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Faculty of Social Sciences
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MASTER'S THESIS

Fiscal policy in real-time: Role of growth surprises

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Declaration of Authorship

The author hereby declares that she compiled this thesis independently; using only the listed resources and literature, and the thesis has not been used to obtain a different or the same degree.

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Prague, January 6, 2020

Signature

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Abstract

This thesis explores the reliability of real-time estimates of the cyclically-adjusted primary balances. Using fixed effects and weighted least squares models, we show that the real-time estimates are systematically biased and subsequently revised downwards. Moreover, the most important determinants of the revisions are economic conditions and the cyclically-adjusted primary balance revisions are positively correlated with growth surprises. On the other hand, we do not confirm any significant role of institutions and political environment that has appeared in the previous literature.

JEL Classification	C23, E62, H68, H87
Keywords	Real-time data, fiscal surveillance, Stability and Growth Pact, cyclically-adjusted primary balance
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Abstrakt

Tato práce se zabývá ex-post revizemi cyklicky upraveného primárního salda rozpočtu a jejich determinanty. S použitím modelů s fixními efekty a metody vážených nejmenších čtverců jsme ukázali, že odhady cyklicky upraveného primárního salda rozpočtu prováděné v reálném čase jsou zkreslené, a ex-post upravované směrem dolů. Ukázali jsme také, že nejvýznamnějšími determinanty těchto revizí jsou ekonomické podmínky a že existuje pozitivní korelace mezi těmito revizemi a revizemi růstu hrubého domácího produktu. Nebyli jsme nicméně schopni potvrdit závěry předchozích analýz, týkající se signifikantního vlivu institucionálního a politického prostředí na revize.

Klasifikace	C23, E62, H68, H87
Klíčová slova	Data sbíraná v reálném čase, fiskální dohled, Pakt stability a růstu, cyklicky upravené primární saldo rozpočtu
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Acronyms

CAB	Cyclically-adjusted balance
CAPB	Cyclically-adjusted primary balance
EA	Euro area
EDP	Excessive Deficit Procedure
EMU	Economic and Monetary Union
EU	European Union
FE	Fixed effects
HP	Hodrick-Prescott
MTBF	Medium-term budgetary framework
SGP	Stability and Growth Pact
WLS	Weighted least squares

Master's Thesis Proposal

Author: Ing. Vendula Kulichová
Supervisor: PhDr. Jaromír Baxa, Ph.D.
Defense Planned: January 2020

Proposed Topic:

Fiscal policy in real-time: The role of growth surprises

Motivation:

Since the reform of Stability and Growth Pact (SGP) of 2005, cyclically-adjusted budget balance has become the key element of EU fiscal surveillance framework, as it is used for both the assessment of country-specific medium-term fiscal objectives under the preventive arm of SGP and the assessment of the effective action of the excessive deficit procedure under the corrective arm of SGP. Governments therefore calculate with cyclical component while creating fiscal policy. However, the output gap identifying the cyclical component of the budget balance is often subject to numerous ex-post revisions. Hence understanding the relation between the real-time estimate of the output gap and its final figures is vital.

Few researchers have already been dealing with the problem of fiscal data revisions in European Union. For example, De Castro, Pérez and Rodríguez-Vives (2013) use panel data from EU-15 countries in years 1995 to 2008 to test whether the initial releases are rational forecasts of finally revised budget balances. Kempkes (2012) also works with EU-15 countries and tests real-time bias of data from databases of the EU, the IMF and the OECD. As we are now able to gather data from the time of financial and European debt crisis, this thesis follows the intuition of these authors, but consider also the influence of growth surprises and performance of public finances on the reliability of the estimates.

Hypotheses:

1. Hypothesis #1: Cyclically-adjusted budget balance real-time estimates are predictable.
2. Hypothesis #2: Cyclically-adjusted budget balance real-time estimates revisions are correlated with growth surprises.
3. Hypothesis #3: Cyclically-adjusted budget balance real-time estimates differ across fiscal policy regimes/fiscal policy rules.

Methodology:

For the first part of the thesis, existing literature will be synthesized to form comprehensive theoretical background on the topic and the summary of yet covered topics. The second step will be gathering the data for 28 member states of the EU. Panel will be constructed from data drawn from European Economic Forecast published by European Commission over the period 2002–2017, OECD Economic Outlook (1999-2017) and World Economic Outlook published by IMF (2000–2017). All the reports are published on semi-annual basis, therefore two real-time estimates

per year will be considered. The data will be used to test the hypotheses using regression analysis. For the primary analysis, the dependent variable will be the revised estimate of output gap and the explanatory variables will be the real-time estimates of the output gap. Then growth surprises and the fiscal transparency will be added as explanatory variables. When constructing the model, I will draw from experience of De Castro, Pérez and Rodríguez-Vives (2013) and Kempkes (2012).

Expected Contribution:

Since fiscal coordination of member states is years after European debt crisis outbreak still a vivid topic within the EU, we can expect further contemplation on the state of SGP. Understanding the mechanisms of current fiscal framework will then be crucial. The thesis focuses on understanding of one of the key elements of the framework – the cyclical component of budget balance and its revisions. The thesis aims to extend existing literature on the topic further not only by using broader dataset than other authors, but also by exploring the role of growth surprises and fiscal transparency during the years of severe economic conditions with worse predictability of economic development.

Outline:

1. Introduction
2. Literature review: Summary on the previous research on the topic and theoretical background necessary for understanding of the topic
3. Methodology: Explanation of models used for testing of the hypotheses
4. Data: Description of the model inputs
5. Results: Discussion of the findings resulting from the model
6. Conclusion: Summary of the findings and implications for fiscal policy and future research

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1 Introduction

The Stability and Growth Pact (SGP) is essential to the EU fiscal coordination. Based on the SGP, the EU member states set their medium-term budgetary objectives in terms of cyclically-adjusted primary balances and the European Commission together with the Economic and Financial Affairs Council monitor their compliance. In case of non-compliance, a member state enters Excessive Deficit Procedure. This process gained even more importance in the light of the recent European debt crisis, which showed a substantial deterioration of public finances in the EU and a great need for fiscal consolidation. Naturally, the effectiveness of the monitoring process is conditional on the provision of correct data, which are submitted to the European Commission by national statistical agencies. However, Kempkes (2014), De Castro et al. (2013), Hallett et al. (2012), and others found recently that these fiscal data are subject to uncertainty and sizeable revisions, which can take place even several years after they are first reported. This literature was surveyed by Cimadomo (2012).

The most important study dealing with the accuracy of real-time cyclically-adjusted primary balance (CAPB) figures is the work of Hallett et al. (2012). With OECD data the authors conclude that there is a systematic link between CAPB revisions and fiscal position of the economy – in times of poor state of public finances and fiscal slippage, CAPB estimations are less precise and overly optimistic. Nevertheless, Hallett et al. (2012) address only the issue of fiscal position and not any other types of variables determining CAPB. To study the determinants behind budget balance revisions further, we must look past the literature on cyclically-adjusted budget balance and focus on papers analysing the topic regardless of the cyclical component and on papers working with different fiscal data than budget balance. In research focussing on the properties of fiscal data in the EU, we can observe similar results with respect to the presence of bias no matter which fiscal variable is in question. For example, Kempkes (2014) shows a significant negative bias of output gap revisions in European Commission, IMF and OECD samples of EU-15 countries between the beginning of the millennium and 2012, De Castro et al. (2013) conclude negative bias of budget balance is present in a sample of EU-15 countries in 1999–2009. At the same time, researchers studying the impact of strong fiscal institutions and different political factors on budget balance revisions also come to similar conclusions – Pina and Venes (2011) and Beetsma et al. (2009) agree that strong fiscal rules are linked to cautious forecasts and policymaking; Bruck and Stephan (2006) show the existence of political cycles in fiscal policymaking

and together with Beetsma et al. (2009) they confirm the left-right position of governments plays a role in how optimistic or pessimistic governments are when estimating budget balance.

In this paper, we focus on statistical properties of the revisions in cyclically-adjusted primary balance (CAPB) to evaluate its reliability for policy-guidance, since the CAPB is the central indicator of fiscal policy stance in the current EU fiscal framework (European Commission, 2019). We contribute to the existing studies by evaluating whether the fiscal revisions remain systematic even when the data after the financial crisis of 2008 are employed. Moreover, we explore the role of growth surprises and institutional variables to assess what are the most important determinants of the revisions and whether the fiscal revisions remain more pronounced in countries with less sound record of fiscal rule compliance. To do so, we gather a panel of real-time fiscal and macroeconomic data for the EU-28 member states between 2003 and 2018. Drawing on the literature on budget balance revisions properties and determinants, we test for the presence of systemic bias in different countries and years using the fixed effects models, and then we focus on estimation of the determinants of this bias with panel data techniques.

We confirm systematic bias in revisions of the cyclically-adjusted primary balances, which is consistent with previous research. Contrary to previous research, we find that the role of institutional and political variables is negligible. The results suggest that the most significant determinants of cyclically-adjusted primary balance revisions are economic variables, particularly revision in output gap and lagged output gap. We discover that CAPB revisions of the data estimated in the year of budget-making are significantly positively correlated with growth surprises. We also show the negative impact of the global financial crisis outbreak on the reliability of the CAPB estimates. Therefore, my results have somewhat different policy implications than previous literature, suggesting that under fast-changing economic conditions, sound institutional framework has little positive impact on the correctness of CAPB estimations. We confirm the optimism hypothesis studied by numerous researchers (e.g. Strauch et al. (2004) and von Hagen (2010)) that in good times, policymakers are prone to overestimating budget balances.

The remainder of this paper is organized as follows: chapter 2 reviews the most relevant research and literature on real-time fiscal data, the Stability and Growth Pact and the role of CAPB within it; chapter 3 describes weighted least squares and fixed effects models, their application on our research question and explains the reasoning behind the choice of these models; chapter 4 provides a description of the data used including

data sources, and also includes summary statistics of both response and explanatory variables; chapter 5 presents the results of our empirical analysis; finally, chapter 6 concludes with a summary of the main findings of this thesis and their policy implications.

