32	59
Public sector wages (% GDP)	12.17	12.16	0.98	81	82	12.21	12.36	0.70	78	80	12.18	12.49	0.45	77	76
Change in public sector wages (% GDP)	0.02	0.08	0.49	79	79	−0.02	0.14	0.04	76	78	−0.03	−0.00	0.73	75	74
Transfers (% government expenditure)	54.46	58.67	0.21	42	66	55.48	59.12	0.28	42	67	55.57	60.06	0.17	44	66
Change in transfers (% government expenditure)	0.45	0.14	0.70	31	63	0.75	−0.11	0.14	39	63	0.58	0.16	0.43	41	64
Transfers c.a. (% government expenditure)	54.02	59.11	0.09	42	65	54.90	58.20	0.29	42	67	55.30	58.40	0.33	44	66
Change of c.a. transfers (% government expenditure)	0.55	−0.19	0.36	31	63	0.68	−0.69	0.04	39	63	0.70	−0.37	0.07	41	64
Social expenditure (% GDP)	19.88	21.76	0.02	93	93	20.31	22.31	0.02	92	93	20.47	22.73	0.01	91	93
Change in social expenditure (% GDP)	0.28	0.33	0.71	91	89	0.31	0.51	0.15	88	92	0.20	0.33	0.33	90	91
Social expenditure c.a. (% GDP)	18.71	20.87	0.01	86	87	18.95	21.24	0.01	88	86	18.94	21.38	0.00	88	89
Change in social expenditure c.a. (% GDP)	0.13	0.46	0.04	84	83	0.21	0.30	0.56	84	86	0.08	0.19	0.40	87	86

Table 6 (continued)

	T_{-1}					T					T_{+1}				
	Δs<M	Δs>M	p-val	N_{<M}	N_{>M}	Δs<M	Δs>M	p val	N_{<M}	N_{>M}	Δs<M	Δs>M	p-val	N_{<M}	N_{>M}
Debt (% GDP)	54.93	52.89	0.66	90	92	56.29	55.87	0.93	89	92	58.47	58.56	0.99	89	92
Change in debt (% GDP)	2.17	2.13	0.95	90	91	2.33	2.76	0.49	89	92	2.01	2.52	0.39	88	91
Change in debt (%)	0.04	0.04	0.80	90	90	0.04	0.05	0.67	88	91	0.04	0.05	0.47	89	89
Fiscal rules	−0.11	0.12	0.16	33	57	0.05	0.16	0.53	31	58	0.21	0.25	0.85	30	57
Change of fiscal rules	0.05	0.02	0.43	24	54	0.04	0.02	0.55	29	56	0.07	0.04	0.51	30	55
Primary balance (% GDP)	0.06	0.27	0.68	92	90	−0.04	0.01	0.92	92	92	0.15	−0.04	0.71	92	93
Change in primary balance (% GDP)	**0.18**	**−0.43**	**0.04**	**92**	**87**	−0.01	−0.37	0.23	92	87	0.16	−0.07	0.43	90	89
Primary balance c.a. (% GDP)	0.37	0.49	0.83	85	84	0.67	0.43	0.68	86	84	0.82	0.47	0.58	86	88
Change in primary balance c.a. (% GDP)	**0.18**	**−0.62**	**0.01**	**83**	**79**	0.13	−0.35	0.11	84	83	0.24	−0.12	0.21	86	84
Cost of debt service (% GDP)	4.19	3.72	0.12	90	93	4.41	3.81	0.06	91	93	**4.58**	**3.76**	**0.02**	**92**	**93**
Change in the cost of debt service (% GDP)	0.18	0.11	0.21	91	92	0.10	0.07	0.64	91	92	0.03	−0.03	0.38	91	89
Monetary policy															
Short-term rate (p.p.)	**8.48**	**6.37**	**0.00**	**80**	**86**	7.37	6.08	0.08	83	86	**7.09**	**4.91**	**0.00**	**79**	**86**
Change in short-term interest rate (%)	−0.34	0.04	0.19	77	86	**−1.28**	**−0.45**	**0.00**	**80**	**85**	−0.83	−1.05	0.39	76	84
Change in short-term interest rate (p.p.)	**−0.05**	**0.04**	**0.08**	**80**	**85**	−0.18	−0.15	0.36	81	85	−0.15	−0.14	0.83	78	86
Change in M3 (%)	0.10	0.08	0.32	38	27	0.09	0.08	0.50	39	28	0.08	0.07	0.71	41	27
Central bank independence	**0.44**	**0.56**	**0.00**	**86**	**92**	**0.42**	**0.56**	**0.00**	**81**	**92**	**0.42**	**0.56**	**0.00**	**79**	**89**
Change of central bank independence	0.00	0.00	0.30	85	92	0.00	0.00	0.91	80	91	**−0.00**	**0.00**	**0.09**	**76**	**89**
Exchange rate	−0.01	−0.00	0.63	93	91	−0.01	−0.01	0.63	93	91	**−0.01**	**0.00**	**0.07**	**90**	**93**
Fixed regime	0.24	0.29	0.43	92	93	0.27	0.27	0.93	91	93	0.26	0.26	0.97	91	92
Floating regime	0.55	0.55	0.94	92	93	0.53	0.59	0.39	91	93	0.56	0.64	0.27	91	92
Intermediate regime	0.21	0.16	0.43	92	93	0.20	0.14	0.30	91	93	**0.18**	**0.09**	**0.08**	**91**	**92**
EMU															

Table 6 (continued)

	T_{-1}					T					T_{+1}				
	Δs < M	Δs > M	p-val	N_{<M}	N_{>M}	Δs < M	Δs > M	p val	N_{<M}	N_{>M}	Δs < M	Δs > M	p-val	N_{<M}	N_{>M}
Labour market															
Unemployment (%)	**7.97**	**7.06**	**0.07**	**79**	**85**	**8.47**	**7.59**	**0.10**	**83**	**84**	8.75	8.10	0.20	84	86
Change in unemployment (p.p.)	**0.48**	**0.08**	**0.03**	**83**	**82**	0.47	0.50	0.87	84	85	0.16	0.45	0.12	87	85
Change in unit labour cost (%)	0.02	0.02	0.52	92	93	**0.03**	**0.01**	**0.10**	**90**	**93**	0.01	0.03	0.17	87	93
Labour protection	**1.87**	**2.29**	**0.01**	**57**	**74**	**1.82**	**2.27**	**0.00**	**61**	**75**	**1.80**	**2.24**	**0.00**	**61**	**78**
Change in labour protection	−0.00	−0.00	0.81	49	72	−0.00	0.00	0.17	51	72	−0.00	−0.00	0.95	56	74
Unions density	38.70	37.80	0.75	88	92	37.87	37.46	0.89	88	90	37.05	37.23	0.95	86	90
Changing in unions density	−0.02	−0.01	0.29	88	90	**−0.02**	**−0.01**	**0.02**	**85**	**90**	**−0.03**	**−0.01**	**0.01**	**84**	**89**
Retirement age	**62.55**	**61.80**	**0.07**	**78**	**81**	**62.53**	**61.75**	**0.06**	**77**	**82**	62.37	61.75	0.12	76	83
Change in retirement age	−0.08	−0.01	0.33	78	79	−0.06	−0.00	0.41	76	80	**−0.16**	**0.01**	**0.02**	**75**	**81**
Markets and regulation															
Degree of integration with global markets	**71.67**	**75.87**	**0.01**	**85**	**91**	**72.41**	**76.23**	**0.02**	**85**	**91**	**72.68**	**76.73**	**0.01**	**80**	**91**
Change in degree of integration with global markets	0.62	0.47	0.50	84	91	**0.74**	**0.36**	**0.10**	**85**	**90**	0.75	0.50	0.26	80	91
Competitiveness of the economy															
Change in competitiveness of the economy	−0.01	−0.00	0.73	89	90	0.00	−0.01	0.13	88	90	**−0.02**	**0.01**	**0.01**	**89**	**89**
Capitalization of government bond market (% GDP)	40.51	41.41	0.84	36	67	40.13	41.71	0.72	38	65	40.95	43.31	0.58	40	66
Change in capitalisation of the government bond market (% GDP)	1.41	0.74	0.38	25	65	0.93	1.84	0.19	34	64	0.81	1.70	0.22	38	64
Entry barriers	1.96	2.20	0.15	75	60	2.05	2.28	0.15	75	60	2.20	2.33	0.39	75	60
Change in entry barriers															
Degree of privatisation	1.73	1.83	0.61	75	60	1.76	1.82	0.77	75	60	1.83	1.80	0.89	75	60
Change in the degree of privatisation															

Table 6 (continued)

	T_{-1}					T					T_{+1}				
	Δs<M	Δs>M	p-val	N<M	N>M	Δs<M	Δs>M	p val	N<M	N>M	Δs<M	Δs>M	p-val	N<M	N>M
Degree of financial market reform	0.70	0.73	0.47	75	60	0.73	0.75	0.56	75	60	0.77	0.77	0.98	75	60
Change in the degree of financial market reform	0.02	0.02	0.54	74	59	0.03	0.02	0.18	73	59	**0.03**	**0.02**	**0.08**	**72**	**59**
Quality of government	0.68	0.71	0.59	93	93	0.71	0.76	0.36	93	93	0.80	0.76	0.40	92	93
Change in the quality of government	−0.00	0.00	0.67	84	92	**0.00**	**−0.00**	**0.07**	**90**	**87**	0.00	0.00	0.55	84	93
Openness of financial markets	1.61	1.81	0.23	92	93	1.65	1.87	0.17	91	93	1.71	1.91	0.19	91	92
Change in the openness of financial markets	0.03	0.02	0.39	87	92	0.03	0.01	0.26	90	87	0.02	0.02	0.97	87	89
Macroeconomic environment															
GDP growth (%)	0.06	0.05	0.31	91	92	0.06	0.04	0.14	90	92	0.05	0.04	0.18	89	92
Output gap (% GDP)	**−0.83**	**0.39**	**0.04**	**64**	**74**	**−1.86**	**−0.87**	**0.07**	**69**	**75**	−2.17	−1.70	0.30	73	77
Change in the output gap (p.p.)	−0.73	−0.54	0.57	62	70	−0.98	−0.94	0.88	68	70	−0.23	−0.52	0.33	71	72
Exports (% GDP)	**29.74**	**34.96**	**0.03**	**90**	**93**	**29.58**	**35.38**	**0.02**	**90**	**93**	**29.73**	**35.89**	**0.02**	**89**	**93**
Change in exports (% GDP)	0.56	0.32	0.52	93	93	0.28	0.42	0.73	92	93	0.35	0.51	0.71	91	93
Savings (% GDP)	**20.75**	**23.54**	**0.00**	**67**	**73**	**20.75**	**23.17**	**0.00**	**66**	**74**	**21.29**	**22.88**	**0.05**	**67**	**74**
Change in savings (% GDP)	−0.03	−0.39	0.18	66	71	**−0.01**	**−0.48**	**0.08**	**66**	**72**	0.07	−0.13	0.45	63	72
Investment (% GDP)	**22.29**	**23.27**	**0.05**	**89**	**92**	21.89	22.50	0.19	89	92	21.70	21.90	0.65	89	92
Change in investment (% GDP)	−0.53	−0.27	0.17	91	92	−0.63	−0.61	0.94	92	90	**−0.20**	**−0.55**	**0.04**	**91**	**92**
Consumption (% GDP)	77.12	75.91	0.11	92	93	76.85	76.24	0.43	91	93	76.43	75.88	0.50	91	92
Change in consumption (% GDP)	0.14	0.44	0.19	92	93	**−0.13**	**0.32**	**0.09**	**92**	**93**	−0.41	−0.21	0.40	92	92
Inflation (p.p.)	**5.51**	**3.68**	**0.00**	**91**	**89**	4.23	3.88	0.55	90	91	3.21	3.37	0.75	89	91
Change in inflation	−0.00	−0.00	0.41	89	91	**−0.01**	**−0.00**	**0.00**	**87**	**93**	−0.01	−0.00	0.14	88	88
Change in industrial production (%)															
Current account balance (% GDP)	−0.39	−0.45	0.93	68	71	−0.07	0.31	0.56	66	73	0.15	0.79	0.34	67	73
Change in current account balance (% GDP)	**0.57**	**−0.01**	**0.04**	**66**	**73**	0.54	0.32	0.39	67	74	**−0.03**	**0.44**	**0.05**	**65**	**74**

Table 6 (continued)

	T_{-1}					T					T_{+1}				
	Δs < M	Δs > M	p-val	N$_{<M}$	N$_{>M}$	Δs < M	Δs > M	p val	N$_{<M}$	N$_{>M}$	Δs < M	Δs > M	p-val	N$_{<M}$	N$_{>M}$
Crisis	0.50	0.57	0.41	66	79	**0.36**	**0.57**	**0.01**	**66**	**79**	0.41	0.39	0.86	66	71
Banking crisis	0.21	0.21	0.94	82	85	0.21	0.27	0.34	82	85	0.19	0.21	0.67	81	85
Currency crisis															
Stock market crisis	**0.24**	**0.42**	**0.01**	**82**	**85**	**0.18**	**0.29**	**0.09**	**82**	**85**	0.15	0.13	0.73	81	85
Inflation crisis															
VIX	**19.10**	**22.17**	**0.01**	**49**	**69**	**18.59**	**22.64**	**0.00**	**52**	**70**	**18.01**	**21.82**	**0.00**	**53**	**70**
Change of VIX	**−0.09**	**0.06**	**0.00**	**38**	**57**	−0.05	−0.03	0.66	46	61	−0.04	−0.02	0.73	51	68
European Union Membership															

The analyzed determinants are divided into groups. The columns Δs < M and Δs > M contain the average level of variable considered for the periods in which the risk premium change was lower and higher than median change respectively. All significant differences of 10% are bolded. The columns N$_{<M}$ and N$_{>M}$ indicates the number of observations qualified for comparison. Their different values result from gaps in data. Cyclically adjusted variables are marked with "c.a."

