

Fiscal institutions, fiscal policy and sovereign risk premia

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Abstract:

We investigate the effect of fiscal institutions such as the strength of the finance minister in the budget process and deficits on interest spreads contained in bond yields of the countries now belonging to the Eurozone. Deficits significantly increase risk premia measured by relative swap spreads. The effect of deficits is significantly lower under EMU. This effect partly results from neglecting the role of fiscal institutions. After controlling for institutional changes, fiscal policy remains a significant determinant of risk premia. We find that better institutions are connected with lower risk premia. Furthermore deficits and surpluses matter less for risk premia in countries with better institutions. This reflects the market perception, that better institutions will reduce fiscal difficulties and make the monitoring of annual developments less important. The results are robust to controlling for country fixed effects and different estimation methodologies.

Keywords:

Budget institutions, fiscal rules, sovereign risk premia, EMU, fiscal policy, government bond yields

JEL-Classification:

E43, E62, H61, H62, G12, G15

Non technical summary

Fiscal rules have gained considerable prominence over the last decade. Especially in the countries of the Eurozone, where policymakers and voters are concerned about large and persistent deficits, fiscal rules are often seen as a remedy to reduce the deficit bias. However, persistently high deficits and weak compliance with the fiscal rules in Europe has initiated a debate about additional institutions capable of reducing deficits. An extensive literature suggests that the institutional framework of budgetary processes has important effects on fiscal outcomes. In a seminal paper, von Hagen (1992) models the deficit bias as resulting from a common pool problem. He investigates the constraint that fiscal institutions pose on governments to reduce the common pool resource problem and finds that institutional features of the budget process, such as the veto rights of the finance minister in the budget process, affect budget discipline. Better institutions are connected with better fiscal performance, i.e. lower deficits/debt levels. These results have subsequently been confirmed and extended in numerous studies (e.g., von Hagen and Harden (1995), Hallerberg (2004)). While the relevance of fiscal institutions for fiscal outcomes is thus well documented, to our knowledge no study investigates to what extent financial markets consider budget processes when assessing default probabilities in Europe.

This paper assesses the impact of good institutions on risk premia in European government bond markets. In particular, we argue that if better institutions improve the long-term fiscal prospects, they should have beneficial effects beyond their direct effects on the fiscal performance in a given year. Furthermore, individual deficits should be less important in countries with better institutions, as financial markets know that they are not driven by a systematic bias but rather reflect temporary effects. We test these hypotheses in a regression framework consistent with Codogno, Favero, and Missale (2003). Our regression results show that better budget institutions are connected with lower risk premia. Furthermore, the effect of budget deficits on risk premia is lower in countries with more centralized budget processes. Finally, neglecting the role of institutions leads to an omitted variable bias in the effects of fiscal policy on risk premia under EMU. Our results therefore lend support to the hypothesis that budget institutions are an effective way of reducing deficit biases.

Nicht technische Zusammenfassung

Finanzpolitische Regeln sind in den vergangenen zehn Jahren immer stärker in den Blickpunkt gerückt. Besonders in Ländern der Eurozone, wo Entscheidungsträger und Wähler über hohe und anhaltende Defizite besorgt sind, werden finanzpolitische Regeln häufig als Mittel zur Verringerung der Defizitneigung angesehen. Anhaltend hohe Defizite und schwache Einhaltung der finanzpolitischen Regeln in Europa haben eine Debatte darüber in Gang gesetzt, welche zusätzlichen Institutionen geeignet sind, Defizite zu reduzieren. Eine umfangreiche Fachliteratur zeigt, dass der institutionelle Rahmen der Haushaltsverfahren bedeutende Auswirkungen auf die Haushaltsergebnisse hat. In einem richtungsweisenden Forschungsbeitrag modelliert von Hagen (1992) die Defizitneigung als Ergebnis eines Allmende-Problems. Er untersucht die den Regierungen durch finanzpolitische Institutionen auferlegten Beschränkungen, die dem Problem des gemeinsamen Ressourcenpools entgegenwirken sollen, und stellt fest, dass institutionelle Merkmale des Haushaltsverfahrens wie etwa die Vetorechte des Finanzministers die Haushaltsdisziplin beeinflussen. Bessere finanzpolitische Institutionen korrelieren mit einer besseren Haushaltslage, d. h. geringeren Defiziten und Schuldenständen. Diese Befunde wurden in der Folge in zahlreichen Untersuchungen bestätigt und weiter differenziert (z. B. von Hagen und Harden (1995), Hallerberg (2004)). Während die Bedeutung finanzpolitischer Institutionen für die Haushaltsergebnisse somit gut dokumentiert ist, liegen unseres Wissens nach keine Untersuchungen darüber vor, inwieweit die Finanzmärkte die jeweiligen Haushaltsverfahren bei der Beurteilung der Ausfallwahrscheinlichkeiten in Europa berücksichtigen.

Im vorliegenden Beitrag wird abgeschätzt, welchen Einfluss gute finanzpolitische Institutionen auf die Risikoprämien an den europäischen Staatsanleihemärkten haben. Im Einzelnen wird argumentiert, dass Haushaltsinstitutionen, die die langfristigen Aussichten für die öffentlichen Finanzen verbessern, positive Auswirkungen haben sollten, die über ihren direkten Einfluss auf die Haushaltsergebnisse in einem gegebenen Jahr hinausgehen. Überdies sollten einzelne Defizite in Ländern mit besseren Haushaltsinstitutionen von geringerer Tragweite sein, da die Finanzmärkte wissen, dass diese Defizite nicht auf eine systematische Defizitneigung, sondern vielmehr auf temporäre Effekte zurückzuführen sind. Diese Hypothesen werden anhand eines

Regressionsmodells nach Codogno, Favero und Missale (2003) geprüft. Die Regressionsergebnisse zeigen, dass bessere Haushaltsinstitutionen mit niedrigeren Risikoprämien einhergehen. Zudem sind die Auswirkungen von Haushaltsdefiziten auf die Risikoprämien in Ländern mit besseren finanzpolitischen Institutionen geringer. Wird die Bedeutung dieser Institutionen außer Acht gelassen, so führt dies zu einer durch ausgelassene Variablen bedingten Verzerrung ("Omitted Variable Bias") bei den Auswirkungen der Finanzpolitik auf die Risikoprämien im Rahmen der WWU. Die Ergebnisse stützen daher die Hypothese, dass die Defizitneigung über Haushaltsinstitutionen wirksam verringert werden kann.

