Original Article

Capital markets and tax policy making: A comparative analysis of European tax reforms since the crisis

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Abstract   Since the creation of monetary union, European governments have received loans from the international financial markets at low interest rates. The recent sovereign debt crisis has, however, once more revealed the structural dependence of capitalist governments on the capital markets. Countries such as Spain and Greece are charged unsustainable interest rates and their policy decisions have come under scrutiny by international bond holders who fear losing their investments. Based on a unique dataset of European tax policy decisions from 2008 to 2010, we show that financial market pressure, in the form of rising bond yields, has forced European governments to raise their taxes, especially in the more regressive field of indirect taxes. The findings suggest that capitalist democracies have little political room to maneuver and to conduct redistributive politics at times of high fiscal stress.
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Capital Markets and Tax Politics

In capitalist democracies, governments depend on the confidence of their voters. But to maintain this confidence they also depend on the performance of their real economies and, increasingly, on the confidence of financial markets. To meet these requirements at the same time is difficult even under the best circumstances. (Scharpf, 2011, p. 1)

Even under good economic and financial conditions, it is difficult to satisfy the demands of financial markets while also responding to citizens' wishes for low and

fair taxes, redistribution and public goods. The recent crisis represents a momentum of high economic pressure, exposing European member states to economic uncertainty and fiscal stress. With the outbreak of the economic and financial crisis in 2008 growth rates plummeted and unemployment rates shot up. At the same time, the member states spent considerable amounts of revenue on bailing out financial institutions, stimulating the economy and maintaining social safety nets. As a result, expenditure and debt levels increased significantly. These economic developments brought about uncertainty in the financial markets and investors worried that governments would be unable to repay their loans. Consequently, average bond yields in the European Union shot up by about 10 per cent between 2008 and 2009 placing the member states, above all those with particularly poor economic outlooks such as Lithuania and Latvia, under pressure to act and to readjust their economies.

Although the recent crisis has demonstrated the dependency of capitalist democracies on international financial markets, it is by no means a new scenario. In fact, Reinhart and Rogoff (2009), who map the history of financial crises, show that rich and poor countries have been lending, borrowing and crashing owing to sovereign default, banking, currency or inflation for many decades. For instance, the United Kingdom needed funding from the International Monetary Fund in the 1970s and the French government paid about 18 per cent for a 10-year bond yield to receive international loans in 1980. While a few scholars have illustrated the weaknesses of capital markets (for example Strange, 1997; Reinhart and Rogoff, 2009), others have studied the constraint they have imposed on domestic macroeconomic policy autonomy (for example Hibbs, 1977; Andrews, 1994; Cerny, 1994; Clark and Hallerberg, 2000). However, there is little research about how capital markets constrain fiscal policy making and governments' ability to conduct redistributive tax politics. Quite intuitively, however, it makes a difference if a government pays less than 3 per cent for a 10-year loan or over 25 per cent as in the current case of Greece. The Greek government is under more pressure to restructure the domestic economy and to attain public finances from other sources than the capital market.

In this article we examine governments' tax policy responses when international capital becomes costly. Our main argument is that once access to international capital is restricted, governments turn to domestic tax payers to acquire public revenue. Accordingly, the Greek government was under high pressure to implement extensive economic reforms between 2008 and 2010 and mainly introduced tax increases to compensate for the rising prices of international finance. By contrast, governments with more stable economic outlooks such as France required fewer reforms and they were able to use their good bond ratings to acquire funds from the markets to finance tax cuts and to stimulate their economies.

Introducing new data on tax policy change in the European Union between 2008 and 2010, we show that financial stress constrains governments' tax policy responses. The financial and economic crisis represents a momentum of change, in

which some European governments were confronted with exploding bond yields. Certainly, the crisis does not represent a long time period; however, the data allow us to compare detailed tax policy decisions among a relatively similar set of geographically close, developed democracies, which were affected to different degrees by the crisis. This cross-national comparison provides a valuable source of evidence.

The article is structured as follows: in the next section, we illustrate our argument based on a review of the taxation literature and develop guiding research hypotheses. The third part introduces our new dataset on tax policy reforms and describes the independent variables as well as the methodology underpinning the analysis. In the fourth part, we discuss the results and offer some robustness checks, before we conclude in the last section by showing how premium bond charges demanded by the financial markets have severely restricted the policy capacity of the state during the crisis.

Capital Markets and Tax Policy Making

In this section we discuss the effects of capital liberalization on tax policy making. We argue that two main shortfalls characterize the field of study: first, research in this field has a dependent variable problem as scholars do not directly measure policy changes. Second, scholars have highlighted numerous factors such as capital openness or the debt level but they have paid little attention to the mediating effect of bond rates on tax policy making in capitalist democracies. It is our main argument that governments, which have lost fiscal credibility and are unable to obtain low-priced credits from the financial markets, revert to other sources, mainly taxes, to realize their fiscal obligations. In the following, we briefly summarize the literature before elaborating on our argument.

A literature review

In the comparative public policy literature, we can identify two main strands, which explain tax adjustments in the context of financial integration: those that stress domestic institutions and politics and those that highlight economic imperatives. According to the former, labor organization and the Left-Right composition of governments (Cusack, 1997; Garrett, 1998; Garrett and Mitchell, 2001; Bradley *et al*, 2003) as well as the decision-making system determine policy outcomes (Hallerberg and Basinger, 1998; Clark and Hallerberg, 2000; Ganghof, 2007; Hays, 2009). By contrast, scholars from the functionalist strand highlight the growth rate and the debt level as well as trade and capital openness, which limit governments' room to maneuver (Genschel, 2002; Swank and Steinmo, 2002; Genschel, 2004). Although we do not regard the two schools of thought as mutually exclusive and control for a

number of political variables in the empirical analysis, the focus of this article is on the political economy discussion of external constraints.

Many governments, particularly those of the Eurozone, cannot independently adjust their monetary policies, but they still can align their fiscal policies according to their individual preferences and to macroeconomic developments.[1] There is an extensive literature, which addresses how governments' revenue and spending decisions are constrained by the moods of international markets (for example Andrews, 1994; Cerny, 1994). Assuming that states do not want to risk capital flights but intend to attract investors, theories of tax competition predicted a race-to-the-bottom (Oates, 1972; Zodrow and Mieszkowski, 1986) or that tax regimes would converge around a single policy model (Steinmo, 1994; Rodrik, 1997; Swank, 2006). Consequently, high tax revenues and progressive tax systems were considered unsustainable, as capital would exit the country hindering domestic prosperity and growth. Likewise, a shift from direct to indirect taxes is likely to occur as the latter are less exposed to competitive pressures (Rixen, 2008). In other words, the internationalization of capital markets has constrained governments' tax choices.

Although various scholars have measured the extent to which capital liberalization has caused tax changes, the findings are far from homogenous (Garrett and Mitchell, 2001; Genschel, 2002; Swank and Steinmo, 2002; Kemmerling, 2010). For example, Swank and Steinmo (2002) demonstrate that tax cuts have systematically followed increases in capital mobility and trade openness between 1981 and 1995. Yet, Garrett and Mitchell (2001) conclude that capital mobility is neither associated with lower rates of capital taxation nor with lower ratios of capital to labor and consumption taxes. The impact of capital liberalization on national tax systems is therefore inconclusive: the measured effects are often small and dependent on the specification of the model (Swank, 2002; Plümper *et al*, 2009).