Table 7 Determinants of changes in the risk premium following fiscal tensions. Robustness check: modified definition of periods of 'stress' and, consequently 'relaxation'

	T_{-1}					T					T_{+1}				
	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M
Fiscal consolidation	**0.16**	**0.08**	**0.09**	**80**	**80**	**0.06**	**0.20**	**0.01**	**80**	**80**	0.08	0.11	0.43	80	79
Start of consolidation	0.49	0.31	0.02	80	80	0.45	0.41	0.63	80	80	0.41	0.45	0.57	80	79
Consolidation (% GDP)	0.66	0.23	0.00	80	80	0.52	0.41	0.37	80	80	0.43	0.46	0.83	80	79
Size of expenditure cuts (% GDP)	0.38	0.13	0.00	80	80	0.37	0.23	0.15	80	80	0.33	0.30	0.80	80	79
Size of tax hikes (% GDP)	0.28	0.10	0.01	80	80	0.16	0.18	0.77	80	80	0.10	0.15	0.36	80	79
Share of expenditure cuts in total consolidation (%)	0.52	0.56	0.67	25	39	0.62	0.54	0.35	33	36	0.70	0.60	0.26	36	32
Budget revenue (% GDP)	**40.82**	**44.52**	**0.00**	**80**	**80**	**40.99**	**44.60**	**0.00**	**80**	**79**	**40.95**	**44.44**	**0.01**	**80**	**78**
Change in government revenue (% GDP)	0.58	−0.05	0.00	80	80	0.29	0.08	0.22	80	79	0.08	−0.16	0.17	80	78
Budget revenue c.a. (% GDP)	39.54	44.05	0.00	76	75	39.65	44.02	0.00	75	78	39.38	43.79	0.00	77	77
Change in budget revenue c.a. (% GDP)	0.37	−0.06	0.06	72	74	−0.04	−0.07	0.91	75	74	−0.18	−0.27	0.71	75	77
VAT revenue (% GDP)	4.60	5.59	0.04	80	79	4.66	5.59	0.06	80	79	4.81	5.71	0.06	80	79
Change in VAT (% GDP)	0.19	−0.04	0.03	80	79	0.15	0.00	0.09	80	78	0.15	0.11	0.75	80	78
Revenue from VAT c.a. (% GDP)	4.83	5.78	0.05	76	74	4.96	5.79	0.08	75	77	5.05	5.96	0.05	77	77
Change in VAT c.a. (% GDP)	0.19	−0.07	0.02	72	73	0.11	0.00	0.23	75	73	0.09	0.13	0.74	75	77
Taxation of goods and services (% GDP)	10.02	10.41	0.38	80	80	10.04	10.45	0.34	80	79	10.04	10.50	0.30	80	78
Change in the tax of goods and services (% GDP)	**0.10**	**−0.03**	**0.09**	**80**	**80**	0.09	0.05	0.60	80	79	0.08	0.04	0.67	80	78
Taxation of goods and services c.a. (% GDP)	**9.64**	**10.37**	**0.09**	**76**	**75**	9.75	10.35	0.17	75	78	**9.75**	**10.48**	**0.09**	**77**	**77**
Change in the tax of goods and services c.a. (% GDP)	0.05	−0.08	0.14	72	74	0.01	0.02	0.85	75	74	0.04	0.05	0.86	75	77
Income tax revenues (% GDP)	10.70	10.63	0.92	80	77	10.56	10.55	0.98	80	77	10.48	10.41	0.91	80	77
Change in income tax (% GDP)	0.06	−0.01	0.49	80	77	−0.07	−0.08	0.89	80	76	−0.09	−0.14	0.54	80	76

Table 7 (continued)

	T₋₁					T					T₊₁				
	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M
Income tax revenue c.a. (% GDP)	10.24	10.48	0.71	76	72	10.58	10.44	0.83	75	75	10.53	10.38	0.82	77	75
Change in income tax c.a. (% GDP)	0.02	−0.01	0.71	72	71	−0.08	−0.05	0.80	75	71	−0.05	−0.12	0.44	75	75
CIT (% GDP)	2.48	2.69	0.37	80	77	2.40	2.60	0.41	80	77	2.49	2.57	0.74	80	77
Change in CIT (% GDP)	**−0.05**	**−0.20**	**0.06**	**80**	**77**	−0.05	−0.10	0.53	80	76	0.09	−0.03	0.16	80	76
CIT c.a. (% GDP)	2.90	2.88	0.95	76	72	2.82	2.82	0.99	75	75	2.89	2.81	0.77	77	75
Change to CIT c.a. (% GDP)	**0.02**	**−0.20**	**0.01**	**72**	**71**	−0.01	−0.07	0.48	75	71	0.07	0.00	0.39	75	75
Capital gains tax (% GDP)	0.10	0.11	0.95	75	72	0.11	0.10	0.97	75	72	0.12	0.11	0.79	75	72
Change in capital gains tax (% GDP)	−0.01	0.01	0.33	75	72	0.00	−0.00	0.72	75	71	0.01	0.00	0.47	75	71
Capital gains tax c.a. (% GDP)	0.13	0.13	1.00	71	67	0.13	0.13	0.93	70	70	0.14	0.14	0.87	72	70
Change in capital gains tax c.a. (% GDP)	−0.01	0.01	0.19	67	66	0.01	0.00	0.80	70	66	0.01	0.00	0.64	70	70
Tax on property (% GDP)	2.01	1.81	0.14	80	80	2.03	1.81	0.11	80	80	2.04	1.83	0.12	80	79
Change in tax on property (% GDP)	−0.01	−0.02	0.66	80	80	0.02	−0.00	0.64	80	80	−0.01	0.01	0.56	80	79
Tax on property c.a. (% GDP)	2.00	1.82	0.19	76	75	2.03	1.84	0.15	75	78	2.05	1.85	0.13	77	77
Change in tax on property c.a. (% GDP)	−0.00	−0.01	0.89	72	74	0.04	0.01	0.31	75	74	0.02	0.02	0.87	75	77
Financial transaction tax (% GDP)	0.44	0.44	0.94	80	79	0.44	0.42	0.72	80	79	0.44	0.43	0.74	80	79
Change of the financial transaction tax (% GDP)	−0.02	−0.03	0.52	80	79	0.00	−0.01	0.14	80	78	0.00	0.00	0.97	80	78
Financial transaction tax c.a. (% GDP)	**0.56**	**0.47**	**0.10**	**76**	**74**	0.56	0.47	0.15	75	77	0.56	0.49	0.26	77	77
Change in tax on financial transactions c.a. (% GDP)	−0.01	−0.02	0.52	72	73	0.01	0.01	0.89	75	73	0.00	0.02	0.22	75	77
Social contributions (% GDP)	**8.39**	**10.15**	**0.04**	**80**	**80**	**8.40**	**10.24**	**0.04**	**80**	**80**	**8.45**	**10.26**	**0.04**	**80**	**79**

Table 7 (continued)

	T_{-1}					T					T_{+1}				
	Δs < M	Δs > M	p-val	$N_{<M}$	$N_{>M}$	Δs < M	Δs > M	p-val	$N_{<M}$	$N_{>M}$	Δs < M	Δs > M	p-val	$N_{<M}$	$N_{>M}$
Change in social contributions (% GDP)	0.13	0.07	0.34	80	80	0.00	0.08	0.61	80	80	−0.06	0.02	0.59	80	79
Social contributions c.a. (% GDP)	**8.35**	**10.16**	**0.03**	**76**	**75**	**8.15**	**10.25**	**0.01**	**75**	**78**	**8.11**	**10.17**	**0.01**	**77**	**77**
Change in social contributions c.a. (% GDP)	0.04	0.04	0.97	72	74	0.05	0.01	0.62	75	74	0.01	−0.04	0.41	75	77
Government expenditure (% GDP)	**45.43**	**47.63**	**0.08**	**80**	**79**	**45.66**	**48.33**	**0.04**	**80**	**78**	**45.35**	**48.37**	**0.02**	**80**	**78**
Change in government expenditure (% GDP)	0.41	1.07	0.16	80	79	0.35	0.71	0.37	80	78	−0.31	0.03	0.36	80	78
Government expenditure c.a. (% GDP)	**42.39**	**46.44**	**0.00**	**76**	**74**	**42.50**	**46.51**	**0.00**	**75**	**77**	**41.87**	**46.40**	**0.00**	**77**	**77**
Change in government expenditure c.a. (% GDP)	**0.01**	**0.93**	**0.05**	**72**	**73**	−0.27	0.15	0.27	75	73	−0.63	−0.35	0.42	75	77
Primary expenditure (% GDP)	**40.84**	**43.87**	**0.01**	**80**	**79**	**40.91**	**44.55**	**0.00**	**80**	**78**	**40.62**	**44.69**	**0.00**	**80**	**78**
Change in primary expenditure (% GDP)	0.28	0.99	0.12	80	79	0.21	0.68	0.22	80	78	−0.29	0.14	0.24	80	78
Primary expenditure c.a. (% GDP)	**38.77**	**43.42**	**0.00**	**76**	**74**	**38.76**	**43.65**	**0.00**	**75**	**77**	**38.21**	**43.60**	**0.00**	**77**	**77**
Change in Primary expenditure c.a. (% GDP)	**0.05**	**0.97**	**0.05**	**72**	**73**	−0.24	0.28	0.16	75	73	−0.55	−0.16	0.24	75	77
Government consumption (% GDP)	**19.85**	**20.93**	**0.02**	**72**	**70**	**19.56**	**21.19**	**0.00**	**72**	**70**	**19.42**	**21.23**	**0.00**	**72**	**69**
Change in government consumption (% GDP)	**−0.02**	**0.43**	**0.00**	**72**	**70**	**−0.29**	**0.27**	**0.08**	**72**	**70**	−0.43	0.03	0.15	72	69
Government investment (% GDP)	0.03	0.04	0.66	50	27	0.03	0.04	0.20	52	27	0.03	0.04	0.32	54	26
Change in government investment (% GDP)	**−0.00**	**0.00**	**0.00**	**48**	**23**	**−0.00**	**0.00**	**0.04**	**50**	**27**	−0.00	−0.00	0.54	52	26
Public sector wages (% GDP)	12.14	11.84	0.47	70	69	12.17	12.02	0.74	68	66	12.08	12.06	0.97	65	65

Table 7 (continued)

	T₋₁					T					T₊₁				
	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M
Change in public sector wages (% GDP)	0.02	0.06	0.81	70	69	0.03	−0.02	0.78	68	66	−0.09	−0.16	0.68	65	65
Transfers (% government expenditure)	53.49	59.88	0.08	59	35	54.64	61.29	0.06	59	35	54.79	61.94	0.04	60	37
Change in transfers (% government expenditure)	3.22	−0.32	0.09	57	25	0.83	1.41	0.76	59	32	−0.06	0.61	0.52	59	35
Transfers c.a. (% government expenditure)	52.98	59.11	0.07	59	35	53.98	59.84	0.08	59	35	54.52	59.93	0.10	60	37
Change of c.a. transfers (% government expenditure)	3.07	−0.67	0.07	57	25	0.77	0.74	0.98	59	32	0.06	0.01	0.96	59	35
Social expenditure (% GDP)	19.69	21.82	0.02	80	80	20.00	22.33	0.01	80	79	20.10	22.61	0.01	80	78
Change in social expenditure (% GDP)	0.33	0.55	0.18	80	80	0.40	0.51	0.52	80	79	0.19	0.28	0.59	80	78
Social expenditure c.a. (% GDP)	18.23	21.10	0.00	76	75	18.34	21.44	0.00	75	78	18.35	21.49	0.00	77	77
Change in social expenditure c.a. (% GDP)	0.08	0.52	0.00	72	74	0.14	0.26	0.45	75	74	0.07	0.10	0.83	75	77
Debt (% GDP)	58.76	53.71	0.34	80	79	59.86	56.57	0.53	80	78	61.41	59.05	0.65	80	78
Change in debt (% GDP)	2.55	2.66	0.89	80	79	2.59	2.86	0.69	80	78	1.55	2.49	0.20	80	78
Change in debt (%)	0.05	0.07	0.45	80	79	0.06	0.08	0.38	80	78	0.04	0.06	0.44	80	78
Budgetary rules	−0.13	0.08	0.23	52	27	0.20	0.12	0.74	52	26	0.52	0.18	0.16	52	26
Change of budgetary rules	0.31	0.07	0.06	50	21	0.36	0.05	0.02	52	26	0.32	0.06	0.05	52	26
Primary balance (% GDP)	0.11	0.65	0.39	80	80	0.16	0.05	0.86	80	80	0.40	−0.25	0.24	80	79
Change of primary balance (% GDP)	0.49	−1.04	0.00	80	80	0.04	−0.60	0.10	80	80	0.26	−0.30	0.11	80	79
Primary balance c.a. (% GDP)	0.77	0.65	0.87	76	75	0.87	0.37	0.50	75	78	1.20	0.20	0.16	77	77
Primary balance change c.a. (% GDP)	0.52	−1.03	0.00	72	74	0.19	−0.35	0.14	75	74	0.33	−0.12	0.17	75	75
Cost of debt service (% GDP)	4.58	3.76	0.02	80	80	4.72	3.79	0.01	80	80	4.71	3.68	0.01	80	79