Contents

1	Introduction	1
2	Empirical approach	3
2.1	A short review of the indices of budgeting	3
2.2	Estimation approach	9
3	Empirical results	12
4	Conclusions	15
	References	15
A	Figures	19
B	Estimation results	21

List of Tables

1	Institutions	8
2	Regression results	22
3	Regression results	23

List of Figures

1	Institutional change	6
2	Interest rate spreads	19
3	Marginal effects	20
4	Marginal effects	21

Fiscal institutions, fiscal policy and sovereign risk premia¹

1 Introduction

Fiscal rules have gained considerable prominence over the last decade. Especially in Europe, where policymakers and voters are concerned alike about large and persistent deficits, fiscal rules are often seen as a remedy to reduce the deficit bias. An extensive literature investigates the effectiveness of fiscal rules in establishing sound public finances. The effectiveness of simple numerical targets appears to be limited due to significant government operations to circumvent the targets, which shift spending to non-restricted items (von Hagen (1991), Bunch (1991), Kiewiet and Szakaly (1996), Dafflon and Rossi (1999), Milesi-Ferretti (2003), and von Hagen and Wolff (2006)). Furthermore, the effectiveness of numerical targets crucially depends on the enforcement of penalties for violating them, as has been shown by Bohn and Inman (1996) for the US. For Europe, inconsistent compliance with the Stability and Growth Pact's fiscal rules suggests that enforcement mechanisms are weak.

On the other hand, an extensive literature suggests that the institutional framework in which budgetary processes are embedded has important effects on fiscal outcomes. In a seminal paper, von Hagen (1992) models the deficit bias as resulting from a common pool problem. He investigates the constraint that fiscal institutions pose on governments to reduce the common pool resource problem and finds that institutional features of the budget process, such as the veto rights of the finance minister in the budget process, that centralize the decision-making process lead to tighter budget discipline. Better institutions are connected with better fiscal performance, i.e. lower deficits/debt levels. These results have subsequently been confirmed and extended in numerous studies for the European Union by von Hagen and Harden (1995), Hallerberg and von Hagen (1997), Hallerberg, Strauch, and von Hagen (2004), Hallerberg (2004) and Gleich (2003) for Central and Eastern European countries. Alesina

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and Perotti (1996) lend additional support to the hypothesis that budget institutions significantly influence fiscal outcomes. Krogstrup and Wyplosz (2006) further extend this literature by modelling how different institutions reduce the common pool deficit bias. They find that a strong finance minister is an effective way to reduce the bias.²

This literature on fiscal rules contrasts with another literature that considers the role of markets in disciplining bad governmental behavior. Market actors monitor governments. They also determine the interest rate at which they are willing to finance public deficits, or whether they are willing to lend additional money at all. Governments for their party cannot run budget deficits if they cannot borrow. The strongest disciplining markets at the sub-national level are probably in the United States. There is some evidence that markets have played an important role in disciplining developing countries in some contexts as well (Wibbels 2005). In the European context, it is clear that markets pay some attention to what governments are doing (Afonso and Strauch (2004) and Bernoth, von Hagen, and Schuknecht (2004)). Yet there has been increasing frustration among some policy-makers that markets seemingly do not react sufficiently to deteriorations of public finances in euro-zone countries (Schuknecht 2004). Also, it is feared that potential reactions will come too late and then too strongly.

Given this backdrop, there are few studies that bring together financial market monitoring and fiscal institutions. If the institutions matter as much as the literature suggests, markets should consider the quality of a given country's institutions when they assess default probabilities. The only work we know of considers just the American context. Poterba and Rueben (1999, 2001) analyze the role of state fiscal institutions on interest rates in the U.S. municipal bond market. They show that institutions affect interest rates beyond their indirect effect on the actual fiscal state measured by e.g., the debt level. Lowry and Alt (2001) specify a similar regression equation and show that fiscal institutions in American states have real effects on bond rates. Johnson and Kriz (2005) show that expenditure limits and stricter balanced budget rules lower interest costs because they lower the credit risk.

An additional benefit of investigating the relevance of institutions with financial market data is that endogeneity problems are less of a concern. It is

²In a recent paper, Dutttagupta and Tolosa (2006) empirically show the existence of an additional deficit bias resulting from a currency union.

difficult to untangle the direction of causality between institutions and budget deficits (Acemoglu 2005). However, we argue that it is unlikely that countries change their institutions because of risk premia in government markets. Financial market data are thus an additional way of assessing the relevance of fiscal institutions. Since one is able to control for actual fiscal outcomes, the effects are neither driven by reverse causality nor by an omitted variable bias.

The main purpose of this paper is to assess the impact of good institutions on risk premia in Eurozone government bond markets. In particular, we argue that if better institutions improve the long-term fiscal prospects, they should have beneficial effects beyond their direct effects on the fiscal performance in a given year. Furthermore, individual deficits should be less important in countries with better institutions, as financial markets know that they are not driven by a systematic bias but rather reflect temporary effects. Finally, we show that neglecting the role of institutions in the regressions results in an omitted variable bias. We test these hypotheses in a regression framework by Codogno, Favero, and Missale (2003) and Pagano and Thadden (2004) and confirm the standard results of the effects of fiscal policy on risk premia in Europe by Bernoth, von Hagen, and Schuknecht (2004) and Bernoth and Wolff (2006). Our regression results show that better budget institutions are connected with lower risk premia. Furthermore, the effect of fiscal policy variables on risk premia is lower in countries with better fiscal institutions. Our results therefore lend support to the hypothesis that budget institutions are an effective way of reducing deficit biases.

The next section outlines the empirical approach for testing the relevance of institutions, section 3 summarizes the results, and the last section concludes.

2 Empirical approach

2.1 A short review of the indices of budgeting

Problems with fiscal discipline can arise from at least two sources (von Hagen (1992) and von Hagen and Harden (1995))³: Differences between long-run and short-run benefits can induce deficit spending biases if policy makers discount the future more heavily than private consumers, second, differences between the marginal benefit and marginal cost to an individual group in the budget

³For a further discussion of the political economy of budget deficits, see Alesina and Perotti (1995)

making process lead to a common pool resource problem. Individual spending ministers and their constituency benefit from a spending program, while the cost of the program is being placed on the general taxpayer. Procedural rules of the budget process can be used as a commitment device to reduce this spending bias. The main feature characterizing fiscal institutions can thus be characterized by the degree to which they centralize the decision-making process (Hallerberg, Strauch, and von Hagen 2004). Good budget institutions centralize the process and reduce the spending bias associated with the common pool problem.