2 Literature Review

In order to understand the importance of accurate real-time estimates of cyclical components for the European Union fiscal surveillance framework, the first part of the literature review is dedicated to the description of the development and the current state of the Stability and Growth Pact and the role of cyclically-adjusted primary balance within it. In the second part of the literature review, existing research examining different aspects of real-time estimates of fiscal data is summarized and divided into three thematic areas: (1) research mapping ex-post revisions of fiscal data, their properties and consequences; (2) papers explaining how fiscal governance and different political factors interact with real-time estimates of fiscal data; and (3) ex-post analyses of actual fiscal policy stances using data available at the time of policy decision-making.

2.1 Stability and Growth Pact

The Stability and Growth Pact was first introduced into the system of EU law in 1997 in the form of two regulations: Council Regulation (EC) No 1466/97 of 7 July 1997 on the strengthening of the surveillance of budgetary positions and the surveillance and coordination of economic policies and Council Regulation (EC) No 1467/97 of 7 July 1997 on speeding up and clarifying the implementation of the Excessive Deficit Procedure. In their work, Morris et al. (2006) describe the rationale behind the existence of fiscal rules in the EU and the introduction, implementation and modification of the SGP until the first reform in 2005. Authors provide evidence of budget deficits ran in the years 1977–1991 by original euro area member states (with the exception of Finland and Luxembourg) leading to rising debt levels. They also provide reasons for the persistence of such fiscal policy, which are mainly behavioural and connected to transaction costs in the political process – high information costs of the concept of fiscal constraint to voters or the common pool problem consisting of widely spread costs and narrowly focussed target groups of public spending are among them. Budget deficits and increasing debt have an impact on economic stability and growth, e.g. in the form of inflationary pressures or smaller room for fiscal policy manoeuvring during unfavourable economic conditions. In the EMU, where automatic market mechanisms that could exert discipline are weakened and spillover effects are strong, the need for a coordinated approach to fiscal policy is even more pressing.

The first step towards a coordinated fiscal policy in EMU was incorporation of the benchmarks for “excessive deficit” (debt in the amount of 60% of GDP and deficit in the amount of 3% of GDP) into the Maastricht Treaty. The SGP was then set to provide the framework of actions to prevent and correct the excessive deficit in its two respective arms. Under the preventive arm, member states submitted annual stability programmes with medium-term fiscal policy objective (MTO), which should have been “close to balance or in surplus” and a path to achieve it. Under the corrective arm, the European Commission had the right to start a process in which the European Council recommended a course of action for a member state with an excessive deficit and monitored the implementation of its recommendations. After a period of fiscal consolidation, which followed the Maastricht Treaty entry into force in 1990s, the first years of existence of the SGP were marked by multiple countries failing to follow the rules. Even though member states complied in nominal terms, they were not able to adequately react to favourable economic conditions, and structural balances deteriorated as a result. In addition, the Council did not adopt the necessary procedures due to the inability to secure a qualified majority. Therefore, the credibility of the SGP was questioned and in 2005 the first reform was proposed.

The 2005 reform of the Pact enabled states to set medium-term objectives by themselves, and thus account for their specific circumstances, and overall introduced flexibility to the procedures. Opinions on the execution of the reform differed, primarily because of the increase in flexibility. Schuknecht et al. (2011), when describing the developments following the 2005 reform, show that despite remaining favourable economic conditions, few countries carried out significant fiscal consolidation, and cyclically-adjusted indicators performed poorly. The problems with data reporting also became apparent. When the crisis hit the EU, member states’ public finances rapidly deteriorated and, eventually, the SGP was reformed. Three new regulations, Six Pack, Fiscal Compact and Two Pack strengthened fiscal governance in the EU and made it more complex. Laffan and Schlosser (2016) explain the different functions of these legislative acts. The first response to the developments triggered by the crisis was the adoption of Six Pack in 2011. The aim of this package of five regulations and one directive was to restore the credibility of EU member states with respect to bond markets. Therefore, the European Commission’s authority over member states’ economies in the fiscal policy area was significantly strengthened and broadened. Neither Two Pack, nor Fiscal Compact introduced in the EU fiscal governance network in 2013, relate directly to the SGP. Two Pack, which introduced new monitoring tools in the framework of the European Semester, was only binding for Eurozone members. Fiscal Compact was a new international agreement aiming to further strengthen the commitments of most EU member states in the area of fiscal

governance. Nevertheless, as Laffan and Schlosser (2016) state, its role was rather symbolic. After 2013, no further reforms to the EU fiscal governance framework were made.

The topic of the role of cyclically-adjusted primary balance in the SGP framework is dealt with in the work of Larch and Turini (2010). The CAPB became one of the most important indicators of the SGP after its reform in 2005. The use of CAPB in the SGP framework is based on Keynesian economics, stating that there are temporary fluctuations in economics. Fiscal policymaking must take these conditions into account and distinguish between temporary and permanent changes in the macroeconomic variables used in the assessment of fiscal developments. CAPB serves this purpose and answers the two crucial questions of the SGP – when a member state breach the threshold of 3% of GDP deficit (expressed in structural terms) and how distant the medium-term objectives are (defined also in structural terms).

The counterweight of the fairly simple rationale behind the employment of CAPB in the framework of EU fiscal surveillance is its problematic computation arising from unobservable true cyclical position of the economy. The prevalent method to calculate CAPB is to (1) obtain the output gap by subtracting actual output from potential output; (2) calculate the cyclical component of budget balance by multiplying the output gap and the budgetary sensitivity parameter aggregating the elasticities of individual budgetary items, and (3) subtract the cyclical component of budget balance from the nominal budget balance. The main problem of this process is the calculation of potential output as its real value is not observable. During the SGP's existence, countries were using two methods to calculate potential output. Before 2002, a statistical detrending method using the HP filter was employed, but after its criticism at the turn of the century, the production function estimation approach was adopted. Havik et al. (2014) describe in detail the current methodology. Mc Morrow et al. (2015) compare the quality of output gap estimates drawn from both these approaches. The authors conclude that the production function method performed better, especially during a period of crisis.

Even if the potential output (and therefore output gap) estimation is reasonably reliable when using the production function methodology, problems with CAPB estimation exist. Larch and Turini (2010) identify two main weak spots: the uncertainty of the estimation accuracy and fluctuations of the tax elasticity with respect to GDP. The uncertainty problem arises from inaccurate forecasts of the output gap and its revisions and is addressed in the second subchapter of the literature review. The tax elasticity problem arises from the assumption of constant tax elasticities when calculating the

cyclical component of the budget. Although it can be a reasonable assumption most of the time, in exceptional cases tax can differ from their normal values, and it can have an unfavourable effect on the accuracy of fiscal policy, e.g. at the turn of the century, when tax cuts and expense increases were excessive and resulted in a reform of the SGP in 2005.

2.2 Fiscal Data in Real Time

2.1.1 Fiscal Data Revisions

Fiscal data revisions only came to the attention of scholars in the last two decades. Given the importance of fiscal data estimations for the EU fiscal surveillance framework, the number of papers focussing on European countries is sizeable. A comprehensive survey of the literature on the topic of real-time fiscal data was put together by Cimadomo (2012), who divides real-time fiscal data literature into four groups: (1) papers dealing with the statistical properties of revisions in fiscal data; (2) papers examining the political and institutional determinants of projection errors; (3) papers focussing on the reaction of fiscal policies to the business cycle and (4) papers addressing the use of real-time fiscal data in structural vector autoregression (VAR) models. Regarding the first group, Cimadomo (2012) concludes that the revisions are large, characterized as noise and predictable, therefore, they are biased. He states that the role of political and institutional factors (e.g. fiscal rules, fiscal governance or upcoming elections) is significant. He points out that analyses of fiscal policy show counter-cyclicity when using the data available *ex-ante*. Lastly, the author suggests that papers show the usefulness of real-time data for fiscal shocks identification in VAR models. Following the logic of his work, the literature review covers (1) the statistical properties of fiscal data revisions, (2) the determinants of the projection errors, with a special focus on fiscal rules and fiscal governance and (3) the reaction of real-time fiscal policy to business cycle developments.

One of the most recent analyses on real-time fiscal data estimation accuracy in the EU is that of Kempkes (2014). In his paper, the author analyses the output gap of the EU-15 countries¹ estimated in real-time by the EU, the OECD and the IMF over the 2002–2012, the 1989–2012 and the 2000–2012 periods, respectively. For the analysis, the output gap estimated in spring and autumn one year before the target year and in spring and autumn of the target year are denoted as real-time estimates. Both years are considered because different periods may be of interest during the process of fiscal

¹ EU-15 countries comprise of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

policy making in different states. For the revised data, the author uses the latest numbers available. Kempkes (2014) concludes that the joint hypothesis of unbiased real-time output gaps is rejected for all real-time vintages of all three institutions. In the case of OECD and IMF data, the bias is downward for all countries and it is statistically significant for most real-time vintages of the countries. EU data also yields a negative bias of real-time estimates for all countries with the exception of Greece, where the bias is positive, which the author attributes to estimation difficulties of Greece's potential output during the crisis. However, the significance of the country dummies is lower than in the case of OECD and IMF. The author also analyses the real-time output gap estimates obtained with the Hodrick-Prescott filter published by the European Commission. The most significant difference is the important negative bias of real-time estimates in the case of Greece. Otherwise, the results suggest a bias stronger in magnitudes but less significant. According to the author, the sources of the bias are macroeconomic projections and slow adoption of new information by estimating institutions.

The reliability of revisions of output gap by different international organizations is also discussed by Deutsche Bundesbank (2014). In their report, the estimates of OECD and IMF for G7 economies from 1999 to 2010 are examined. The analysis supports the results obtained by Kempkes (2014) and shows large ex-post revisions in output gap data in an upward direction for both the OECD and IMF data. In addition, Deutsche Bundesbank (2014) points to the possibility of distant years revisions and as well as the magnitude of the revisions, which is so large that it is not an uncommon practice to change the sign of the output gap estimation during the revision. The analysis describes the impact of too pessimistic real-time estimations of the cyclical position of economy, which could potentially lead to a relatively high increase in the debt ratio.