Table 7 (continued)

	T_{-1}					T					T_{+1}				
	Δs<M	Δs>M	p-val	N_{<M}	N_{>M}	Δs<M	Δs>M	p-val	N_{<M}	N_{>M}	Δs<M	Δs>M	p-val	N_{<M}	N_{>M}
Change in the cost of debt service (% GDP)	0.13	0.08	0.53	80	80	0.14	0.03	0.10	80	80	−0.03	−0.10	0.42	80	79
Monetary policy															
Short-term rate (p.p.)	9.16	6.32	0.00	76	71	7.84	5.54	0.00	77	73	7.71	4.63	0.00	77	69
Change in short-term interest rate (%)	−0.39	−0.23	0.63	76	69	−1.44	−0.89	0.05	76	71	−0.78	−0.91	0.69	77	67
Change in short-term interest rate (p.p.)	−0.10	263.13	0.34	76	69	281.49	−0.20	0.30	76	71	−0.12	−0.13	0.94	77	67
Amendment M3 (%)	0.10	0.11	0.94	26	35	0.10	0.08	0.44	26	35	0.08	0.08	0.97	26	35
Central bank independence	0.42	0.57	0.00	80	73	0.40	0.57	0.00	80	68	0.41	0.57	0.00	79	67
Review of central bank independence	0.00	0.00	0.16	80	73	0.00	0.00	0.94	80	68	0.02	0.00	0.10	79	67
Exchange rate	−0.01	−0.01	0.89	80	80	−0.00	−0.01	0.54	80	80	−0.01	−0.00	0.34	80	79
Fixed regime	0.25	0.26	0.89	80	79	0.27	0.26	0.92	80	78	0.24	0.24	0.93	80	78
Floating regime	0.57	0.54	0.69	80	79	0.54	0.63	0.27	80	78	0.58	0.66	0.27	80	78
Intermediate regime	0.18	0.20	0.72	80	79	0.19	0.11	0.16	80	78	0.18	0.09	0.09	80	78
EMU	0.16	0.41	0.00	80	80	0.16	0.41	0.00	80	80	0.15	0.41	0.00	80	79
Labour market															
Unemployment (%)	9.90	7.08	0.00	76	75	10.03	7.60	0.00	75	79	9.91	8.10	0.01	77	78
Change in unemployment (p.p.)	0.64	0.21	0.07	72	74	0.13	0.57	0.25	75	75	−0.24	0.37	0.10	75	78
Change in unit labour cost (%)	0.02	0.02	0.93	80	80	0.03	0.02	0.36	80	79	0.03	0.03	1.00	80	78
Labor protection	1.85	2.26	0.02	68	50	1.87	2.23	0.04	69	55	1.85	2.21	0.03	72	55
Changing the labor protection	−0.02	−0.00	0.05	66	44	0.00	−0.00	0.39	68	45	−0.00	−0.00	0.77	69	50
The importance of trade unions	37.26	36.54	0.81	80	75	36.35	36.09	0.93	78	75	35.41	35.63	0.94	79	73
Change in unions density	−0.02	−0.01	0.42	78	75	−0.02	−0.01	0.03	78	72	−0.03	−0.01	0.00	78	71
Retirement age	62.49	61.66	0.07	68	67	62.44	61.68	0.09	69	66	62.25	61.71	0.22	70	65

Table 7 (continued)

	T_−1					T					T_+1				
	Δs < M	Δs > M	p-val	N_<M	N_>M	Δs < M	Δs > M	p-val	N_<M	N_>M	Δs < M	Δs > M	p-val	N_<M	N_>M
Change in retirement age	−0.10	0.02	0.14	67	67	−0.07	0.05	0.13	68	66	−0.20	0.06	0.00	69	65
Markets and regulation															
Degree of integration with global markets	70.40	77.21	0.00	78	74	71.25	77.49	0.00	79	74	71.39	78.12	0.00	79	69
Change of degree of integration with global markets	0.71	0.30	0.09	78	73	0.85	0.34	0.03	78	80	0.78	0.64	0.54	79	69
Competitiveness of the economy	103.12	110.92	0.49	80	80	99.53	104.96	0.45	80	79	96.00	101.54	0.22	80	78
Change in competitiveness of the economy	−0.02	−0.02	0.87	80	80	−0.01	−0.02	0.17	80	79	−0.02	−0.01	0.78	80	78
Capitalization of government bond market (% GDP)	42.05	39.55	0.60	61	29	41.78	41.20	0.90	60	32	41.72	43.19	0.74	61	34
Change in the capitalisation of the government bond market (%)	2.68	0.64	0.02	59	19	0.85	1.97	0.13	60	28	−0.02	2.39	0.00	60	32
Entry barriers	2.00	2.25	0.15	52	67	2.10	2.33	0.19	52	67	2.27	2.38	0.47	52	67
Change of entry barriers	0.12	0.12	0.95	52	67	0.10	0.08	0.64	52	67	0.16	0.06	0.12	52	67
Degree of privatisation	1.73	1.90	0.41	52	67	1.76	1.88	0.56	52	67	1.84	1.88	0.82	52	67
Change of the degree of privatisation	0.00	0.02	0.52	52	67	0.03	−0.02	0.10	52	67	0.07	0.00	0.04	52	67
Degree of financial market reform	0.71	0.76	0.27	52	67	0.75	0.78	0.41	52	67	0.78	0.80	0.63	52	67
Change of the degree of financial market reform	0.03	0.01	0.15	52	67	0.03	0.02	0.25	52	67	0.04	0.02	0.12	52	67
Quality of government	0.70	0.76	0.27	80	80	0.74	0.81	0.15	80	80	0.83	0.82	0.94	80	79
Change of the quality of government	0.10	0.01	0.01	80	80	0.04	0.05	0.76	80	80	0.09	0.01	0.03	80	79
Openness of financial markets	1.60	1.91	0.08	80	79	1.65	1.96	0.06	80	78	1.70	2.03	0.04	80	78

Table 7 (continued)

	T₋₁					T					T₊₁				
	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M
Change in the openness of financial markets	0.07	0.03	0.47	80	79	0.05	0.05	0.84	80	78	0.05	0.07	0.61	80	78
Macroeconomic environment															
GDP growth (%)	0.07	0.05	0.08	80	80	0.06	0.04	0.05	80	79	0.06	0.05	0.06	80	78
Output gap (% GDP)	−2.40	0.48	0.00	68	59	−3.20	−0.94	0.00	69	65	−2.90	−1.42	0.01	71	67
Change in the output gap (p.p.)	−0.76	−1.15	0.35	67	53	−0.88	−1.44	0.14	68	59	0.08	−0.54	0.10	69	64
Exports (% GDP)	31.20	35.76	0.14	80	80	31.02	36.04	0.12	80	80	31.46	36.91	0.10	80	79
Change in exports (% GDP)	0.60	−0.16	0.06	80	80	−0.17	0.28	0.43	80	80	0.04	0.87	0.16	80	79
Savings (% GDP)	20.77	24.00	0.00	61	59	20.94	23.41	0.01	61	58	21.47	23.13	0.06	61	58
Change in savings (% GDP)	0.03	−0.81	0.01	61	58	−0.00	−0.59	0.07	61	58	0.28	−0.29	0.09	61	57
Investment (% GDP)	21.93	23.14	0.03	80	80	21.45	22.41	0.07	80	79	21.36	21.98	0.21	80	78
Change in investment (% GDP)	−0.78	−0.30	0.03	80	80	−0.61	−0.74	0.51	80	79	−0.22	−0.43	0.23	80	78
Consumption (% GDP)	76.06	75.79	0.83	80	80	74.65	76.03	0.38	80	80	75.24	75.78	0.69	80	79
Change in consumption (% GDP)	−1.04	0.33	0.24	80	80	−1.41	0.24	0.16	80	80	−0.35	−0.25	0.68	80	79
Inflation (p.p.)	5.93	4.04	0.02	80	80	4.43	3.69	0.28	80	79	3.45	3.30	0.81	80	78
Change in inflation	−0.01	−0.00	0.60	80	80	−0.02	−0.00	0.00	80	79	−0.01	−0.00	0.06	80	78
Change in industrial production (%)	0.01	−0.00	0.12	80	80	0.01	−0.00	0.09	80	80	0.03	0.01	0.20	80	79
Current account balance (% GDP)	−0.41	0.41	0.29	61	59	0.12	0.71	0.42	61	58	0.22	0.91	0.35	61	58
Change in current account balance (% GDP)	0.88	−0.18	0.00	61	58	0.52	0.30	0.40	61	58	0.19	0.21	0.94	61	57
Crisis	0.48	0.56	0.41	70	56	0.36	0.53	0.06	70	56	0.43	0.34	0.32	62	56
Banking crisis	0.18	0.24	0.33	80	80	0.19	0.28	0.19	80	80	0.18	0.18	0.97	80	79
Monetary crisis	0.06	0.06	1.00	80	80	0.04	0.11	0.07	80	80	0.09	0.05	0.34	80	79

Table 7 (continued)

	T$_{-1}$					T					T$_{+1}$				
	Δs < M	Δs > M	p-val	N$_{<M}$	N$_{>M}$	Δs < M	Δs > M	p-val	N$_{<M}$	N$_{>M}$	Δs < M	Δs > M	p-val	N$_{<M}$	N$_{>M}$
Stock market crisis	**0.19**	**0.38**	**0.01**	**80**	**80**	0.15	0.21	0.31	80	80	0.14	0.09	0.31	80	79
Inflationary crisis	0.01	0.01	1.00	80	80	0.00	0.01	0.32	80	80	0.01	0.00	0.32	80	79
VIX	**18.44**	**23.04**	**0.00**	**62**	**42**	**17.30**	**23.21**	**0.00**	62	45	**17.20**	**21.70**	**0.00**	**62**	**46**
Change of VIX	**−0.15**	**0.18**	**0.00**	**60**	**32**	−0.04	0.05	0.13	62	42	−0.02	−0.03	0.71	62	44
European Union Membership	**0.56**	**0.75**	**0.01**	**80**	**80**	**0.58**	**0.75**	**0.02**	**80**	**80**	**0.58**	**0.75**	**0.02**	**80**	**79**

The analyzed determinants are divided into groups. The columns Δs < M and Δs > M contain the average level of variable considered for the periods in which the risk premium change was lower and higher than median change respectively. All significant differences of 10% are bolded. The columns N$_{<M}$ and N$_{>M}$ indicates the number of observations qualified for comparison. Their different values result from gaps in data. Cyclically adjusted variables are marked with "c.a."