There are several ways to consider how to measure the concept of "good budget institutions." The first focuses only on the power of the finance minister. Markets focus primarily on the role of the most public person on budgetary matters in government, the finance minister. We compute an index *MinFin* that includes only values for the ability of the finance minister to affect the budget. The strongest finance minister is found in France while the weakest is in the Netherlands.

The second method focuses instead on the role of the legislature. Lienert (2005) measures the degree of legislative control of the budget based on information on the medium-term framework, amendment powers, time for scrutiny of the budget, technical support to legislature and restrictions during execution. A larger value of the index implies greater parliamentary powers on the budget. This should in principle aggravate the common pool resource problem and thereby be connected with more persistent deficits and greater risk premia. To make this value comparable with the others, we standardize it to run from 0 to 1 and subtract it from 1, so that high values represent greater centralization of the budget process. Greece and Ireland both have parliaments that most centralize the budget process while Italy has the weakest institution. One note of caution here is that, unlike for the other variables, we have an observation in one point in time for Lienert's index that we must extend across the entire sample. We nevertheless wanted to use this index, as it is derived from an independent source.

von Hagen (1992) develops a more comprehensive index to measure features of the budget process that are conducive to solving the common pool problem. Hallerberg, Strauch, and von Hagen (2005) extensively discuss this index and the updating of the index. They did surveys in 1991, 2000, and 2004, and

Hallerberg (2004) is used to classify the exact year that institutions changed.⁴ The first index used in this paper that comes from von Hagen (1992) is *centralization*. It consists of three sub-indices—the first refers to the structure of negotiations within governments, the second to the parliamentary stage of the budget, and the third to the flexibility of the budget execution. All sub-indices are equally weighted. A large score should be connected with better control of the spending bias and lower deficits.⁵ The highest score in 2004 was for France while the lowest was for the Netherlands.

Finally, Hallerberg, Strauch, and von Hagen (2004) and Hallerberg (2004) contend that one index is not appropriate for all countries. They argue that two different approaches overcome the deficit bias inherent in fragmented budgetary decision-making depending upon the underlying political structure: the delegation approach and the contract approach. The delegation approach rests on the delegation of power to the finance minister, while the contract approach is based on binding fiscal targets usually embedded in coalition agreements. Hallerberg, Strauch, and von Hagen (2004) argue that the different approaches are more or less suited for different types of government. Delegating budgetary power to a finance minister is more suitable in single party governments, while in coalition governments a contract approach to the budget helps to restrict profligate fiscal policy. Accordingly, we compute a third index, the index *ideal*. It includes *delegation* for states where delegation institutions are expected to be optimal, which are countries where the ideological distance among coalition partners is zero or small. For states where the ideological distance is large, the variable *targets* is used instead. It includes the sum of four measures of the use of multi-annual fiscal targets. Using this index, the Netherlands moves from having the weakest institutions to the strongest in 2004 given its extensive use of fiscal targets, while the weakest state is Spain.

Note that each of these indices assumes that greater centralization of the budget process leads to better fiscal performance. The assumption we have is that markets have some innate understanding that some countries have "better" institutions than others, and they price bonds accordingly.

To give the reader a sense for how these institutions vary, Table 1 includes the scores for the indices in 1991 and 2004 normalized to run between 0 and 1, with zero indicating no institutions consistent with budget centralization

⁴More detail is provided in Hallerberg, Strauch, and von Hagen 2006.

⁵This index is equivalent to Structural Index 2 in von Hagen 1992.

while 1 indicates all institutions were included that were consistent with centralization. Our dataset includes the twelve countries that are members of the Eurozone minus Luxembourg, which was in monetary union with Belgium prior to 1999 and hence does not have an independent currency. Germany is the reference country for the study.⁶ The table indicates that the strength of fiscal institutions varies both across countries and across time.

Since we rely on fixed effects regression, the prime interest is in the variation in time of the indices. Figure 1 shows the variation of the *ideal* index in the investigated period. As can be seen, many countries significantly changed the quality of their budget institutions in the 1990s. Greece, e.g., witnessed strong improvements at the beginning of 1998 of *ideal*, but also of the simpler measure, the power of the finance minister. Portugal improved at the beginning of 1998 and subsequently at the beginning of 2003. The Netherlands had some weakening of their institutions at the beginning of 1995, but significantly improved their budgetary system by early 2003.⁷

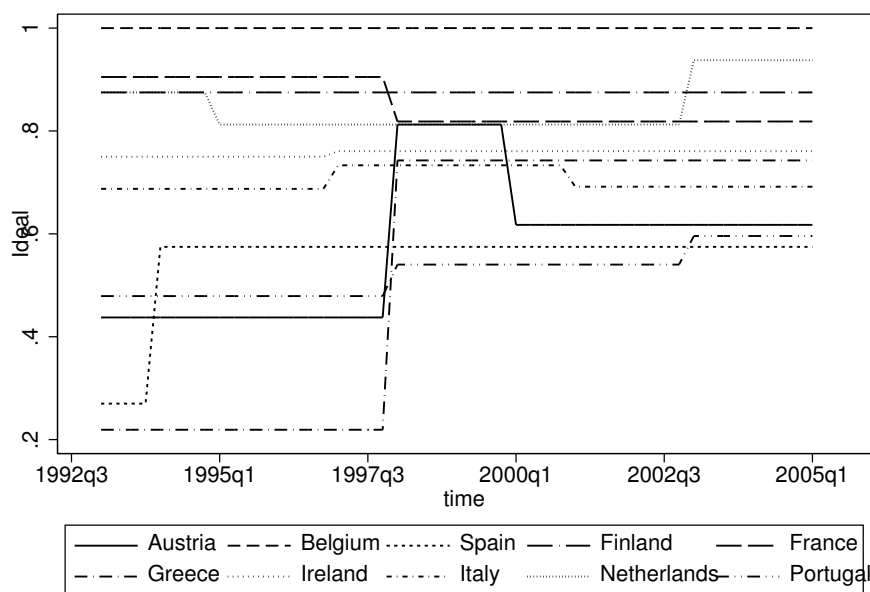


Figure 1: Evolution of the strength of the "Ideal" institution.