Two main shortfalls can explain the lack of clear findings. First, there is the necessity to better operationalize the dependent variable, governments' tax policies. Current literature tends to analyze tax ratios and revenue incomes, which are influenced by other factors not directly linked to political decisions. Although tax rates are a better policy indicator than revenues, scholars often disregard base changes as well as timing effects and therefore only capture half of the picture. We overcome this pitfall by collecting information on the number and the direction (tax cut versus increase) of rate and base changes implemented during the crisis (see Table 1 for an overview of the tax measures).

Second, scholars control for different macroeconomic constraints on tax cuts such as capital or trade openness as well as the debt level or the deficit and growth rates. For instance, Garrett and Lange (1991) control for unemployment, GDP and trade openness while Basinger and Hallerberg (2004) use capital controls, lagged growth and inflation rates as the main macroeconomic determinants. Although these variables are by no means selected randomly, the choice of distinct control variables

Table 1: Tax changes 2008–2010 according to base, rate and timing effects

	Base changes	Rate	Timing
Direct taxes	64	31	17
PIT	38	20	7
CIT	26	11	10
Indirect taxes	21	34	12
VAT	16	11	12
Excise	5	23	0
Total	92	79	29

Source: European Tax Trends (2010).
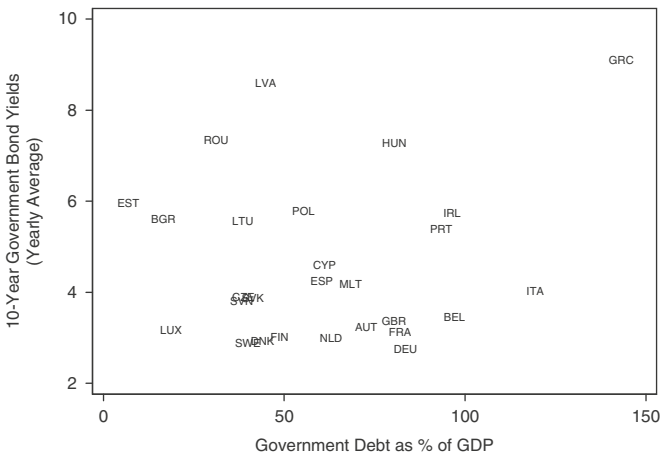
Figure 1: Relation between debt levels and government bond yields in 2010. Data for 2010.
Source: Eurostat and ECB.

illustrates that there is the need to better consider how these macroeconomic variables ultimately affect tax policy making, tax cuts and increases, in capitalist democracies.

Figure 1 illustrates the link between debt levels as a percentage of GDP and government bond yields of the European member states in 2010. It shows that although some countries have a low debt level, the bond yields are considerably higher than those of others. The graph suggests that a high level of public debt does not necessarily force a state to consolidate its finances. France, for instance, attains low-priced funds from the financial markets in 2010 despite its high debt level and can thus still opt for an expansionary fiscal approach. By contrast, Latvia and Romania both have a relatively low debt level but nonetheless, international investors charged a considerable premium for buying their bonds.

This finding suggests that bond yields take a number of other macroeconomic variables into account as well as the confidence and the moods of international investors. In other words, bond yields represent a more all-encompassing measure than the macroeconomic variables that most scholars account for in their analyses. In fact, bonds mediate these macroeconomic pressures and the expectations on the markets and thus, connect capital markets and governmental policy decisions. The importance of this link is by no means new (Andrews, 1994; Cerny, 1994), but has re-surfaced with the outbreak of the economic crisis when a number of European bonds turned into risky assets as investors' confidence in the fiscal sustainability of the public sectors deteriorated. In the remaining part of this section, we elaborate this linkage and develop hypotheses.

The theoretical framework

The increase in financial integration since the 1970s provided national governments with new capital supply (Azzimonti *et al,* 2011), but it has also circumscribed the policy capacity of the state (Cerny, 1994; Scharpf, 2000). Governments must not only perform according to the demands and needs articulated by domestic voters, but they must also respond to the expectations of international capital markets. They are dependent on the positive evaluations of investors and thus, need to make credible policy commitments to gain or maintain access to international finance. The inability to maintain fiscal discipline can be severely punished by market participants by charging an interest premium. Hence, the incapability to comply with such market demands has severe repercussions on the cost of credits or on public liquidity.

Investors in long-term sovereign bonds look for lucrative profits and thus assess potential economies in terms of returns and risks. The three main types of risk that investors face involve currency, exchange and default risk (Sobel, 1999). Mosley (2000) studies the factors that determine investors' decisions to buy government bonds. She shows that in low risk situations, financial market participants economize on collecting information and only consider a small set of aspects such as the inflation rates when deciding on how to allocate their assets. In other words, she finds that the relationship between governments and capital markets is mixed: while governments face pressures to adopt market-pleasing policies in aggregate areas they preserve room to maneuver in other policy areas including taxation. Yet, her findings apply for developed countries when the default risk is non-existent, but when *default risk is salient (…) financial market influence will be broader …* (Mosley, 2000, p. 766). It therefore seems crucial to assess the influence of capital markets for developed countries in the light of the sovereign debt crisis.

Since 2008, risk and uncertainty have steadily increased and kept financial market participants alert. To compensate for holding risky bonds, investors

charge a considerable premium. This recently happened in a number of European countries such as Greece, Lithuania and Ireland, where governments need to pay an extra charge or raise taxes in order not to experience sudden reversals of capital flows and, consequently, a liquidity crisis. As market prices for fresh capital are high, governments are more likely to turn to the taxpayers to obtain the necessary revenue. Under such conditions, expenditure cuts do not suffice and tax increases are necessary to improve the public balance in the short run. Considerable efforts will also be put into reducing the deficit to regain market confidence and to reduce the bond yield. Hence, governments with high bond yields have no room for tax reductions but need to introduce increases, which they dislike at times of stability, as they fear voters' retaliation. However, governments' concern switches from voters to investors owing to the premium charges from the capital markets.

As a response to the financial and economic turbulences, most member states introduced special tax measures to offset the impact of the crisis, by both supporting economic activity and consolidating public finances. Figure 2 illustrates the fiscal responses of the European member states to the crisis. It shows that all governments, irrespective of the bond yield, cut some taxes. Not only those governments with low fiscal pressure such as Germany and Denmark but also Latvia and Lithuania, countries facing high fiscal pressure adopted a considerable
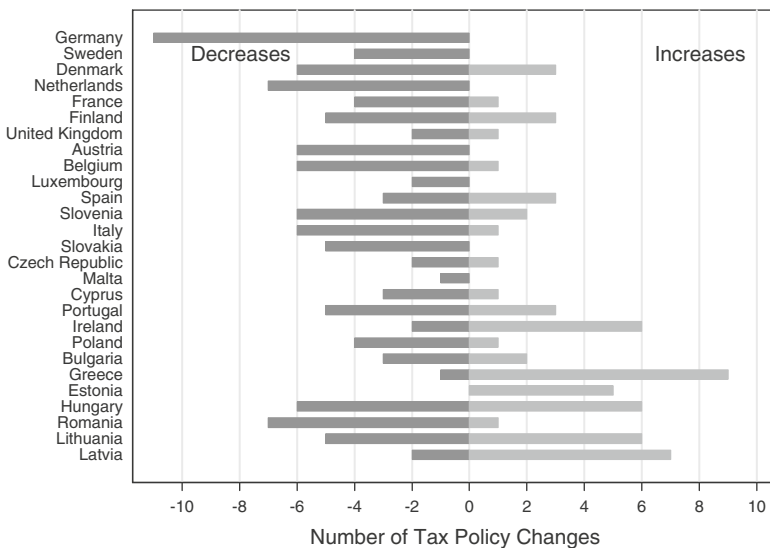
Figure 2: Number of tax changes by country 2008–2010, sorted by bond yields. Sorted by increasing bond yields.
Source: European Tax Trends (2010).

number of tax decreases. Yet, governments with high bond rates introduced significantly more tax increases than the rest. In fact, Germany and Denmark did not increase any taxes while the two Baltic States adopted six and seven tax raising measures, respectively. Hence, also the amount of overall tax changes is higher for countries with higher bond yields.