Table 8 Determinants of changes in the risk premium following fiscal tensions. Robustness check: results for fiscal adjustments instead of fiscal tensions

	T_{-1}					T					T_{+1}				
	$\Delta s<M$	$\Delta s>M$	p-val	$N_{<M}$	$N_{>M}$	$\Delta s<M$	$\Delta s>M$	p-val	$N_{<M}$	$N_{>M}$	$\Delta s<M$	$\Delta s>M$	p-val	$N_{<M}$	$N_{>M}$
Fiscal consolidation	0.81	0.58	0.00	97	97	1.00	1.00		97	97	0.61	0.77	0.01	97	97
Start of consolidation	0.25	0.20	0.39	97	97	0.19	0.42	0.00	97	97	0.00	0.00		97	97
Consolidation (% GDP)	1.06	0.65	0.00	97	97	1.02	1.06	0.75	97	97	0.58	0.84	0.05	97	97
Size of expenditure cuts (% GDP)	0.63	0.38	0.01	97	97	0.70	0.55	0.13	97	97	0.41	0.52	0.22	97	97
Size of tax hikes (% GDP)	0.44	0.27	0.05	97	97	0.31	0.51	0.03	97	97	0.18	0.32	0.06	97	97
Share of expenditure cuts in total consolidation (%)	0.52	0.58	0.27	56	79	0.56	0.51	0.30	97	97	0.62	0.56	0.37	75	59
Budget revenue (% GDP)	43.76	41.17	0.03	97	97	44.11	41.98	0.07	97	97	44.35	42.18	0.06	97	97
Change in government revenue (% GDP)	0.57	0.43	0.73	97	97	0.35	0.80	0.14	97	97	0.24	0.20	0.86	97	97
Budget revenue c.a. (% GDP)	41.98	40.16	0.09	94	92	42.42	40.76	0.11	93	95	42.74	40.96	0.08	95	95
Change in budget revenue c.a. (% GDP)	0.43	0.17	0.48	92	90	0.28	0.62	0.18	93	92	0.32	0.11	0.32	93	95
VAT revenue (% GDP)	5.23	4.84	0.34	97	97	5.32	4.91	0.32	97	97	5.37	5.00	0.35	97	97
Change in VAT (% GDP)	0.03	0.04	0.90	97	97	0.09	0.07	0.81	97	97	0.06	0.09	0.60	97	97
Revenue from VAT c.a. (% GDP)	5.23	4.90	0.44	94	92	5.38	4.97	0.35	93	95	5.41	5.11	0.47	95	95
Change in VAT c.a. (% GDP)	0.03	−0.08	0.30	92	90	0.07	0.08	0.88	93	92	0.03	0.08	0.40	93	95
Taxation of goods and services (% GDP)	10.27	9.82	0.26	97	97	10.36	9.89	0.23	97	97	10.35	9.96	0.31	97	97
Change in the tax of goods and services (% GDP)	0.00	0.05	0.36	97	97	0.09	0.06	0.65	97	97	0.00	0.07	0.20	97	97
Taxation of goods and services c.a. (% GDP)	9.98	9.69	0.47	94	92	10.15	9.70	0.27	93	95	10.14	9.81	0.40	95	95
Change in the tax of goods and services c.a. (% GDP)	−0.01	−0.08	0.48	92	90	0.04	0.06	0.77	93	92	−0.01	0.03	0.45	93	95
Income tax revenues (% GDP)	10.58	9.67	0.09	96	97	10.71	9.77	0.08	96	97	10.80	9.88	0.09	96	97
Change in income tax (% GDP)	0.08	0.06	0.80	96	97	0.13	0.10	0.62	96	97	0.08	0.12	0.69	96	97
Income tax revenue c.a. (% GDP)	10.44	9.71	0.18	93	92	10.72	9.77	0.08	92	95	10.82	9.91	0.10	94	95
Change in income tax c.a. (% GDP)	0.07	−0.01	0.39	91	90	0.12	0.06	0.38	92	92	0.10	0.08	0.87	92	95
CIT (% GDP)	2.42	2.35	0.51	96	97	2.46	2.48	0.89	96	97	2.51	2.57	0.63	96	95
Change in CIT (% GDP)	0.08	0.03	0.34	96	97	0.04	0.13	0.08	96	97	0.05	0.09	0.44	96	97

Table 8 (continued)

	T_−1					T					T_+1				
	Δs<M	Δs>M	p-val	N<M	N_gt:M	Δs<M	Δs>M	p-val	N<M	N>M	Δs<M	Δs>M	p-val	N<M	N>M
CIT c.a. (% GDP)	2.66	2.65	0.96	93	92	2.67	2.78	0.39	92	95	2.70	2.84	0.34	94	95
Change to CIT c.a. (% GDP)	0.09	0.04	0.37	91	90	0.04	0.12	0.08	92	92	0.04	0.07	0.52	92	95
Capital gains tax (% GDP)	0.09	0.12	0.32	81	88	0.08	0.11	0.34	81	88	0.10	0.12	0.48	81	88
Change in capital gains tax (% GDP)	0.00	−0.01	0.39	81	88	0.00	−0.01	0.82	81	88	0.01	0.01	0.69	81	88
Capital gains tax c.a. (% GDP)	0.12	0.14	0.71	78	83	0.12	0.14	0.69	77	86	0.13	0.15	0.59	79	86
Change in capital gains tax c.a. (% GDP)	0.00	−0.01	0.56	76	81	0.00	0.00	0.89	77	83	0.01	0.01	0.65	77	86
Tax on property (% GDP)	2.09	2.06	0.82	97	97	2.15	2.06	0.53	97	97	2.18	2.09	0.53	97	97
Change in tax on property (% GDP)	**0.06**	**−0.02**	**0.02**	**97**	**97**	**0.05**	**0.00**	**0.03**	**97**	**97**	**0.03**	**0.03**	**0.91**	**97**	**97**
Tax on property c.a. (% GDP)	2.12	2.07	0.67	94	92	2.16	2.09	0.57	93	95	2.19	2.11	0.52	95	95
Change in tax on property c.a. (% GDP)	0.07	0.02	0.27	92	90	**0.05**	**0.01**	**0.09**	**93**	**92**	0.03	0.04	0.80	93	95
Financial transaction tax (% GDP)	0.45	0.48	0.62	97	97	0.47	0.47	0.90	97	97	0.48	0.47	0.87	97	97
Change of the financial transaction tax (% GDP)	0.00	−0.02	0.27	97	97	**0.01**	**0.00**	**0.06**	**97**	**97**	0.02	0.00	0.13	97	97
Financial transaction tax c.a. (% GDP)	0.57	0.56	0.87	94	92	0.59	0.58	0.87	93	95	0.60	0.59	0.90	95	95
Change in tax on financial transactions c.a. (% GDP)	0.01	0.00	0.44	92	90	0.02	0.02	0.93	93	92	0.01	0.01	0.94	93	95
Social contributions (% GDP)	10.07	9.73	0.63	97	97	10.15	9.77	0.60	97	97	10.12	9.86	0.72	97	97
Change in social contributions (% GDP)	**0.13**	**−0.01**	**0.02**	**97**	**97**	0.08	0.05	0.58	97	97	**−0.03**	**0.09**	**0.06**	**97**	**97**
Social contributions c.a. (% GDP)	9.67	9.42	0.71	94	92	9.58	9.48	0.89	93	95	9.54	9.52	0.97	95	95
Change in social contributions c.a. (% GDP)	**0.04**	**−0.09**	**0.09**	**92**	**90**	0.03	0.00	0.72	93	92	−0.03	0.06	0.15	93	95
Government expenditure (% GDP)	48.95	47.02	0.12	97	97	48.52	47.33	0.34	97	97	48.17	46.85	0.27	97	97
Change in government expenditure (% GDP)	**−0.13**	**0.95**	**0.05**	**97**	**97**	−0.43	0.31	0.13	97	97	−0.35	−0.48	0.75	97	97
Government expenditure c.a. (% GDP)	45.05	44.26	0.54	94	92	44.86	44.22	0.60	93	95	44.68	43.89	0.51	95	95
Change in government expenditure c.a. (% GDP)	**−0.45**	**0.52**	**0.06**	**92**	**90**	−0.56	0.04	0.17	93	92	−0.18	−0.58	0.34	93	95
Primary expenditure (% GDP)	43.78	42.74	0.37	97	97	43.34	42.96	0.74	97	97	43.11	42.41	0.53	97	97
Change in primary expenditure (% GDP)	**−0.28**	**0.90**	**0.03**	**97**	**97**	−0.44	0.22	0.17	97	97	−0.23	−0.55	0.41	97	97

Table 8 (continued)

	T_{-1}					T					T_{+1}				
	Δs < M	Δs > M	p-val	N<M	N_{gt:M}	Δs < M	Δs > M	p-val	N<M	N>M	Δs < M	Δs > M	p-val	N<M	N>M
Primary expenditure c.a. (% GDP)	41.18	40.99	0.87	94	92	40.93	40.97	0.97	93	95	40.86	40.49	0.73	95	95
Change in Primary expenditure c.a. (% GDP)	**−0.44**	**0.54**	**0.05**	**92**	**90**	−0.50	0.03	0.21	93	92	−0.06	−0.63	0.16	93	95
Government consumption (% GDP)	20.95	20.55	0.33	81	84	20.83	20.37	0.25	81	84	20.69	20.20	0.22	81	84
Change in government consumption (% GDP)	**−0.13**	**0.08**	**0.05**	**81**	**84**	−0.12	−0.18	0.48	81	84	−0.15	−0.17	0.82	81	84
Government investment (% GDP)	0.03	0.04	0.19	49	49	0.03	0.03	0.49	57	49	0.03	0.03	0.97	62	51
Change in government investment (% GDP)	0.00	0.00	0.63	47	43	**0.00**	**0.00**	**0.05**	**49**	**49**	**0.00**	**0.00**	**0.06**	**57**	**49**
Public sector wages (% GDP)	12.58	12.22	0.28	86	83	12.42	11.92	0.16	85	81	12.26	11.75	0.15	81	81
Change in public sector wages (% GDP)	**−0.16**	**0.01**	**0.04**	**86**	**83**	−0.17	−0.32	0.28	85	81	−0.16	−0.33	0.21	81	81
Transfers (% government expenditure)	58.63	58.84	0.94	67	59	58.62	58.81	0.94	69	60	59.42	58.77	0.80	69	65
Change in transfers (% government expenditure)	2.03	0.41	0.28	65	53	0.23	0.42	0.90	67	58	1.20	−0.20	0.14	68	60
Transfers c.a. (% government expenditure)	57.81	57.89	0.98	67	59	57.58	58.02	0.86	69	60	58.77	57.89	0.71	69	65
Change of c.a. transfers (% government expenditure)	1.90	0.41	0.32	65	53	0.18	0.42	0.87	67	58	1.19	−0.13	0.16	68	60
Social expenditure (% GDP)	21.71	21.33	0.64	96	96	21.88	21.42	0.56	96	96	21.85	21.59	0.73	96	96
Change in social expenditure (% GDP)	0.15	0.38	0.15	96	96	0.17	0.09	0.56	96	96	−0.02	0.18	0.14	96	96
Social expenditure c.a. (% GDP)	20.21	20.11	0.90	93	91	20.27	20.17	0.90	92	94	20.30	20.30	0.99	94	94
Change in social expenditure c.a. (% GDP)	0.02	0.06	0.85	91	89	0.07	0.01	0.57	92	91	0.03	0.15	0.34	92	94
Debt (% GDP)	64.10	62.91	0.80	97	97	66.50	66.31	0.97	97	97	67.82	68.63	0.87	97	97
Change in debt (% GDP)	3.17	3.66	0.47	97	97	2.40	3.39	0.16	97	97	1.32	2.33	0.12	97	97
Change in debt (%)	0.07	0.08	0.51	97	97	0.04	0.08	0.11	97	96	0.02	0.04	0.41	97	97
Fiscal rules	−0.24	−0.18	0.58	56	50	−0.11	−0.10	0.96	57	51	0.13	0.01	0.48	58	52
Change of fiscal rules	0.06	0.03	0.40	54	49	0.14	0.08	0.42	56	50	0.26	0.12	0.21	57	51
Primary balance (% GDP)	**−0.01**	**−1.55**	**0.00**	**97**	**97**	**0.79**	**−0.97**	**0.00**	**97**	**97**	**1.26**	**−0.22**	**0.01**	**97**	**97**
Change in primary balance (% GDP)	**0.85**	**−0.45**	**0.00**	**97**	**97**	0.80	0.58	0.53	97	97	0.47	0.75	0.41	97	97

Table 8 (continued)

	T₋₁					T					T₊₁				
	$\Delta s<M$	$\Delta s>M$	p-val	$N_{<M}$	$N_{gt:M}$	$\Delta s<M$	$\Delta s>M$	p-val	$N_{<M}$	$N_{>M}$	$\Delta s<M$	$\Delta s>M$	p-val	$N_{<M}$	$N_{>M}$
Primary balance c.a. (% GDP)	**0.79**	**−0.85**	**0.00**	94	92	**1.49**	**−0.22**	**0.00**	93	95	**1.87**	**0.46**	**0.01**	95	**95**
Change in primary balance c.a. (% GDP)	0.88	−0.35	**0.00**	92	**90**	0.78	0.59	0.56	93	92	0.38	0.74	0.30	93	95
Cost of debt service (% GDP)	5.18	4.28	**0.02**	97	**97**	5.18	4.37	0.03	97	97	**5.06**	**4.43**	**0.10**	**97**	**97**
Change in the cost of debt service (% GDP)	0.15	0.05	0.17	97	97	0.00	0.08	0.26	97	97	**−0.13**	**0.07**	**0.00**	**97**	**97**
Monetary policy															
Short-term rate (p.p.)	**6.94**	**5.73**	**0.06**	93	**91**	6.01	5.92	0.90	94	92	5.59	5.64	0.92	95	94
Change in short-term interest rate (%)	−0.44	−0.56	0.65	92	89	**−0.96**	**0.12**	**0.00**	93	**91**	−0.55	−0.31	0.27	94	92
Change in short-term interest rate (p.p.)	−0.03	−0.06	0.52	92	89	**−0.16**	**0.07**	**0.00**	93	**91**	**−0.11**	**0.00**	**0.04**	**94**	**92**
Change in M3 (%)	0.07	0.06	0.25	34	34	**0.08**	**0.06**	**0.10**	34	**34**	0.07	0.06	0.82	34	34
Central bank independence	0.51	0.54	0.23	97	97	0.51	0.55	0.16	96	91	0.51	0.55	0.25	92	85
Change of central bank independence	0.01	0.01	0.56	97	97	0.02	0.00	0.12	96	91	0.02	0.01	0.34	92	85
Exchange rate	0.00	−0.01	0.78	97	97	0.00	−0.01	0.21	97	97	0.00	0.00	0.44	97	97
Fixed regime	0.16	0.14	0.69	97	97	0.22	0.10	0.03	97	97	0.21	0.12	0.12	97	97
Floating regime	**0.60**	**0.71**	**0.10**	**97**	**97**	0.57	0.74	0.01	97	97	**0.57**	**0.69**	**0.08**	**97**	**97**
Intermediate regime	0.21	0.12	0.12	97	97	0.19	0.13	0.33	97	97	0.20	0.16	0.58	97	97
EMU	**0.20**	**0.31**	**0.07**	**97**	**97**	**0.21**	**0.32**	**0.07**	**97**	**97**	0.23	0.32	0.15	97	97
Labour market															
Unemployment (%)	9.97	9.08	0.15	94	92	10.16	9.38	0.23	93	95	10.03	9.60	0.52	95	95
Change in unemployment (p.p.)	0.31	0.36	0.82	92	90	0.13	0.31	0.36	93	92	**−0.12**	**0.14**	**0.10**	**93**	**95**
Change in unit labour cost (%)	0.01	0.03	0.31	95	95	0.02	0.01	0.65	94	95	0.01	0.03	0.32	93	95
Labour protection	2.04	2.20	0.33	83	77	2.00	2.16	0.31	84	83	2.00	2.14	0.38	85	82
Change in labour protection	−0.01	0.00	0.37	82	72	0.00	−0.01	0.50	83	77	0.00	−0.01	0.52	83	77
Unions density	36.10	33.01	0.27	96	97	35.91	32.62	0.25	96	96	35.49	32.44	0.28	95	95