The following case studies of Spain and Italy provide further insights of

⁶Germany is the standard reference country. In addition, the fiscal institutions hardly changed at all in Germany, with the centralization and ideal indices moving up only slightly (from .57 to .62). Taking the institutional indices as difference to Germany thus does not affect the main results.

⁷For details on these cases, see Hallerberg (2004) and Hallerberg, Strauch, and von Hagen (2006).

when and under what circumstances the described institutions changed. In 1993, Spain's budget deficit was almost seven percent of GDP. It began to improve by 1995, as economic growth picked up after the brief recession in the early 1990s, but, as a Financial Times article noted at the time, "international financial markets have been in an unforgiving mood towards Spain's economic difficulties" (May 23, 1995). Markets generally lacked confidence in the reforms initiatives of the Gonzalez government. One reason for this lack of confidence may very well have been the signals that the fiscal rules and institutions sent to investors—as Table 1 indicates, Spain also had one of the weakest set of fiscal institutions in place. At the beginning of 1996, the new Prime Minister, Jose Maria Aznar, changed significantly the way governments make budgets. He strengthened significantly the power of the Minister of Economy and Budget, with this minister now, among other powers, negotiating the budget bilaterally with his cabinet colleagues (Hallerberg 2004, 213). Overall, the strength of the finance minister increased and pulled up Spain's centralization of the budget process. Deficits fell notably in both 1996 and 1997.

Evidence from Italy reinforces the point. After the EMS crisis in Fall 1992, few observers believed that Italy could qualify for Economic and Monetary Union. Fiscal institutions were weak. The country had multi-party coalition governments with significant ideological differences among the parties. From the fiscal governance perspective, the country should have fiscal contracts in place, that is, institutions that support the execution of multi-annual expenditure targets. These institutions were relatively weak. By early 1996, matters had changed politically since 1992, however. A new electoral system meant that parties were encouraged to run as two opposing blocks, and this meant that the delegation form of fiscal governance would be most appropriate. Indeed, the newly elected Prime Minister, Romano Prodi, gave significant budget-setting powers to his Treasury Minister, Carlo Ciampi. In summary, both case studies show how fiscal institutions changed in the mid-1990s to address fiscal imbalances.

Table 1: Different measures of budget institutions

Country	Negotiating Power of MF		Parliament		Delegation Rules		Fiscal Targets		"Ideal" Rules		
	1993	2000/04	Entire Period	1993	2000/04	1993	2000/04	1993	2000/04	1993	2000/04
Austria	0.25	0.88	0.14	0.38	0.62	0.43	0.81	0.43	0.62	0.43	0.62
Belgium	0.75	0.75	0.43	0.44	.44/.51	0	1	1	1	1	1
Finland	0.31	0.75	0.14	0.37	0.52	0.88	0.88	0.88	0.88	0.88	0.88
France	1	1	0.42	0.91	.87/.81	0.19	0.81	0.91	.87/.81	0.91	.87/.81
Greece	0.06	0.88	1	0.22	0.74	0.31	0.75	0.22	0.74	0.22	0.74
Ireland	0.88	0.88	1	0.76	0.76	0.75	0.75	0.76	0.76	0.76	0.76
Italy	0.48	1/.88	0	0.27	.73/.69	0.69	0.81	0.69	.73/.69	0.69	.73/.69
Netherlands	0.67	0.69	0.14	0.56	0.47	0.88	.81/.94	0.88	.81/.94	0.88	.81/.94
Portugal	0.6	0.75	0.29	0.48	.54/.6	0.36	0.88	0.48	.54/.6	0.48	.54/.6
Spain	0.38	0.94	0.57	0.27	0.57	0.38	0.81	0.27	0.57	0.27	0.57
Average	0.54	.84/.83	0.41	0.47	.62/.63	0.49	.84/.85	0.65	.78/.79	0.65	.78/.79

Notes: The index for the parliaments was taken from Lienert (2005), all other indices from Hallerberg et al (2006).

2.2 Estimation approach

The aim of the paper is to measure the effect of the described fiscal institutions on risk premia in financial markets. We test three hypotheses: (1) The estimated weakening of the effects of fiscal policy on risk premia under EMU partly results from omitting institutional variables. (2) Better institutions are connected with lower default risk premia. (3) Furthermore, the annual budget balances should matter less when institutions are good. There are at least two reasons for this last expectation. First, the common pool spending bias should be lower in countries with more centralized fiscal institutions. Markets should therefore recognize, that individual deficits and surpluses lose their information content on likely future fiscal stances. The general time path of deficits is expected to be lower and therefore bonds are priced without reference to annual fiscal behavior. Second, more robust institutions should strengthen the credibility of government promises about future fiscal behavior.⁸

Econometrically, this suggests that we perform one set of regressions, where we include the institution as an additional variable to assess the risk premia reducing effect of institutions. In this regression, we can also test, whether weaker effects of fiscal variables under EMU are due to an omitted variable problem. In particular, Bernoth and Wolff (2006) suggest that the strong weakening of the relevance of fiscal policy for risk premia under EMU found in Bernoth, von Hagen, and Schuknecht (2004) might either result from a significant improvement of the fiscal institutions in Europe or from a perceived increase in the likelihood of a bail-out. Indeed, the discussion of the institutional changes shows that we observe strong improvements in countries with relatively bad fiscal performance prior to EMU. Including these institutional data should therefore result in stronger relevance of fiscal policy under EMU.

In a next regression, we include besides the institutional variable an interaction term between institution and the deficit. In this regression, we look at the conditional coefficient of the effect of fiscal deficits given the strength of the fiscal institutions. A budget deficit in a country with weak institutions should affect bond prices while a deficit in a country with strong institutions should not. This requires the calculation of conditional coefficients. As Greene

⁸We also thought about testing, whether debt levels become less relevant with better institutions. Here, the case is less clear, however. Debt levels are a state variable. Large debt levels in countries with good institutions still represent a burden of repayment for governments. This should still be reflected in risk premia. The weakening of risk premia through better institutions should thus be less pronounced.

(2003, 123-24) explains in his classic econometrics textbook, the interpretation of conditional coefficients includes more than just looking at the interaction term. The conditional standard error in particular depends both on the values of the interacted variables and a covariance that must be calculated (see also Brambor, Clark, and Golder (2006) for a careful discussion of the interpretation of interaction models.)