Governments' policy decisions are then largely determined by their dependence on the financial markets: when policy decisions and economic outlooks are inconsistent with investors' expectations, bond rates are high. Consequently, governments will adjust and implement policy changes to meet investors' demands. As loans on the capital markets become too expensive, governments are now more likely to increase taxes. Although voters' may retaliate and elect a new government, politicians revert to tax increases, as they do no longer obtain cheap access to international finance. Vice versa, a low bond rate signals investors' approval of governments' policy actions, so that governments have lower pressure for economic adjustment. They are, however, free to decrease taxes and gain voters' support as money can be borrowed for a low price at the capital markets. In other words, interest rate differentials are likely to cause different economic responses among the EU member states.

In sum, we hypothesize that the liberalization of capital markets does not equally affect all governments. Governments that are being charged a bond premium implement more tax policy changes, especially increases, than countries with low bond rates reflecting the need to repetitively respond to the surcharge. While our theoretical focus is on the upward pressure of bond yields on tax policy choices, the insights generated by the literature on tax competition also hold for our argument. In other words, those governments that can afford to lower taxes owing to good bond ratings will do so to stay competitive, to attract investments and to generate economic growth. Moreover, they are more likely to lower direct than indirect taxes as these are thought to be more growth-stimulating (Rixen, 2008; OECD, 2010). Vice versa, governments that are under more pressure will rather increase indirect than direct taxes to meet their spending requirements. The financial crisis provides a momentum to test these propositions owing to the growing interest spread differentials in the European Union since 2008.

Hypothesis 1: The higher the bond rate, the more tax adjustments a government is likely to implement.

Hypothesis 2: The higher the bond rate, the more likely are governments to adopt tax increases in order to obtain capital and to lower the premium charge.

Hypothesis 3: The higher the bond rate, the more likely are governments to increase indirect taxes instead of direct ones.

Analysis

To explore the effects of the crisis on governments' fiscal responses we analyze a unique dataset on tax policy changes in the European Union. The data include the amount and the kind of tax changes overall as well as for the tax mix, which the European governments implemented over the period from 2008 to 2010. Our unit of analysis is the country-year. In the following, we discuss the measurement of our variables as well as our estimation strategy.

Data and methodology

Tax policy is not a straightforward concept to measure. So far, with some remarkable exceptions (Mahon, 2004; Jensen and Lindstädt, 2012), scholars focus on the output of tax policy rather on the policy choice itself, as data are only easily available for the former. Given our interest in the political process rather than in purely economic outcomes, which might have little to do with active government politics, we choose the second strategy and collect data on tax policy changes for all EU member states from 2008 to 2010, which we discuss in more detail in the next paragraph. Afterwards, we describe the independent variables as well as the Poisson and Heckman models that we use for the analysis.

Dependent variable
Our dependent variable is the count of increases and decreases in four major taxes for each European member state from 2008 to 2010. We take the data on corporate income taxes (CIT), personal income taxes (PIT), value added taxes (VAT) and excises (EX) from the Eurostat report on 'Taxation trends in the European Union' (European Tax Trends, 2010). Unfortunately, the European Commission does not usually report these measures, which restricts our period of analysis to the first three years of the financial crisis. We believe that this count variable is the best measure of tax policy changes as our theoretical focus is on the political reactions to the crisis rather than on the consequences of the crisis on the tax system as a whole.

For instance, let us compare the tax rate changes and the revenue implications conducted by the Finnish government in 2010. The Finnish government raised its VAT rate, while the corporate tax rate remained unchanged. Yet, we observe that the VAT revenue declined while the revenue stemming from the corporate tax revenue increased. This example shows that revenue measures are often affected by a change in the business cycle rather than by actual policy decisions. Hence, we do not use revenue data as we are interested in the policy decisions of governments.

Moreover, our data do not only focus on tax rate changes but also take other policy decisions into consideration such as tax base adjustments and timing effects. Table 1 provides an overview of the distribution of the policy responses across the three

dimensions of base, rate and timing effects. Overall, base changes make up the majority of the reforms implemented by the European governments with rate changes ranking second and timing effects third. Base changes are most often employed in the field of direct taxes, where they account for about half of the reforms. By contrast, in the area of indirect taxes, above all EX, base changes are less prominent. Nonetheless, the overall amount of base changes demonstrates the importance of including other dimensions of tax changes than the rate.

Table 2 further sheds light on our dependent variable by describing the main tax changes conducted by the French and the British governments and how they translate into our count data. Even though the count data do not account for differences in scope, they allow for a joint measure of base and rate changes as well as timing effects. Using levels or rates, which account for scope differences, is unable to integrate base changes, which make up a significant part of tax policy decisions. Overall, we therefore believe that this count variable is more inclusive than regularly used tax rate data.

Figure 3 shows the number of increases and decreases in each of the four tax policies as well as the total changes. Overall, decreases outweigh increases with the exception of EX. The European governments focus on direct taxes. We observe most changes in the PIT, followed by the CIT. Policies regarding consumption taxes are targeted to a lesser extent. Yet, we observe variation in the number as well as the direction of change for all tax types and across all member countries (Lierse, 2012). For instance, the British government raised the top PIT rate in 2010 whereas others, particularly Eastern European countries reduced the top rates (European Tax Trends, 2010). Also in the field of corporate taxation, European governments introduced different reforms. While Hungary and Lithuania raised the tax rate, the Slovenian and the Swedish governments reduced it and the Dutch allowed for accelerated depreciation and tax incentives. Although VAT reforms are less common than direct tax changes, we find remarkable differences ranging from reductions in certain sub-fields such as hotels and construction to general rate increases and decreases (European Tax Trends, 2010).

In our empirical analysis, we use the number of changes over all taxes and the percentage of increases over total changes as dependent variables. We do this for the total changes and for changes in direct (CIT and PIT) and indirect taxes (VAT and EX) to arrive at a full picture of how governments responded to pressures from international capital markets during the crisis. Before we turn to discuss the empirical research strategy, we introduce our independent variables.

Independent variables

Our article aims to establish whether and how market pressure shapes tax policy decisions during times of economic turmoil. As the crisis effect on the member states was not homogeneous, the period provides a suitable momentum to test our

Table 2: Example of the coding strategy for our dependent variable

	France			UK		
	Description of the tax change	Tax revenue % GDP	Count variable	Description of the tax change	Tax revenue % GDP	Count variable
PIT						
2009	PIT reduction for low-income households resulting in a cut of 2/3 in 2009 PIT for people concerned.	7.6	−1	NA	10.3	0
2010	A 50% tax is levied on bonuses exceeding € 27 500 paid in 2009 by financial institutions to their traders.	7.6	+1	A higher tax rate (50 %) for incomes over GBP 150 000 and the allowance is restricted for incomes over GBP 100 000.	9.9	+1
CIT						
2009	Treasury measures for firms: tax credit reimbursements (research tax credit and carry-back tax credits)	1.3	−1	Deferral of the planned increase in the small companies' rate of corporation tax.	2.8	−1
2010	The local business tax is replaced by an 'economic territorial contribution'.	1.9	−1	NA	3.0	0
VAT						
2009	Treasury measures for firms: VAT reimbursements are anticipated.	6.9	−1	Temporary reduction in the standard VAT rate from 17.5% to 15%	5.6	−1
2010	A reduced VAT rate of 5.5% applies to restaurant services.	—	−1	—	—	—
	NA	7.0	0	NA	6.5	0