Table 8 (continued)

	T_{-1}					T					T_{+1}				
	$\Delta s<M$	$\Delta s>M$	p-val	$N_{<M}$	$N_{gt:M}$	$\Delta s<M$	$\Delta s>M$	p-val	$N_{<M}$	$N_{>M}$	$\Delta s<M$	$\Delta s>M$	p-val	$N_{<M}$	$N_{>M}$
Changing in unions density	−0.01	−0.01	0.72	96	97	−0.01	−0.01	0.50	96	96	−0.01	−0.01	0.85	95	94
Retirement age	61.88	62.09	0.60	83	86	61.79	62.05	0.51	83	86	61.71	62.01	0.43	84	86
Change in retirement age	−0.11	−0.12	0.85	82	86	−0.09	−0.04	0.47	83	86	−0.08	−0.01	0.32	83	86
Markets and regulation															
Degree of integration with global markets	75.23	74.25	0.51	96	94	76.08	75.11	0.50	97	94	77.01	75.77	0.37	97	94
Change in degree of integration with global markets	0.95	**0.60**	**0.10**	**96**	**93**	0.85	0.89	0.83	96	94	0.93	0.66	0.20	97	94
Competitiveness of the economy	95.14	96.51	0.42	97	97	94.82	94.40	0.78	97	97	94.51	94.17	0.82	97	97
Change in competitiveness of the economy	−0.01	−0.01	0.47	97	97	**0.00**	**−0.02**	**0.03**	**97**	**97**	0.00	0.00	0.89	97	97
Capitalization of government bond market (% GDP)	50.25	51.80	0.76	70	57	51.56	54.38	0.60	67	55	52.13	55.36	0.57	62	56
Change in the capitalisation of the government bond market (%)	1.99	2.97	0.22	68	54	1.53	2.69	0.15	66	51	1.44	1.91	0.56	60	54
Entry barriers	2.27	2.32	0.68	74	83	2.33	2.41	0.52	70	83	2.41	2.42	0.98	67	82
Change in entry barriers	0.06	0.09	0.46	74	83	0.06	0.13	0.21	70	83	**0.10**	**0.03**	**0.10**	**67**	**82**
Degree of privatisation	2.14	2.15	0.98	74	83	2.19	2.24	0.73	70	83	2.24	2.27	0.87	67	82
Change in the degree of privatisation	0.02	0.07	0.34	74	83	0.05	0.07	0.64	70	83	0.06	0.01	0.16	67	82
Degree of financial market reform	0.81	0.81	0.97	74	83	0.83	0.82	0.89	70	83	0.85	0.84	0.72	67	82
Change in the degree of financial market reform	0.02	0.03	0.19	74	83	0.02	0.02	0.76	70	83	0.02	0.01	0.37	67	82
Quality of government	0.77	0.75	0.64	97	97	0.81	0.77	0.40	97	97	0.84	0.78	0.13	97	97
Change in the quality of government	**0.07**	**0.01**	**0.06**	**97**	**97**	0.04	0.02	0.59	97	97	0.03	0.01	0.36	97	97
Openess of financial markets	1.84	1.92	0.53	97	97	1.88	2.04	0.20	97	97	1.93	2.06	0.27	97	97
Change in the openness of financial markets	**0.11**	**0.04**	**0.10**	**97**	**97**	0.04	0.11	0.12	97	97	0.05	0.02	0.30	97	97
Macroeconomic environment															
GDP growth (%)	0.05	0.05	0.55	97	97	0.05	0.05	0.45	97	97	0.05	0.05	0.64	97	97

Table 8 (continued)

	T_{-1}					T					T_{+1}				
	Δs<M	Δs>M	p-val	N<M	N>M	Δs<M	Δs>M	p-val	N<M	N>M	Δs<M	Δs>M	p-val	N<M	N>M
Output gap (% GDP)	−1.12	−1.23	0.78	82	78	−1.35	−1.16	0.67	83	83	−1.35	−1.20	0.74	84	87
Change in the output gap (p.p.)	−0.33	−0.37	0.91	81	74	−0.29	0.05	0.18	82	78	0.05	−0.05	0.63	83	83
Exports (% GDP)	33.96	30.69	0.24	97	97	34.54	32.25	0.42	97	97	35.06	33.41	0.57	97	97
Change in exports (% GDP)	1.08	0.77	0.36	97	97	**0.58**	**1.55**	**0.00**	**97**	**97**	**0.52**	**1.16**	**0.02**	**97**	**97**
Savings (% GDP)	21.57	20.78	0.21	83	85	21.62	20.94	0.27	83	85	21.89	21.02	0.16	83	86
Change in savings (% GDP)	**0.16**	**−0.29**	**0.07**	**83**	**84**	0.06	0.16	0.64	83	85	0.23	0.08	0.50	83	85
Investment (% GDP)	**21.27**	**22.31**	**0.01**	**97**	**97**	**21.06**	**21.95**	**0.02**	**97**	**97**	21.09	21.65	0.13	97	97
Change in investment (% GDP)	−0.34	−0.48	0.42	97	97	−0.21	−0.36	0.34	97	97	**0.03**	**−0.31**	**0.02**	**97**	**97**
Consumption (% GDP)	76.86	77.14	0.62	97	97	76.71	76.97	0.66	97	97	76.29	76.95	0.33	97	97
Change in consumption (% GDP)	**−0.01**	**−0.32**	**0.03**	**97**	**97**	−0.15	−0.18	0.87	97	97	**−0.42**	**−0.01**	**0.05**	**97**	**97**
Inflation (p.p.)	3.86	3.58	0.59	97	97	3.12	3.73	0.21	97	97	**2.49**	**3.64**	**0.01**	**97**	**97**
Change in inflation	0.00	0.00	1.00	97	97	**−0.01**	**0.00**	**0.00**	**97**	**97**	**−0.01**	**0.00**	**0.01**	**97**	**97**
Change in industrial production (%)	0.02	0.02	0.54	97	97	0.02	0.02	0.22	97	97	0.02	0.02	0.40	97	97
Current account balance (% GDP)	**−0.03**	**−1.61**	**0.00**	**83**	**85**	**0.28**	**−1.13**	**0.01**	**83**	**85**	**0.29**	**−0.59**	**0.10**	**83**	**86**
Change in current account balance (% GDP)	0.50	0.22	0.18	83	84	0.31	0.48	0.44	83	85	**0.08**	**0.54**	**0.02**	**83**	**85**
Crisis	0.34	0.42	0.26	92	85	0.30	0.38	0.28	85	84	0.38	0.29	0.23	79	84
Banking crisis	0.18	0.25	0.22	97	97	0.12	0.15	0.54	97	97	0.11	0.10	0.82	97	97
Currency crisis	0.08	0.08	1.00	97	97	0.05	0.09	0.27	97	97	**0.09**	**0.03**	**0.07**	**97**	**97**
Stock market crisis	0.13	0.13	1.00	97	97	0.12	0.11	0.83	97	97	0.15	0.12	0.54	97	97
Inflation crisis	0.00	0.02	0.16	97	97	0.00	0.01	0.32	97	97	0.00	0.01	0.32	97	97
VIX	18.89	19.01	0.90	72	64	18.92	17.94	0.25	73	67	19.41	18.51	0.31	74	69

Table 8 (continued)

	T_{-1}					T					T_{+1}				
	Δs<M	Δs>M	p-val	N$_{<M}$	N$_{gr:M}$	Δs<M	Δs>M	p-val	N$_{<M}$	N$_{>M}$	Δs<M	Δs>M	p-val	N$_{<M}$	N$_{>M}$
Change of VIX	0.00	−0.02	0.56	70	61	0.03	−0.03	0.14	72	64	0.03	0.07	0.41	73	67
European Union Membership	0.74	0.66	0.21	97	97	0.74	0.68	0.34	97	97	0.75	0.69	0.34	97	97

The analyzed determinants are divided into groups. Years of fiscal adjustments are as defined by Alesina et al. (2017) and Devries et al. (2011.) The columns Δs<M and Δs>M contain the average level of variable considered for the periods in which the risk premium change was lower and higher than median change respectively. All significant differences of 10% are bolded. The columns N$_{<M}$ and N$_{>M}$ indicate the number of observations qualified for comparison. Their different values result from gaps in data. Cyclically adjusted variables are marked with "c.a."

Table 9 Determinants of changes in the risk premium following fiscal tensions. Robustness check: results for initial conditions

	Split by median					Split by Q_1				
	$\Delta s < M$	$\Delta s > M$	p-val	$N_{<M}$	$N_{>M}$	$\Delta s < Q_1$	$\Delta s > Q_1$	p-val	$N_{<Q_1}$	$N_{>Q_1}$
Fiscal consolidation	0.43	0.38	0.36	93	93	0.37	0.42	0.46	47	139
Consolidation (% GDP)	2.15	1.80	0.35	93	93	1.94	1.99	0.90	47	139
Size of expenditure cuts (% GDP)	1.45	1.07	0.20	93	93	1.08	1.32	0.48	47	139
Size of tax hikes (% GDP)	0.70	0.73	0.88	93	93	0.85	0.67	0.32	47	139
Share of expenditure cuts in total consolidation (%)	0.69	0.54	0.05	55	54	0.64	0.61	0.78	24	85
Budget revenue (% GDP)	40.20	44.06	0.00	93	93	38.75	43.27	0.00	47	139
Budget revenue c.a. (% GDP)	39.79	44.09	0.00	82	84	37.75	43.35	0.00	41	125
VAT revenue (% GDP)	4.43	5.57	0.02	93	93	4.17	5.28	0.04	47	139
VAT revenue c.a. (% GDP)	4.72	5.71	0.04	82	84	4.65	5.41	0.18	41	125
Taxation of goods and services (% GDP)	9.82	10.52	0.08	93	93	10.01	10.22	0.65	47	139
Taxation of goods and services c.a. (% GDP)	9.45	10.29	0.03	82	84	9.59	9.97	0.40	41	125
Income tax revenues (% GDP)	10.92	10.93	0.99	91	92	10.99	10.91	0.91	45	138
Income tax revenue c.a. (% GDP)	10.23	10.56	0.60	80	83	10.08	10.49	0.58	39	124
CIT (% GDP)	2.61	2.97	0.12	91	92	2.25	2.96	0.01	45	138
CIT c.a. (% GDP)	2.91	3.13	0.48	80	83	2.60	3.16	0.13	39	124
Capital gains tax (% GDP)	0.10	0.06	0.24	85	85	0.12	0.07	0.29	40	130
Capital gains tax c.a. (% GDP)	0.13	0.08	0.17	74	76	0.18	0.08	0.05	34	116
Tax on property (% GDP)	1.95	1.80	0.20	93	93	1.96	1.85	0.43	47	139
Tax on property c.a. (% GDP)	1.97	1.76	0.10	82	84	2.01	1.81	0.18	41	125
Financial transaction tax (% GDP)	0.48	0.52	0.37	93	93	0.49	0.50	0.84	47	139
Financial transaction tax c.a. (% GDP)	0.53	0.50	0.62	82	84	0.63	0.47	0.02	41	125
Social contributions (% GDP)	8.09	9.72	0.04	93	93	7.44	9.40	0.03	47	139
Social contributions c.a. (% GDP)	8.42	10.14	0.03	93	93	7.78	9.79	0.03	41	125
Government expenditure (% GDP)	44.36	45.72	0.21	93	93	43.89	45.43	0.22	47	139
Government expenditure c.a. (% GDP)	42.89	45.10	0.06	82	84	41.09	44.96	0.00	41	125
Primary expenditure (% GDP)	40.31	42.18	0.07	93	93	39.77	41.74	0.10	47	139

Table 9 (continued)