Besides the reliability of fiscal data, several researchers also examined potential factors influencing revisions of fiscal data. Among the most relevant here are De Castro et al. (2013) focussing on European Commission data on the budget balance of the EU-15 and the USA in the period 1995–2005 and Hallett et al. (2012) working with CAPB OECD data on 19 countries in the period 1995–2008. Budget balance data gathered by De Castro et al. (2013) shows negative bias being a significant property for the pool of countries and years when comparing real-time estimates and the furthest revision, i.e. the final value of the budget balance tends to be higher (lower deficit or higher surplus) than ex-ante data would suggest. De Castro et al. (2013) also analyse whether the revision is due to “noise”, i.e. the first announcement is correlated with the final estimation and thus it is measured with an error, or it is due to “news”, i.e. initial release is efficient, and the revision arises from the emergence of new information. Authors

conclude that revisions can be attributed to “noise”, therefore, measurement error is present.

Unlike previously mentioned authors, Hallet et al. (2012) do not provide the readers with information on the magnitude or the significance of the bias. The authors analyse CAPB in three ways: (1) comparison of the OECD ex-ante estimates reliability with their own estimates obtained using HP filter; (2) assessment of identification of fiscal loosening episodes; (3) analyses of the link between public finances condition and CAPB estimation errors. The first conclusion is that simpler estimation method using the HP filter yields better results with respect to reliability. The second conclusion is that CAPB estimates perform poorly not only when identifying fiscal loosening in real-time and 2 years after, but also when detecting failures of the member states to improve their fiscal positions. Finally, Hallet et al. (2012) address the problem of public finances performance – according to their analysis, CAPBs tend to be over-optimistic in periods of fiscal loosening and over-pessimistic in periods of fiscal tightening.

Different types of output gap estimates are also taken into consideration by Marcellino and Musso (2011). In their research, they focus on five different types of euro area real-time output gap estimates for the years 1999–2010. The authors include data for the USA in their analysis and use them as a benchmark. The five types of estimates considered are: (1) measures based on capacity utilisation extracted from European Commission survey on manufacturing sector; (2) estimates computed using the multivariate unobserved components models; (3) measures provided by international organization (including IMF and OECD estimates based on production function approach and European Commission estimated based both on HP filter and production function approach); (4) measures obtained by applying standard filters to real GDP levels (including HP filter, band-pass filter and deviations from a linear trend) and (5) estimates computed by averaging different groups of estimators from the types mentioned above). Marcellino and Musso (2011) define different types of uncertainty linked to output gap estimates as model uncertainty, parameter uncertainty, parameter instability and data uncertainty. The performance of different types of estimates with respect to these uncertainties is assessed. All types of estimation suggest high uncertainty regarding real-time output gap data both in the euro area and the USA. High correlation across different types of estimators could be found. Overall, some of the unobserved components models appeared to be relatively more reliable – a result which supports earlier research by Rünstler (2002) on the reliability of unobserved components models. Regarding the comparison between euro area and US output gap reliability, Marcellino and Musso (2011) find that euro area estimates tend to be revised to a larger extent, a the correlation between real-time and final estimates can be found.

Particularly in the early stages of the research on output gap reliability, papers focussed on individual countries. Among them are for example the works of Nelson and Nikolov (2002) focussed on the UK's real-time output gap in the 1970s and 1980s, Orphanides and van Norden (2002) investigating measurement issues for US output gap from the 1960s or Cayen and van Norden (2005) examining revisions of Canadian output gap 1972–2000. All three papers show low reliability of real-time output gap estimates regardless of the methodology used for the estimation. Ley and Misch (2014), who used a data sample by the IMF for 169 countries from 1990 to 2012 and divided them into income groups, also support the finding that reliability of fiscal data is not an isolated problem of the euro area or developed countries. In their research, the authors find that for all income groups revisions were significant, although of different magnitude for different groups. The group of high-income countries not members of the OECD was the one with the lowest mean revisions and the only one with positively biased real-time estimates. The highest average bias was present with high-income OECD countries.

In general, the authors agree that the real-time output gap estimations should be approached by both fiscal and monetary policymakers with great caution. Few of the above-mentioned researchers offer their thoughts on possible solutions to the unreliability of real-time output gap estimates. Nelson and Nikolov (2002), Kempkes (2014) and Bundesbank (2014) suggested an adjustment of fiscal rules. Nelson and Nikolov (2002) state the example of an optimized output gap response in a Taylor rule or the possibility of using of “prudent” simple policy rules proposed by Orphanides (2003). Kempkes (2014) and Bundesbank (2014) offered another solution: bias in cyclical component should be followed and assessed after one economic cycle (8 to 10 years) – if the real-time output gap estimates are not balanced across one cycle, borrowing limit should be adjusted.

Output gap and primary balance or debt are the two types of fiscal variables whose revisions have figured the most in studies on fiscal data revision and which are the most relevant to this thesis. Naturally, research focussing on the reliability and characteristics of other real-time fiscal variables exists, but it is beyond the scope of this work to cover it thoroughly. To name just two examples: Aruoba (2005), who considers nominal and real output and six variables derived from them, as well as unemployment rate and levels and growth rates of employment, capacity utilization and industrial production in the USA in different periods from 1960s; and Clements and Galvão (2008), who assess real output growth revisions in the USA in the period 1967–1991.

2.1.2 Fiscal Governance and Fiscal Data Reliability

Since the introduction of the SGP and its numerical threshold to the European fiscal surveillance framework, papers considering possibility and incentives for policymakers to adjust fiscal data appeared. In this part of the literature review, two thematic areas are introduced: (1) the role of fiscal institutions and rules for the revisions of fiscal data; and (2) the topic of political cycles influence on fiscal data. Pina and Venes (2011) are among researchers focussing on the role of fiscal institutions. According to their findings, high coverage and strength of national-level expenditure rules are associated with prudent forecasts of macroeconomic developments. Strong fiscal rules are linked not only to cautious forecasts but also to more cautiousness in fiscal policymaking, as previously shown by Beetsma et al. (2009). In their paper, Beetsma et al. (2009) use real-time data from Europe's Stability and Convergence Programmes to analyse the factors influencing fiscal plans and their implementation in the period 1998–2007. The role of national fiscal institutions in the form of strong medium-term budgetary framework and tight numerical fiscal rules in the budgeting and the implementation stages is examined. The authors conclude that stronger national fiscal institutions are linked to more ambitious fiscal plans in the budgetary stage, as well as to adherence to such plans in the implementation stage. This link is confirmed by the above-mentioned paper by De Castro et al. (2013). Beetsma et al. (2009) also address the problem of creative accounting in the form of stock-flow adjustment and find that with more ambitious fiscal plans, more unplanned stock-flow adjustment appears in the implementation stage.

The strength of fiscal governance is also tackled by von Hagen (2010), who carried out an analysis on EU-15 data collected between 1998 and 2004. He investigates the issue in the context of governments operating either under delegation, i.e. the situation when the ministry of finance has significant power over fiscal policymaking decisions compared to the rest of the government or under contracts where fiscal policymaking decisions are made among all members of the government. Von Hagen (2010) finds neither group reports unbiased projections. Governments operating under contracts and strong fiscal rules tend to be more cautious with their growth forecasts, which are systematically biased downward, while governments operating under delegation are more optimistic and their projections are biased upwards. Nonetheless, the implementation of fiscal policy, overly optimistic projections do not necessarily pose a problem for governments under delegation, as they are more flexible in changing their fiscal policy decisions. These findings further clarify the results from previous research by Strauch et al. (2004), who conduct similar analysis and confirm the

cautiousness of the contracts systems but are not able to find a statistically significant effect of the delegation systems on data projections.

Political factors in EU-15 countries are a subject of interest for Bruck and Stephan (2006) and Pina and Venes (2011). Both studies focus on similar periods (1995–2004 and 1994–2006, respectively) and conclude that the introduction of the SGP provided additional incentives for EU countries to issue overly optimistic real-time projections of their budget balances. Bruck and Stephan (2006) additionally observe that this incentive is especially strong in the run-up to an election and with minority governments. They find a different pattern on different sides of the left-right political spectrum: left-wing governments are prone to more optimistic real-time projections, while right-wing governments prone to more pessimistic ones. This is in line with findings by Beetsma et al. (2009) that a leftward ideological shift in government produces larger spending increases and smaller revenue increases.

2.1.3 Actual Fiscal Policy Stance

Crucially, real-time data provide us with insight into the reaction of fiscal policies to business cycles through the data available to policymakers at the time of decision making. As the assessment of fiscal policy often differs depending on the use of real-time or revised data, this section of the literature review will briefly discuss important papers on the topic. One of the first researchers to tackle this problem was Orphanides (2001). He uses a simple US monetary policy example of Taylor rule in the period 1987-1992 and shows how ex-post data yield an incorrect description of historical policy. The problem of different assessments of the fiscal policy with regard to the cyclical conditions of the economy is comprehensively addressed by Golineli and Momigliano (2008). The authors review empirical literature on the cyclical response of fiscal policies in the euro area with the aim of explaining significant differences in conclusions as to whether fiscal policy acts counter-cyclically or pro-cyclically. Among the factors in such differences are the choice of model and the choice of data used for the estimation. Often-used ex-post revised data suggest pro-cyclical or a-cyclical fiscal policy, but when accounting for real-time data available at the time of policymaking, fiscal policy appears to be anti-cyclical.

Researchers working with data on EU countries confirm this bias in a manner coincident with Golineli and Momigliano's (2008) findings. Beetsma and Giuliadori (2009) use a sample of OECD countries' fiscal plans from 1995 to 2006 and conclude that the EU subsample shows that planned fiscal policy for EU countries is a-cyclical. According to the authors, the reason of pro-cyclicality suggested by later data revisions lies in the implementation stage of fiscal policy, when EU countries react pro-cyclically

to worsening of the business cycle, but do not react to an improvement in macroeconomic conditions. Assessing actual fiscal policy stances, Beetsma and Giuiliodori (2009) and Bernoth et al. (2008) conclude that for pre-election years, fiscal loosening can be identified regardless of whether ex-post data or ex-ante data are used, suggesting intentional loosening. Beetsma and Giuiliodori (2009) add that the opposite effect of fiscal tightening for periods after violations of the Maastricht and the SGP reference deficit levels is systematically present when using real-time data. Among other papers confirming the inappropriate evaluation of actual fiscal policy stances in the EU and OECD when using ex-post data are, for example, Gali and Perotti (2003), Golineli and Momigliano (2006), Paloviita and Kinunen (2011), Cimadomo (2012) or Forni and Momigliano (2004), who all find that when employing data available at the time of policymaking, the planned fiscal policy was counter-cyclical.