Source: European Tax Trends (2010) and (2014).
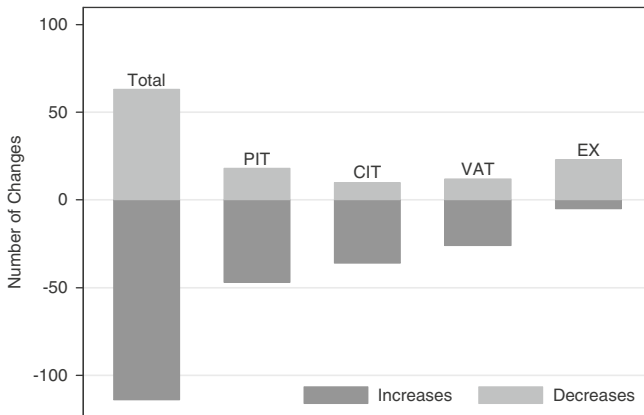
Figure 3: Number of changes 2008–2010 by tax type.
Source: European Tax Trends (2010).

propositions. We use the 10-year government bond yield to account for the strength of the crisis in each member state. It measures the interest rate governments have to pay for money on the financial market. The higher the risk, that is the less likely investors estimate the full on-time repayment of their loans, the higher are the yields. A high interest rate reflects strong market pressure on the respective government, which can no longer obtain low-priced finance from the markets. Hence, it needs to resort to the taxpayer and signal its commitment to future fiscal discipline in the hope of returning to normal priced bond rates. We use the 10-year bond, rather than bonds with lower maturity, as it is the mostly traded government bond in the Eurozone and as such the standard measure of choice. This is what governments mostly rely upon for fresh and long-term capital (Codogno *et al,* 2003).

Moreover, we use the ratio of the yield to the average bond yield for the EU. The main reason why we relate our measure to the average bond yield in the EU, is that although the average level in the EU went up compared to the 2000s, there are some countries such as Germany, the Netherlands and Sweden, where the interest rates dropped during the onset of the crisis. This reflects investors' risk aversion: when sovereign default or some macroeconomic uncertainty increases in one country such as Lithuania and Greece, the demand for bonds goes up elsewhere for example in Germany. Hence, we use the yield ratio, the difference to the average bond yield in the EU, as an empirical proxy for the relative costs of borrowing on capital markets.

In order to account for endogeneity concerns, we use the average bond yields from July to June, thus including 6 months from the year before and 6 months from the current year. This compromise allows us to include an appropriate measurement of market pressure, which is close enough to the current events to matter for government policy yet at the same time early enough to account for proper sequencing of events.

As a robustness check we also include the January-to-January spread as well as changes in the June spread. The data stem from Eurostat (2011).

The bond yields mirror other, usually used variables, which measure national and international economic pressures such as unemployment, inflation, growth or deficits and allow us to save considerable degrees of freedom. Moreover, bond rates better reflect the market pressure that governments face than deficit and debt ratios. For instance, France's deficit amounted to 7.5 and 7 in 2009 and 2010, which is considerably higher than Bulgaria's deficit, which only added up to 4.7 and 3.2 per cent of GDP for the respective years. Nonetheless, the Bulgarian yields were substantially higher with an average of 6.3 for 10-year bonds in contrast to France, which only paid 3.4 per cent.

While bond yields are our main theoretical concern as they account for the strength of the crisis effect on each country, we also include two political control variables in our main models. The first is the government partisanship, measured on a scale between 0 (left) and 10 (right) and weighted by seat share for coalition governments (Döring and Manow, 2011 based on Castles and Mair, 1984; Huber and Inglehart, 1995; Benoit and Laver, 2006; Hooghe *et al,* 2010). In general, parties to the right of the political spectrum are more likely to advocate tax decreases, especially for mobile capital, whereas left parties are more likely to increase taxes, at least for progressive direct taxes. We also include a dummy for a change in government, lagged by 1 year. We expect that new governments reward their constituency with tax cuts (see for example Franzese, 2002, p. 95).

Next, we include a crisis dummy, which takes on the value of one for 2009 and 2010.[2] The crisis dummy measures the overall shock of the crisis to all member states. At the end of 2008, the European Commission set up a European Economic Recovery Plan as a reaction to the forthcoming recession. Economic growth was predicted to turn negative in 2009 for the European Union with some limited recovery in 2010. The EU member states agreed on a few economic policy measures aimed at limiting the economic slowdown over a period of 2 years. Therefore, we include a dummy for the years 2009 and 2010. Thus 2008 is the reference year before the crisis, which was followed by drastic policy adjustments. The crisis dummy represents this general upsurge of fiscal stress. Although all governments stepped up their tax (and other) policy reactions to deal with the crisis, how they react depends on the borrowing costs. In contrast to the crisis dummy, which measures the overall shock, the bonds measure the exact extent for each country.

Furthermore, we include a dummy for Eurozone membership to account for the possibility that membership of the European Monetary Union led governments, who do not have the means to react with monetary policy, to react with more fiscal measures.

In addition to the main models, we run several robustness checks, which also include other control variables. Here, we add the population size in millions to measure the structural extent to which a country is prone to international tax competition.

As outlined in the literature review, smaller countries are more influenced by the international financial markets, but at the same time they can also gain more from tax competition than bigger states. As governments have not only the option to raise more revenue, but can also cut their spending, we include two variables to deal with this substitution effect. In one robustness check we include the change in government expenditure directly. As this biases our estimates (expenditure is also determined by the same independent variables), we also measure expenditure constraints more indirectly by including the dependency ratio. This measures the ratio of the population over 65 per working age population (15–64 years of age) (UN, 2011). The number of people (potentially) relying on government expenditure in their old age is the most pressing structural spending constraint in advanced economies (Plümper *et al,* 2009).[3] Moreover, we also include a dummy for when a country received a conditional loan from the troika as this might change the pressure for policy adoption. At last, we also control for differences in national fiscal rules to account for the ease with which tax policy can be changed as some scholars (that is Poterba, 1993) show that strong fiscal rules have an effect on the speed and nature of fiscal adjustments. Hence, we include the fiscal rule index provided by the European Union (EU, 2014). It takes five different aspects into consideration: the statutory base of the rule, the room for revising objectives, the mechanisms of monitoring compliance and enforcement of the rule, the existence of pre-defined enforcement mechanism and media visibility of the rule. The higher the index, the more timely and comprehensively a country is likely to respond with measures to the crisis in order to revert to budgetary discipline and achieve macroeconomic stabilization. The data again stem from Eurostat. Table A1 in the Appendix provides an overview of the descriptive statistics of all our variables (the Appendix is available upon request to the authors).

Methodology

We employ two different econometric models to estimate the effects of the independent variables on different versions of the dependent variable: the total number of changes over all taxes, the total number of changes for direct and indirect taxes, and the percentage of increases for all three. First, we look at the number of changes. As this is a count variable, we run Poisson models. A look at the descriptive statistics as well as a check for the goodness of fit after the estimation confirms that we have no over-dispersion. Poisson is thus the model of choice rather than for instance a negative binomial regression.