	Split by median					Split by Q$_1$				
	Δs < M	Δs > M	p-val	N$_{<M}$	N$_{>M}$	Δs < Q$_1$	Δs > Q$_1$	p-val	N$_{<Q1}$	N$_{>Q1}$
Primary expenditure c.a. (% GDP)	**39.49**	**42.15**	**0.02**	**82**	**84**	**37.80**	**41.83**	**0.00**	**41**	**125**
Government consumption (% GDP)	19.90	20.20	0.45	81	87	19.79	20.14	0.46	40	128
Government investment (% GDP)	0.03	0.04	0.58	34	54	0.03	0.04	0.30	22	66
Public sector wages (% GDP)	12.09	11.92	0.63	83	85	12.27	11.92	0.39	41	127
Transfers (% government expenditure)	54.26	54.54	0.94	39	66	49.38	55.49	0.21	18	87
Transfers c.a. (% government expenditure)	**54.64**	**59.86**	**0.07**	**42**	**67**	**50.29**	**59.87**	**0.01**	**23**	**86**
Social expenditure (% GDP)	**17.17**	**20.08**	**0.01**	**93**	**93**	18.33	18.72	0.77	47	139
Social expenditure c.a. (% GDP)	**18.74**	**20.80**	**0.02**	**82**	**84**	**18.28**	**20.27**	**0.04**	**41**	**125**
Debt (% GDP)	53.87	51.61	0.66	93	93	59.10	50.59	0.14	47	139
Fiscal rules	**−0.24**	**0.03**	**0.07**	**34**	**58**	−0.20	−0.03	0.34	20	72
Primary balance (% GDP)	**−0.11**	**1.88**	**0.00**	**93**	**93**	**−1.02**	**1.53**	**0.00**	**47**	**139**
Primary balance c.a. (% GDP)	**0.18**	**1.91**	**0.02**	**82**	**84**	**−0.20**	**1.47**	**0.06**	**41**	**125**
Cost of debt service (% GDP)	**4.05**	**3.55**	**0.10**	**93**	**93**	4.12	3.69	0.22	47	139
Monetary policy										
Short-term rate (p.p.)	**9.33**	**7.51**	**0.02**	**80**	**86**	**9.60**	**7.99**	**0.09**	**41**	**125**
Central bank independence	**0.46**	**0.56**	**0.00**	**93**	**93**	0.46	0.52	0.11	47	139
Exchange rate										
Fixed regime	0.28	0.26	0.74	93	93	0.23	0.28	0.54	47	139
Floating regime	0.54	0.59	0.46	93	93	0.55	0.57	0.86	47	139
Intermediate regime	**0.22**	**0.32**	**0.10**	**93**	**93**	**0.15**	**0.31**	**0.03**	**47**	**139**
EMU	**0.17**	**0.82**	**0.10**	**93**	**93**	0.26	0.32	0.43	47	139
Labour market										
Unemployment (%)	**7.96**	**6.76**	**0.06**	**78**	**85**	**10.09**	**6.50**	**0.00**	**38**	**125**
Labour protection	**1.80**	**2.29**	**0.00**	**55**	**72**	**1.74**	**2.18**	**0.03**	**29**	**98**
Unions density	39.05	38.14	0.75	92	93	39.37	38.33	0.75	47	138

Table 9 (continued)

	Split by median					Split by Q₁				
	$\Delta s < M$	$\Delta s > M$	p-val	$N_{<M}$	$N_{>M}$	$\Delta s < Q_1$	$\Delta s > Q_1$	p-val	$N_{<Q1}$	$N_{>Q1}$
Retirement age	62.83	61.82	0.01	78	80	62.99	62.07	0.05	42	116
Markets and regulation										
Degree of integration with global markets	70.16	75.64	0.00	86	86	69.01	74.37	0.01	47	125
Capitalization of government bond market (% GDP)	46.30	43.22	0.47	40	61	48.79	43.50	0.33	18	83
Entry barriers	1.84	2.05	0.19	75	60	1.86	1.96	0.58	35	100
Degree of privatisation	1.72	1.80	0.67	75	60	1.63	1.80	0.42	35	100
Degree of financial market reform	0.66	0.69	0.40	75	60	0.63	0.69	0.19	35	100
Quality of government	101.11	102.00	0.00	90	70	103.00	103.46	0.00	47	114
Openness of financial markets	1.46	1.75	0.09	93	93	1.44	1.66	0.25	47	139
Macroeconomic environment										
GDP growth (%)	0.09	0.08	0.39	93	93	0.09	0.08	0.19	47	139
Output gap (% GDP)	0.44	2.21	0.01	59	71	−1.28	2.14	0.00	28	102
Exports (% GDP)	30.59	35.03	0.10	93	93	30.27	33.67	0.28	47	139
Savings (% GDP)	21.59	24.71	0.00	68	74	20.28	24.25	0.00	37	105
Investment (% GDP)	23.92	23.96	0.94	93	93	23.62	24.05	0.50	47	139
Consumption (% GDP)	76.88	75.03	0.03	93	93	77.75	75.35	0.01	47	139
Inflation (p.p.)	7.44	4.91	0.00	93	93	9.00	5.22	0.00	47	139
Current account balance (% GDP)	−0.85	0.20	0.18	68	74	−1.47	0.11	0.08	37	105
Crisis	0.55	0.48	0.38	93	93	0.55	0.50	0.56	47	139
Banking crisis	0.23	0.05	0.00	93	93	0.21	0.12	0.10	47	139
Currency crisis	0.03	0.03	1.00	93	93	0.06	0.02	0.16	47	139
Stock market crisis	0.37	0.42	0.46	93	93	0.30	0.42	0.13	47	139
Inflation crisis	0.04	0.03	0.70	93	93	0.09	0.02	0.05	47	139
VIX	21.20	19.46	0.03	41	67	21.76	19.80	0.06	18	90

Table 9 (continued)

	Split by median					Split by Q_1				
	$\Delta s < M$	$\Delta s > M$	p-val	$N_{<M}$	$N_{>M}$	$\Delta s < Q_1$	$\Delta s > Q_1$	p-val	$N_{<Q1}$	$N_{>Q1}$
European Union Membership	**0.59**	**0.72**	**0.06**	93	93	**0.55**	**0.69**	**0.09**	47	139

The analyzed determinants are divided into groups. Initial conditions are defined as the last year of 'stress' periods. The columns $\Delta s < M$ and $\Delta s > M$ contain the average level of variable considered for the periods in which the risk premium change was lower and higher than median change respectively. The columns $\Delta s < Q_1$ and $\Delta s > Q_1$ contain the average level of variable for the periods in which the risk premium change was lower and higher than first quartile respectively. All significant differences of 10% are bolded. The columns $N_{<M}$, $N_{>M}$, $N_{<Q1}$ and $N_{>Q1}$ indicate the number of observations qualified for comparison, their different values result from gaps in data. Cyclically adjusted variables are marked with "c.a."

premium. However, for this effect to occur, the new rules had to be introduced and work, and not just be announced.

The measures leading to deeper falls in the risk premium were, in a way, forced by high costs of servicing sovereign debt. It was not so much the higher sovereign debt that contributed to those costs(because, as mentioned, it was similar in both cases) but rather the higher nominal interest rates. They may be associated with lower central bank independence and higher inflation that often preceded deeper falls in the risk premium.

The exchange rate regime was irrelevant for changes in the risk premium following fiscal tensions. Deeper falls in the risk premium occurred less frequently within the Euro area than outside it. This frequency difference was so large that it affected the assessment of the impact of EU membership. However, additional ANOVA analysis indicates that EU members from outside the Euro area were particularly successful in lowering risk premium following fiscal tensions. By contrast, EU members from the Euro area performed slightly worse than even non-EU members, though the difference is not statistically significant (see Fig. 1). This result may reflect heterogeneity of the Euro area, where credibility of core countries could weaken incentives of peripheries to run sustainable fiscal policy, as suggested, e.g. by Afonso et al. (2014) or Ciżkowicz et al. (2015).

Periods of deeper falls in the risk premium were marked by reforms that improved government quality, reduced employment protection (which was otherwise already lower, making the economy more flexible and therefore facilitating its rebound), reduced trade union density, privatised state-owned enterprises and liberalized financial markets. The very announcement of most of these reforms led to deeper falls in risk premium. The exception in this respect was the reduction in labour protection, which only helped with a one-year lag. This suggests that the impact of this reform was mainly through its effects on economic performance. Surprisingly enough, although a higher retirement age was of help, its changes were not, and the statistical significance of the relationship is weak.

A higher integration with global markets did not contribute to deeper falls in the risk premium, although this may reflect a lower financial integration in the 1980s when the falls were particularly large and frequent.

Deeper falls in the risk premium were preceded and accompanied by a more difficult domestic macroeconomic environment. This manifested itself in a higher unemployment rate and its sharper increase in the run-up to the fall in the risk premium, a more negative output gap and a lower investment rate. At the same time, the tougher macroeconomic conditions were conducive to an improvement in the current account balance, which helped to reduce the risk premium. In contrast, they were mitigated by less frequent crises, including in particular the stock market crashes in the run-up to the fall in the risk premium.

Deeper falls in the risk premium improved the domestic macroeconomic environment. They led to a fall in unemployment, limited a decrease in investment rate and increased industrial production.

Lowering the risk premium was more difficult with a higher risk aversion in global markets (which, by the way, correlates with the stock market crashes

mentioned above). A moderation of global market volatility facilitated deeper falls in the risk premium.

Most of the results are robust to changes in definitions and other checks described in Section three. Those checks reveal some additional regularities.

If we tighten the definition of deeper falls in the risk premium, then as shown in Table 5 government revenue and expenditure at which they occurred decline as compared to the baseline results. Above all, however, the size of fiscal adjustments that preceded them increases. Both cuts in government expenditure during adjustments and tax increases become larger, but the latter increase more relative to the baseline results. Eventually, they outweigh the cuts in public expenditure. However, if not confined to periods of fiscal adjustment, the deeper falls in the risk premium differed from their remaining changes only in periods of public expenditure cuts, and no longer in periods of tax increases. The role of tightening fiscal rules grows and begins to have a signalling effect. Membership in the Euro area (and, as a result, the EU) ceases to be an impediment to deeper falls in the risk premium. The domestic macroeconomic environment becomes even tougher than the baseline results indicate, with an even higher unemployment, a more negative output gap and a lower investment rate, which additionally drops strongly in periods preceding the deeper falls in the risk premium. More frequent banking crises further exacerbate macroeconomic conditions. In contrast, exports emerge as a factor that alleviates those conditions.

Table 6 reports the results with the outliers removed.[4] Their removal results in the disappearance of the statistical significance of cuts in government expenditure, both during periods of fiscal adjustment and beyond, as factors determining deeper falls in the risk premium. At the same time, signals that economic performance improves after deeper falls in the risk premium weaken relative to the baseline results. Mitigation of a drop in investments (which directly depend on the risk premium) is the only signal that remains significant. Taken together, these results suggest that if there were exceptionally strong cuts in government expenditure, the vast majority of them preceded deeper falls in the risk premium. At the same time, it was mainly after such cuts that economic performance improved.

Table 7 shows the results for the modified definition of periods of 'stress' and, consequently 'relaxation.' Most relationships and their statistical significance do not change. Tax increases as a driver for deeper falls in the risk premium weigh more than the baseline results indicate, but cuts in government expenditure still play a more important role. Low social security contributions (affecting labour costs) join the set of government revenue features that facilitate deeper falls in the risk premium. Surprisingly enough, however, the increase in CIT receipts becomes a measure that fosters such falls. Tightening fiscal rules gains a signalling effect, while financial market reforms lose any significance. After deeper falls in the risk

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[4] Removing outliers eliminates dummy variables, index variables with small number of possible values and those with strongly skewed distributions. These are fiscal consolidation, EMU and EU memberships, currency regimes, entry barriers, privatization, and competitiveness of the economy, labour protection and crises periods.

premium, drop in investments is no longer more mitigated than after its remaining changes, but the output gap still closes and unemployment falls.

Table 8 presents the results for fiscal adjustments instead of fiscal tensions. The results suggest that fiscal adjustments can lead to deeper falls in the risk premium in virtually all circumstances. The adjustments only need to be strong enough, which in practice is possible when they consist of both significant tax increases and large expenditure cuts. Once these conditions are met, fiscal adjustments lead to deeper falls in the risk premium, even if taxation is high from the outset, fiscal burden increases include social security contributions, initial fiscal imbalances are not large, few reforms are implemented (if any, entry barriers easing, improvement in government quality or increase in the openness of financial markets). Such falls then occur regardless of the degree of integration into global markets, global risk aversion and changes in global markets volatility. That said, they were still less frequent in the Euro area. The floating exchange rate did not foster them, but interest rate cuts were of help.

