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Abstract

Solid budgets serve as important quality signals for the electorate. Politicians might therefore face an incentive to influence tax revenue forecasts, which are widely regarded as a key element for budget setups. Looking at the time period from 1996 to 2012, in this study we systematically analyze whether national tax revenue forecasts in eighteen OECD countries are biased through political distortions. Based on several theoretical approaches drawn from the theories of political economy, we test four hypotheses using panel estimation techniques. We find strong support for partisan politics. Left-wing governments seem to produce more optimistic or less pessimistic tax revenue forecasts than right-wing ones do. Contrary to the theoretical prediction based on the "common pool" problem, we find that more fragmented governments and parliaments tend to produce more pessimistic or less optimistic tax revenue forecasts. One reason might be that at least one of the incumbents will stay in office and will be part of the next government, too. We do not find empirical evidence for political business cycles or an influence of the reelection probability on tax revenue forecasts at all.

JEL Code: F59, H11, H30, H68, P16.
Keywords: Political economy, tax revenue forecasts, fragmentation, political business cycles, electoral cycles.

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1. Motivation

Voters increasingly evaluate the quality of political performance by looking at public budgets. Rising public debts, public bailouts of private banks and the ongoing monetary and economic stress in the Euro Area contribute to shifting the focus of the electorate to sound fiscal policies. A solid budget serves as an important quality signal for political performance. Consequently, politicians might face an incentive to influence tax revenue forecasts, which are widely regarded as a key element for budget setups (see Auerbach, 1999). This view is confirmed by Chatagny and Soguel (2012), as they find that an underestimation of tax revenues leads to a significant reduction of fiscal deficits in Swiss cantons.

In the parliamentary process, drawing up the budget attracts much more attention than controlling budgetary implementation.[1] Usually, drawing up the budget takes around half a year. In early summer the budget plan passes cabinet, and from September onwards it is discussed extensively in parliament before it is adopted at the end of the year. Parliamentarians and the public thus only briefly take notice of the report of the Court of Auditors that analyzes budgetary implementation. When the budget is set up its core elements such as expenditure and revenue volumes as well as the resulting gap between them, i.e. the public deficit, become obvious. If a sound budget is regarded as a quality signal, politicians face an incentive to influence one or more of these elements. As the tax revenue forecast is the basis for the planned revenue volume, there might be an incentive for politicians to manipulate this forecast. Several arguments for this behavior can be found in the theoretical literature on political economy.

In this paper, we systematically analyze whether national tax revenue forecasts in eighteen OECD countries are biased through political distortions for the time period from 1996 to 2012. We test whether tax revenue forecasts are systematically biased with the electoral cycle, for different ideological compositions of the governments, by a higher degree of political fragmentation or the less likely a reelection is. We find strong support for partisan politics. Left-wing governments seem to produce positive markups on predicted tax revenues in comparison to right-wing incumbents. We do not find empirical evidence for any political business cycle or the "common pool" problem in fragmented governments. On the contrary, we find that more fragmented governments and parliaments tend to produce more pessimistic or less optimistic tax revenue forecasts. One reason might be that at least one of the incumbents will stay in office and will be part of the next government, too.

To date, there is a broad empirical literature on the quality of revenue forecasts. One such survey is provided by Leal *et al.* (2008). Most of the existing studies exclusively focus on rather technical aspects, such as unbiasedness, rationality, judgmental and methodological issues (see, e.g., Bretschneider *et al.*, 1989; Feenberg *et al.*, 1989; Mocan and Azad, 1995;

[1] How forecast errors in Italy vary over the different planning and implementation phases is intensively discussed by Cepparulo *et al.* (2014).

Vorhees, 2004; Chatagny and Siliverstovs, 2013; Breuer, 2015). Only a few studies deal with political influences on revenue forecasts (see, e.g., Cassidy *et al.*, 1989; Bretschneider and Gorr, 1992; Ohlsson and Vredin, 1996; Paleologou, 2005; Boylan, 2008; Bischoff and Gohout, 2010; Chatagny, 2013). Most of these studies focus on electoral business cycles (Boylan, 2008; Brück and Stephan, 2006; Cimadomo, 2015; Kauder *et al.*, 2015) or partisan politics. For the United States, some studies mention the influence of political ideology on forecast accuracy of tax revenues (see, e.g., Bretschneider *et al.*, 1989; Cassidy *et al.*, 1989; Mocan and Azad, 1995; Vorhees, 2004; Paleologou, 2005). Although Serritzlew (2005) and Goeminne *et al.* (2008) are – to the best of our knowledge – the only studies that analyze political fragmentation, they concentrate on local governments only.

International comparative studies mainly focus on the consequences of forecast errors for the budget balance. For the European Union, Strauch *et al.* (2004) examine whether forecast errors are triggered by the Stability and Growth Pact. Political biases in gross domestic product (GDP) forecasts within the European Union are discussed by Jonung and Larch (2006), as well as by Brück and Stephan (2006). Pina and Venes (2011), as well as von Hagen (2010), explore institutional and political influences on budget balance forecasts. The study by Jong-A-Pin *et al.* (2012) focuses on twenty-five OECD countries in a real-time setting. Instead of analyzing forecast errors, Jong-A-Pin *et al.* (2012) use different data vintages of current revenues and find distortions within the resulting data revisions along the electoral cycle. Another study that focuses on real-time data is the one provided by Cepparulo *et al.* (2014). An extensive survey on various forecasts and fiscal policy is provided by Cimadomo (2015).

There are virtually no international comparative studies focusing on tax revenue forecasts. The existing ones mainly discuss the case of developing countries (Kyobe and Danninger, 2005), their underdeveloped institutions (Danninger, 2005) and the political economy behind that (Danninger *et al.*, 2005). Büttner and Kauder (2010) compare OECD countries and analyze how different tax revenue forecasting practices affect forecasting performance. They focus on twelve OECD countries and explain differences in forecasting performances with macroeconomic uncertainty, the importance of different taxes (e.g., the income tax), the timing of the forecast and the independence of tax revenue forecasts. However, Büttner and Kauder (2010) do not analyze any politically motivated bias. The study by von Hagen (2010) examines the influence of institutional setups within the budget process on revenue projections. He finds that the position of the finance minister plays a crucial role.[2]

Our study differs from these in several ways; to the best of our knowledge, ours is the first to combine political economy arguments with national tax revenue forecasts in an international comparative study as a key aspect. We extend the data set by Büttner and Kauder

[2]The influence of the finance minister on budget performance is also intensively analyzed by Jochimsen and Thomasius (2014). For tax revenue forecasts in Swiss cantons and characteristics of the finance minister see Chatagny (2013).

(2010) by adding more countries, as well as four additional years. First, we use data from national budget plans instead of forecasts made by the OECD in its half-year Economic Outlook. Second, we focus on ex-post observable forecast errors, and not on forecast revisions, since national real-time data are to the best of our knowledge not observable for all states considered here. Finally, we test several hypotheses from the field of political economy (partisan theory, political fragmentation and reelection probability), and not only political business cycles.

The remainder of the paper is organized as follows: Section 2 uses the literature on political economy to derive our hypotheses. The institutional background of revenue forecasting is discussed in Section 3. Data and estimation methodology are described in Section 4. Section 5 presents our results, together with a variety of robustness checks. Section 6 concludes the paper.

2. The Political Economy of Tax Revenue Forecasting

Because there is currently no cohesive theoretical approach in the field of political economy for analyzing tax revenue forecasts, we refer to the comprehensive theoretical literature on political economy explaining the evolution of public deficits or debt. As overestimated future tax revenues can be seen as substitutes for an explicit deficit, relying on the literature on the political economy of public deficits is legitimate. We use the term "overestimation" in a broad sense, i.e., tax revenue is either literally overestimated or less underestimated. Overestimating tax revenues opens up two main strategies for the incumbent government. First, it might plan higher expenditures or lower taxes, keeping estimated deficits constant. Or second, it might keep planned expenditures and tax rates constant and lower the estimated deficit. These two options are two sides of the same coin.

Politicians face incentives to overestimate tax revenues to demonstrate their fiscal competence. This competence can be shown at two stages within the budgetary procedure. First, overestimated tax revenues might support the supposed fiscal competence of a politician ***in the drafting and planning process*** of the budget. If forecasted taxes are high, planned expenditures can be high(er), too, or estimated deficits can be low(er). Thus, the politician pretends to show fiscal competence for the next budgetary period, i.e. the **future**. Second, overestimated tax revenues might support the supposed fiscal competence of a politician ***in the implementation phase*** of the budget. If forecasted taxes are high, **realized** expenditures during the entire fiscal year can be high(er), too. This is because for most parts of the ongoing budgetary year, the expenditure side of the budget is not adjusted even if realized tax revenues fall below the forecast ones. In this setting, higher expenditures might have real economic consequences, such as lower unemployment or higher transfer payments. Consequently, the electorate would not only appreciate the politician's reputed fiscal competence but would also feel a real improvement in living conditions. Of course, overestimated taxes

followed by excessively high expenditures lead to rising deficits. Therefore, the described mechanisms only work if at least some voters are myopic or if voters are rational and there is only a weak and publicly not noticed budgetary control. In this section, we review the most relevant theoretical literature and derive the hypotheses to be tested later on. We test four theoretical approaches, namely political business cycles, partisan politics, fragmented governments and the probability of reelection.