In a second step, we analyze the direction of change. We therefore generate a variable, which measures the percentage of increases over the total changes. To account for the fact that not all governments implemented changes in their tax system, especially not for the two tax categories, we run a Heckman selection model. Here, the first step estimates the effects of the significant independent variables from

the main count model on a dependent dummy variable, which takes on the value of one if a change occurs and zero otherwise. The second step corrects for the selection effect and estimates the effects of all independent variables on the percentage increase. The rho indicates for all models that the errors from the selection and the direction equation are correlated and we are thus rightly implementing the Heckman model rather than two separate models for the two stages. We apply these estimations to changes in the tax system in general, as well as to the changes in direct and indirect taxes. To illustrate that none of our findings are driven by the choice of models, we also ran simple OLS regressions with random effects and standard errors clustered at the country level (see Table A8 in the Appendix). Given our very short time frame, the crisis dummy is enough to soak in time-varying effects. In general, different to most studies cited in this article, we have many more countries than we have years under observation, thus placing the focus of the analysis on the cross-sectional aspect of European policy reactions during the crisis.

Discussion of results

The crisis forced the European member states to adjust their tax systems with the goal to stimulate economic activity and/or to consolidate public finances. Owing to the EU-wide agreement on a fiscal stimulus package, all member states initially introduced tax cuts. Only in the end of 2009 the crisis turned into a sovereign debt crisis placing increased pressure on the governments to consolidate. Hence, while in 2009 the majority of reforms involve some kind of tax relief, in 2010, when loans from the financial markets became more and more pricey, governments increasingly opted for increases.

Yet, the interest rate a government has to pay in return for capital on the financial market strongly influences economic reactions in terms of the amount and the direction of tax changes. Our findings confirm previous studies, which highlight socio-economic pressures as crucial policy determinants (see section 'Capital Markets and Tax Policy Making'). They also support our hypotheses. When governments lose fiscal credibility, they need to make strong reform commitments and increasingly turn to taxpayers to obtain public finance. In the following, we discuss our findings in more detail with reference to the theoretical propositions: we first address the overall number of tax changes before we investigate the tax mix.

Table 3 shows the results for the Poisson models for the total number of changes and the number of changes for direct and indirect taxes. Let us start by considering the first column, which lists the results for the impact of bond rates on the overall tax changes implemented by a country. The calculations of the Poisson model illustrate that the number of tax adjustments is dependent on the interest rates on bonds compared to the average EU bond yield (and the crisis dummy). It shows that the higher the bond rate is above the European average, the more policy measures

Table 3: Poisson model for number of changes

	Number of total changes	Number of direct changes	Number of indirect changes
Bond yield ratio	0.34**	0.02	0.79***
	(0.15)	(0.23)	(0.25)
Partisanship	0.03	0.04	0.01
	(0.06)	(0.08)	(0.10)
Lagged new government	0.33**	0.48**	0.16
	(0.15)	(0.20)	(0.26)
Crisis dummy	3.93***	4.06***	3.49***
	(0.71)	(1.00)	(1.01)
Euro dummy	−0.03	−0.01	0.27
	(0.17)	(0.22)	(0.30)
Observations	81	81	81

Standard errors in parentheses. *** $P<0.01$, ** $P<0.05$, * $P<0.1$. Constant not reported.

governments implement. Using clarify (Tomz *et al,* 2002) we simulate the influence of a change in the bond yields on the expected number of changes. Holding partisanship at its mean for a Euro country without a recent government change during the crisis, an increase in the value of government bonds from their 20th to their 80th percentile significantly increases the expected number of changes in the tax system by 0.5. If we were to go from the minimum bond yield ratio of 0.5 in Germany (2010) to the maximum of 2.6 in Lithuania (2009) within our sample under investigation, we should observe 2.9 additional adjustments in the tax system. In reality, the German government implemented six changes, while the Lithuanian government introduced nine.

The finding that the bond ratio significantly influences the amount of tax changes adopted by a country supports Hypothesis 1 of our theory. It shows that the crisis impact is more pronounced for those governments, from which investors charge an interest premium. In other words, the amount of tax changes is largely determined by the perceptions of financial market participants: when policy decisions and economic outlooks are inconsistent with investors' expectations, bond rates are high. As a result, government officials adjust and implement policy changes to signal their commitment to fiscal reform and to regain access to international finance.

The two columns of Table 3 illustrate that differences in bond yields lead to different tax adjustment strategies in the field of indirect taxes. When a government is under pressure from the financial markets, it is more likely to adjust VAT or EX whereas personal or CIT are less affected. A simulated move from the minimum to the maximum bond rate predicts almost four more adjustments in the field of indirect taxes, whereas the switch has no significant effect on direct taxes. In all three models

Table 4: Heckman selection model for percentage of increases

		Total changes	*Direct changes*	*Indirect changes*
% increase	Bond yield ratio	34.1***	19.6	33.6**
		(10.8)	(12.8)	(16.7)
	Partisanship	3.50	4.58	0.50
		(3.53)	(4.14)	(4.62)
	Lagged new government	9.24	16.1	2.87
		(9.42)	(11.5)	(13.5)
	Euro dummy	16.7*	16.5	6.50
		(9.85)	(12.0)	(14.9)
Selection	Bond yield ratio	0.35	−0.14	0.81
		(0.78)	(0.47)	(0.54)
	Lagged new government	−0.15	0.09	0.59
		(0.49)	(0.41)	(0.38)
	Crisis dummy	3.27***	2.92***	2.58***
		(0.50)	(0.50)	(0.54)
	Observations	81	81	81

Standard errors in parentheses. *** $P<0.01$, ** $P<0.05$, * $P<0.1$. Constant not reported.

of Table 3, the political orientation of the government, as well as Euro membership does not play a significant role. Unsurprisingly, governments enacted more tax changes during the crisis years. Also in line with our expectations newly elected politicians adopt more tax policy changes, especially in the field of direct taxes. It illustrates that these new governments take over office at an unusual time: they were elected to alleviate the pressure arising from the crisis. As such, they are likely to adopt comprehensive fiscal reforms to stabilize the macroeconomic environment and to strive towards fiscal balance. Why new governments mainly turn to direct taxes would need some qualitative exploration. It is possible, however, that they are particularly important as a tool for macroeconomic stabilization.

After having examined the Poisson models, which we use to analyze the number of tax adjustments, we now turn to the Heckman selection models. The latter serve to better understand if governments, when charged a bond premium, respond with more tax increases than countries with lower bond rates. In hypothesis 2 we suggested that an increase in the default risk restricts access to international finance or makes it so costly that governments turn to other finance sources such as taxes. Table 4 shows the results from the Heckman selection model for the overall direction of policy change, as well as for the changes in the fields of direct and indirect taxes.

The calculations of the model are in line with Hypotheses 2 and 3, which suggests that the higher the bond yields of a government, the more tax increases it will adopt.

The effect of financial market pressure significantly affects the direction of tax adjustment for indirect taxes only, which then drives the overall increases. The impact of higher bond yield ratios on direct taxes is positive, yet not significant. Governments under pressure from the capital markets do not only raise more taxes *per se*, but they preferably do so by increasing VAT and EX rather than corporate or PIT. This finding is in line with the tax competition literature and OECD (2010) recommendation, which suggest increasing consumption taxes rather than direct taxes. The main argument is that taxes on immobile bases can be expected to have a smaller negative effect on growth than direct taxes, as they do not discourage savings and investments.

As regards the controls, we first find that the crisis dummy is positive. It shows that the outbreak of the financial crisis forced governments all over the European Union to undertake economic adjustments. Hence, we see a significant increase of tax reforms in 2009 and 2010 compared to 2008, shortly after the crisis had erupted.