Finally, Table 9 reports results for initial conditions defined as the last year of 'stress' periods. It follows that neither fiscal adjustments prior to 'relaxation' periods, nor tax increases and expenditure cuts they consist of, are a factor differentiating subsequent changes in the risk premium. Apparently, only sustaining (or, on the contrary, abandoning), in a 'relaxation' period, the adjustments introduced to end the 'stress' period affect these changes. Low social security contributions in a stress period (that ease labour costs) foster the subsequent falls in the risk premium even more than low taxes on goods and services (which provide space for tax increases with no significant distortions). Besides, initial conditions preceding deeper falls in the risk premium included tough macroeconomic environment not only domestic, as suggested by the baseline results, but also international, which manifested itself in greater volatility in global markets. They also contained larger initial fiscal imbalances, as measured by a cyclically-adjusted primary balance, as well as weaker fiscal rules and lower government quality. However the significance of these last two features fades with the modified definition of the 'stress' periods (see the last column of the table).

Comparing the above results with those from studies on fiscal adjustments (summarized in Section two) leads to the following main conclusions.

For deeper falls in the risk premium, the size of the adjustment is more important than its composition. For sustainability of fiscal adjustment and reduction of its costs (in terms of aggregate demand), the opposite is true: size matters (see, e.g. Giavazzi and Pagano 1996), but composition matters more (see, e.g. Alesina et al. 1998; Alesina et al. 2018; Borys et al. 2014 or Tsibouris et al. 2006).

The risk premium can fall if taxes are raised, especially on goods and services; in certain circumstances also CIT increases foster its deeper falls. While there are quite a lot of studies pointing out that tax-based adjustment can be sustainable and of limited costs (see, e.g. Batini et al. 2012), especially when initial fiscal imbalances are large enough (see, e.g. Giavazzi et al. 2005), there are far fewer suggesting that CIT increases could have such effects (Holden and Midthjell 2013 is among those few).

Tough domestic macroeconomic conditions, which may increase the costs of fiscal adjustment (see, e.g. Auerbach and Gorodnichenko 2012; Gechert and

Rannenberg 2018; Heimberger 2017, or Müller 2014a, b), do not rule out deeper falls in the risk premium. In turn, such falls do not depend on the initial sovereign debt burden, which, if high or fast-growing, increases the chances of low fiscal adjustment costs (provided that the adjustment is of an appropriate size; see, e.g. Ardagna 2004; Bhattacharya 1999 or Ilzetzki et al. 2013). Apparently, it is easier to lower the risk premium than to reduce the fiscal adjustment costs.

The fiscal adjustment reduces the risk premium almost always as long as it is sustained during a 'relaxation' period. What makes the adjustment sustainable is usually leads to a deeper fall in the risk premium. In particular, cuts in government expenditure, including social spending, that foster sustainability of adjustment and reduce its costs (see, e.g. Alesina and Ardagana 1998 or 2013; Alesina and Perotti 1997; Bermperoglu et al. 2013, von Hagen et al. 2002), simultaneously help to lower the risk premium more deeply.

Deeper falls in the risk premium after fiscal adjustment are more frequent if the central bank cuts interest rates. It is not surprising given that the interest rates cuts help sustain fiscal adjustments and reduce their costs (see, e.g. Ahrend et al. 2006; Alesina and Ardagna 2013; Hellebrandt et al. 2012). However, there is no such option for the countries where the ELB binds (see, e.g. Eggertsson 2010).

Without fiscal adjustments, a deeper fall in the risk premium is possible mainly if the government introduces supply-side reforms or global risk aversion declines. Allowing for fiscal tensions does not eliminate the chance to benefit from the very announcement of reforms. If accompanied by a sufficiently large fiscal adjustment, even the tightening of fiscal rules, previously circumvented (or in any case ineffective in preventing fiscal tensions) can have a signaling effect. Lack of fiscal adjustments and reforms means relying on good luck alone. However, necessity of low level or decline in global risk aversion for deep falls in the risk premium when no fiscal adjustment is introduced may also suggest that there are time-breaks in relations between the risk premium and other factors.

Supply-side reforms, especially of the labour market (Alesina and Ardagna 2013), but also privatization (Alesina and Perotti 1997), increase in financial market openness (Giavazzi and Pagano 1990) and improvement of government quality (Monastiriotis 2014), which help sustain fiscal adjustment and reduce its costs, favour deeper drops in the risk premium. Economic policy does not have to look for compromise between the fall in the risk premium on the one hand, and the sustainability of fiscal adjustment and reduction of its costs on the other. A set of measures can be designed to support all these objectives. That said, recall that the ELB may cause some trade-offs. In any case, there is no broad consensus on the effects of supply-side reforms in such conditions (cf., e.g. Eggertsson 2010; DeLong and Summers 2012 and Mertens and Ravn 2014).

5 Conclusions

We study more than a hundred likely determinants of the risk premium in 22 OECD countries over 1978–2017 to show what works in lowering it and what doesn't following fiscal tensions. While most other studies on the risk premium don't put

particular stress on fiscal tensions, we focus on them because that's when success may bring particularly large gains while failure risks extreme pains.

We find that for deeper falls in the risk premium, size of fiscal adjustment matters more than its composition. However, what makes the adjustment sustainable is generally conducive to a deeper fall in the risk premium. There are no serious trade-offs between the fall in the risk premium on the one hand, and the sustainability of fiscal adjustment and reduction of its costs on the other. In particular, expenditure based fiscal adjustments, which other studies found to be more sustainable and less costly in terms of aggregate demand, are also more effective in lowering the risk premium following fiscal tensions than tax-based ones. Fiscal adjustments can outweigh the effects of global risk aversion. Otherwise its low level or decline is needed for deep falls in the risk premium, suggesting there are time-breaks in relations between the risk premium and other factors. Reforms, especially of the labour market, but also those that liberalize financial and product markets, as well as improve government quality are of help. The risk premium often responds to the very announcements of reforms, suggesting that fiscal tensions do not necessarily delay payoffs from reform efforts.

That said, it has to be stressed that the results obtained are only qualitative in nature. Moreover, they do not provide any conclusions as to mechanisms or causality.

Thus, our study is only a modest step towards bridging two strands of research, one dealing with the sustainability and costs of fiscal adjustments in terms of aggregate demand and the other devoted to the risk premium. We are aware of all weaknesses that simple comparisons of averages have, even if accompanied by various robustness checks. Hence, next steps should follow.

References

Afonso A, Arghyrou MG, Bagdatoglou G, Kontonikas A (2015) On the time-varying relationship between EMU sovereign spreads and their determinants. Econ Model 44(1):363–371

Afonso A, Arghyrou M, Kontonikas A (2014) Pricing sovereign bond risk in the EMU area: an empirical investigation. Int J Financ Econ 19(1):49–56

Afonso A, Jalles J (2014) Assessing fiscal espisodes. Econ Modell 37(C):255–270

Afonso A, Jalles J, Kazemi M (2020) The effects of macroeconomic, fiscal and monetary policy announcements on sovereign bond spreads. Int Rev Law Econ 63(September):105924

Afonso A, Kazemi M (2018) Euro area sovereign yields and the power of unconventional monetary policy. Finance a Úvěr-Czech J Econ Finance 68(2):100–119

Afonso A., Leal F. (2020), Fiscal episodes in the economic and monetary union: elasticities and non-keynesian effects, Int J Finance Econ, forthcoming

Afonso A, Martins L (2016) Monetary developments and expansionary fiscal consolidations: evidence from the EMU. Int J Financ Econ 21(3):247–265

Afonso A, Arghyrou M, Gadea M, Kontonikas A (2018) "Whatever it takes" to resolve the European sovereign debt crisis? Bond pricing regime switches and monetary policy effects. J Int Money Finance 86(C):1–30

Agca S, Igan DO (2013) Fiscal consolidation and the cost of credit; evidence from syndicated loans, IMF Working Papers, 13/36

Ahrend R., Catte P, Price R (2006) Interactions between monetary and fiscal policy: how monetary conditions affect fiscal consolidation, OECD economics department working papers, 521

Aizenman J., Hutchison M., Jinjarak Y. (2013), "What is the risk of European sovereign debt defaults? Fiscal space, CDS spreads and market pricing of risk," *Journal of International Money and Finance*, 34(C): 37–59

Alesina A. (2010), Fiscal adjustments: lessons from recent history, paper prepared for the ECOFIN meeting, Madrid

Alesina A, Ardagna S (1998) Tales of fiscal adjustment. Economic Policy 13(27):487–546

Alesina A, Ardagna S (2010) Large changes in fiscal policy: taxes versus spending. In: Brown JR (ed) Tax policy and the economy, vol 24. National Bureau of Economic Research, Cambridge, MA, pp 35–68

Alesina A, Ardagna S (2013) The design of fiscal adjustments. In: Brown JR (ed) Tax policy and the economy, vol 27. University of Chicago Press, Chicago, pp 19–67

Alesina A, Barbiero O, Favero C, Giavazzi F, Paradisi M (2017) The effects of fiscal consolidations: theory and evidence, NBER Working Papers, 23385

Alesina A, Favero CA, Giavazzi F (2018) What do we know about the effects of Austerity? Am Econ Assoc Papers Proc 108:524–530

Alesina A, Favero C, Giavazzi F (2012) The output effect of fiscal consolidations, NBER Working Papers, 18336

Alesina A, Perotti R (1997) Fiscal adjustments in OECD countries: composition and macroeconomic effects. IMF Staff Pap 44(2):210–248

Alesina A, Perotti R, Tavares J (1998) The political economy of fiscal adjustments. Brook Pap Econ Act 1:197–266

Ardagna S (2004) Fiscal stabilizations: when do they work and why. Eur Econ Rev 48(5):1047–1074

Ardagna S, Caselli F, Lane T (2007) Fiscal discipline and the cost of public debt service: some estimates for OECD countries. B.E. J Macroecon 7(1):1–35

Attinasi M-G., Checherita C., Nickel C. (2009). What explains the surge in euro area sovereign spreads during the financial crisis of 2007–09? ECB Working Papers, 1131

Auerbach AJ, Gorodnichenko Y (2012) Measuring the output responses to fiscal policy. Am Econ J Econ Pol 4(2):1–27

Baldacci E, McHugh J, Petrova I (2011) Measuring fiscal vulnerability and fiscal stress: a proposed set of indicators, IMF Working Papers, 11/94

Baldacci E, Petrova I, Belhocine N, Dobrescu G, Mazraani S (2011) Assessing fiscal stress, IMF Working Papers, 11/100

Barrell R, Holland D, Hurst I (2012) (2012), "Fiscal multipliers and prospects for consolidation." OECD J Econ Studies 1:71–102

Barrios S, Iversen P, Lewandowska M, Setzer R (2009), Determinants of intra-euro-area government bond spreads during the financial crisis, European Commission Economic Papers, 388

Batini N, Callegari G, Melina G (2012) Successful austerity in the United States, Europe and Japan, IMF Working Papers, 12/190

Beck T, Demirgüç-Kunt A, Levine R (1999) A new database on financial development and structure, World Bank Policy Research Working Paper, 2146

Belke A, Kronen D, Osowski T (2015) Planned fiscal consolidations and growth forecast errors – new panel evidence on fiscal multipliers. Rev Econ 66(1):47–70

Bermperoglu D, Pappa E, Vella E (2013) Spending-based austerity measures and their effects on output and unemployment, CEPR Discussion Papers, 9383

Bernanke BS (2013) Long-Term interest rates, In: Speech at the annual monetary/macroeconomics conference: the past and future of monetary policy, sponsored by Federal Reserve Bank of San Francisco, San Francisco, California

Bernoth K, Hagen von J, Schuknecht L (2006) Sovereign risk premiums in the european government bond market, Discussion Paper Series of SFB/TR 15 Govern Effic Econ Syst, 151

Bernoth K, von Hagen J, Schuknecht L (2012) Sovereign risk premiums in the European government bond market. J Int Money Financ 31(5):975–995

Bhattacharya R (1999) Private sector consumption behavior and non-Keynesian effects of fiscal policy, IMF Working Papers, 99/112

Bi H (2012) Sovereign default risk premia, fiscal limits, and fiscal policy. Eur Econ Rev 56(3):389–410

Blanchard OJ (1993) Suggestions for a new set of fiscal indicators (mimeo)

Blanchard OJ, Leigh D (2013) Growth forecast errors and fiscal multipliers. Am Econ Rev 103(3):117–120

Bocola L, Dovis A (2019) Self-fulfilling debt crises: a quantitative analysis. Am Econ Rev 109(12):4343–4377

Born B, Juessen F, Müller GJ (2013) Exchange rate regimes and fiscal multipliers. J Econ Dyn Control 37(2):446–465

Born B, Müller G, Pfeifer J (2015) Does austerity pay off?, CEPR Discussion Papers, 10425

Borys P, Ciżkowicz P, Rzońca A (2014) Panel data evidence on the effects of fiscal policy shocks in the EU new member states. Fisc Stud 35(2):189–224

Botta A, Tori D (2017) A critique to the expansionary austerity (part III): empirical counter facts beyond theoretical weaknesses, Greenwich Papers in Political Economy, 16387

Botta A, Tori D (2018) The theoretical and empirical fragilities of the expansionary austerity theory. J Post Keynesian Econ 41(3):364–398

Boussard J, Castro de F, Salto M (2012) Fiscal multipliers and public debt dynamics in consolidations, European Economy. Economic Papers, 460

Bruyckere VD, Gerhardt M, Schepens G, Vennet RV (2012) Bank/sovereign risk spillovers in the European debt crisis, National Bank of Belgium Working Paper Research, 232