2.1. Political Business Cycles

Without having any ideological motives, opportunistic governments are primarily interested in being reelected (Nordhaus, 1975). Alesina and Perotti (1994) as well as Persson and Tabellini (1997) show that the government has an incentive to boost the economy prior to elections to appear competent to voters and therefore increase its chances of being reelected. Higher expenditures or tax cuts can lead to higher output or lower unemployment in the short term, raising the popularity of the incumbent government (Hibbs, 1977; Franzese, 2002). Let us assume that year t is an election year. Then, the government has an incentive to overestimate revenues for year t with the forecast made in $t-1$ because this way spending options seem to be larger in t than otherwise. Voters might be impressed by the large expenditure plans in the budget and might assume that these planned higher expenditures drive output and unemployment in the desired directions. This makes it more likely that they will vote for the incumbent government.

Normally, this strategy only works with fiscal illusion. When voters are myopic they do not (completely) anticipate two aspects. First, planned expenditures might not be fully realized and, consequently, output and unemployment might not be driven in the desired directions. Second, higher expenditures might lead to higher debt and, subsequently, higher debt burdens must be borne after elections. Rogoff and Sibert (1988), however, show that political business cycles may also exist with rational expectations. Their theoretical approach is based on temporary information asymmetries between government and voters. Keeping expenditures constant and overestimating taxes, the government tries to exploit its information advantage by running deficits that seem lower; the incumbent thus signals competence, as it can appear that expenditures can be provided more efficiently (i.e. with lower deficits).. Consequently, we can derive the following first hypothesis:

Hypothesis 1: *Tax revenues are overestimated for election years.*

2.2. Partisan Theory

According to partisan theory, government politics are primarily driven by ideological motives; the theory predicts a more expansionary policy for left-wing governments than for right-wing incumbents because left-wing governments are typically more inclined to redistributive

policies. Public spending may be used to mitigate income inequality by increasing transfers. Left-wing parties may also be more willing to run deficits since their voters benefit more from declining unemployment than they are harmed by the impacts of higher debt or inflation (see, e.g., Hibbs, 1977). As parties also care about winning the next elections, it may be short-sighted to assume that a party's policy is solely driven by ideological motives. In an electoral competition both parties, equally well informed and caring to win the elections, will adopt the same platform: the one that maximizes the probability of being reelected. Once elected, the governing party will deviate from its announced platform and implement its most favored policies. Irrational voters may not anticipate the party's incentive to deviate, and partisan effects may result. Alesina (1988) extended this theoretical attempt to rational voters. He explored that partisan politics might also occur under rational expectations if the parties' discount factor is rather low, i.e. in a situation where reputation only plays a minor role.

Empirical evidence for this theory is rather weak. For the members of the European Union, de Haan and Sturm (1994), for example, find that government's ideology does not affect budget deficits. Analyzing twenty-two OECD countries, Volkerink and De Haan (2001) also conclude that left-wing governments do not run higher deficits than right-wing incumbents. According to their study, government ideology seemed to have mattered only in the 1970's, when right-wing governments ran lower deficits than left-wing incumbents.

As mentioned before, in our setting running deficits can be substituted by overestimating tax revenues. Therefore, we can write our next hypothesis as:

> **Hypothesis 2:** *Left-wing governments tend to produce positive markups on predicted tax revenues compared to right-wing governments.*

2.3. Political Fragmentation

In the theoretical literature as well as in the political discussion, the fragmentation of the policy-making process is often made responsible for loose fiscal policy (e.g., Roubini and Sachs, 1989a,b; Volkerink and De Haan, 2001; Perotti and Kontopoulos, 2002). Perotti and Kontopoulos (2002) define "fragmentation" as the degree to which each politician internalizes the cost of one unit of aggregate expenditures. In a coalition government, for instance, each coalition partner tries to allocate as much of the budget as possible to its supporters. Coalition partners suggest spending proposals that are asymmetric, in that benefits primarily go to their favorite interest groups, whereas costs are equally shared among all coalition partners. Consequently, costs are not fully internalized. Thus, coalition governments face a common pool problem. In contrast to the two theoretical approaches described above, the approach of political fragmentation does not distinguish between myopic and rational voters or politicians. Instead, the entire theoretical background of the common pool problem is based on rational behavior.

The common pool problem is likely to increase with the number of coalition partners because the fraction of internalized costs decreases with coalition size. Instead of looking at the number of coalition partners, one could also take the number of spending ministers in a government as an indicator for fragmentation. Each spending minister tries to serve his or her constituency. In this case, a similar common pool problem emerges. Following Perotti and Kontopoulos (2002), we test different definitions of fragmentation in our setup.

Most fragmentation theories are based on the assumption that governments draft the budget and – as they usually have a majority in parliament – thereby de facto set them. However, the parliament might influence the government's budget drafts. Depending on factors such as size of the majority of seats, fragmentation of the opposing parties, strengths of the whip or political culture parliamentarian's influence on the final budget might be substantial. Volkerink and De Haan (2001) discuss the potential influence of the parliament's fragmentation on fiscal performance in detail. If the government faces a more fragmented parliament, it is less likely that the opposition will form a unity against the incumbent. We refer to the discussion by Volkerink and De Haan (2001) and extend our hypothesis from fragmented governments to fragmented parliaments.

The idea of political fragmentation can be applied to tax revenue forecasts as well. More optimistic forecasts ease budget negotiations within the government because financial resources seem to increase. More coalition members or more spending ministers can bring forward policies to satisfy their electorate, which eases the drafting of the budget and prevents difficult budget negotiations. Analogously, budget implementation in parliament is eased by simply overestimating tax revenues. These arguments lead to our next hypothesis:

> **Hypothesis 3:** *More fragmented governments or parliaments tend to produce positive markups on predicted tax revenues.*

2.4. The Reelection Perspective

If the incumbent government does not expect to be reelected, it has an incentive to use debt strategically. By raising debt prior to elections to an inefficiently high level, the incumbent can afford more spending programs or tax cuts and, thereby, limit the scope of action of the following government (Persson and Svensson, 1989). Instead of raising debt immediately, the incumbent might be tempted to overestimate tax revenues. As explained before, overestimated tax revenues offer options for more expenditure programs that will result in higher deficits at a later point of time. Similar to the strategic use of debt, the scope of action for the succeeding government will be limited, too. Therefore, we expect an overestimation of tax revenues when the chance of reelection of the incumbent party is small. This theory is known as the "stubborn conservative government"-hypothesis (Tabellini and Alesina, 1990). The conservative incumbent wants to prevent the left-wing successor from spending money on expenditures that they believe to be unnecessary (Pettersson-Lidbom,

2001; Sutter, 2003). This argument is also valid in the other direction, i.e., an incumbent left-wing government wants to bind future governments to pursue left policies by increasing the deficit prior to elections. Here, in the theoretical background chapter, we can derive the following general hypothesis:

> **Hypothesis 4:** *The lower the reelection probability for the incumbent government, the more it tends to overestimate tax revenues.*

3. Institutional Background of Revenue Forecasting

Although it is not the focus of this analysis, institutional characteristics will have an impact on forecasting performances. Therefore, we provide a broad overview on crucial institutional settings and describe their variations within our country sample.

One important institutional aspect of revenue forecasting is whether forecasts are independent from political actors and influence. Some revenue forecasts are conducted in the respective ministries of finance; most are assigned to agencies differing widely in their political independence. The least independent option is to allocate responsibility for forecasts directly to the government, e.g., to a department of the Ministry of Finance, as in Belgium, France, Iceland, Ireland, Italy, Japan, New Zealand, Norway, Switzerland or the United Kingdom. In those cases, political actors can directly influence tax revenue forecast results. In other countries, responsibility is divided between the government, experts from academia, research institutions and the central bank (e.g. Germany) or between different government agencies as in Australia. By delegating revenue forecasts entirely to independent research institutes, the Netherlands most strictly limits the influence of the executive branch (see among others Büttner and Kauder, 2010, for more details). The independence of revenue forecasts is equally challenged if macroeconomic forecasts produced by the government or government agencies have to be used in the revenue forecasting process. The most relevant macroeconomic variable for tax revenue forecasts is the forecast of GDP. Thus, the government might influence revenue forecasts indirectly by forcing forecasting agencies (even independent) to base their forecasts on the GDP forecast by the government. In our sample, only few countries (e.g., Austria, Belgium, Canada) use external macroeconomic forecasts.

A second institutional characteristic of revenue forecasts varying between the sample countries are technical and organizational conditions, such as estimation methods or the number of taxes that are forecast. Estimation methods range from basic extrapolation methods based on past developments to sophisticated econometric methods such as time series analysis. All countries use a mix of different forecasting methods, mostly because tax revenue forecasts are broken down into many tax types. Austria, for example, mostly uses trend extrapolation whereas Canada heavily relies on elasticity methods and the United Kingdom on micro simulations (see Büttner and Kauder, 2008).

Third, the timing within the budget process influences the quality of tax revenue forecasting (Danninger *et al.*, 2005). Across countries, there are differences in the time span between tax revenue forecasts and the start of the forecasted fiscal year. Whereas in Ireland, in the United Kingdom and in Sweden revenue forecasts are made less than a month before the budget is set up, tax revenues are forecast roughly eight months before the budget passes parliament in Germany and the United States. Büttner and Kauder (2010) find that the timing of forecasting significantly influences forecasting quality. The earlier the forecast is carried out (i.e., the larger the time span between forecast and budget endorsement), the larger is the forecasting error.