Moreover, the two political variables, partisanship and a new government, do not significantly affect tax increases in times of the European sovereign debt crisis. First with regard to partisanship, earlier studies show that governments with a strong left in parliament opt for more progressive and redistributive measures to lessen the tax burden on the poor (Garrett, 1998; Garrett and Mitchell, 2001). Yet, our findings do not support this. By contrast, the results indicate that when governments are under financial pressure they tend to raise revenue from indirect taxes. An increase in indirect taxes, particularly in VAT, has however, a more regressive effect on income distribution than if governments raised taxes for high incomes. In other words, the analysis does neither indicate a redistributive impact in general nor in countries with a strong left in parliament.

Second, the results do not provide any evidence that new governments are more likely to raise taxes as is suggested by the political business cycle in taxation (Nordhaus, 1975). The weak support for the political cycle is likely to be driven by the extraordinary crisis situation. It suggests that fiscal pressure only increases the overall level of fiscal adjustments, but new governments are as likely to increase taxes as they are to decrease them.

In sum, tax policy adjustments are strongly influenced by market pressures measured in terms of government bond rate ratios. The more governments have to pay for credits on the capital markets compared to their European counterparts, the more tax adjustments and increases they implement. Political and structural factors on the other hand, only play a minor role during the first three years of the crisis. The Left-Right composition of governments seems to have no impact on the policy responses during the period of analysis, which is contrary to earlier work (Garrett and Lange, 1991), but in line with the findings of recent research (Hays, 2003, 2009). New governments enact more tax policy changes, following their election promises.

Robustness

We employ several robustness checks to account for the accuracy of our findings. In general, our findings are robust to different measures of our dependent variable as well as to changes in the control variables. Tables A2 – A8 in the Appendix illustrate this for each dependent variable (the number of changes as well as the percentage of increases for total, direct and indirect tax changes). The ratio of the bond yield has a positive and significant effect on the percentage of tax increases, which is driven by increases in indirect taxation. The effect is positive, but not significant for some models, if we look at the level or the yearly change in the ratio, which probably introduces too much noise in the data. For all other robustness checks it is both positive and significant. In line with our argument governments, which have a higher dependency ratio, face structural spending needs and thus implement more tax changes. Interestingly, the dependency ratio drives direct increases rather than indirect ones. With the exception of direct tax changes, population size has no effect. Here, larger countries implement more direct changes, yet the size seems to have no effect on the direction of the changes. The extent of fiscal rules or the existence of troika loans does not affect tax policy changes.

The findings show that bond rates affect economic responses and severely restrict tax choices available to governments in capitalist democracies. The higher the bond rates, the more governments readjust their economies reflecting the attempt to make credible policy commitments and to regain access to international finance. Moreover, the changes are more likely to be indirect tax increases than a tax raise on mobile factors when governments are forced to adopt short-term austerity measures.

Conclusion

In capitalist democracies, governments not only depend on voters' support but also on the confidence and the willingness of financial market participants to provide low-priced capital. Under favorable economic conditions, or at least under non-crisis situations, governments tend to have the freedom to adopt policies according to their preferences and in accordance with those of their main constituencies (for example Garrett, 1998; Garrett and Mitchell, 2001). A number of scholars show that party politics matters for tax policy-choices, with left-wing governments being more in favor of redistributive policies than their right-wing counterparts (Quinn and Shapiro, 1991; Bradely *et al*, 2003; Timmons, 2010).

However, our study illustrates that during times of economic crisis, when bonds turn into risky assets, policy decisions are no longer influenced by domestic politics but they are increasingly constrained by the participants of the international capital markets. As the ability to meet future financial commitments becomes more and more uncertain, investors charge a considerable premium to compensate for the increase in

default risk. The premium price on bonds, however, changes governments' priority: now, governments introduce extensive reforms to return to fiscal credibility and they turn to domestic taxpayers to satisfy their fiscal commitments. Although voters' may retaliate, governments need fresh capital, which they can no longer solely obtain from the markets as investors' confidence vanishes.

The empirical results suggest a high structural dependence of the state on international capital markets during the global financial crisis. All European governments actively intervened to stabilize the economy and to restore confidence on the financial markets. Yet, policy responses are significantly determined by differences in market pressures. In fact, an increase in fiscal stress affects taxation in a threefold manner: in terms of the number and the direction of tax adjustments as well as the tax mix. The higher the interest rates on bonds, the more reforms are implemented by the government to demonstrate their commitment to budgetary discipline. Moreover, they do not only implement more reforms at times of high fiscal stress, but they are also more likely to raise indirect taxes. While an increase in indirect taxes is regressive, an increase in direct taxes can at least potentially have progressive effects. This illustrates that most European governments opted for a more regressive tax approach rather than a redistributive one to deal with the sovereign debt crisis.

While the findings show that governments' are highly dependent on the confidence of international capital markets during times of economic instability, we find very little evidence for the influence of domestic politics. In fact, traditional left-right party differences did not play a significant role for tax policy making under higher fiscal pressure. Accordingly, the policy choices of democratic capitalist governments are severely circumscribed at times of fiscal crises and are less influenced by domestic politics. In other words, the functionalist school is right, at least when it comes to tax policy choices during the great financial crisis: its markets, rather than politics.

Our findings have not only severe implications for scholars from the comparative public policy field, but also for empirical and normative assessments of the roles of voters and actors of the capital markets in modern democracies. Capitalist democracies do not only act in accordance with domestic policy preferences but in crisis times government's main concern is to return to fiscal sustainability, thus paying utmost attention to the demands of the capital markets. However, recent debates about tax avoidance and economic inequality as well as the electoral campaigns of some member states such as France and Italy show that tax policy making has become a more politicized issue. The once rather technical subject has gained awareness among the public and voters are demanding policy alternatives and choices. The question whether the increasing demand of taxpayers and the politicization of government finance will bring about a reversal in the relationship between international capital markets, domestic voters and governments' responses needs further empirical scrutiny.

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Hanna Lierse completed her PhD at the University of Hamburg in 2011. Since then she works as a postdoctoral fellow at the Research Center on the Transformation of the State located in Bremen. Her research interests pivot around international political economies, particularly linked to issues of welfare, taxation and redistribution. She has published a book about the evolution of the European economic governance system and is currently expanding the focus to other regions of the world. Two of her current projects address patterns and evolutionary paths of the modern welfare and tax state beyond rich western democracies.

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Notes

1 Certainly, European governments' budgetary decisions also need to comply with the European Stability and Growth Pact and a number of national regulations. Nonetheless, fiscal decisions are mainly taken by domestic actors and are very little constrained by supranational laws.
2 We also included separate year dummies for 2009 and 2010, but their effects were not significantly different from each other, which is why we choose to save degrees of freedom and included the combined crisis dummy in our main models.
3 Please also note that the fact that governments can also lower their spending rather than increase taxes potentially underestimates our results rather than biasing them upwards.