Bulow J, Rogoff K (1989) Sovereign debt: is to forgive to forget? Am Econ Rev 79(1):43–50

Burger JD, Warnock FE (2006) Local currency bond markets. IMF Staff Papers 53(Special Issue):115–132

Caceres C, Guzzo V, Segoviano M (2010) Sovereign spreads: global risk aversion, contagion or fundamentals? IMF Working Papers, 10/120

Cantor RM, Packer F (1996) Determinants and impact of sovereign credit ratings. FRBNY Econ Policy Rev 2(2):37–54

Canzoneri MB, Cumby RE, Diba BT (2002) Should the european central bank and the federal reserve be concerned about fiscal policy?, In: Rethinking stabilization policy, proceedings of economic policy symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole: 333–389

Cebula R (2014) Impact of federal government budget deficits on the longer-term real interest rate in the U.S.: evidence using annual and quarterly data 1960–2013. Appl Econ Q (formerly Konjunkturpolitik) 60(1):23–40

Chinn MD, Ito H (2006) What matters for financial development? Capital controls, institutions, and interactions. J Dev Econ 81(1):163–192

Chinn M, Frankel JA (2003) The euro area and world interest rates, Santa Cruz centre for international economics working papers, 9823140f

Christiano L, Eichenbaum M, Rebelo S (2011) When is the government spending multiplier large? J Polit Econ 119(1):78–121

Ciżkowicz P, Radzikowski B, Rzońca A, Wojciechowski W (2020) Fiscal devaluation and economic activity in the EU. Econ Modell 88(C):59–81

Ciżkowicz P, Rzońca A, Trzeciakowski R (2015) Windfall of low interest payments and fiscal sustainability in the Euro area. Analysis through panel fiscal reaction functions. Kyklos 68(4):475–510

Claessens S, Kose MA (2013) Financial crises: explanations, types, and implications, IMF Working Papers, 13/28

Codogno L, Favero C, Missale A (2003) Yield spreads on EMU government bonds. Economic Policy 18(37):211–235

Corsetti G, Kuester K, Meier A, Müller GJ (2014) Sovereign risk and belief-driven fluctuations in the euro area. J Monetary Econ 61(C):53–73

Cottarelli C (2011) The risk octagon: a comprehensive framework for assessing sovereign risks, (mimeo)

Cusack TR (1998) Public Employment Data Set. Update of original data from Cusack, T. R., T. Notermans, and M. Rein (1989). 'Political-Economic Aspects of Public Employment.' Eur J Polit Res 17:471–500

Cwik T, Wieland V (2011) Keynesian government spending multipliers and spillovers in the euro area. Econ Policy 26(67):493–549

Dai Q, Philippon T (2005) Fiscal policy and the term structure of interest rates, NBER Working Paper, 11574

De Grauwe P, Ji Y (2012) Mispricing of sovereign risk and macroeconomic stability in the Eurozone. J Common Market Stud 50(6):866–880

De Grauwe P., Ji Y. (2013), "Self-fulfilling crises in the Eurozone: An empirical test," *Journal of International Money and Finance*, 34(C): 15–36

DeLong JB, Summers L (2012) Fiscal policy in a depressed economy. Brook Pap Econ Act 1:233–274

Detragiache E, Abiad A, Tressel T (2008) A new database of financial reforms, IMF Working Paper, 08/266

Devries P, Guajardo J, Leigh D, Pescatori A (2011) A new action-based dataset of fiscal consolidation, IMF Working Papers, 11/128

Dumicic M, Primorac M (2011) Determinants of sovereign risk premia for European emerging markets. Financ Theory Practice 35(3):277–227

Ebner A (2009) An empirical analysis on the determinants of CEE government bond spreads. Emerg Mark Rev 10(2):97–121

Eggertsson GB (2010) What fiscal policy is effective at zero interest rates? NBER Macroecon Annual 25:59–112

Engen EM, Hubbard RG (2005) Federal government debt and interest rates. In: Gertler M, Rogoff K (eds) NBER macroeconomics annual 2004, vol 19. MIT Press, Cambridge

Fabozzi FJ (2015) Capital markets: institutions, instruments, and risk management, 5th edn. The MIT Press, Cambridge MA

Fatás A, Summers LH (2018) The permanent effects of fiscal consolidations. J Int Econ 112(May):238–250

Favero C, Karamysheva M (2015) What do we know about fiscal multipliers?, CEPR Discussion Papers, 10986

Ford R, Laxton D (1995) World public debt and real interest rates, IMF Working Papers, 95/30

Gale WG, Orszag PR (2004) Budget deficits, national saving, and interest rates. Brook Pap Econ Act 2(2004):101–187

Garriga AC (2016) Central bank independence in the world: a new data set. International Interactions 42(5):849–868

Gechert S, Horn G, Paetz Ch (2019) Long-term effects of fiscal stimulus and austerity in Europe. Oxford Bull Econ Stat 81(3):647–666

Gechert S, Rannenberg A (2018) Which fiscal multipliers are regime-dependent? A meta-regression analysis. J Econ Surv 32(4):1160–1182

Giavazzi F, Jappelli T, Pagano M, Benedetti M (2005) Searching for non-monotonic effects of fiscal policy: new evidence. Monetary Econ Stud 23(Special Edition):197–217

Giavazzi F, Pagano M (1990) Can severe fiscal contractions be expansionary? Tales of two small European countries. In: Blanchard OJ, Fischer S (eds) NBER macroeconomics annual 1990, vol 5. MIT Press, Cambridge

Giavazzi F, Pagano M (1996) Non-Keynesian effects of fiscal policy changes: international evidence and the Swedish experience. Swedish Econ Policy Rev 3(1):67–103

Gibert A (2016) The signalling role of fiscal austerity, DIW Berlin discussion paper, 1623

Giudice G, Turrini A, in 't Veld J (2003) Can fiscal consolidations be expansionary in the EU? Ex-post evidence and ex-ante analysis, European commission directorate-general for economic and financial affairs economic papers, 195

Gros D (2013) Foreign debt versus domestic debt in the euro area. Oxf Rev Econ Policy 29(3):502–517

Gruber JW, Kamin SB (2010) Fiscal positions and government bond yields in OECD countries, Board of governors of the federal reserve system international finance discussion papers, 1011

Guajardo J, Leigh D, Pescatori A (2014) Expansionary austerity? International evidence. J Eur Econ Assoc 12(4):949–968

Guichard S, Kennedy M, Wurzel E, André Ch (2007) What promotes fiscal consolidation: OECD country experiences, OECD economics department working papers, 55

Hagemann RP (2012) Fiscal consolidation: part 6. what are the best instruments for fiscal consolidation?, OECD economics department working papers, No. 937

Haugh D, Ollivaud P, Turner D (2009) What drives sovereign risk premiums? An analysis of recent evidence from the euro area, OECD economics department working paper, 718

Hauptmeier S, Heipertz M, Schuknecht L (2007) Expenditure reform in industrialised countries: a case-study approach. Fisc Stud 28(3):293–342

Heimberger P (2017) Did fiscal consolidation cause the double-dip recession in the euro area? Rev Keynes Econ 5(3):439–458

Hellebrandt T, Posen AS, Tolle M (2012) Does monetary cooperation or confrontation lead to successful fiscal consolidation? Financ Stab Rev 16(April):131–142

Heppke-Falk KH, Hüfner FP (2004) Expected budget deficits and interest rate swap spreads - evidence for France, Germany and Italy, Deutsche bundesbank discussion paper series 1: economic studies, 2004/40

High R (2000) Dealing with outliers: how to maintain your data's integrity, (mimeo)

Holden S, Midthjell NL (2013) Successful fiscal adjustments – does the choice of fiscal instruments matter?, CESifo working papers, 4456

Hördahl P, Tristani O (2012) Inflation risk premia in the term structure of interest rates. J Eur Econ Assoc 10(3):634–657

Ilzetzki E, Mendoza EG, Végh CA (2013) How big (small?) are fiscal multipliers? J Monet Econ 60(2):239–254

Kumar MS, Leigh D, Plekhanov A (2007) Fiscal adjustments: determinants and macroeconomic consequences, IMF working paper, 07/178

Lambertini L, Tavares J (2005) Exchange rates and fiscal adjustments: evidence from the OECD and implications for the EMU. BE J Macroecon 5(1):1–30

Landschoot Van A (2004) Sovereign Credit Spreads and the Composition of the Government Budget. Rev World Econ/Weltwirtschaftliches Archiv 140(3):510–524

Laubach T (2009) New evidence on the interest rate effects of budget deficits and debt. J Eur Econ Assoc 7(4):858–885

Leigh D, Devries P, Freedman C, Guajardo J, Laxton D, Pescatori A (2010) Will it hurt? Macroeconomic effects of fiscal consolidation, In: IMF world economic outlook. Recovery, risk, and rebalancing, October, Washington D.C.: International Monetary Fund: 93–124

Lemmen J, Goodhart Ch (1999) Credit risks and european government bond markets: a panel data econometric analysis. East Econ J 25(1):77–107

Levy-Yeyati EL, Sturzenegger F (2016) Classifying exchange rate regimes: 15 years later, Center for International Development at Harvard University Working Papers, 319

Lindé J (2001) Fiscal policy and interest rates in a small open economy. Finn Econ Pap 14(2):65–83

Luengnaruemitchai P, Schadler S (2007) Do economists' and financial markets' perspectives on the new members of the EU differ, IMF working papers, 07/65

Mauro P, Romeu R, Binder AJ, Zaman A (2013) A modern history of fiscal prudence and profligacy, IMF working paper, 13/5

Mertens K, Ravn MO (2014) Fiscal policy in an expectations driven liquidity trap. Rev Econ Stud 81(4):1637–1667

Monastiriotis V (2014) (When) does austerity work? On the conditional link between fiscal austerity and debt sustainability. Cyprus Econ Policy Rev 8(1):71–92

Mooij de R, Keen M (2012), Fiscal devaluation' and fiscal consolidation: the VAT in troubled times, IMF working papers, 12/85

Müller GJ (2014a) Fiscal austerity and the multiplier in times of crisis. German Econ Rev 15(2):243–258

Müller GJ (2014b) The debate over austerity. Int Finance 17(3):403–418

Oliveira L, Curto JD, Nunes JP (2012) The determinants of sovereign credit spread changes in the Eurozone. J Int Finan Markets Inst Money 22(2):278–304

Orr A, Edey M, Kennedy M (1995) The determinants of real long-term interest rates: 17 country pooled-time-series evidence, OECD economics department working papers, 155

Osborne JW, Overbay A (2004) The power of outliers (and why researchers should always check for them). Pract Assess Res Eval 9(6):1–8

Padoan PC, Sila U, van den Noord P (2012) Avoiding debt traps: fiscal consolidation, financial backstops and structural reforms. OECD J Econ Stud 1:151–217

Peat M, Svec J, Wang J (2015) The effects of fiscal opacity on sovereign credit spreads. Emerging Markets Rev 24(C):34–45

Perotti R (2011) The 'Austerity Myth': gain without pain?, CEPR discussion paper, 8658

Pescatori A, Sy ANR (2007) Are debt crises adequately defined? IMF Staff Pap 54(2):306–337

Peter M, Grandes M (2005) How important is sovereign risk in determining corporate default premia? The case of South Africa, IMF working papers, 05/217

Reinhart CM, Rogoff KS (2011) From financial crash to debt crisis. Am Econ Rev 101(5):1676–1706

Reinhart V, Sack B (2000) The Economic consequences of disappearing government debt. Brook Pap Econ Act 31(2):163–220

Samanni M, Teorell J, Kumlin S, Dahlberg S, Rothstein B, Sören H, Svensson R (2012) The QoG social policy dataset. The Quality of Government Institute, University of Gothenburg

Segura-Ubiergo A, Simone A, Gupta S (2006) New evidence on fiscal adjustment and growth in transition economies, IMF working papers, 06/244

Teorell J, Dahlberg S, Holmberg S, Rothstein B, Alvarado N, Svensson P, Svensson R (2018) The quality of government standard dataset, version Jan18. The Quality of Government Institute, University of Gothenburg

Thomas L, Wu D (2009) Long-term interest rates and expected future budget deficits: evidence from the term structure. Appl Econ Lett 16(4):365–368

Tsibouris GC, Horton MA, Flanagan MJ, Maliszewski WS (2006) Experience with large fiscal adjustments, IMF occasional papers, 246

Veld J, Roeger W (2013) Rising sovereign risk premia and the profile of fiscal consolidation. Q Report Euro Area 12(1):33–38

von Hagen J, Hughes HA, Strauch R (2002) Budgetary consolidation in europe: quality, economic conditions, and persistence. J Japanese Int Econ 16(4):512–553

Woodford M (2011) Simple analytics of the government expenditure multiplier. Am Econ J Macroecon 3(1):1–35

Wyplosz Ch (2002) Fiscal policy: institutions versus rules, CEPR discussion papers, 3238

Yuan Ch, Pongsiri TJ (2015) Fiscal austerity, growth prospects, and sovereign CDS spreads: the Eurozone and beyond. Int Econ 141(May):50–79