Finally, our sample countries show a wide variation in their general institutional setup. First, the tax structures of the countries differ. Instead of relying on a few large taxes, a country might have many small taxes. This might reduce forecasting errors, provided that the tax bases of those small taxes are not closely correlated (Büttner and Kauder, 2010). Second, the centralization of countries is different. Canada, the United States, Belgium, Switzerland, Spain and Germany, for example, are fiscally decentralized countries where not only the central government but regions or local jurisdictions have tax-setting power. This may lead to less accurate tax revenue forecasts if actors from different layers of government have to be involved in the forecasting process as coordination effort gravely increases. However, in Germany, Belgium and Switzerland, for example, tax revenue forecasts are fully centralized, although all of them fiscally decentralized countries; the effects of centralization on tax revenue forecasts might therefore be negligible.

The described institutional backgrounds of our sample countries do not change over time, or they have only minor variations. The focus of our analysis is not to determine characteristics of revenue forecasting accuracy **between** countries but to test if forecasts are influenced by political economic factors **within** countries. We elaborate more on this in Section 4 where our estimation strategy is presented. We provide a variety of robustness checks. Among other things we show estimation results for different sub-samples.

4. Data and Empirical Strategy

We start our empirical analysis by expanding the data set from Büttner and Kauder (2010), who use tax revenue forecasts and tax revenues for twelve OECD countries for the time period from 1996 to 2008. The panel data set is not strongly balanced, since some countries did not report tax revenue forecasts for several years. We add six more countries and four more years. We can rely on a panel data set of eighteen OECD countries, running from 1996 to 2012.[3] Our panel data set offers a rich source of variation to find potential political

[3]The countries in the sample are: Australia, Austria, Belgium, Canada, France, Germany, Iceland, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, the United Kingdom and the United States of America. Our cross-section has nineteen entries, however, since we have two competing forecasts for the United States: one from the executive and the other from the legislative.

distortions in revenue forecasts among countries. First, the large cross-section dimension covers many countries with different government sizes and political systems. Second, the time span of our data comprises on average more than four elections per country.

Before we describe our data in detail, we start by presenting our baseline specification to measure potential political distortions in tax revenue forecasts. Our basic empirical model has the following form:

$$FEPERC_{s,t} = c + \beta_1 CYCLE_{s,t} + \beta_2 PARTISAN_{s,t} + \beta_3 FRAG_{s,t} + \beta_4 REELECT_{s,t} + \sum_{i=5}^{9} \beta_i X_{i,s,t} + a_s + \nu_t + \varepsilon_{s,t} \,. \quad (1)$$

As the dependent variable, we use the ex-post percentage forecast error ($FEPERC$), which shows the over- or underestimation of tax revenues in terms of realized revenues for every state s in year t. It is calculated as follows:

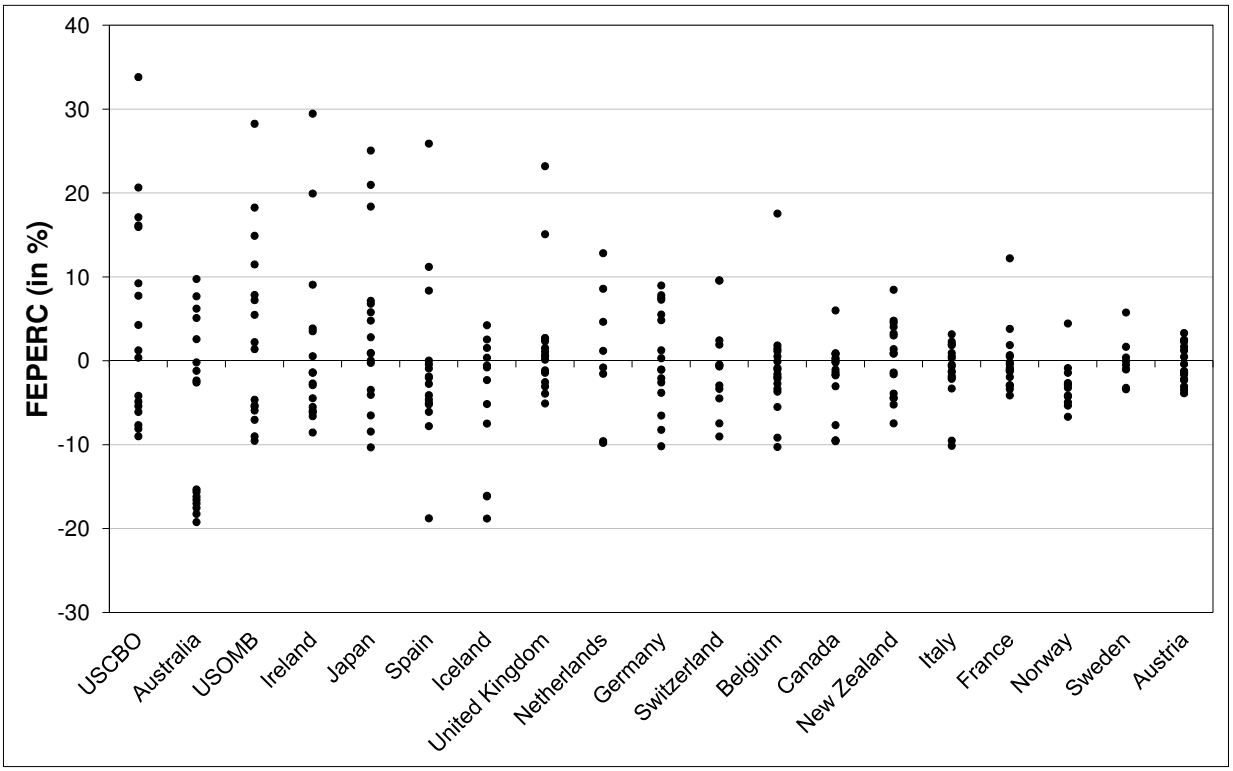
$$FEPERC_{s,t} = \frac{PTR_{s,t|t-1} - RTR_{s,t}}{RTR_{s,t}} \,,$$

with $PTR_{s,t|t-1}$ = being the projected tax revenues of state s for the fiscal year t and $RTR_{s,t}$ = the realized tax revenues of state s for year t. Rather than looking at forecasts made within the actual fiscal year, we use $PTR_{s,t|t-1}$ from the previous fiscal year $t-1$. For example, if 2012 is the year of interest, then we look at $PTR_{s,2012|2011}$ obtained in 2011. We look at ex-post forecast errors since we cannot account for different data vintages of tax revenues over time. Thus our variable of realized tax revenues is the final number where all data revisions have already taken place. In this way, we differ from the studies of Jong-A-Pin *et al.* (2012) or Cepparulo *et al.* (2014), as we do not analyze a real-time setting.

Whenever $FEPERC$ shows a positive or negative sign, future tax revenues were overestimated or underestimated, respectively. Because we cannot divide the forecast error in different sources (e.g., macroeconomic uncertainty or technical issues) as in Auerbach (1999), we decided to use the total forecast error in our analysis. Table 7 in the Appendix provides some descriptive statistics of all variables in our data set. On average, the percentage forecast error is slightly negative (-0.2%) but shows a high standard deviation of 7.9%. The root mean squared percentage forecast error (RMSPFE) reaches almost 8.0%. Figure 1 presents the percentage forecast errors for each country in the sample. The countries are arranged in descending order by the standard deviation of individual forecast errors. Each dot in the figure represents one single forecast error from a specific year. In terms of standard deviation in forecast errors, the United States and Australia show the least accurate tax revenue forecasts. On average, the best forecasts are produced by Norway, Sweden and Austria.

Before we introduce our variables of interest, we briefly discuss our control variables ($X_{i,s,t}$). Since many of the countries in our sample just report tax projections in their publications, we

Figure 1: Percentage forecast errors for each state



Note: USCBO = US Congressional Budget Office (i.e. the legislative branch's forecast); USOMB = US Office of Management and Budget (i.e. the executive branch's forecast). *Source:* Büttner and Kauder (2010); authors' calculations, extensions and illustration.

are not able to observe national GDP forecasts, which are the basis for a specific tax revenue forecast outcome. We are therefore not able to identify to what extent national GDP forecast errors are responsible for tax projection errors. To overcome this shortcoming, we chose nominal GDP growth forecasts for each state s, provided by the OECD ($GDPFORE_{s,t}$) as a suitable proxy for nationally provided GDP forecasts. The OECD projections offer an additional benefit in our analysis. Since the OECD has no politically motivated incentive to produce biased GDP forecasts, the variable $GDPFORE_{s,t}$ should capture all technical problems or wrongly anticipated macroeconomic shocks when it comes to economic forecasting. The hypothetical difference between $GDPFORE_{s,t}$ and the mostly unobservable macroeconomic forecasts made by the national governments might be another source of possible political distortions. Our political variables eventually capture all potential political biases introduced into tax revenue forecasting, either through a discretionary adjustment of tax revenues themselves or via modified macroeconomic forecasts (see Büttner and Kauder, 2015). The OECD publishes its GDP forecasts twice a year, in June and in December. To be in line with the timing of tax revenue forecasts, we decided to use OECD's GDP forecasts for year t made in June of $t-1$. As the descriptive statistics in the appendix show, there is a huge variation in GDP forecasts (Std. Dev. 1.92%). A more optimistic forecast for eco-

nomic output leads to higher projected tax revenues in a given year. Holding projected tax revenues fixed, a higher growth rate of nominal GDP causes a less positive or more negative forecast error of tax revenues. Whenever the economy develops more poorly than expected, tax revenue forecasts will be biased upwards. We expect a positive sign of $GDPFORE_{s,t}$.