Accordingly we define our estimation equation as

$$spread_{it} = \alpha_1 deficit_{it} + \alpha_2 debt_{it} + \alpha_3 I_{it} + \alpha_4 I_{it} * deficit_{it} + Z_{it} \alpha_5 + \varepsilon_{it} \quad (1)$$

where the spread variable is calculated following Favero, Giavazzi, and Spaventa (1997) and Codogno, Favero, and Missale (2003) as the component of yield differentials not related to exchange rate factors measured by the relative asset swap of a country, defined as

$$spread_{it} \equiv (R_t^i - R_t^{GER}) - (RSW_t^i - RSW_t^{GER}) \quad (2)$$

where R_t^i are the redemption yields to maturity of 10 year bonds issued of country i respectively Germany, and RSW are the 10-year fixed interest rates on swaps denominated in currency i and in deutschmarks respectively.⁹ We measure this spread at a quarterly frequency.¹⁰ Our sample starts with the first quarter 1993 and ends with the first quarter 2005. The start date is chosen so that we have the same number of years before the introduction as after the introduction of the Euro in most countries of the sample. We only have knowledge of the institutional data until the end of 2004/early 2005 and therefore ended our sample here.

$deficit_{it}$ is the difference in the deficit between country i and Germany in year t . $debt_{it}$ is the difference in the debt level positions of the two countries. The deficit and debt data are taken from the Ameco database at an annual frequency in the definition of the excessive deficit procedure.¹¹ I_{it} is one of the four described institutional indicators. For three of the four indicators, we are able to date the quarter of the institutional change.

⁹The swap rate is a fixed interest rate for a variable interest rate. Following the expectation hypothesis and the uncovered interest parity, the expected devaluation of a currency and the inflation rate is included in this rate. In fact, after the introduction of the Euro, the difference in the swap rate to Germany is virtually zero.

¹⁰These data are taken from Datastream.

¹¹We used the same annual value for each of the four quarters. Alternatively, one could use one fourth of the annual value without change of results.

Finally, Z_{it} is a vector of control variables for market liquidity, and market risk aversion. The *liquidity* variable serves to estimate the liquidity premium. We assume that the total volume of supply of a security has a positive effect on its liquidity. Following this reasoning, we assume as Bernoth, von Hagen, and Schuknecht (2004) and Gómez-Puig (2006) that liquidity depends on relative market size. Thus, the liquidity premium is assumed to be proportional to the ratio of the debt issued by a government relative to the total debt of EU countries issued.

Yield spreads also co-move (Figure 2). Empirical research shows that the *investors' risk aversion* towards credit risk determines this co-movement.¹² Since investors' risk aversion is not directly observable, we use, similar to Codogno, Favero, and Missale (2003) Favero and Giavazzi (2004), and Bernoth, von Hagen, and Schuknecht (2004)), the yield spread between low grade US corporate bonds (BBB) and benchmark US government bonds as an empirical proxy. The corporate yield spreads variable, which measures the difference between 7 to 10 year low grade corporate bonds (BBB) and 7 to 10 year benchmark government bonds in the USA, is provided by Merrill Lynch.¹³

Finally, the conventional wisdom is that EMU changed the rules of the game on bond prices. To address potential structural breaks resulting from the introduction of a common currency, we include a dummy for EMU, and we also interact the dummy with the deficit and debt variables.

We performed a Hausman test, which clearly indicates that a fixed effects model needs to be estimated instead of a random effects model. Our first specification is therefore simple fixed effects. Bond spreads are likely to be autocorrelated as yields depend on the individual country's business cycle. This suggests the need for a lagged dependent variable to correct for the autocorrelation. Indeed, the lagged dependent variable is highly significant

¹²Dungey, Martin, and Pagan (2000) provide strong evidence of a common international factor in many yield differentials. Codogno, Favero, and Missale (2003) and Pagano and Thadden (2004) also note considerable co-movement of yield spreads, probably driven by international risk factors. Bernoth, von Hagen, and Schuknecht (2004) confirm as well that interest differentials between EU countries are significantly affected by international risk factors and that the USA and Germany enjoy a 'safe haven' status.

¹³A variable that measures the respective corporate bond spread for the complete Euroarea is not available, but the empirical literature on sovereign bond spreads of emerging markets shows that spreads are sensitive to US risk factors (see, e.g., Barnes and Cline (1997), Kamin and von Kleist (1999), Eichengreen and Mody (2000)). Therefore, data on US corporate-government bond yield spreads can be used as a good proxy for the overall investors' risk attitude.

when included in all models, which suggests an empirical reason to include it as well to avoid omitted variable bias. Nickell (1981) points out, that this introduces a bias of its own because the lagged dependent variable is by construction correlated with the fixed effects. This bias, however, decreases in T . Using Monte Carlo simulations, Beck and Katz (2004) find that the Nickel bias is low (two percent or less) once $T=20$, and they advise that one includes a lagged dependent variable if T is at least 20. Given that T is above 40 in our sample and we have both theoretical and empirical reasons to include it in the first place, we focus on this specification with panel-corrected standard errors when interpreting the results. Judson and Owen (1999) compare the performance of different dynamic panel estimators in typical macroeconomic data-sets and also conclude that for unbalanced samples the least square estimator with country dummies and lagged dependent variable performs best. The bias for the coefficients on the independent variables is minor in any of the estimators. For each of the institutional configurations, we also include a simple fixed effects specification without the lagged dependent variable for comparison purposes.

Our hypotheses are that the deficit and the debt level increase risk premia, while better institutions should lower the spread. Furthermore, the conditional coefficient of the effect of deficits in an interaction model should be positive and significant when fiscal institutions are weak but statistically insignificant when institutions are strong.

3 Empirical results

The main empirical results for the indices taken from Hallerberg, Strauch, and von Hagen (2005) are presented in Table 2, Table 3 shows the dynamic model. We find that indeed deficits and debt levels significantly increase spreads in specifications with fixed effects and without the interaction terms (A). An increase of the deficit by one percent of GDP increases the relative spread by roughly 4 basis points. We also find the effects of deficits to be significantly weaker in EMU in specification (A), confirming previous results by Bernoth, von Hagen, and Schuknecht (2004) and Bernoth and Wolff (2006) with different data. Under EMU an equivalent deficit increase will increase the spread by only 1.5 basis points, this effect remains significant. Regarding the effects of debt levels under EMU, an F-test reports an insignificant effect on risk premia

in bond markets. In the dynamic model, these numbers are somewhat smaller and fiscal policy becomes even less relevant under EMU.