The topic of actual fiscal policy stances analysed using real-time being different than fiscal policy stances assessed using ex-post revised data is included mainly for the illustration of the importance of distinguishing between those two types of data. For the purposes of this work, the previous two chapters on fiscal data revisions and the relation between fiscal data revisions and fiscal governance are of greater significance. The literature does not cover the more recent years of the crisis, which could potentially bring a shift in some of the observed phenomena. The inclusion of the crisis years to the analysis is the first contribution this work aspires to make. The second one is a thorough analysis of factors influencing revisions in CAPBs. Literature studying budget balances revisions and the possible factors influencing them exists and is described above. None of the works explores how these factors affect budget balance when the cyclical component is added into the equation. Given the importance of CAPB in the current EU fiscal framework, we believe this analysis necessary.

3 Methodology

The primary aim of this thesis is to study the reliability of real-time cyclically-adjusted primary balance releases with respect to their final, revised estimates. Besides that, cyclically-adjusted net lending is analysed with an intention to do a sensitivity check. The presence and magnitude of a bias in different countries and for different years is considered and three different sources of the bias (economic, institutional and political) are analysed. The purpose of the analysis is addressing the following hypotheses: (1) CAPB real-time estimates are predictable; (2) CAPB revisions are correlated with growth surprises; and (3) CAPB revisions differ across fiscal policy regimes/fiscal policy rules. For this, a panel of data for 28 European Union countries² during the period of 2003–2018 was put together. Based on the nature of panel data and methodologies used in previous studies, we chose three different models to analyse our data: (1) baseline model for average absolute bias analysis, (2) weighted least squares and (3) fixed effects estimation for a more complex analysis of factors influencing the reliability of CAPB real-time data.

3.1 Baseline model

The starting point for the thesis is a model similar to the one proposed by Kempkes (2014) for his analysis of output gap revisions. By regressing the revisions of cyclically-adjusted primary balance on dummy variables representing each country and year, we will estimate systemic bias in different countries and for different years. The model stands as:

$$rev_{it}^{CAPB} = \alpha_i + \varepsilon_{it},$$

where

$$rev_{it}^{CAPB} = CAPB_{it}^{final} - CAPB_{it}^{real-time}.$$

$CAPB_{it}^{final}$ denotes the last available CAPB vintage for country i and year t , while $CAPB_{it}^{real-time}$ denotes the real-time estimate of the CAPB of country i in year t . The α_i here catches the average country-specific or year-specific bias. The model offers us

² EU-28 countries comprise of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

the possibility to look at the revision in cyclically-adjusted primary balance for each country in its most simple form, disregarding the source of the bias and focussing solely on its robustness. With this model, we can also directly compare the average absolute bias in the countries. Should CAPB real-time figures be unbiased estimates of the final estimations, we would not be able to reject the hypothesis that $\alpha_i = 0$. In case of positive bias, the real-time estimations are on average higher than the final ones ($CAPB_{it}^{final} < CAPB_{it}^{real-time}$) and $\alpha_i < 0$. When negative bias occurs, the real-time estimations are on average lower than the final ones ($CAPB_{it}^{final} > CAPB_{it}^{real-time}$) and $\alpha_i > 0$.

As Kempkes (2014) already stated, serial correlation, heteroscedasticity and contemporaneous cross-sectional correlation are among the problems of this model when using panel data on the EU countries. Heteroscedasticity will be tackled later with weighted least squares estimation. Cross-sectional correlation resulting from the alignment of EU member states business cycles will be addressed by adding economic variables to the model.

3.2 Weighted Least Squares

To analyse the reliability of real-time CAPB estimates in a more complex way, we employ more explanatory variables into our framework. In general, we could formulate our model as follows:

$$rev_{it}^{CAPB} = \beta^{econ} X_{it}^{econ} + \beta^{inst} X_{it}^{inst} + \beta^{pol} X_{it}^{pol} + \varepsilon_{it},$$

where rev_{it}^{CAPB} is the revision in the CAPB estimates, X_{it}^{econ} , X_{it}^{inst} , X_{it}^{pol} are vectors of economic, institutional and political explanatory variables, where i denotes country and t denotes year, and β^{econ} , β^{inst} , β^{pol} are parameters for different explanatory variables. Our panel data suffer from heteroscedasticity, i.e. a not constant error variance given the explanatory variable. Since OLS estimator is biased in these conditions, we cannot use it for our analysis. The solution is to use weighted least squares (WLS) estimator which is, in the case of groupwise heteroscedasticity, more efficient than OLS estimator (Greene, 2002) and was used earlier by Beetsma et al. (2009) or Bruck and Stephan (2006) for the analysis of real-time budget balance data.

The idea behind this estimator is that the form of the heteroscedasticity is captured and accounted for by incorporating a particular constant (or weight) to a particular observation. Therefore, the contribution of this observation to the final parameter changes relative to other observations, as the weighted sum of squares is minimized. To formalize this model let us say that:

$$\text{Var}(\varepsilon_{it} | rev_{it}^{CAB}) = \sigma^2 h(rev_{it}^{CAB}),$$

where $h(rev_{it}^{CAB})$ is some function of explanatory variables determining the heteroscedasticity of the data. The standard deviation of the error term ε_{it} conditional on the dependent variable rev_{it}^{CAB} is then $\sigma \sqrt{h(rev_{it}^{CAB})}$. Dividing the whole equation by our chosen weight we get the transformed equation

$$\frac{rev_{it}^{CAB}}{\sqrt{h(rev_{it}^{CAB})}} = \beta^{econ} \left(\frac{X_{it}^{econ}}{\sqrt{h(rev_{it}^{CAB})}} \right) + \beta^{inst} \left(\frac{X_{it}^{inst}}{\sqrt{h(rev_{it}^{CAB})}} \right) + \beta^{pol} \left(\frac{X_{it}^{pol}}{\sqrt{h(rev_{it}^{CAB})}} \right) + \left(\frac{\varepsilon_{it}}{\sqrt{h(rev_{it}^{CAB})}} \right).$$

The error term in this transformed equation has zero mean and a constant variance σ^2 conditional on rev_{it}^{CAB} . The greatest problem in respect of the transformation above is the identification of the true weights. For great portion of all estimations, the possibility exists that weights are misspecified, which is causing test statistic invalidity and possibly also the inefficiency of the WLS estimator compared to the OLS estimator. We assume that our data show different error variances across data for different countries. Therefore, following Bruck and Stephan (2006), we choose the country-specific error variances obtained from the baseline model to be our weight $h(rev_{it}^{CAB})$. That way we catch the specific error variances for different countries – i.e. the heteroscedasticity of the data sample.

3.3 Fixed Effects

To cross-check our findings from weighted least squares estimation, we will re-estimate the relationship between CAPB revisions and economic, institutional and political variables using fixed effects (FE) estimation. Using this method also allows us to observe the estimation differences among countries and years and thus validate the results from the baseline model. The general formulation of our model stays the same:

$$rev_{it}^{CAPB} = \beta^{econ} X_{it}^{econ} + \beta^{inst} X_{it}^{inst} + \beta^{pol} X_{it}^{pol} + \varepsilon_{it},$$

Since we employ panel data in our analysis, the error term affecting the dependent variable consist of two parts – an individual-specific component constant over time (c_i) and an idiosyncratic component varying over time (u_{it}):

$$\varepsilon_{it} = c_i + u_{it}.$$

The individual-specific component c_i (unobserved effect) can be either correlated with one or more of the explanatory variables, in which case the fixed effects estimator (or the within estimator) is used, or it can be uncorrelated with each explanatory variable, in which case the random effects model is used. The Hausman test is used in an empirical analysis to determine, whether to use a fixed effects or a random effects model. In line with previous research using similar data (e.g. Beetsma et al. (2009) or Pina and Venes (2011)) the unobserved effect in our data is correlated with our explanatory variables and a fixed effects model should be employed. Fixed effects estimation uses the fact that the unobserved effect is not changing over time and averages the estimated equation:

$$\overline{rev}_i^{CAB} = \beta^{econ} \bar{X}_i^{econ} + \beta^{inst} \bar{X}_i^{inst} + \beta^{pol} \bar{X}_i^{pol} + c_i + \bar{u}_i,$$

where $\overline{rev}_{it}^{CAB} = T^{-1} \sum_{t=1}^T rev_{it}^{CAB}$ and so on. Then, the averaged equation is subtracted from the original equation, leaving us with the estimation of time-demeaned data, where we lost the unobserved effect because of its constant nature:

$$(rev_{it}^{CAB} - \overline{rev}_i^{CAB}) = \beta^{econ} (X_{it}^{econ} - \bar{X}_i^{econ}) + \beta^{inst} (X_{it}^{inst} - \bar{X}_i^{inst}) + \beta^{pol} (X_{it}^{pol} - \bar{X}_i^{pol}) + (u_{it} - \bar{u}_i).$$

A fixed effects estimator is unbiased under the assumptions of linearity in parameters, a random sample from the cross-section, strict exogeneity and changing explanatory variables over time. The last assumption poses a limitation to the analysis of some of our explanatory variables. Therefore, this is one of the reasons for which we use weighted least squares estimation as our primary estimation method.

4 Data

For our empirical analysis, we have compiled a dataset comprising of the 28 EU member states data for the period of 2003–2018. Since some of the countries joined the EU later in the observed periods, the sample of countries is unbalanced – narrower at the beginning and wider towards the second half of the period.³ Nevertheless, all EU countries are included, as all of them are subject to the regulations of the Stability and Growth Pact. The length of the observed period is determined by the availability of economic data, which is sourced from the European Economic Forecast with the earliest available publication in 2002.⁴ The European Economic Forecast is published semi-annually, but when collecting the data, we considered only the second (autumn) publication of each year, as autumn is the time of budgeting in the majority of the countries under study. Other sources of the data are the EU Fiscal Rules Database, EU medium-term budgetary frameworks index, Comparative political Dataset (Armingeon et al., 2019) and EU overview on ongoing and closed Excessive Deficit Procedures.