Using the succeeding control variables we follow the existing literature and base our reasoning on their argumentation. As was brought forward by Boylan (2008), the unemployment rate ($UR_{s,t}$) plays a crucial role for the accuracy of fiscal forecasts. The average unemployment rate in our sample is 6.55%. Boylan (2008) has shown that in times of high unemployment, states in the US overestimate tax revenue changes. We expect a positive sign for the unemployment rate.

The next variable is the population of a country ($POP_{s,t}$), controlling for the potential effects of the size of different nations. Our sample has countries with a very small number of inhabitants (e.g., Iceland) and countries with a very large population (e.g., the United States). As mentioned by Goeminne *et al.* (2008), the sign of the coefficient of $POP_{s,t}$ is not unambiguous. Rising complexity – and therefore more difficult forecasts – leads to overoptimism in tax projections (Duru and Reeb, 2002; Goeminne *et al.*, 2008). This causes a positive effect of population. A negative sign can be possible due to a more efficient tax administration. Whenever the performance of tax authorities rises, $RTR_{s,t}$ must be relatively higher in relation to $PTR_{s,t|t-1}$. If this is true, then population has a negative effect on tax revenue forecasting errors.

We control for possible tax base changes by introducing the population growth rate $POPGR_{s,t}$. A negative sign is expected. Whenever population growth is wrongly anticipated ex-ante, this leads to smaller or more negative tax revenue forecasting errors ex-post. A growing population (e.g. through a positive net migration) increases tax revenues, thus reducing $FEPERC_{s,t}$, all things being equal. We observe on average a population growth in our sample.

Finally, we introduce the tax quota of a country ($TAXQ_{s,t}$), measured as tax revenues divided by nominal GDP. In line with the argumentation of $POP_{s,t}$, higher tax quotas represent size effects. The higher the tax quota of a certain country, the more important are tax revenues for the economy. This importance may cause a more efficient tax administration, thus leading to a negative sign. Our sample comprises countries with a low tax quota (e.g. Japan) and countries with a very high share of taxes to GDP (e.g. the Scandinavian countries such as Norway and Sweden).

Our main hypotheses derived in Section 2 are tested with the following political variables, which are all taken from either the *Comparative Political Data Set III 1990-2012* (see Armingeon *et al.*, 2014) or the *Political Data Yearbook*.[4] All political variables are measured at the central government level.

[4]The data from the Political Data Yearbook can be downloaded from the interactive data base under http://www.politicaldatayearbook.com.

Possible political business cycle effects are covered via the variable $CYCLE_{i,s,t}$. In a first step, we code election years ($ELCTY_{s,t}$) with a dummy variable. The variable $ELCTY_{s,t}$ takes a value of one when t is an election year. The descriptive statistics reveal that almost one third of all years in our sample are election years. We expect a positive sign in election years ($\beta_1 > 0$). In a second step, we consider the exact election dates. If an election took place within the first six months of a year t, the year $t-1$ is coded as the election year. So 1 July is the cut-off date for the election. We therefore name this variable $ELCTYCUT_{s,t}$ and use this variable as a robustness check.

The variable $PARTISAN_{s,t}$ stands for the effects presumed by the partisan theory, and captures ideology of the incumbent government. First, we test the hypothesis by introducing the Schmidt-Index ($SCHMIDT_{s,t}$), representing cabinet composition ($SCHMIDT \in \{1, 2, 3, 4, 5\}$) (see Armingeon *et al.*, 2014). It takes a value of one when a hegemony of right-wing and center parties governs a country. The value of two is obtained when left-wing parties have fewer than 33.3% of total cabinet posts. The Schmidt-Index takes a value of three when a balance between left- and right-wing parties is observed in a country. Values four (left-wing parties with more than 66.6% of all cabinet posts) and five (hegemony of left-wing parties) are constructed in a similar way as values one and two. The average of the Schmidt-Index in our sample is 2.32. Thus, on average, more right-wing governments are present in our data. Second, we substitute the Schmidt-Index through a simple Ideology-Dummy ($IDEO_{s,t}$). It takes a value of one, when the governing party is left-wing. Right-wing incumbents are denoted with zero. As stated in Section 2, we expect positive signs for $SCHMIDT_{s,t}$ and $IDEO_{s,t}$ ($\beta_2 > 0$). Thus, left-wing governments are more optimistic or less pessimistic than right-wing incumbents.

The different forms of political fragmentation are covered by $FRAG_{s,t}$. We measure fragmentation with six different indices. Five of these six indices capture fragmentation of the ruling government; one captures legislative fragmentation. To measure legislative fragmentation we use a Rae-Index ($RAE\_LEG_{s,t}$). This takes into account the share of seats (p) of every party m in parliament. It is defined as $RAE\_LEG = 1 - \sum_{m=1}^{M} p_m^2$ and possibly measures the position of the opposition against the government. The more fragmented a parliament is, the weaker the position of the opposition against the governing parties. The opposition can counteract more strongly against the ruling incumbent if the parties of the opposition form a closed unity. To account for governmental fragmentation, we follow the literature in several ways. First, we simply count the number of coalition members ($NUMCOAL_{s,t}$) of the ruling government. Second, we use the effective number of coalition partners in a government ($EFFNUMCOAL_{s,t}$). Instead of simply counting coalition members, the number of each party's spending ministers serves as the weighting scheme. We apply a standard inverse Hirschman-Herfindahl-Index (HHI): $EFFNUMCOAL_{s,t} = 1/\sum_{j=1}^{J} sm_{j,s,t}^2$, where $sm_{j,s,t}$ is the share of the number of spending ministers each coalition member j supplies. Thus, we explicitly account for the distribution of political power within a coalition. We find

predominantly two party coalitions in our data; we also observe a maximum of five coalition members. Third, we use the number of spending ministers as a measure of fragmentation ($SPENDMIN_{s,t}$). Fourth, we apply the concept of the Rae-Index to governmental fragmentation ($RAE\_GOV_{s,t}$), measuring how fragmented the incumbent government is. Fifth, assuming that optimism is unlikely to increase linearly in the number of parties, ministers or parliamentarians, we also test for a possible non-linearity in the effect of fragmentation by including two dummy variables, which represent a group and are, therefore, described as the last index: (i) $SINGLE_{s,t}$ has a value of one whenever a single majority is the incumbent, and (ii) $LARGE_s, t$ has a value of one whenever more than two parties are represented in government with two party governments as the reference category. In sum, we have four variables and two dummies ($NUMCOAL_{s,t}$, $EFFNUMCOAL_{s,t}$, $SPENDMIN_{s,t}$, $RAE\_GOV_{s,t}$ and $SINGLE_{s,t} + LARGE_{s,t}$) measuring the fragmentation of governments, and one variable ($RAE\_LEG_{s,t}$) for parliament's fragmentation. For all variables, we expect $\beta_3 > 0$; for the two dummies, we expect a negative sign for $SINGLE_{s,t}$ and a positive sign for $LARGE_s, t$. This would imply a positive linear effect of fragmentation. Thus, whenever the two dummies show other signs, the fragmentation effect has either a V-shaped or inverse V-shaped form.

To empirically test the reelection hypothesis, election polls should be taken as independent variables. As these polls are not available, we have to look for suitable proxies. The most obvious proxy for the reelection probability is the election result itself. Assuming that incumbents correctly anticipate election results, we can take these results as a proxy variable for reelection probabilities ($REELECT_{s,t}$). Assume that election results clearly confirm the government in office. If these results were correctly anticipated, then the pre-election government had no incentive to overestimate taxes. If the pre-election government correctly anticipated that it would not be reelected, it had an incentive to overestimate revenues. Therefore, the election results of the incumbents enter the baseline regression with a time lead of one year. We expect that $REELECT_{s,t}$ has a negative sign. Armingeon *et al.* (2014) also provide a dummy variable, reflecting whether the ideological composition of the cabinet has changed from one year to another ($NEWGOV_{s,t}$). We also use this dummy variable with a time lead of one year to capture the potential anticipation of the incumbent due to a changing government in the future. Since ($NEWGOV_{s,t}$) is coded in a different way than $REELECT_{s,t}$, we expect a positive sign here. If the incumbent anticipates that the ideological composition will change in the next year, then we should observe an overestimation of tax revenues.

One might also think of taking the number of coalition partners as a suitable proxy for reelection probability. The more parties form a coalition, the higher the likelihood that one coalition partner will be part of the post-election government, too. Especially in cases where it is unsure which of the existing coalition partners will be part of the post-election government, they no longer have the incentive to overestimate tax revenues. Therefore, tax

revenue forecasts might be less optimistic or even underestimated. Following this idea, we take the five variables and two dummies of fragmentation not only to measure government's fragmentation but also to account for reelection probability. However, to confirm Hypothesis 4 the coefficient of these variables should be negative, i.e. the more fragmented the government, the less overestimated or the more underestimated are tax revenues.

a_s are country fixed-effects, covering the unobservable heterogeneity between the countries in our sample. Non-time varying effects such as tax revenue estimation techniques, independence of the forecasts, institutional frameworks etc. are covered by these fixed-effects. A fixed-effects approach is a suitable way to measure the effects of our political economic hypotheses since we are interested in the within variation of the countries. We introduce year dummies ν_t to capture potential business cycle effects or macroeconomic shocks. c is a constant and $\varepsilon_{s,t}$ an idiosyncratic error term. We performed stationarity tests on the variables to avoid the problem of spurious regression. Our baseline model from Equation (1) is then estimated via standard OLS techniques. Among others, we apply other estimation techniques as robustness checks. We elaborate more on this point in Section 5.2.