In regression B, F, and H we check whether the weakening of the effects of fiscal policy under EMU results from an omitted variable bias, the institution. Stronger powers granted to the minister of finance indeed result in an increase of the relevance of fiscal policy under EMU. An F-test on the joint effect of deficits under EMU respectively debt under EMU allows one to reject the null hypothesis of no relevance of these variables for risk premia. This result suggests that the institutional changes explain the weakening of the relevance of fiscal policy for risk premia. Once one controls for this previously omitted variable, fiscal policy remains significant under EMU.

The regression results for the role of the finance minister further confirm our hypotheses. Stronger finance ministers are connected with lower spreads. This effect is still valid even after controlling for country fixed effects and is thus not determined by unobserved country specific factors. An increase in the index by 1 standard deviation lowers the spread by 9 basis points *ceteris paribus*.

In regressions C, G, and I, we also find our third hypothesis confirmed. Countries that have institutions better suitable to solve deficit biases have to pay lower risk premia for their current deficits. This probably reflects the perception of markets that any deficit that exists is not caused by a systematic bias resulting from inappropriate institutions but rather reflects a reaction to specific (short-run) events. Therefore, the deficit is seen as less harmful and increases spreads less.

These three basic findings have partial confirmation with the parliamentary index by Lienert (2005). A reduction in the power of the parliament lowers risk premia in the specification without a lagged dependent variable. The effect becomes insignificant, however, in the dynamic model specification. This could be because we have no variance in this variable over time. It could also be that parliament is only one part of the budget process, and an index focused only on its role is an inexact measure of the level of centralization of the process as a whole.

With the interaction terms, the interest is in the marginal effect of deficits on spreads given the strength of fiscal institutions. We therefore calculate the marginal effect of both deficits and debt prior to EMU as well as after EMU conditional on different values of the institutional indices.

The conditional coefficients are visualized in Figures 3 and 4. There are several notable features. The figures both show that the marginal effects of deficits decrease with better institutions. This clearly confirms our third hypothesis. For very good institutions, financial markets will not bother to change their default risk assessment when fiscal policy changes. For the negotiating power of the finance minister, our results indicate that financial markets do not care about deficits once the index passes a certain threshold. The deficits become marginally insignificant at a 5 percent level, once the power of the finance minister has passed a threshold of 0.82 before EMU and 0.75 after EMU.

Finally, the expectation from Hallerberg, Strauch, and von Hagen (2006) is that the centralization index is not appropriate for all countries. Strengthening the finance minister in the Netherlands, for example, where detailed fiscal targets centralize the process instead of giving powers to one central player in the budget process, should have the same effect. Indeed, the best results appear for this *ideal* index. In Figure 4, the conditional coefficients for the effects of both deficits and debts are positive when the fiscal institution is weak. They fall progressively as institutions strengthen, and they become statistically insignificant at around .8. Note that this is the case both in the pre-EMU period AND in the post-EMU period, and there is a slight shift downward of the effects of the fiscal institutions under EMU.

These results indicate that, when institutions are designed to fit the underlying political institutions, they have real effects on the bond spreads. Parliaments changes matter somewhat, but reforms of all parts of the budget process have the greatest impact.

Testing the relevance of fiscal institutions with financial market data is a way to overcome the problem of reverse causality potentially driving previous studies on the deficit reducing effects of institutions (Acemoglu 2005). If our hypothesis holds true, that countries do not change budget processes because of risk premia in government bond markets, our results establish that fiscal institutions actually cause financial markets to change their risk assessment. This effect goes beyond the direct effect of deficits and debt levels as these variables are included as control variables.

Overall, our empirical results therefore establish that fiscal institutions influence financial markets' risk assessment of government bonds. Financial markets most likely care, because they know that these institutions play a pivotal role in solving deficit biases.

4 Conclusions

We investigate the relevance of budget institutions for risk premia contained in relative asset swap spreads of a Eurozone country with respect to Germany. We find that better institutions are connected with lower risk premia. Furthermore deficits matter less in countries with better institutions. The results are robust to controlling for country fixed effects. Furthermore, our empirical results suggest that the weakening of the effects of fiscal policy on risk premia under EMU previously reported in Bernoth and Wolff (2006) appears to result from neglecting the role of institutions. After controlling for the institutional improvements in Europe, fiscal policy remains a significant determinant of risk premia in sovereign bond markets.

These results confirm the hypotheses developed in von Hagen (1992), that budget institutions play a pivotal role in solving common pool resource problems. They also show that this role is acknowledged by financial markets when pricing default risk.

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A Figures

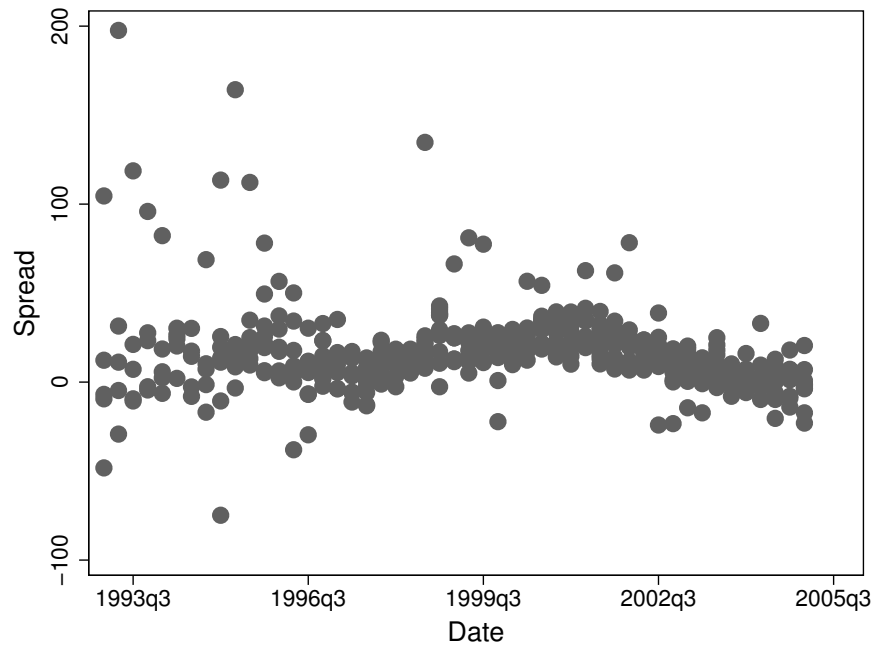


Figure 2: Relative asset swap spreads vs benchmark country Germany in basis points.