Our primary response variable of interest in this analysis is revision in cyclically-adjusted primary balance. As a sensitivity check, we perform all regressions also with revision in cyclically-adjusted net lending (borrowing) as a response variable. The explanatory variables can be divided into three different groups: (1) economic variables covering economic conditions (output gap, GDP growth and business cycle volatility) (2) institutional variables covering different fiscal institutions and their quality (existence of fiscal rules in general and their quality, employment of different fiscal rules and quality of medium-term budgetary framework, and (3) political variables covering political conditions and different phases of political cycle (proximity of elections, left-right position of government, previous opposition reports outturn and ongoing Excessive Deficit Procedure).

³ Exact periods are covered later for different variables.

⁴ One year was lost in the beginning of the period due to inclusion of t-1 estimation of CAB.

4.1 Response variables

4.1.1 Cyclically-adjusted primary balance

The first response variable is cyclically-adjusted primary balance, i.e. cyclically-adjusted budget balance net of interest payments. As interest payments are excluded, CAPB shows the ability of governments to generate resources to pay its debts and is not affected by changes in interest rate as much as net lending or borrowing. These characteristics make it a key determinant of government debt dynamics.

Table 1: Observation periods of cyclically-adjusted primary balance for different countries

Countries	Years
Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom	2003–2018
Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia	2004–2018
Bulgaria, Romania	2006–2018
Croatia	2012–2018

For our dataset compiled from the European Economic Forecast, we considered four different estimation vintages (the points in time when the variable was estimated): (1) $t-1$ vintage depicting cyclically-adjusted primary balance of year t , as estimated in the autumn of the preceding year, (2) t vintage depicting cyclically-adjusted primary balance of year t , as estimated in the autumn of the same year, (3) $t+1$ vintage depicting cyclically-adjusted primary balance of year t , as estimated in the autumn of the following year, and (4) final vintage depicting cyclically-adjusted primary balance of year t , as estimated in the last available estimation (for a majority of the sample that means after 4 years). Employment of different vintages allows us to observe the change in the bias over time. We can thus discover whether the bias disappears immediately after the budgeting or the budget implementation stage.

4.1.2 Cyclically-adjusted net lending

Cyclically-adjusted net lending of borrowing shows cyclically-adjusted budget balance including interest payments, i.e. the total sum of capital account and current account in balance of payments. By employing this variable and comparing the results to the results obtained using cyclically-adjusted primary balance we perform a sensitivity

check to our analysis of CAPB, but it also allows us to assess the role of changing interest payments and interest rate for the magnitude of the bias in cyclically-adjusted budget balance revisions. Similarly to CAPB, we have compiled four vintages for each year: (1) t-1 vintage, (2) t vintage, (3) t+1 vintage, and (4) final vintage. The observed periods for different countries are the same as for the cyclically-adjusted primary balance.

4.2 Explanatory variables

4.2.1 Output gap

We use output gap as an explanatory variable in our analysis in order to account for the stage of the economic cycle in which the economy finds itself. We employ output gap in different ways. Firstly, we use lagged final estimate of output gap to consider the cyclical conditions at the time of budget-making. The literature (see e.g. Strauch et al. (2004), Pina and Venes (2011) or von Hagen (2010)) works with the hypothesis that policymakers tend to be optimistic – in good times, they underestimate the expenses or overestimate the income, and in bad times, they are conducting even more ambitious fiscal consolidation than previously planned. Proving the hypothesis true means the sign of this variable in regression should be negative, as was shown by Strauch et al. (2004) and von Hagen (2010), but could not be confirmed by Pina and Venes (2011). Data for lagged output gap are available for the whole considered period.

The second way in which we employ output gap in this analysis is by considering revision in output gap. That way we can observe how much of the revision in the analysed cyclically-adjusted variable is caused by the revision in output gap. We consider revision from the year of budget-making (t-1) to the final available vintage. The availability of t-1 vintage follows the same pattern as that of cyclically-adjusted primary balance estimates.

4.2.2 GDP growth

Employing GDP growth is another way to reflect on the economic cycle in the analysis. Again, we use lagged final estimates of GDP growth to account for the cyclical condition at the time of policymaking with the intention of testing optimism in good times and pessimism in bad times. Data for lagged GDP growth are available for the whole considered period. We also consider revision in GDP growth from period t-1, when the budget was prepared. This way we test our hypothesis that revisions in CAPB are correlated with growth surprises. The GDP growth revision data availability is depicted in Table 2.

Table 2: Observation periods of GDP growth revision for different countries

Countries	Years
Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom	2003–2018
Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia	2004–2018
Bulgaria, Romania	2007–2018
Croatia	2014–2018

4.2.3 Volatility of business cycle

The last economic variable we account for is volatility of the business cycle. Strauch et al. (2004) test whether high volatility leads risk-averse policymakers to make more cautious forecasts. They indeed find that countries are more likely to pursue their previously set fiscal policy in times of volatile output. Following Strauch et al. (2004) we consider a standard deviation of GDP growth over the 8-year business cycle as our measure for volatility. Data on the volatility of the business cycle are available for the whole considered period.

4.2.4 Fiscal rules

To account for different forms of fiscal governance we employ multiple dummy variables for different fiscal rules into our empirical analysis. We considered four types of fiscal rules: (1) budget balance rule, (2) debt rule, (3) expenditure rule and (4) revenue rule. On top of that, we also constructed dummy variable depicting whether any fiscal rule was in place in a given year and country. We assume that the presence of fiscal rule leads policymakers to have greater discipline when implementing the budget, so as not to break the rule. We gathered the data from the European Union fiscal rule database and considered only the rules which were applicable to the central government or general government. This data are available for the whole considered period.

4.2.5 Fiscal Rule Strength Index

The existence of a fiscal rule can be insignificant for fiscal policymakers in the phase of budget execution if the rule itself is not strong. To take into consideration the quality of fiscal rules we include the Fiscal Rule Strength Index computed by the European Commission. The index is calculated according to five criteria with equal weight: (1) the statutory base of the rule, (2) its binding character, (3) the nature of bodies

monitoring compliance and correction mechanism, (4) correction mechanisms in case of deviation from the rule and (5) resilience to shocks or events outside the control of the government. Firstly, the index is calculated for every single fiscal rule, then the scores of each rule are aggregated. In our work, we consider only the aggregated index for each country and year. The data are available for the period 2003–2017.

4.2.6 Medium-term Budgetary Framework Index

The quality of the fiscal framework is not accounted for only by employing the Fiscal Rule Strength Index, but also by including the Medium-term Budgetary Framework Index as an explanatory variable into our empirical analysis. We expect that with a stronger MTBF index and stronger budgeting guidelines, revisions are less likely or smaller in their magnitude. The index is constructed by the European Commission, which accounts for budgetary procedures, medium-term budgetary frameworks and Stability and Convergence Programmes. Five criteria are assessed: (1) coverage of targets set in national MTBF, (2) relation between the targets set in the MTBF and the actual annual budgets, (3) involvement of national parliaments in the process of preparation of the MTBF, (4) involvement of independent fiscal institutions in the process of preparation of the MTBF and (5) level of detail covered in the MTBF. The data are available for the period 2006–2017. The 2007 data are missing from the European Commission dataset and, therefore, created using the method of interpolation. In the original dataset, data for the years 2016 and 2017 were originally computed differently to data from other periods (due to a change in European Commission computation methodology). Thus, we recalculated the 2016–2017 data with simple differencing.

4.2.7 Proximity of elections

One of our political explanatory variables is the proximity of elections, in years. We hypothesize that approaching elections lead governments to issue overly optimistic estimations of the budget deficit and subsequently spend more to win over their voters. Results from previous empirical analyses are mixed – e.g. Bruck and Stephan (2006) confirm the hypothesis of excessive optimism about the budget deficit, but von Hagen (2010) does not find any significant effect of elections proximity. When compiling the data, we assigned value 0 to the years of expected elections (or years of snap elections if snap elections occurred in the same year as previously expected elections), value 1 to years previous to the year of expected elections and so on. When snap elections occurred, we started the countdown to the next elections in the following year, as could be expected in the case of a standard political term. The data were sourced from Armingeon et al. (2019) and the ParlGov database by Döring and Manow (2019).

4.2.8 Left-right position of government

We also employ a hypothesis about the left-right position of governments as previously studied by Bruck and Stephan (2006). According to the hypothesis, left-wing governments seek employment at the expense of price stability and right-wing governments seek price stability at the expense of employment. Therefore, left-wing governments might be more optimistic about income tax following from employment and, thus, tend to overestimate the budget balance. To test the hypothesis, we include the left-right position of government in the form of an index calculated by Armingeon et al. (2019). The index considers the balance of power in governments among different parties with different political ideologies and varies from 1 to 5, where 1 depicts governments with a hegemony of right-wing parties and 5 depicts governments with a hegemony of social democratic and other left-wing parties. The data are available for the period 2003–2017. An increasing value of the index should lead to an increase in the number of occurrences where the budget balance was overestimated (higher number of downward revisions in CAPB or higher magnitude of such revisions). That means that we expect a negative sign of the coefficient.

4.2.9 Previous opposition reports outturn

Following Pina and Venes (2011) we include a dummy variable taking on value 1 when the *t* vintage and the final vintage were reported by governments of opposing parties. The motivation of the party governing later could be to show the former government in a bad light – therefore publishing how inaccurate their original estimation was. Tarnishing the former government could also mean showing a higher deficit than originally planned, which is the reason why we expect the sign on this coefficient to be negative. The data were compiled mainly from Armingeon et al. (2019) and completed by authors with 2018 data in order to have complete data for the observed period 2003–2018.

4.2.10 Ongoing Excessive Deficit Procedure

The last explanatory variable is a dummy variable showing whether the Excessive Deficit Procedure was or was not opened for the country in a particular year. Opened Excessive Deficit Procedure should motivate policymakers to produce a more reliable real-time estimate. Then, the effect of this dummy variable would be insignificant. Data are available for the whole observed period and were compiled from the European Commission overview of ongoing and closed Excessive Deficit Procedures.