5. Results

5.1. Political Distortions in Tax Revenue Forecasts

Table 1 presents our baseline regression results obtained from Equation (1). In this baseline regression, we use the standard election dummy ($ELCTY_{s,t}$), the Schmidt-Index for partisan effects ($SCHMIDT_{s,t}$) and in models (1) to (4) the Rae-Index for legislative fragmentation ($RAE\_LEG_{s,t}$). In models (3)' and (4)' we substitute the Rae-Index for legislative fragmentation with the two dummies $SINGLE$ and $LARGE$ to detect potential effects of governmental fragmentation. All regressions include country fixed-effects (*C-FE*). Models (1) and (2) do not include any control variables. All even-numbered models incorporate time dummies, indicated by the row *T-FE*.

From Table 1 we can conclude that no political business cycles exist at all. The election dummy fails to reach any statistically significant level in all considered models; in addition, it has the wrong sign. Hypothesis 1 can therefore not be confirmed. This is more or less in line with the existing literature on political economy. Empirical evidence for political business cycles is rather mixed. Among many others, Brender and Drazen (2005) find in an extensive study no support, whereas de Haan (2014) does. One reason for the non-existence of political business cycles was brought forward by Brender and Drazen (2005). They argue that the empirical finding of opportunistic behavior is driven by the inclusion of young democracies. Fiscal manipulation can only work in the absence of data availability or of the ability to report and analyze the relevant data (this might refer to asymmetric information, brought forward by Rogoff and Sibert (1988)) or in lack of a deeper understanding an electoral system.

"Older" or more experienced democracies do not show these characteristics. This argument could be one reason why we do not find any political business cycle effects, as the eighteen OECD countries of our sample are mainly "old" democracies.[5]

Table 1: Baseline estimation results

Variable	(1)	(2)	(3)	(4)	(3)'	(4)'
ELCTY	-0.0024	-0.0038	-0.0066	-0.0066	-0.0086	-0.0086
	(0.0062)	(0.0062)	(0.0059)	(0.0060)	(0.0063)	(0.0061)
SCHMIDT	0.0099	0.0099*	0.0096**	0.0094**	0.0076*	0.0078*
	(0.0067)	(0.0049)	(0.0044)	(0.0041)	(0.0042)	(0.0041)
RAE_LEG	-0.0031***	-0.0018	-0.0036**	-0.0027**	–	–
	(0.0009)	(0.0012)	(0.0015)	(0.0012)		
SINGLE	–	–	–	–	0.0459**	0.0361**
					(0.0166)	(0.0151)
LARGE	–	–	–	–	0.0304	0.0201
					(0.0274)	(0.0233)
REELECT	-0.0009	-0.0006	-0.0004	-0.0004	0.0011	0.0007
	(0.0008)	(0.0009)	(0.0011)	(0.0011)	(0.0011)	(0.0010)
GDPFORE	–	–	0.0087**	0.0056	0.0086**	0.0048
			(0.0031)	(0.0070)	(0.0034)	(0.0076)
UR	–	–	0.0056**	0.0039	0.0062**	0.0047
			(0.0023)	(0.0039)	(0.0027)	0.0040
POP	–	–	1.05e-09	2.28e-09**	1.40e-09	2.58e-09**
			(8.33e-10)	(8.57e-10)	(9.32e-10)	(9.62e-10)
POPGR	–	–	0.7510	0.0236	0.5591	-0.1532
			(0.7370)	(0.7150)	(0.8533)	(0.8577)
TAXQ	–	–	-0.0257***	-0.0168***	-0.0227***	-0.0142***
			(0.0054)	(0.0046)	(0.0056)	(0.0047)
c	0.2170**	0.1290	0.9880***	0.5920**	0.5384**	0.2401
	(0.0754)	(0.0993)	(0.2940)	(0.2340)	(0.2524)	(0.2041)
C-FE	YES	YES	YES	YES	YES	YES
T-FE	NO	YES	NO	YES	NO	YES
R^2 (within)	0.0420	0.3349	0.3213	0.4667	0.3174	0.4628
Obs.	283	283	281	281	281	281

Note: Robust standard errors in parentheses. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

We find a positive and robust coefficient for partisan effects ($SCHMIDT$), so that left-wing governments tend to produce more optimistic or less pessimistic tax revenue estimates than right-wing incumbents. This is a clear confirmation of Hypothesis 2. Not only that the effect is positive and significant, it also has a clear impact on the forecasting outcome of tax revenues in a specific state. If we just focus on very simple average effects, then left-wing governments produce tax revenue forecast errors that are about 0.9 percentage points higher

[5]Instead of using $FEPERC$ as the dependent variable, we also tested the political business cycle hypothesis with the absolute percentage error. We find no significant effects, however.

than under right-wing incumbents. This positive markup of left-wing governments occurs regardless of whether tax revenues are over- or underestimated.

The effect of legislative fragmentation shows the opposite sign as theoretically predicted from Hypothesis 3, although it is in line with our Hypothesis 4 and the existing literature (see Goeminne *et al.*, 2008). A higher level of fragmentation leads to less optimistic or more pessimistic revenue forecasts. On average, the tax revenue forecast error is almost 0.3 percentage points lower if the Rae-Index for legislative fragmentation rises by one unit. This additional negative bias is observable for both over- and underestimated tax revenues. First, because more coalition members represent – in parliament as well as in the government – a broader part of the population, minor interest groups have limited power to influence policy. This circumstance makes overoptimistic revenue forecasts (and thus a higher expenditure level) less attractive. Second, more parties in a coalition (and the resulting increase in struggles among them) increases the power of the finance minister (Jochimsen and Thomasius, 2014). Because this minister has no incentive to bias the forecasts, overoptimism should decrease with more coalition members. Third, as mentioned in Section 2, it is likely that one party from a broad-based coalition will stay in office in the next legislative period. Thus, overoptimistic revenue forecasts (and therefore higher deficits ex-post) are no longer attractive for them. This leads to the negative coefficient of $RAE\_LEG_{s,t}$. This result is confirmed by the two dummies for governmental fragmentation. The *SINGLE* dummy is positive and highly significant, meaning that single-party governments tend to be more optimistic than larger coalition governments. To be more specific, single-party governments produce, on average, tax revenue forecast errors that are 3.6 percentage points higher than forecast errors of two-party coalition governments. Thus, single-party governments produce a positive markup compared to two-party incumbents in both cases: over- or underestimation of tax revenues. The *LARGE* dummy fails to be statistically significant. In total, fragmentation seems to have a negative non-linear impact on tax revenue forecast errors. Similar results have also been found by Goeminne *et al.* (2008) for Flemish municipalities.

Finally, the reelection variable has the right sign but fails to be statistically significant different from zero. This result is not in line with our fourth hypothesis. This suggests that reelection probabilities have no additional explanatory power apart from the fragmentation argument.

Turning to the control variables, we find that $GDPFORE$ has the expected positive sign. However, this impact vanishes after controlling for time fixed-effects (see model (4) in Table 1). The same result holds for the unemployment rate (UR). It has the expected sign but fails to reach significance after estimating a two-way fixed-effects model. Population (POP) seems to have a positive impact on forecast errors; thus, with more complexity there is, the more overestimated the tax revenues will be. The coefficient of population growth varies heavily between the different models and fails to have any significant impact. Instead of showing the expected negative sign, in most cases population growth seems to have a positive impact on

tax revenue forecast errors. A possible explanation is provided by Goeminne *et al.* (2008) for firm growth. They suggest that forecasters may overestimate the movement of local firms. For our purposes it could be the case that population forecasts are too optimistic, thus leading to overestimated tax projections. For the tax quota ($TAXQ$) we find a highly significant and robust negative effect in all baseline specifications; thus, a more efficient tax administration might lead to more pessimistic or less optimistic tax revenue forecasts.

5.2. Robustness Checks

We checked the robustness of our results via three different approaches. First, we ran robustness checks on the variables of interest and the controls. Second, we experimented with different methodological approaches and introduced interaction models. Finally, we estimated the effects for different sub-samples to confirm that the results are not driven by outliers.

5.2.1. Robustness Checks on the Variables

(a) Robustness on the GDP control variable

To check the validity of our results, we performed robustness checks by changing the control variable for GDP.[6] Instead of using the forecast of nominal GDP, we experimented with four different types of models. First, we substituted the forecast with the percentage forecast error of nominal GDP ($GDPERR$), which is defined as the difference of $GDPFORE$ and the realization of nominal GDP. Second, we used the estimated output gap ($OGAP$) as a proxy to detect whether tax revenue forecast errors were driven by the capacity utilization of the specific economy. In the third model we used the growth rate of nominal GDP as a control variable ($GDPGR$). Finally, we excluded GDP or any measures to capture false predicted output growth. Table 2 presents the result of these four models.

All in all, we can confirm our baseline results from the previous section. Left-wing incumbents overestimate tax revenues or are less pessimistic than right-wing governments. We still find the negative fragmentation effect in the data. Not only does legislative fragmentation matter, governmental fragmentation also has a negative impact. The latter effect is not significant in all specifications, however. As in the baseline regression, our measures for election and reelection probabilities have no significant effect.

[6] In addition, we added other variables such as the deficit to GDP ratio to our baseline regression. This inclusion did not change our results and we will therefore no longer refer to this point.