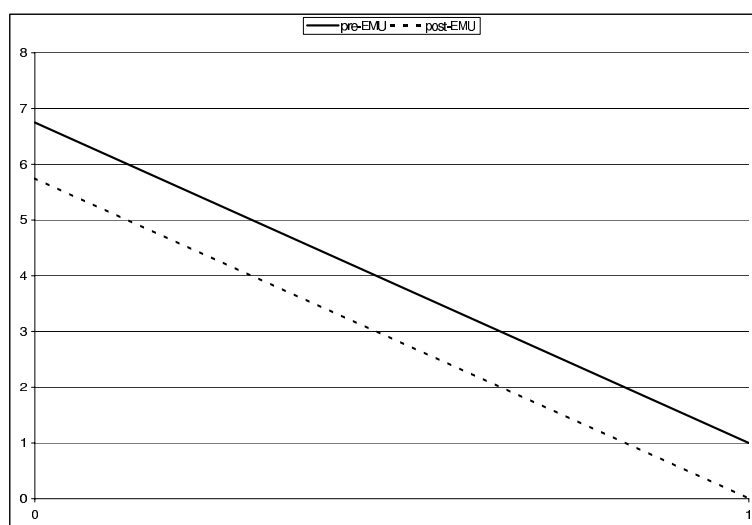


Figure 3: The marginal effect of deficits on risk premia before and under EMU conditional on the institutional strength measure by "MinFin".

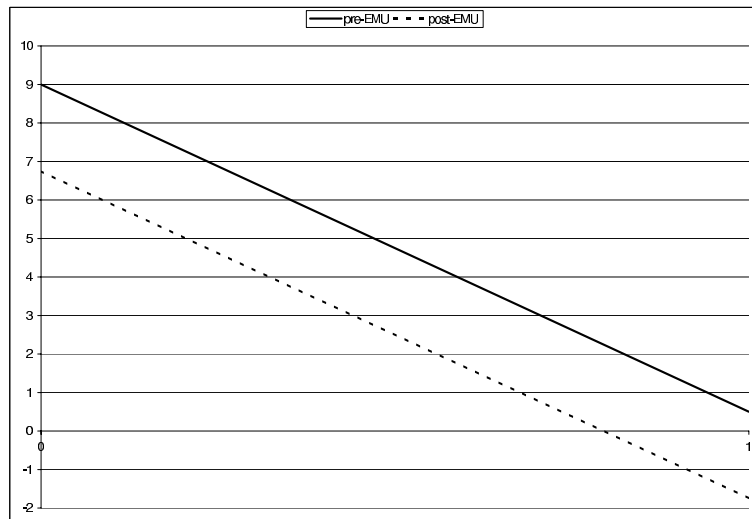


Figure 4: The marginal effect of deficits on risk premia before and under EMU conditional on the institutional strength measure by "ideal".

B Estimation results

Table 2: The effect of institutions on spreads

institution (I)	A		B		C		D		E		F		G		H		I	
		MinFin	MinFin	MinFin	Parl.	Parl.	Parl.	delegation	delegation	delegation	ideal	ideal	ideal	ideal	ideal	ideal	ideal	ideal
debt	0.36	0.55	0.56	0.21	0.21	0.21	0.55	0.53	0.44	0.68	0.44	0.68	0.44	0.68	0.44	0.68	0.44	0.68
	2.1	3.2	3.25	3.46	3.39	3.39	3.36	3.23	2.58	3.86	2.58	3.86	2.58	3.86	2.58	3.86	2.58	3.86
deficit	4.15	2.53	11.24	4.66	5.79	5.79	1.61	6.52	3.77	13.19	3.77	13.19	3.77	13.19	3.77	13.19	3.77	13.19
	4.1	2.36	3.78	4.65	5.46	5.46	1.55	2.47	3.72	5.43	3.72	5.43	3.72	5.43	3.72	5.43	3.72	5.43
liquidity	-2.75	-4.91	-7.63	0.87	0.64	0.64	-6.99	-8.99	-4.07	-5.63	-4.07	-5.63	-4.07	-5.63	-4.07	-5.63	-4.07	-5.63
	-1.14	-2.02	-2.99	2.89	2.09	2.09	-2.93	-3.5	-1.67	-2.33	-1.67	-2.33	-1.67	-2.33	-1.67	-2.33	-1.67	-2.33
liquidity*EMU	-0.86	-0.86	-0.64	-1.05	-0.98	-0.98	-0.49	-0.45	-1.15	-0.75	-1.15	-0.75	-1.15	-0.75	-1.15	-0.75	-1.15	-0.75
	-2.41	-2.44	-1.79	-2.98	-2.79	-2.79	-1.4	-1.3	-3.09	-2	-3.09	-2	-3.09	-2	-3.09	-2	-3.09	-2
corspread	0.12	0.12	0.12	0.12	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
	4.58	4.65	4.73	4.36	4.66	4.66	4.64	4.78	4.36	4.46	4.36	4.46	4.36	4.46	4.36	4.46	4.36	4.46
EMU	9.38	15.58	13.64	9.84	9.07	9.07	11.76	11.00	14.40	13.79	14.40	13.79	14.40	13.79	14.40	13.79	14.40	13.79
	2.32	3.67	3.22	2.63	2.45	2.45	3.05	2.85	3.28	3.2	3.28	3.2	3.28	3.2	3.28	3.2	3.28	3.2
debt*EMU	-0.14	-0.19	-0.16	-0.06	-0.01	-0.01	-0.12	-0.09	-0.16	-0.28	-0.16	-0.28	-0.16	-0.28	-0.16	-0.28	-0.16	-0.28
	-1.52	-2.02	-1.71	-0.76	-0.12	-0.12	-1.38	-0.99	-1.7	-2.91	-1.7	-2.91	-1.7	-2.91	-1.7	-2.91	-1.7	-2.91
deficit*EMU	-2.50	-1.01	0.02	-3.31	-3.03	-3.03	-0.47	0.04	-1.92	-1.75	-1.92	-1.75	-1.92	-1.75	-1.92	-1.75	-1.92	-1.75
	-2.19	-0.86	0.02	-2.93	-2.7	-2.7	-0.42	0.03	-1.67	-1.55	-1.67	-1.55	-1.67	-1.55	-1.67	-1.55	-1.67	-1.55
I		-39.55	-24.86	-1.81	-6.93	-6.93	-94.89	-76.65	-59.70	-38.67	-59.70	-38.67	-59.70	-38.67	-59.70	-38.67	-59.70	-38.67
		-4.1	-2.34	-0.52	-1.81	-1.81	-6.63	-4.54	-2.77	-1.78	-2.77	-1.78	-2.77	-1.78	-2.77	-1.78	-2.77	-1.78
I*deficit			-11.85		-3.55	-3.55		-9.30		-13.10		-13.10		-13.10		-13.10		-13.10
			-3.13		-3.01	-3.01		-2.02		-4.24		-4.24		-4.24		-4.24		-4.24
N	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
r2	0.21	0.24	0.26	0.32	0.33	0.33	0.28	0.29	0.22	0.25	0.22	0.25	0.22	0.25	0.22	0.25	0.22	0.25