5 Results I: Statistical properties of data revisions

To better understand our data, we report several summary statistics. Tables 3 and 4 depict means, variances and number of observations for planned cyclically-adjusted primary balance and cyclically-adjusted net lending, their final values and implementation error. We computed those statistics across the whole sample for both response variables and for different vintages. We are reporting data excluding the years 2017 and 2018, as the period between the initial planning of the budget balance and the availability of final revised estimate is too short, which could lead to distortion, particularly with regards to mean final balance and revision. The summary statistics computed from data including the years 2017 and 2018 are reported in tables A.1 and A.2 of the Annex.

A number of observations can be made from tables 3 and 4. Firstly, we see that the planned balance is on average always higher than the final balance for both cyclically-adjusted primary balance and cyclically-adjusted net lending. Looking at the minimum and maximum values columns, we also see that the difference between the highest planned deficit from year $t-1$ and its final value is significantly bigger than the difference between the highest planned surplus from year $t-1$ and the final value of the surplus. Both these observations tell us that in the budget planning phase, policymakers are on average overly optimistic about future developments. That would suggest a positive (upward) bias when planning the CAB.

Another observation is that cyclically-adjusted primary balance is on average positive in the planning stage and roughly balanced in the implementation stage, meanwhile cyclically-adjusted net lending, also including interest payments, is on average negative in both the planning and implementation stages. This tells us that even in the planning stage, policymakers do not account for sufficient income to cover interest payments.

The revisions of the cyclically adjusted primary balance from the $t-1$ vintage to the final estimates exceeds 0.5% of GDP. From a policy perspective, this effectively means that the size of revisions undermines utilization of the CAPB for ex-ante policy guidance since the medium term budgetary objectives are supposed to be higher than -0.5% of GDP. Thus, the revisions are of the same magnitudes as the targets themselves.

Also, we observe that the revision is on average negative not only for the t-1 vintage but for all of the observed vintages. That means that even the latest data assessed by the European Commission in the procedures of the Stability and Growth Pact are incorrect, biased data.

Table 3: Summary statistics of plans, outcomes and implementation error of cyclically-adjusted primary balance (in per cent of GDP)

	Mean	Sd	Min	Max	N
t-1 vintage					
Planned balance	0.475	2.412	-8.7	7.6	340
Final balance	-0.157	3.179	-27.2	9.4	340
Revision	-0.630	2.479	-19.0	5.6	340
t vintage					
Planned balance	0.152	2.957	-27.2	8.7	353
Final balance	-0.184	3.145	-27.2	9.4	353
Revision	-0.336	1.516	-9.3	3.8	353
t+1 vintage					
Ex-post expectation of balance	0.055	3.171	-26.2	9.3	367
Final balance	-0.192	3.101	-27.2	9.4	367
Revision	-0.247	0.978	-9.9	2.7	367

Note: 'Sd' = standard deviation, 'Min' = minimum value in the sample, 'Max' = maximum value in the sample, 'N' = number of observations. All data were gathered from the autumn edition of European Economic Forecast. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007. The final balance statistics were computed in different vintages from the data on years and countries for which the planned balance was available. Therefore, N differs for each vintage.

Table 4: Summary statistics of plans, outcomes and implementation error of cyclically-adjusted net lending (in per cent of GDP)

	Mean	Sd	Min	Max	N
t-1 vintage					
Planned balance	-1.977	2.475	-11.5	5.4	339
Final balance	-2.451	3.366	-30.2	6.3	339
Revision	-0.474	2.536	-18.7	6.6	339
t vintage					
Planned balance	-2.192	3.055	-30.2	4.8	353
Final balance	-2.463	3.329	-30.2	6.3	353
Revision	-0.270	1.548	-9.6	4.6	353
t+1 vintage					
Ex-post expectation of balance	-2.210	3.351	-29.3	5.3	367
Final balance	-2.457	3.298	-30.2	6.3	367
Revision	-0.247	0.977	-10	2.8	367

Note: 'Sd' = standard deviation, 'Min' = minimum value in the sample, 'Max' = maximum value in the sample, 'N' = number of observations. All data were gathered from the autumn edition of European Economic Forecast. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007. The final balance statistics were computed in different vintages from the data on years and countries for which the planned balance was available. Therefore, N differs for each vintage.

To further examine the nature of our data, we divided European Union countries in four groups: (1) core countries comprising euro area countries and excluding periphery countries⁵, (2) periphery countries⁶, (3) Non-euro area countries which joined the EU in 2004 and after⁷, and (4) Non-Euro area countries which joined prior to 2004⁸. We computed summary statistics of plans, outcomes and implementation error of cyclically-adjusted primary balance from different time vintages for all these groups.

⁵ Group of core countries consists of Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Slovakia and Slovenia.

⁶ Group of periphery countries consists of Greece, Ireland, Italy, Portugal and Spain.

⁷ Group of non-EA countries joining during and after 2004 consists of Bulgaria, Croatia, Czech Republic, Hungary, Poland and Romania.

⁸ Group of non-EA countries joining prior to 2004 consists of Denmark, Sweden and United Kingdom.

The results can be found in Table A.3 of the appendix. When interpreting the results, we must bear in mind that the samples for periphery and non-European area countries are relatively small.

The data shows disparities among groups in terms of the magnitude of the revision with the greatest average revision being present in periphery countries and the second greatest in non-EA countries which joined the EU in or after 2004. At the same time, the group of periphery countries is the one in which we observe the most ambitious fiscal policy in the planning stage – the mean from t-1 vintage amounts to the surplus of 1.167% of GDP. Surprisingly, the group of non-EA countries which joined prior to 2004 is the only one for which the mean revision grows from t-1 and t vintages to t+1 vintage, showing that in these countries the revisions of CAB in t+1 were on average moving the expected CAB away from the “true” final value. Standard deviations are not significantly smaller for any of these groups than they are for the whole sample, showing that none of the groups is relatively more coherent. On the contrary, we observe higher standard deviations for periphery countries suggesting a more turbulent development within this group.

6 Results II: Bias in real-time fiscal data

6.1 Bias in revisions

This section describes the results of the baseline model – regression of cyclically-adjusted primary balance and cyclically-adjusted net lending on dummies of countries (obtaining country-fixed effects) and years (obtaining year-fixed effects). Firstly, we conduct the analysis only for country-fixed effects to observe systemic bias for different countries, disregarding the effects of different years. The results for both response variables are reported in tables A.4 and A.5 of the Annex. We observe similarities between both tables in terms of countries with some significant bias in revisions and in terms of the degree of significance of the biases. The results show a significant effect on primary balance and on net lending in different time vintages for 12 countries – Croatia, Denmark, Estonia, France, Greece, Hungary, Luxembourg, Poland, Portugal, Slovenia and Sweden. The only countries showing significant negative bias for both response variables are Luxembourg and Croatia. In the case of Luxembourg, we can attribute it to its well-performing economy with strong growth. Results for Croatia are most probably affected by the period for which the data are available – the period of growth after the economic crisis.

Most notably, the biggest bias in magnitude and also the only bias with a p-value lower than 0.001 for more than one vintage is the positive bias of Greece. Greece's bias with an underestimation higher than 2% of GDP for both cyclically-adjusted primary balance and cyclically-adjusted net lending most likely results from the severe conditions Greece was in during the European debt crisis. Similarly to Greece, Portugal and Ireland were also among the countries most affected from the crisis the most and in our sample, they are both showing significant positive bias.

Employing year dummies in our baseline model will help us clarify, whether bias for these countries is truly caused by the crisis or if it is a systemic characteristic of the country. Including year dummies to the model could also help increase the explanatory power of the model, which is very low, particularly when considering R-squared adjusted for the number of predictors in the model. Results for cyclically-adjusted primary balance are reported in table 6, results for cyclically-adjusted net lending can be found in table A.6 of the Annex. The first observation we can make is that including

year-fixed effects substantially increased the explanatory power of the model. The R-squared of the model with only country-fixed effects is no more than 15.6%, adjusted R-squared does not exceed 9.174%. Including year-fixed effects increases R-squared up to 36.92% and 36.48% for cyclically-adjusted primary balance and cyclically-adjusted net lending, respectively. Adjusted R-squared increased even more, from no more than 0.09174% and 0.0726% up to 29.23% and 28.7%, for model with cyclically-adjusted primary balance and cyclically-adjusted net lending respectively. This development tells us that most of the variability in CAB is not among different countries, but rather among different years. This property of the sample is also supported by another observation: year-fixed effects inclusion diminished the significance (and in the case of Greece even the magnitude) of the positive bias found in the previous models. The only country with an enhanced magnitude of the effects after the inclusion of year-fixed effects is Luxembourg, underestimating both observed variables by 2% of GDP on average. Similarly to models with only country-fixed effects we also observe high standard errors, suggesting high uncertainty in CAB revisions.

Year-fixed effects also allow us to refer this model to the economic cycle. We observe significant positive bias at the beginning of the studied period (years 2005 to 2009) when governments overestimated budget balances in different time vintages. In particular, the effects of the years 2008 and 2009 are strong in magnitude, showing the CAPB estimates accuracy worsening at the onset of the global economic crisis. After that, we see systematic negative bias and underestimating of budget balances during the recovery years of 2015–2017, though this is less significant than the 2005–2009 bias. One possible explanation for this negative bias is that policymakers still perceived the crisis as reverberating, even though their countries were already experiencing an economic upturn. The year 2018 is not defined in this model due to singularities, as it does not provide any additional information. Therefore, we will drop it from further analysis.

To illustrate the relation between year-fixed effects of CAPB revisions and of the economic developments we include two figures. Figure 1 depicts cyclically-adjusted primary balance year-fixed effects estimates over the course of years for all three data vintages. We see that the outbreak of the global economic crisis affected the accuracy of t-1 estimates the most. On the contrary, the magnitude of change in year-fixed effects is the lowest for year-fixed effects estimates from t+1 vintage – most probably due to more information available in further vintages.