Table 2: Estimation results: robustness on the GDP control variable

Variable	(1) GDPERR	(2) OGAP	(3) GDPGR	(4) without
ELCTY	-0.0048	-0.0077	-0.0062	-0.0076
	(0.0059)	(0.0062)	(0.0061)	(0.0064)
SCHMIDT	0.0087*	0.0088**	0.0085*	0.0093**
	(0.0044)	(0.0042)	(0.0043)	(0.0042)
RAE_LEG	-0.0027**	-0.0025**	-0.0025*	-0.0026**
	(0.0012)	(0.0012)	(0.0012)	(0.0012)
REELECT	-0.0004	-3.77e-05	7.46e-05	-0.0001
	(0.0009)	(0.0010)	(0.0010)	(0.0009)
c	0.6150**	0.6190**	0.6430**	0.6100**
	(0.2400)	(0.2190)	(0.2410)	(0.2240)
Controls	YES	YES	YES	YES
C-FE	YES	YES	YES	YES
T-FE	YES	YES	YES	YES
R^2 (within)	0.4924	0.4680	0.4866	0.4629
Obs.	281	281	281	281

Note: Robust standard errors in parentheses. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

(b) Robustness on the political variables

The next robustness checks cover the modification of the political variables. Instead of presenting another table, we will only discuss our results in a qualitative way. The substitution of our election dummy through the cut-off coded variable ($ELCTYCUT_{s,t}$) does not reveal any new insights. The coefficient of the cut-off variable fails to reach any level of statistical significance. All other results remain the same as in the baseline regression.

Now let us turn to the partisan variable. Substituting the Schmidt-Index with a simple ideology dummy confirms our results for the partisan theory. The coefficient of the ideology dummy is positive in any specification. Thus, left-wing governments produce a positive markup on either over- or underestimated tax revenues. However, the dummy just fails to reach statistical significance (p-value 0.126). Obviously, the dummy is not as able to capture the complete ideological spectrum than the Schmidt-Index can. Since the Schmidt-Index is highly significant in almost all other specifications, we concentrate on this variable in the following.

We substituted the two dummies $SINGLE$ and $LARGE$ for governmental fragmentation by our four other variables ($NUMCOAL$, $EFFNUMCOAL$, $SPENDMIN$, RAE_GOV). Overall, our results are confirmed, as the coefficients show the anticipated negative sign in all specifications and are mostly significant.

Finally, we will discuss the "robustness" of our reelection variable. The dummy $NEWGOV$ also fails to be statistical significant as the $REELECT$ variable. Thus, we confirm that the reelection probability plays no role for national tax revenue forecasts.

5.2.2. Methodological Robustness

The estimation results for various techniques are presented in Table 3. Altogether, we present three different model outcomes. First of all, we can expand the standard two-way fixed-effects model by interaction terms between the cross section and time dimension (FE-INT). Since we lose a large amount of degrees of freedom by interacting all years with all countries, we just focus on the economic crisis of the year 2009. Since the economic crisis hit the countries with different intensities, this should also influence tax revenue forecast errors in different ways. To account for it, we introduce an interaction term between the cross section dimension and the time dummy for the year 2009 in Equation (1).

As brought forward by Goeminne *et al.* (2008), tax revenue forecast errors (and, therefore, the behavior of tax forecasting institutions) might not be independent over time. So we secondly include the lagged forecast error in Equation (1); we expect a positive sign. Goeminne *et al.* (2008) state that estimating a dynamic panel data setup (DYNAM) accounts for slow adjustment processes of governments. Optimistic tax revenue forecasts are not immediately followed by pessimistic tax revenue forecasts, so we think that a positive path dependency is present. In a dynamic panel setup, standard fixed-effects techniques lead to biased and inconsistent coefficient estimates (see Nickell, 1981). A valid set of instrumental variables is necessary to avoid such a bias. We follow the literature and apply the generalized method of moments (GMM) estimator proposed by Arellano and Bond (1991). Specifically, we rewrite the model in Equation (1) in first differences to eliminate the country fixed-effects a_s, and then use lags of $FEPERC_{s,t}$ as viable instruments for the percentage forecast error. The employed instruments are only valid when no autocorrelation in the error term is present. We estimate the model in such a way that autocorrelation and the weak instrument problem are no longer present. Since the estimation technique by Arellano and Bond (1991) was developed for short time series, it suits our analysis perfectly. We apply the GMM estimator in its one-step version, since Arellano and Bond (1991) stated that the two-step estimator produces downward biased standard errors.

Our last methodological robustness check concerns the problem of correlated error terms between countries. This phenomena is called cross-section dependence (CSD). Whenever we do not control for potential panel correlated error terms, standard errors of the coefficients (and therefore the inference) are biased. One possible explanation is the usage of similar methods. As stated before, elasticity-based methods are common practice in forecasting tax revenues. If all countries use the same methodologies, then it could be the case that the forecast biases are correlated between states. To test whether cross-section dependence was present, we employed the test by Pesaran (2004). The test reveals that cross-section correlation is present. To account for this, we applied the estimator proposed by Driscoll and Kraay (1998). This nonparametric estimator corrects the variance-covariance matrix for heteroscedasticity, auto- and panel correlation. The estimator can be used for very general

forms of cross-section dependence and requires no knowledge of their form. It is possible to apply the estimator in a fixed-effects or pooled OLS setup. Since we are interested in the within variation and not in the variation between countries, we decided to use the former one.

Table 3: Estimation results: methodological robustness

Variable	(1) FE-INT	(2) DYNAM	(3) CSD
$FEPERC_{t-1}$	–	0.2407***	–
		(0.0746)	
ELCTY	-0.0017	-0.0047	-0.0066
	(0.0075)	(0.0066)	(0.0052)
SCHMIDT	0.0098*	0.0117***	0.0094***
	(0.0048)	(0.0037)	(0.0025)
RAE_LEG	-0.0028**	-0.0021*	-0.0027**
	(0.0013)	(0.0011)	(0.0009)
REELECT	-0.0007	-0.0003	-0.0004
	(0.0012)	(0.0017)	(0.0010)
c	0.9440***	0.5850***	0.5920***
	(0.3020)	(0.2030)	(0.1760)
Controls	YES	YES	YES
C-FE	YES	YES	YES
T-FE	YES	YES	YES
R^2 (within)	0.5026	–	0.4667
Obs.	281	243	281

Note: Robust standard errors in parentheses. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

In general, our baseline results are confirmed by the various estimation techniques. We find no significant political business cycle effect and no distortion if reelection is unlikely. Models (1) to (3) in Table 3 clearly verify that left-wing governments produce more optimistic or less pessimistic forecast errors than their right-wing counterparts. We furthermore find the negative fragmentation effect, as in the baseline regression.

As we stated at the beginning of this subsection, we now turn to a discussion of interaction models. Since we are interested in the within variation, maybe the interaction of our political variables shed some more light on political distortions in national tax revenue forecasts. Our results clearly suggest that left-wing incumbents are more optimistic or less pessimistic than their right-wing counterparts. For political business cycles, we find no effect at all. The overestimation of left-wing governments, however, may vary across the electoral cycle. Another interesting point is the interaction of our partisan variable with one of the fragmentation variables. It is conceivable that the incumbent party may behave in a different way if the composition and therefore the fragmentation of the parliament varies. Such

questions can easily be answered with standard interaction models. Thus, our baseline regression from Equation (1) is enlarged with the interaction terms $ELCTY * SCHMIDT$ and $SCHMIDT * RAE\_LEG$ separately. The following Table 4 presents the estimation results from the interaction model.

Table 4: Estimation results: with interaction terms

Variable	(1)	(2)
ELCTY	-0.0168	-0.0070
	(0.0114)	(0.0054)
SCHMIDT	0.0086**	0.0740**
	(0.0038)	(0.0308)
RAE_LEG	-0.0027**	-0.0006
	(0.0012)	(0.0012)
REELECT	-0.0004	-0.0003
	(0.0011)	(0.0011)
ELCTY*SCHMIDT	0.0045	–
	(0.0049)	
SCHMIDT*RAE_LEG	–	-0.0009**
		(0.0004)
c	0.5960**	0.3990*
	(0.2330)	(0.2000)
Controls	YES	YES
C-FE	YES	YES
T-FE	YES	YES
R^2 (within)	0.4680	0.4810
Obs.	281	281

Note: Robust standard errors in parentheses. ***, **, * denote statistical significance at the 1%, 5% and 10% level.

The interaction model reveals two interesting results. First, political business cycle effects are not present, independent from the ideology of the incumbent. In addition, the results for partisan theory and legislative fragmentation still hold. This confirms our baseline results. Second, the interaction between ideology and legislative fragmentation is negative and statistically significant. Thus, for a given level of the Schmidt-Index, a higher fragmentation in the parliament reduces the overestimation of the incumbent. This result confirms our former finding that – contrary to standard theory – overestimation decreases the more fragmented a parliament is.

5.2.3. Sample Composition

In order to check whether our results were driven by single countries, we first reestimated Equation (1) by successively excluding each single country. In a second step, we excluded those countries which were classified by Büttner and Kauder (2010) for having the most

independent estimations (ExINDEP) to produce their tax revenue forecasts (Austria, Germany, the Netherlands and Norway). Third, we reran our estimation by excluding the least and most fragmented countries (ExFRAG). Finally, we estimated the effects by looking at the countries with the most independent forecasts (onlyINDEP). The results can be found in Table 5 and Table 6. To save space, we decided to give only qualitative results for exclusion of one single state. For the regression ExINDEP, ExFRAG and onlyINDEP we show the point estimates.

Let us first stick to results by excluding the most independent and most fragmented forecasts. As in all earlier robustness checks, the results are in most cases robust to these two sub-samples. We find no political business cycles, as well as no effects from the reelection probability. The partisan coefficient is always positive and statistically significant in nearly all cases. Legislative fragmentation again has a negative impact on tax revenue forecast errors. All in all, these robustness checks confirm our baseline results.