Notes: Panel fixed effects except for regressions D and E where OLS had to be employed as the institutional index (Parliament) is time invariant, t-values below the coefficient.

Table 3: The effect of institutions on spreads

institution (I)	A		B		C		D		E		F		G		H		I	
		MinFin	MinFin	MinFin	Parl.	Parl.	Parl.	Parl.	delegation	delegation	delegation	delegation	ideal	ideal	ideal	ideal	ideal	ideal
debt	0.32	0.42	0.42	0.42	0.06	0.06	0.06	0.06	0.44	0.44	0.43	0.43	0.37	0.37	0.53	0.53	0.53	0.53
	2.23	2.61	2.69	2.69	1.82	1.79	1.79	1.79	2.94	2.94	2.91	2.91	2.47	2.47	3.47	3.47	3.47	3.47
deficit	3.17	2.51	6.81	6.81	3.31	3.72	3.72	3.72	1.98	1.98	3.44	3.44	3.01	3.01	8.85	8.85	8.85	8.85
	3.44	2.88	2.77	2.77	3.67	3.41	3.41	3.41	2.27	2.27	1.19	1.19	3.3	3.3	5.36	5.36	5.36	5.36
liquidity	-4.20	-5.18	-6.54	-6.54	0.16	0.09	0.09	0.09	-6.52	-6.52	-7.11	-7.11	-4.88	-4.88	-5.92	-5.92	-5.92	-5.92
	-1.74	-2.14	-2.63	-2.63	0.58	0.34	0.34	0.34	-2.67	-2.67	-2.65	-2.65	-2.05	-2.05	-2.49	-2.49	-2.49	-2.49
liquidity*EMU	-0.17	-0.18	-0.08	-0.08	-0.29	-0.27	-0.27	-0.27	-0.02	-0.02	-0.01	-0.01	-0.32	-0.32	-0.11	-0.11	-0.11	-0.11
	-0.4	-0.44	-0.19	-0.19	-0.81	-0.76	-0.76	-0.76	-0.05	-0.05	-0.02	-0.02	-0.7	-0.7	-0.25	-0.25	-0.25	-0.25
corspread	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05
	1.63	1.73	1.79	1.79	1.32	1.43	1.43	1.43	1.85	1.85	1.89	1.89	1.58	1.58	1.75	1.75	1.75	1.75
EMU	5.53	8.30	7.48	7.48	3.62	3.40	3.40	3.40	6.97	6.97	6.76	6.76	8.15	8.15	8.04	8.04	8.04	8.04
	1.29	1.67	1.52	1.52	0.93	0.87	0.87	0.87	1.6	1.6	1.53	1.53	1.61	1.61	1.61	1.61	1.61	1.61
debt*EMU	-0.05	-0.07	-0.06	-0.06	0.02	0.04	0.04	0.04	-0.05	-0.05	-0.04	-0.04	-0.06	-0.06	-0.14	-0.14	-0.14	-0.14
	-0.53	-0.77	-0.64	-0.64	0.32	0.6	0.6	0.6	-0.49	-0.49	-0.39	-0.39	-0.64	-0.64	-1.38	-1.38	-1.38	-1.38
deficit*EMU	-2.23	-1.60	-1.10	-1.10	-2.42	-2.35	-2.35	-2.35	-1.25	-1.25	-1.10	-1.10	-1.96	-1.96	-1.87	-1.87	-1.87	-1.87
	-2.22	-1.62	-1.17	-1.17	-2.48	-2.49	-2.49	-2.49	-1.28	-1.28	-1.23	-1.23	-1.93	-1.93	-1.86	-1.86	-1.86	-1.86
I		-17.94	-11.73	-11.73	-0.78	-2.53	-2.53	-2.53	-50.93	-50.93	-46.00	-46.00	-30.96	-30.96	-20.50	-20.50	-20.50	-20.50
		-2.09	-1.46	-1.46	-0.23	-0.52	-0.52	-0.52	-3.18	-3.18	-2.74	-2.74	-2.15	-2.15	-1.45	-1.45	-1.45	-1.45
I*deficit			-5.83	-5.83		-1.19	-1.19	-1.19			-2.75	-2.75			-8.11	-8.11	-8.11	-8.11
			-2.11	-2.11		-0.85	-0.85	-0.85			-0.55	-0.55			-4.45	-4.45	-4.45	-4.45
LDV	0.46	0.44	0.43	0.43	0.51	0.51	0.51	0.51	0.41	0.41	0.40	0.40	0.45	0.45	0.43	0.43	0.43	0.43
	6.27	5.75	5.52	5.52	7.37	7.09	7.09	7.09	5.08	5.08	4.99	4.99	6.03	6.03	5.68	5.68	5.68	5.68
N	411	411	411	411	411	411	411	411	411	411	411	411	411	411	411	411	411	411
r2	0.54	0.54	0.55	0.55	0.52	0.52	0.52	0.52	0.55	0.55	0.56	0.56	0.54	0.54	0.55	0.55	0.55	0.55

Notes: Panel corrected standard errors. Lagged dependent variable (LDV) included. Country dummies included except for regressions with Parliament index.

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