Table 5: Country- and time-FE: Cyclically-adjusted primary balance revision estimates

	t-1 vintage	t vintage	t+1 vintage
Austria	0.443371 (0.634539)	-0.0360745 (0.4167785)	-0.0558 (0.25178)
Belgium	0.018371 (0.634539)	-0.5860745 (0.4167785)	-0.0933 (0.25178)
Bulgaria	-0.137042 (0.717335)	-0.5548721 (0.4574529)	0.14815 (0.26915)
Croatia	1.872857. (0.975804)	0.4815476 (0.5948123)	0.09235 (0.33803)
Cyprus	0.57672 (0.677227)	-0.4996817 (0.4343712)	0.38548 (0.25682)
Czechia	0.969028 (0.677227)	0.1146041 (0.4343712)	0.13215 (0.25682)
Denmark	1.430871* (0.634539)	0.3451755 (0.4167785)	-0.3683 (0.25178)
Estonia	0.292105 (0.677227)	-0.6425388 (0.4343712)	-0.23452 (0.25682)
Finland	0.343371 (0.634539)	-0.1798245 (0.4167785)	-0.0933 (0.25178)
France	-0.175379 (0.634539)	-0.3985745 (0.4167785)	-0.1433 (0.25178)
Germany	0.674621 (0.634539)	-0.0548245 (0.4167785)	0.11295 (0.25178)
Greece	-1.769129** (0.634539)	-1.1985745** (0.4167785)	-0.04955 (0.25178)
Hungary	0.484413 (0.677227)	-0.8925388* (0.4343712)	-0.71452** (0.25682)
Ireland	-1.294129* (0.634539)	-0.3235745 (0.4167785)	0.06295 (0.25178)
Italy	0.018371 (0.634539)	-0.4485745 (0.4167785)	-0.11205 (0.25178)
Latvia	0.472771 (0.661194)	-0.2211102 (0.4343712)	0.28548 (0.25682)
Lithuania	0.284413 (0.677227)	-0.1568245 (0.4343712)	0.09215 (0.25682)
Luxembourg	2.0442** (0.661194)	0.9651755* (0.4250566)	0.3192 (0.25178)
Malta	0.822874 (0.677227)	0.2646041 (0.4343712)	0.1788 (0.25682)
Netherlands	0.293371 (0.634539)	-0.0610745 (0.4167785)	0.02545 (0.25178)
Poland	-0.838664 (0.677227)	-0.5139674 (0.4343712)	-0.23452 (0.25682)
Portugal	-0.925379 (0.634539)	-1.0798245** (0.4167785)	-0.32455 (0.25178)
Romania	0.153867 (0.717335)	-0.5132055 (0.4574529)	0.05584 (0.26915)
Slovakia	0.038259 (0.677227)	0.0788898 (0.4343712)	0.37215 (0.25682)

Slovenia	-0.261741 (0.677227)	-0.9425388* (0.4343712)	-0.03452 (0.25682)
Spain	-0.006629 (0.634539)	-0.0048245 (0.4167785)	0.3692 (0.25178)
Sweden	0.730871 (0.634539)	-0.0610745 (0.4167785)	-0.23705 (0.25178)
United Kingdom	0.143371 (0.634539)	-0.0798245 (0.4167785)	0.06295 (0.25178)
2003	-1.458996* (0.677076)	-0.5451755 (0.4447776)	-0.52504. (0.26245)
2004	-1.116139 (0.677076)	-0.4731755 (0.4343712)	-0.41215* (0.22393)
2005	-0.721432 (0.646978)	-0.0834612 (0.3704271)	-0.74415*** (0.22393)
2006	-0.640413 (0.563594)	-0.4794612 (0.3704271)	-1.12621*** (0.21919)
2007	-1.064413. (0.563594)	-0.9525353** (0.3625393)	-1.0151*** (0.21919)
2008	-2.763968*** (0.551519)	-1.5599427** (0.3625393)	-0.02621 (0.21919)
2009	-3.538042*** (0.551519)	-0.0006834 (0.3625393)	-0.17065 (0.21919)
2010	-0.34545 (0.551519)	0.3400573 (0.3625393)	-0.0151 (0.21919)
2011	-0.226931 (0.551519)	-0.2080908 (0.3625393)	-0.42621. (0.21919)
2012	0.061958 (0.551519)	0.3289462 (0.3625393)	0.375. (0.21691)
2013	-0.31582 (0.551519)	0.7321429* (0.3586853)	0.13571 (0.21691)
2014	-0.364286 (0.545491)	0.0357143 (0.3586853)	0.16786 (0.21691)
2015	-0.035714 (0.545491)	0.6071429. (0.3586853)	0.15714 (0.21691)
2016	0.664286 (0.545491)	0.8071429* (0.3586853)	-0.02143 (0.21691)
2017	0.571429 (0.545491)	0.7285714* (0.3586853)	-0.06071 (0.21691)
2018	-	-	-
Multiple R-squared	0.3692	0.3072	0.3308
Adjusted R-squared	0.2923	0.2258	0.2551

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Figure 1: Time-fixed effects estimates (CAPB revision) in time

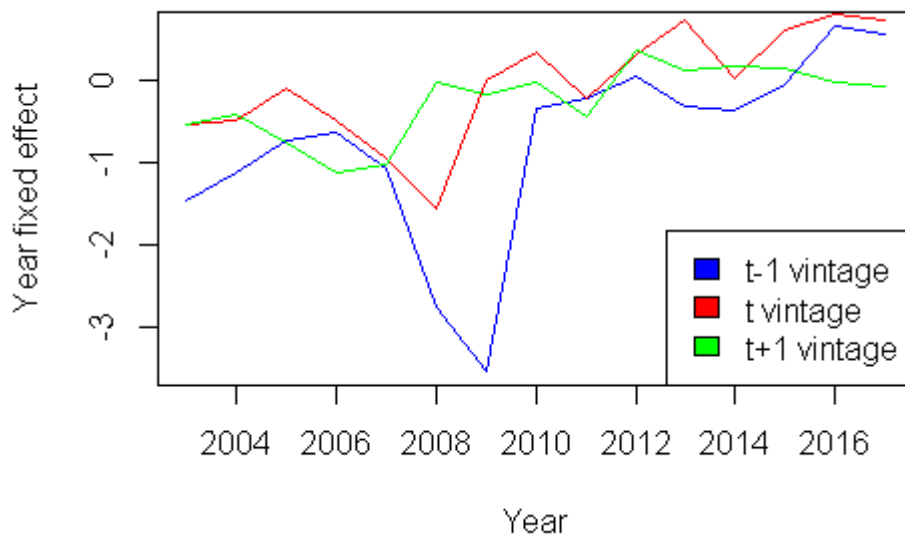
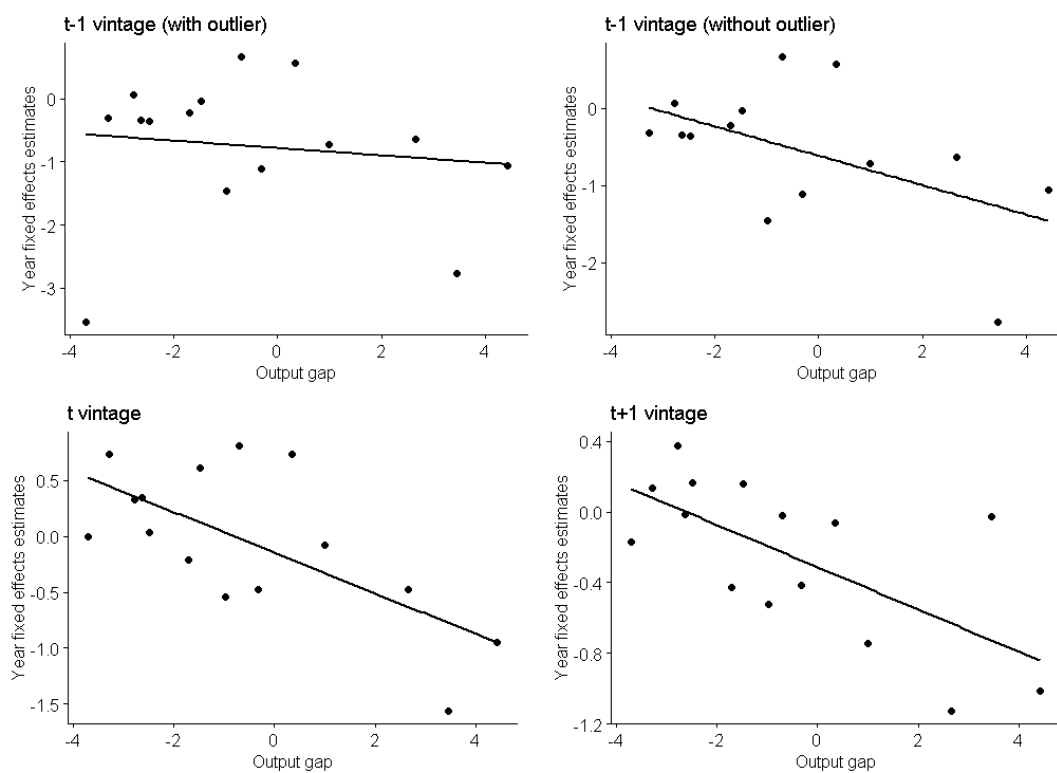