In a second step, we look at the results for the most independent forecasts (Austria, Germany, the Netherlands and Norway). The independence of the tax revenue forecast seems to matter since none of the political variables is statistically significant; the Schmidt-Index has a p-value of 0.107, however, and thus barely misses reaching a conventional level of significance. This confirms the view of Büttner and Kauder (2010) that independence matters for the preparation of tax revenue forecasts.

Table 5: Estimation results: independence and fragmentation

Variable	ExINDEP	ExFRAG	onlyINDEP
ELCTY	-0.0069	-0.0050	0.0184
	(0.0072)	(0.0085)	(0.0150)
SCHMIDT	0.0121**	0.0049	0.0162
	(0.0045)	(0.0040)	(0.0071)
RAE_LEG	-0.0027*	-0.0033**	-0.0028
	(0.0015)	(0.0012)	(0.0024)
REELECT	-0.0011	-0.0005	0.0004
	(0.0012)	(0.0015)	(0.0026)
c	0.6250**	-0.0002	4.4590
	(0.2440)	(0.3200)	(2.3720)
Controls	YES	YES	YES
C-FE	YES	YES	YES
T-FE	YES	YES	YES
R^2 (within)	0.4970	0.4890	0.7940
Obs.	230	147	51

Note: Robust standard errors in parentheses. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

Table 6: Estimation results: exclusion of each single state

Variable	ExAT	ExAU	ExBE	ExCA	ExCH	ExDE	ExES	ExFR	ExIE
ELCTY	(−)	(−)	(−)	(−)	(−)	(−)	(−)*	(−)	(−)
SCHMIDT	(+)**	(+)	(+)**	(+)**	(+)**	(+)*	(+)	(+)*	(+)**
RAE_LEG	(−)**	(−)**	(−)**	(−)**	(−)**	(−)*	(−)**	(−)*	(−)**
REELECT	(−)	(−)	(−)	(−)	(−)	(−)	(−)	(−)	(−)
c	(+)**	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
C-FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
T-FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2 (within)	0.476	0.474	0.462	0.474	0.486	0.466	0.466	0.466	0.459
Obs.	265	265	264	264	270	264	264	264	266

Variable	ExIS	ExIT	ExJP	ExNL	ExNO	ExNZ	ExSE	ExUK	ExUS
ELCTY	(−)	(−)	(−)	(−)	(−)	(−)	(−)	(−)	(−)
SCHMIDT	(+)**	(+)**	(+)**	(+)**	(+)***	(+)**	(+)*	(+)**	(+)**
RAE_LEG	(−)**	(−)*	(−)*	(−)**	(−)**	(−)**	(−)**	(−)***	(−)
REELECT	(−)	(−)	(+)	(−)	(−)	(−)	(−)	(−)	(−)
c	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)***	(+)
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES
C-FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
T-FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
R^2 (within)	0.464	0.479	0.484	0.463	0.486	0.474	0.470	0.516	0.401
Obs.	269	265	265	274	270	264	272	265	247

Note: Robust standard errors in parentheses. ***, **, * indicate statistical significance at the 1%, 5% and 10% level. *Abbreviations:* AT: Austria; AU: Australia; BE: Belgium; CA: Canada; CH: Switzerland; DE: Germany; ES: Spain; FR: France; IE: Ireland; IS: Iceland; IT: Italy; JP: Japan; NL: Netherlands; NO: Norway; NZ: New Zealand; SE: Sweden; UK: United Kingdom; US: United States.

Finally, let us discuss the role of EU member states. The surveillance of member states via EU fiscal rules (e.g., the Stability and Growth Pact) may influence national tax projections. To control for this potential effect we add the fiscal rule index (FRI) for each single European state provided by the European Commission, Department for Economic and Financial Affairs (ECFIN) to our baseline regression. The European Commission collects data on domestic fiscal rules for each EU Member State. This data set comprises all numerical fiscal rules for each member state and has been collected in a survey in 2006. Using all the information of the strength of each fiscal rule, the ECFIN calculates the fiscal rule index. In any specification, the FRI fails to reach a meaningful level of statistical significance. While the point estimates for our political variables remain robust, they are not significant in all specifications. This can be explained with multicollinearity issues raised by introducing the FRI into the estimation. Thus, the regression is not able to clearly distinguish the variation from the political variable from those of the FRI. In the end, this causes the estimated standard errors to be biased upwards, thus resulting in a wrong inference of the variables. The significance of our variables of interest, however, is in almost all cases not far away from reaching conventional levels of significance.

6. Conclusion

This paper's relevance lies in two research areas. First, analyses of governments' tax revenue forecast accuracy have strongly concentrated on technical aspects, paying little attention to political-economic factors, such as political business cycles, ideology, government fragmentation or the influence of reelection probabilities. Second, the few existing studies on the relation between political-economic factors and tax revenue forecast errors mainly focus on single countries and do not include international comparative aspects.

Looking at the time period from 1996 to 2012, we analyze whether national tax revenue forecasts in eighteen OECD countries are biased through the political process. We find strong support for partisan politics. Left-wing governments seem to overestimate tax revenues more or to underestimate tax revenues less compared to right-wing incumbents. One reason might be that they want to satisfy their electorate with additional expenditure plans. We do not find empirical evidence for political business cycles. At first sight, this seems to contradict the results of Jong-A-Pin *et al.* (2012). However, the different results can be explained by the fact that Jong-A-Pin *et al.* (2012) focus on real-time data whereas we use ex-post percentage forecast errors. We also find no empirical evidence for any influence of the reelection probability on tax revenue forecasts.

There seems to be no common pool problem in fragmented governments. Instead, fragmented governments seem to be more cautious with tax projections. This is in line with the existing literature (Goeminne *et al.*, 2008). First, at least some of the incumbents expect to stay in office and will be part of future governments. Second, the position of the finance min-

ister is strengthened the more coalition partners are in the cabinet; and the finance minister has no incentive to over- or underestimate tax revenues. This interpretation is supported by the findings of Chatagny (2013), who stresses the importance of the finance minister for tax revenue projections. Lastly, large coalitions are likely to represent a broader part of the population. In such cases, the usual common pool problem of coalitions loses its attraction.

In total, we find empirical evidence for political distortion in the national tax revenue projection process, leading to politically biased tax revenue projections. Therefore, the focus of good financial government attempts should be widened in two ways: First, tax revenue projection bodies should have institutional and personal independence. This view is supported by Merola and Pérez (2013), who favor the preparation of fiscal forecasts by national institutions rather than international organizations. Thus, in our setup, a straightforward policy recommendation is to completely outsource budget forecasts (and here especially tax revenue forecasts) to independent national institutes. This complete outsourcing also means that the forecasts of gross domestic product or any assessment basis will be produced by the independent institute. Our second policy recommendation is to strengthen public and parliamentarian awareness of budget implementation and budget control. The strategic use of tax revenue forecasts only brings advantages to the respective politicians as long as the public does not realize the complicated mechanism involved in the budget implementation process, and when budget control is loose or nontransparent. Well informed and cautious citizens could overcome this deficiency.

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References

Alesina, A. (1988). Credibility and Policy Convergence in a Two-Party System with Rational Voters. *The American Economic Review*, **78** (4), 796–805.

— and Perotti, R. (1994). The Political Economy of Growth: A Critical Survey of the Recent Literature. *World Bank Economic Review*, **8** (3), 351–371.

Arellano, M. and Bond, S. R. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, **58** (2), 277–297.

Armingeon, K., Knöpfel, L., Weisstanner, D. and Engler, S. (2014). *Comparative Political Data Set III 1990-2012*. Bern: Institute of Political Science, University of Berne.

Auerbach, A. J. (1999). On the Performance and Use of Government Revenue Forecasts. *National Tax Journal*, **52** (4), 765–782.

Bischoff, I. and Gohout, W. (2010). The political economy of tax projections. *International Tax and Public Finance*, **17** (2), 133–150.

Boylan, R. T. (2008). Political distortions in state forecasts. *Public Choice*, **136** (3-4), 411–427.

Brück, T. and Stephan, A. (2006). Do Eurozone Countries Cheat with their Budget Deficit Forecasts? *Kyklos*, **59** (1), 3–15.

Brender, A. and Drazen, A. (2005). Political budget cycles in new versus established democracies. *Journal of Monetary Economics*, **52** (7), 1271–1295.

Bretschneider, S. I. and Gorr, W. L. (1992). Economic, organizational, and political influences on biases in forecasting state sales tax receipts. *International Journal of Forecasting*, **7** (4), 457–466.

—, —, Grizzle, G. and Klay, E. (1989). Political and organizational influences on the accuracy of forecasting state government revenues. *International Journal of Forecasting*, **5** (3), 307–319.

Breuer, C. (2015). On the Rationality of Medium-Term Tax Revenue Forecasts: Evidence from Germany. *Jahrbücher für Nationalökonomie und Statistik: Journal of Economics and Statistics*, **235** (1), 22–40.

Büttner, T. and Kauder, B. (2008). *Methoden der Steuerschätzung im internationalen Vergleich*. ifo Forschungsberichte 44, Ifo Institute, Munich.

— and — (2010). Revenue Forecasting Practices: Differences across Countries and Consequences for Forecasting Performance. *Fiscal Studies*, **31** (3), 313–340.

— and — (2015). *Do External Experts Prevent Political Biases in Revenue Forecasts? Evidence from Germany*. Paper presented at the 52nd Annual Conference of the Public Choice Society, 2015.