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Appendix

Table A1: Descriptive statistics

Variable	Obs	Mean	SD	Min	Max
Total changes	81	2.44	2.46	0	10
Direct changes	81	1.37	1.52	0	6
Indirect changes	81	0.82	1.05	0	4
Total % increases	54	33.07	36.48	0	100
Direct % increases	48	24.06	38.19	0	100
Indirect % increases	38	45.18	42.92	0	100
Total Δ dummy	81	0.67	0.47	0	1
Direct Δ dummy	81	0.59	0.49	0	1
Indirect Δ dummy	81	0.47	0.50	0	1
Ratio government bond yields (June)	81	1.01	0.41	0.55	2.64
Partisanship	81	5.47	1.28	2.79	7.50
Lagged government change	81	0.44	0.5	0	1
Crisis dummy	81	0.67	0.47	0	1
Euro area dummy	81	0.63	0.49	0	1
Ratio government bond yields (yearly)	81	1	0.40	0.58	2.51
Δ Ratio government bond yields	81	−0.04	0.34	−1.54	1.48
Population	81	18.50	23.08	0.41	82.22
Dependency ratio	78	23.15	3.39	15.40	29.6
Δ Govt. expenditure	81	1.77	3.26	−5.20	18.80
Troika dummy	81	0.15	0.36	0	1
Fiscal rule index	81	0.50	0.95	−1.01	2.46

Table A2: Poisson model for number of total tax changes – Robustness check I

	No controls	Controls I	Controls II	Controls III	Controls IV	Controls V	Yearly ratio	Δ ratio	Levels
Bond yield ratio	0.46***	0.37**	0.35**	0.33**	0.37**	0.34**	0.33**	0.25	0.063
	(0.15)	(0.16)	(0.15)	(0.16)	(0.16)	(0.17)	(0.16)	(0.16)	(0.041)
Partisanship	—	0.02	0.00	0.03	0.017	0.029	0.03	0.03	0.048
		(0.06)	(0.06)	(0.06)	(0.059)	(0.059)	(0.06)	(0.06)	(0.062)
Lagged new government	—	0.34**	0.31**	0.35**	0.34**	0.33**	0.33**	0.41***	0.40**
		(0.15)	(0.16)	(0.16)	(0.15)	(0.15)	(0.15)	(0.15)	(0.16)
Crisis dummy	—	3.94***	3.90***	3.93***	3.94***	3.93***	3.91***	3.95***	3.85***
		(0.71)	(0.71)	(0.71)	(0.71)	(0.71)	(0.71)	(0.71)	(0.71)
Euro dummy	—	-0.03	-0.08	-0.04	0.016	-0.027	-0.04	-0.18	-0.00014
		(0.17)	(0.17)	(0.17)	(0.18)	(0.18)	(0.17)	(0.15)	(0.20)
Population	—	0.00	—	—	—	—	—	—	—
		(0.00)							
Dependency ratio	—	—	0.04*	—	—	—	—	—	—
			(0.02)						
Δ Government expenditure	—	—	—	0.01	—	—	—	—	—
				(0.02)					
Fiscal rules	—	—	—	—	0.067	—	—	—	—
					(0.086)				
Troika	—	—	—	—	—	0.013	—	—	—
						(0.22)			
Observations	81	81	78	81	81	81	81	81	78

Standard errors in parentheses. *** $P<0.01$, ** $P<0.05$, * $P<0.1$. Constant not reported.

Table A3: Heckman selection model for percentage of total tax increases – Robustness check II

		No controls	Controls I	Controls II	Controls III	Controls IV	Controls V	Yearly ratio	Δ ratio	Levels
% increase	Bond yield ratio	29.6***	34.2***	33.9***	37.2***	34.1***	37.4***	39.1***	23.8**	4.46
		(9.88)	(11.1)	(10.9)	(10.8)	(11.1)	(12.7)	(10.8)	(11.5)	(2.78)
	Partisanship	—	3.47	3.88	3.28	3.50	3.23	3.48	3.47	0.35
			(3.56)	(3.74)	(3.47)	(3.61)	(3.56)	(3.44)	(3.73)	(3.85)
	Lagged new government	—	9.25	8.79	6.15	9.23	9.31	7.67	16.5*	9.57
			(9.42)	(9.73)	(9.52)	(9.53)	(9.41)	(9.23)	(9.59)	(10.0)
	Euro dummy	—	16.7*	17.9*	19.3*	16.6	15.4	18.3*	3.82	8.74
			(9.86)	(10.1)	(9.88)	(10.5)	(10.2)	(9.64)	(9.54)	(11.4)
	Population	—	0.011	—	—	—	—	—	—	—
			(0.20)							
	Dependency ratio	—	—	−0.46	—	—	—	—	—	—
				(1.40)						
	Δ Government expenditure	—	—	—	−1.63	—	—	—	—	—
					(1.19)					
	Fiscal rules	—	—	—	—	−0.033	—	—	—	—
						(5.31)				
	Troika	—	—	—	—	—	−7.32	—	—	—
							(14.9)			
Selection	Bond yield ratio	0.31	0.35	0.35	0.35	0.35	0.35	0.26	−0.2	0.14
		(0.77)	(0.78)	(0.77)	(0.78)	(0.78)	(0.78)	(0.76)	(0.78)	(0.22)
	Crisis dummy	3.27***	3.27***	3.25***	3.27***	3.27***	3.27***	3.23***	3.22***	3.20***
		(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.48)	(0.48)	(0.50)
	Lagged new government	—	−0.15	−0.14	−0.15	−0.15	−0.15	−0.14	−0.11	−0.16
			(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.48)	(0.49)
	Observations	81	81	79	81	81	81	81	81	78

Standard errors in parentheses. *** $P<0.01$, ** $P<0.05$, * $P<0.1$. Constant not reported.

Table A4: Poisson model for number of direct tax changes – Robustness check III

	No controls	Controls I	Controls II	Controls III	Controls IV	Controls V	Yearly ratio	Δ ratio	Levels
Bond yield ratio	0.074	0.12	0.042	-0.004	0.052	-0.0054	-0.02	0.08	0.029
	(0.23)	(0.24)	(0.22)	(0.23)	(0.23)	(0.26)	(0.23)	(0.22)	(0.056)
Partisanship	—	0.02	-0.02	0.04	0.029	0.042	0.04	0.04	0.097
		(0.08)	(0.08)	(0.08)	(0.079)	(0.078)	(0.08)	(0.08)	(0.083)
Lagged new government	—	0.49**	0.42**	0.50**	0.49**	0.48**	0.49**	0.48**	0.48**
		(0.20)	(0.21)	(0.21)	(0.20)	(0.20)	(0.20)	(0.19)	(0.21)
Crisis dummy	—	4.07***	4.02***	4.06***	4.07***	4.05***	4.06***	4.07***	4.03***
		(1.00)	(1.00)	(1.00)	(1.00)	(1.01)	(1.00)	(1.00)	(1.01)
Euro dummy	—	-0.01	-0.09	-0.03	0.032	-0.00045	-0.03	-0.02	0.15
		(0.23)	(0.23)	(0.23)	(0.24)	(0.24)	(0.23)	(0.20)	(0.26)
Population	—	0.01*	—	—	—	—	—	—	—
		(0.00)							
Dependency ratio	—	—	0.07**	—	—	—	—	—	—
			(0.03)						
Δ Government expenditure	—	—	—	0.01	—	—	—	—	—
				(0.03)					
Fiscal rules	—	—	—	—	0.063	—	—	—	—
					(0.12)				
Troika	—	—	—	—	—	0.054	—	—	—
						(0.32)			
Observations	81	81	78	81	81	81	81	81	78

Standard errors in parentheses. *** $P<0.01$, ** $P<0.05$, * $P<0.1$. Constant not reported.