Cassidy, G., Kamlet, M. S. and Nagin, D. S. (1989). An empirical examination of bias in revenue forecasts by state governments. *International Journal of Forecasting*, **5** (3), 321–331.

Cepparulo, A., Gastaldi, F., Giuriato, L. and Sacchi, A. (2014). Budgeting and implementing fiscal policy in Italy. *Journal of Public Policy*, **34** (3), 475–506.

Chatagny, F. (2013). *Incentive Effects of Fiscal Rules on the Finance Minister's Behaviour: Evidence from Revenue Projections in Swiss Cantons*. KOF Working Papers No. 347.

— and Siliverstovs, B. (2013). *Rationality of Direct Tax Revenue Forecasts under Asymmetric Losses: Evidence from Swiss cantons*. KOF Working Papers No. 324.

— and Soguel, N. C. (2012). The effect of tax revenue budgeting errors on fiscal balance: evidence from the Swiss cantons. *International Tax and Public Finance*, **19** (3), 319–337.

Cimadomo, J. (2015). Real-time Data and Fiscal Policy Analysis: A Survey of the Literature. *Journal of Economic Surveys*, **forthcoming**, DOI: 10.1111/joes.12099.

Danninger, S. (2005). *Revenue Forecasts as Performance Targets*. IMF Working Paper No. 05/14.

—, Cangiano, M. and Kyobe, A. (2005). *The Political Economy of Revenue–Forecasting Experience from Low–Income Countries*. IMF Working Paper No. 05/2.

de Haan, J. (2014). Democracy, Elections and Government Budget Deficits. *German Economic Review*, **15** (1), 131–142.

— and Sturm, J. E. (1994). Political and institutional determinants of fiscal policy in the European Community. *Public Choice*, **80** (1-2), 157–172.

Driscoll, J. C. and Kraay, A. C. (1998). Consistent covariance matrix estimation with spatially dependent panel data. *The Review of Economics and Statistics*, **80** (4), 549–560.

Duru, A. and Reeb, D. M. (2002). International Diversification and Analysts' Forecast Accuracy and Bias. *The Accounting Review*, **77** (2), 415–433.

Feenberg, D. R., Gentry, W., Gilroy, D. and Rosen, H. S. (1989). Testing the Rationality of State Revenue Forecasts. *The Review of Economics and Statistics*, **71** (2), 300–308.

Franzese, R. J. (2002). Electoral and Partisan Cycles in Economic Policies and Outcomes. *Annual Review of Political Science*, **5** (1), 369–421.

Goeminne, S., Geys, B. and Smolders, C. (2008). Political fragmentation and projected tax revenues: evidence from Flemish municipalities. *International Tax and Public Finance*, **15** (3), 297–315.

Hibbs, D. A. (1977). Political Parties and Macroeconomic Policy. *The American Political Science Review*, **71** (4), 1467–1487.

Jochimsen, B. and Thomasius, S. (2014). The perfect finance minister: Whom to appoint as finance minister to balance the budget. *European Journal of Political Economy*, **34** (June 2014), 390–408.

Jong-A-Pin, R., Sturm, J. E. and de Haan, J. (2012). *Using Real-Time Data to Test for Political Budget Cycles*. CESifo Working Paper No. 3939.

Jonung, L. and Larch, M. (2006). Improving fiscal policy in the EU: the case for independent forecasts. *Economic Policy*, **21** (47), 491–534.

Kauder, B., Potrafke, N. and Schinke, C. (2015). *Manipulating fiscal forecasts: Evidence from the German states*. mimeo.

Kyobe, A. and Danninger, S. (2005). *Revenue Forecasting – How is it done? Results from a Survey of Low–Income Countries*. IMF Working Paper No. 05/24.

Leal, T., Pérez, J. J., Tujula, M. and Vidal, J. P. (2008). Fiscal Forecasting: Lessons from the Literature and Challenges. *Fiscal Studies*, **29** (3), 347–386.

Merola, R. and Pérez, J. J. (2013). Fiscal forecast errors: Governments versus independent agencies? *European Journal of Political Economy*, **33** (December 2013), 285–299.

Mocan, H. N. and Azad, S. (1995). Accuracy and rationality of state General Fund Revenue forecasts: Evidence from panel data. *International Journal of Forecasting*, **11** (3), 417–427.

Nickell, S. (1981). Biases in Dynamic Models with Fixed Effects. *Econometrica*, **49** (6), 1417–1426.

Nordhaus, W. D. (1975). The Political Business Cycle. *The Review of Economic Studies*, **42** (2), 169–190.

Ohlsson, H. and Vredin, A. (1996). Political Cycles and Cyclical Policies. *The Scandinavian Journal of Economics*, **98** (2), 203–218.

Paleologou, S. M. (2005). Political Manoeuvrings as Sources of Measurement Errors in Forecast. *Journal of Forecasting*, **24** (5), 311–324.

Perotti, R. and Kontopoulos, Y. (2002). Fragmented fiscal policy. *Journal of Public Economics*, **86** (2), 191–222.

Persson, T. and Svensson, L. E. O. (1989). Why a Stubborn Conservative would Run a Deficit: Policy with Time- Inconsistent Preferences. *Quarterly Journal of Economics*, **104** (2), 325–345.

— and Tabellini, G. (1997). *Political Economics and Macroeconomic Policy*. NBER Working Paper No. 6329.

Pesaran, M. H. (2004). *General diagnostic tests for cross section dependence in panels*. CESifo Working Paper No. 1229.

Pettersson-Lidbom, P. (2001). An Empirical Investigation of the Strategic Use of Debt. *Journal of Political Economy*, **109** (3), 570–583.

Pina, A. M. and Venes, N. M. (2011). The political economy of EDP fiscal forecasts: An empirical assessment. *European Journal of Political Economy*, **27** (3), 534–546.

Rogoff, K. and Sibert, A. (1988). Elections and Macroeconomic Policy Cycles. *The Review of Economic Studies*, **55** (1), 1–16.

Roubini, N. and Sachs, J. D. (1989a). Government Spending and Budget Deficits in the Industrial Countries. *Economic Policy*, **4** (8), 99–132.

— and — (1989b). Political and economic determinants of budget deficits in the industrial democracies. *European Economic Review*, **33** (5), 903–938.

Serritzlew, S. (2005). Breaking Budgets: An Empirical Examination of Danish Municipalities. *Financial Accountability & Management*, **21** (4), 413–435.

Strauch, R., Hallerberg, M. and von Hagen, J. (2004). *Budgetary Forecasts in Europe – The Track Record of Stability and Convergence Programmes*. ECB Working Paper Series No. 307.

Sutter, M. (2003). The political economy of fiscal policy: An experimental study on the strategic use of deficits. *Public Choice*, **116** (3-4), 313–332.

Tabellini, G. and Alesina, A. (1990). Voting on the Budget Deficit. *The American Economic Review*, **80** (1), 37–49.

Volkerink, B. and De Haan, J. (2001). Fragmented Government Effects on Fiscal Policy: New Evidence. *Public Choice*, **109** (3-4), 221–242.

von Hagen, J. (2010). Sticking to fiscal plans: the role of institutions. *Public Choice*, **144** (3-4), 487–503.

Vorhees, W. R. (2004). More Is Better: Consensual Forecasting and State Revenue Forecast Error. *International Journal of Public Administration*, **27** (8 & 9), 651–671.

A. Descriptive statistics

Table 7: Descriptive statistics and forecast errors

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
FEPERC	283	-0.0017	0.0788	-0.1922	0.3382
ELCTY	323	0.2972	0.4577	0	1
ELCTYCUT	323	0.2941	0.4564	0	1
SCHMIDT	323	2.3251	1.5209	1	5
IDEO	323	0.3746	0.4850	0	1
RAE_LEG	323	68.3858	11.0962	48.3438	88.9761
NUMCOAL	323	2.3591	1.4212	1	9
EFFNUMCOAL	323	1.9493	1.0798	1	5.4000
SPENDMIN	323	18.1331	5.7611	7	39
RAE_GOV	323	31.0034	28.2701	0	81.7600
REELECT	323	35.0631	9.0433	10.9000	52.9000
NEWGOV	323	0.2198	0.4148	0	1
SINGLE	323	0.3437	0.4757	0	1
LARGE	323	0.3715	0.4840	0	1
INDEP	323	0.2105	0.2571	0	0.7500
QUALGOV	323	1.6769	0.3489	0.2136	2.2176
GDPGR	323	2.2395	2.4503	-6.5895	11.3422
GDPFORE	323	4.5541	1.9249	-2.6100	12.6200
GDPERR	323	-2.3146	2.4589	-12.3800	5.5900
OGAP	323	0.2385	2.6563	-7.8659	10.2728
ALQ	323	6.5549	3.1121	2.0072	25.0272
POP	323	5.966e+07	8.647e+07	268,927	3.14e+08
POPGR	323	0.0073	0.0059	-0.0219	0.0329
TAXQ	320	35.7899	6.8017	23.7550	51.4370
TAXN	323	17.7895	4.2811	10	25
FISCDEC	323	42.3560	19.7466	5.3872	77.5577
MPFE[a]			-0.0017		
MAPFE[b]			0.0534		
SDPFE[c]			0.0788		
RMSPFE[d]			0.0787		

Calculations based on the whole sample (1996–2012). *a*) mean percentage forecast error; *b*) mean absolute percentage forecast error; *c*) standard deviation of MPFE; *d*) root mean squared percentage forecast error. *Source*: Armingeon *et al.* (2014), Büttner and Kauder (2010), National Budget Plans, OECD Economic Outlook, Political Data Yearbook.

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