Table A5: Poisson model for number of indirect tax changes – Robustness check IV

	No controls	Controls I	Controls II	Controls III	Controls IV	Controls V	Yearly ratio	Δ ratio	Levels
Bond yield ratio	0.81***	0.77***	0.79***	0.78***	0.82***	0.74***	0.84***	0.58**	0.14*
	(0.22)	(0.26)	(0.25)	(0.26)	(0.25)	(0.27)	(0.26)	(0.26)	(0.073)
Partisanship	—	0.019	0.021	0.014	-0.0012	0.025	0.016	0.021	0.014
		(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.11)
Lagged new government	—	0.16	0.17	0.17	0.18	0.16	0.14	0.33	0.25
		(0.26)	(0.27)	(0.27)	(0.26)	(0.26)	(0.26)	(0.25)	(0.28)
Crisis dummy	—	3.49***	3.46***	3.49***	3.50***	3.47***	3.44***	3.53***	3.34***
		(1.01)	(1.01)	(1.01)	(1.01)	(1.01)	(1.01)	(1.01)	(1.01)
Euro dummy	—	0.27	0.29	0.27	0.33	0.31	0.28	-0.091	0.23
		(0.30)	(0.31)	(0.31)	(0.32)	(0.31)	(0.30)	(0.26)	(0.36)
Population	—	-0.00	—	—	—	—	—	—	—
		(0.01)							
Dependency ratio	—	—	-0.01	—	—	—	—	—	—
			(0.04)						
Δ Government expenditure	—	—	—	0.00	—	—	—	—	—
				(0.03)					
Fiscal rules	—	—	—	—	0.080	—	—	—	—
					(0.15)				
Troika	—	—	—	—	—	0.15	—	—	—
						(0.35)			
Observations	81	81	78	81	81	81	81	81	78

Standard errors in parentheses. *** $P<0.01$, ** $P<0.05$, * $P<0.1$. Constant not reported.

Table A6: Heckman selection model for percentage of direct tax increases – Robustness check V

		No controls	Controls I	Controls II	Controls III	Controls IV	Controls V	Yearly ratio	Δ ratio	Levels
% increase	Bond yield ratio	17.5	21.3	20.3	24.5**	21.2	27.6*	26.4**	12.4	3.17
		(11.2)	(13.1)	(13.0)	(12.1)	(13.3)	(15.1)	(13.0)	(12.3)	(3.06)
	Partisanship	—	4.29	3.66	3.11	4.32	3.94	4.61	4.25	2.50
			(4.16)	(4.33)	(3.89)	(4.17)	(4.15)	(4.06)	(4.18)	(4.33)
	Lagged new government	—	16.2	13.9	10	16.8	17.3	13.5	21.4*	13.8
			(11.5)	(12.0)	(11.0)	(11.6)	(11.5)	(11.5)	(10.9)	(11.7)
	Euro dummy	—	16.1	16.3	20.5*	18.1	13.3	19.1	8.05	13.0
			(12.0)	(12.7)	(11.3)	(12.6)	(12.4)	(11.8)	(10.8)	(13.2)
	Population	—	0.13	—	—	—	—	—	—	—
			(0.23)							
	Dependency ratio	—	—	1.18	—	—	—	—	—	—
				(1.83)						
	Δ Government expenditure	—	—	—	-4.35***	—	—	—	—	—
					(1.61)					
	Fiscal rules	—	—	—	—	2.80	—	—	—	—
						(6.33)				
	Troika	—	—	—	—	—	-18.6	—	—	—
							(19.3)			
Selection	Bond yield ratio	-0.12	-0.14	-0.12	-0.14	-0.14	-0.14	-0.22	-0.11	0.065
		(0.46)	(0.47)	(0.47)	(0.47)	(0.47)	(0.47)	(0.48)	(0.57)	(0.13)
	Crisis dummy	2.91***	2.92***	2.90***	2.92***	2.92***	2.92***	2.93***	2.91***	2.95***
		(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.51)
	Lagged new government	—	0.087	0.12	0.087	0.087	0.087	0.1	0.07	-0.11
			(0.41)	(0.41)	(0.41)	(0.41)	(0.41)	(0.41)	(0.40)	(0.43)
	Observations	81	81	79	81	81	81	81	81	78

Standard errors in parentheses. *** $P<0.01$, ** $P<0.05$, * $P<0.1$. Constant not reported.

Table A7: Heckman selection model for percentage of indirect tax increases – Robustness check VI

		No controls	Controls I	Controls II	Controls III	Controls IV	Controls V	Yearly ratio	Δ ratio	Levels
% increase	Bond yield ratio	30.4**	32.4**	33.4**	34.8**	32.8*	34.0*	37.5**	22.6	4.22
		(14.7)	(16.1)	(17.0)	(17.3)	(16.9)	(17.9)	(17.2)	(15.9)	(4.82)
	Partisanship	—	1.46	-0.42	0.51	0.74	0.41	0.57	0.78	-3.51
			(4.59)	(4.94)	(4.61)	(4.69)	(4.75)	(4.57)	(5.01)	(5.34)
	Lagged new government	—	7.03	-2.84	2.28	2.87	2.68	3.34	1.96	0.99
			(13.4)	(14.8)	(13.7)	(13.5)	(13.8)	(13.3)	(15.6)	(14.7)
	Euro dummy	—	7.11	8.54	7.48	4.70	6.07	8.29	-14.4	-4.40
			(14.5)	(15.3)	(15.3)	(16.3)	(15.9)	(14.9)	(14.0)	(18.9)
	Population	—	-0.36	—	—	—	—	—	—	—
			(0.31)							
	Dependency ratio	—	—	0.29	—	—	—	—	—	—
				(1.87)						
	Δ Government expenditure	—	—	—	-0.41	—	—	—	—	—
					(1.51)					
	Fiscal rules	—	—	—	—	-2.10	—	—	—	—
						(7.69)				
	Troika	—	—	—	—	—	-1.45	—	—	—
							(19.5)			
Selection	Bond yield ratio	0.99*	0.81	0.81	0.81	0.81	0.81	0.77	0.036	0.17
		(0.54)	(0.54)	(0.54)	(0.54)	(0.54)	(0.54)	(0.53)	(0.48)	(0.12)
	Crisis dummy	2.42***	2.58***	2.56***	2.58***	2.58***	2.58***	2.51***	2.51***	2.39***
		(0.50)	(0.54)	(0.54)	(0.54)	(0.54)	(0.54)	(0.53)	(0.54)	(0.53)
	Lagged new government	—	0.59	0.66*	0.59	0.59	0.59	0.59	0.73**	0.58
			(0.38)	(0.38)	(0.38)	(0.38)	(0.38)	(0.38)	(0.37)	(0.38)
	Observations	81	81	79	81	81	81	81	81	78

Standard errors in parentheses. *** $P<0.01$, ** $P<0.05$, * $P<0.1$. Constant not reported.

Table A8: Random effects model with clustered standard errors – Robustness check VII

	# total changes	# direct changes	# indirect changes	% total increases	% direct increases	% indirect increases
Bond yield ratio	1.51***	0.15	1.14***	34.6***	19.2	35.0***
	(0.52)	(0.38)	(0.25)	(9.18)	(12.3)	(10.2)
Partisanship	0.018	0.018	0.031	3.53	4.59	0.45
	(0.098)	(0.10)	(0.045)	(3.52)	(3.64)	(4.97)
Lagged new government	0.74*	0.60**	0.10	9.04	16.4	13.8
	(0.42)	(0.27)	(0.20)	(8.46)	(13.9)	(13.5)
Crisis dummy	3.73***	2.07***	1.25***	25.8***	14.3	46.7***
	(0.32)	(0.25)	(0.13)	(7.06)	(12.2)	(15.1)
Euro dummy	0.022	0.033	0.26	16.7	16.5	1.54
	(0.36)	(0.29)	(0.18)	(11.5)	(14.0)	(16.9)
Observations	81	81	81	54	48	38

Standard errors in parentheses. *** $P<0.01$, ** $P<0.05$, * $P<0.1$. Constant not reported.