Figure 2: Correlation between time-fixed estimates (CAPB) and the output gap

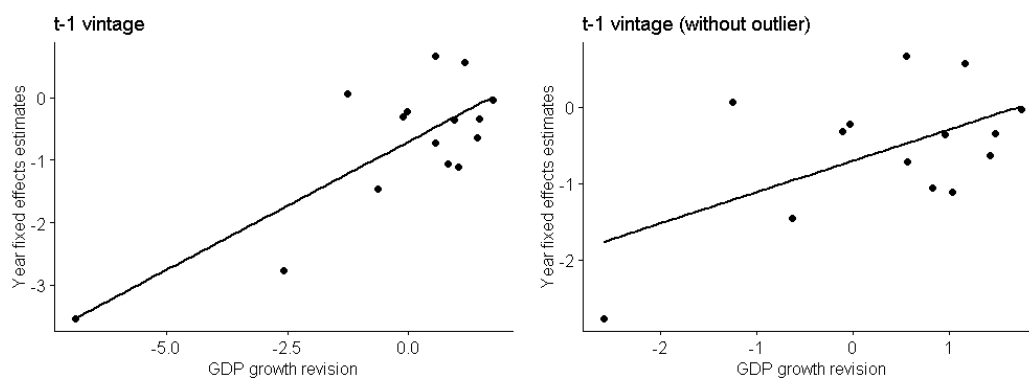


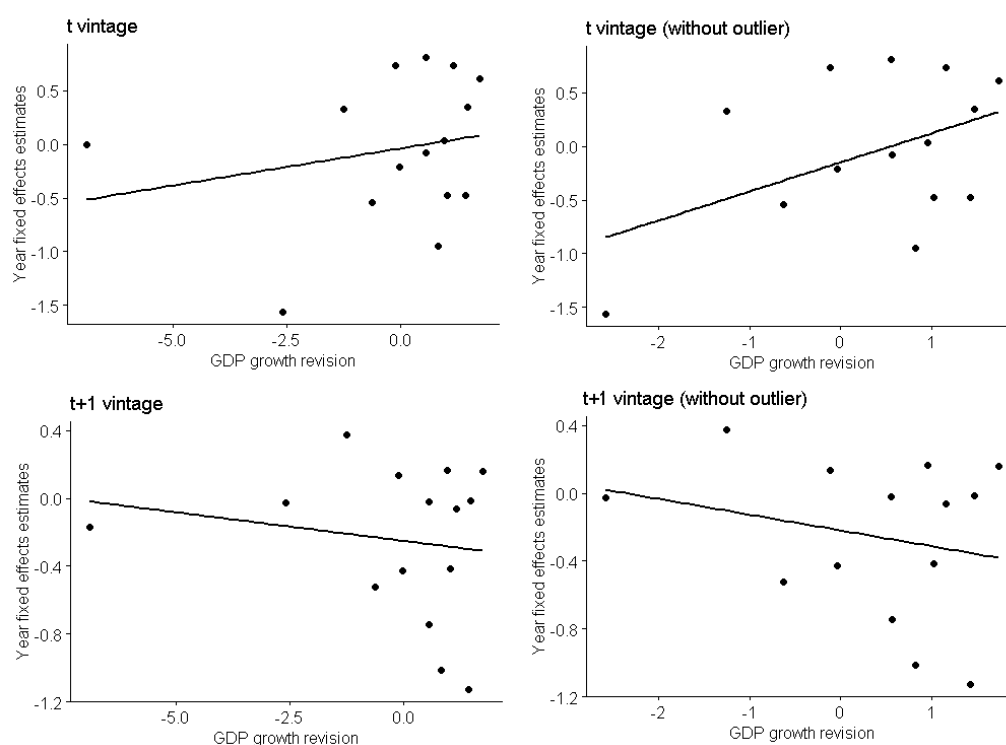
Note: The output gap is computed as a yearly average from final, revised estimates of the output gap across countries.

The second illustration of the relation between year-fixed effects of CAPB revisions and the economic cycle can be found in figure 2. We created a scatter plot from yearly averages of final output gap estimates and year-fixed effects from analysis on cyclically-adjusted primary balance. This figure supports the optimism hypothesis presented by Strauch et al. (2004) or von Hagen (2010) stating that in bad times, policymakers are conducting even more restrictive fiscal policy than they had previously planned, and in good times they overestimate budgets. We see that the higher the average output gap, the more negative the bias is. Interestingly, when comprising all available data in t-1 vintage, the regressing line is less steep than in other vintages. That is due to an outlier, we can observe in the left bottom corner on the first of four figures. The outlier is the year 2009, with the average output gap being -3.704 % of GDP and the year-fixed effect estimate of CAPB bias being -3.538% of GDP. After removing the outlier, the figure is much more similar to other vintages. We will explore the exact nature of the economic cycle effect on the accuracy of cyclically-adjusted primary balance and cyclically-adjusted net lending estimates further when introducing other economic, institutional and political variables in our analysis.

Thirdly, in figure 3, we plot year-fixed effects of CAPB revision on yearly averages of GDP growth revision (revision from t-1 vintage estimation to final estimation) to illustrate the relation of CAPB revision and growth surprises. For all three vintages we include figures with and without year 2009, which is an outlier. We can observe positive relationship between both variables in vintage t-1 and t – with GDP growth being higher than originally expected, primary balance is in higher surplus or lower deficit than previously expected. On contrary, in vintage t+1 the relationship is negative. This could probably be the result of correcting for overcompensation of CAPB in t vintage as a response to GDP growth revision.

Figure 3: Correlation between time-fixed estimates (CAPB) and the GDP growth revision





Note: The GDP growth revision is computed as a yearly average of GDP growth revision across countries

The bigger portion of the variability of CAB estimates results from variability among years, rather than variability among countries. To study this property even further we broaden our baseline analysis and regress cyclically-adjusted primary balance on country and year-fixed effects separately for each of the four groups of countries we defined in subchapter 4.3 (core countries comprising Euro area countries excluding periphery countries, periphery countries, non-Euro area countries which joined the EU in 2004 and after, and non-Euro area countries which joined prior to 2004). We report the results in tables A.7-A.10 in the Annex. The bias occurring prior to the outbreak of the global economic crisis in the years 2005–2007 is most significant in the core countries. At a significance level of 0.001, the core countries overestimated their cyclically-adjusted primary balance by a value of approximately 1% of their GDP when estimating it in year $t+1$ (the last vintage assessed by the European Commission when reviewing Stability and Convergence Programs of member states). The positive bias from the period of the beginning of the crisis is present across all four groups. The bias is the largest in periphery countries, amounting to the overestimation of CAPB by 6.8% of GDP. Interestingly, we do not observe any significant country-fixed effects in the group of periphery countries – i.e. the bias is present in the group as a whole in different years, but none of the countries of the group is standing out as having a significant bias when the effect of the years is accounted for (not even Greece, which showed highly

significant estimates of the bias in the previously-computed baseline models). The second group with the greatest bias in magnitude is the group of countries joining the EU during the 2004 enlargement and after that, most probably due to less favourable economic conditions in these countries. The bias is the least present in the core countries, as we observe significant bias only in t-1 vintages of years 2008 and 2009 compared to somewhat significant biases in t-1 and t vintages of years 2007–2010 in the three non-EA countries joined the EU prior to 2004. These three countries are also the ones with no bias in any of the vintages in the years after the crisis. The analysis of different country groups indicates that the bias showing at the end of the period in table 6 comes mainly from the group of core countries, as it is the only one with a somewhat significant bias in the years 2016 and 2017.

6.2 Determinants of data revisions

The first part of the analysis comprised baseline model regressing cyclically-adjusted primary balance and net lending on country and year-fixed effects. Next, we broaden our analysis and perform a series of regressions gradually introducing economic, institutional and political explanatory variables. Due to the heteroscedasticity in our data, we estimate our model using weighted least squares estimation. Following the literature, we chose the weights to be proportional to the reciprocals of country-specific error variances obtained from our baseline model with country-fixed effects reported in tables A.4 and A.5.

The results of the regression of CAPB revision on economic variables are reported in table 7, results for cyclically-adjusted net lending in table 8. By including the intercept, we clearly see that a negative bias is a systematic property of the whole sample and in the observed period (with the exception of t vintage of net lending revision data), regardless the changing economic conditions. With all economic variables being zero, the average negative revision lies between -0.27% of GDP to -0.55% of GDP in different time vintages. According to our results, the output gap revision is the most significant determinant of CAPB revision across all three vintages. Output gap revisions of one per cent of GDP are linked to CAPB downward revisions by approximately 0.2% of GDP in t-1 and t vintages and approximately 0.1 in t+1 vintage. This effect is in line with previous findings by Kempkes (2014), who discovered negative bias in the EU output gap real-time estimates and suggested that output gap is systematically ex-post revised upwards (which is also an average feature of our sample, as shown in summary statistics of our data). With ex-post upward revision of output gap, cyclically-adjusted primary balance is revised downwards (as the ex-post revealed

better position in the economic cycle suggests that more savings should have been done by governments).

Table 6: WLS: Economic determinants of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.54892* (0.24793)	-0.272328. (0.154459)	-0.3646012*** (0.0938206)
Output gap revision	-0.22102*** (0.06577)	-0.199828*** (0.040614)	-0.0992662*** (0.0245591)
Lagged output gap	-0.10002. (0.05596)	-0.060267. (0.034825)	-0.0430789* (0.0211687)
GDP growth revision	0.25803*** (0.05675)	0.074239* (0.035297)	-0.0174128 (0.0214336)
Lagged GDP growth	0.05913 (0.04202)	0.009191 (0.026116)	0.0009294 (0.0158314)
Volatility	0.04875 (0.06331)	0.046324 (0.039365)	0.0753093* (0.023821)
R-squared	0.1614	0.1656	0.1956
Adjusted R-squared	0.1501	0.1544	0.1847

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

In this model, GDP growth revision is also a significant determinant in t-1 vintage and its estimated parameter is even higher in magnitude than the parameter of output gap revision. With 1% of GDP growth upward revision, cyclically-adjusted primary balance is revised upwards by approximately 0.26% of GDP and cyclically-adjusted net lending is revised upwards by approximately 0.29% of GDP. This finding suggests that growth surprises are a significant determinant of CAPB revisions, but only for estimation of CAPB which was done in year t-1.

Table 7: WLS: Economic determinants of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.44655. (0.24787)	-0.2167 (0.1565)	-0.3409817*** (0.0945141)
Output gap revision	-0.23248*** (0.06592)	-0.2190*** (0.04115)	-0.1061296*** (0.0247407)
Lagged output gap	-0.1152* (0.0559)	-0.05684 (0.03528)	-0.0351907. (0.0213252)
GDP growth revision	0.29286*** (0.05674)	0.09033* (0.03576)	-0.0101097 (0.021592)
Lagged GDP growth	0.05884 (0.04203)	0.01037 (0.02646)	0.0007323 (0.0159485)
Volatility	0.05535 (0.06341)	0.04866 (0.03988)	0.0696093** (0.0239971)
R-squared	0.1979	0.1783	0.183
Adjusted R-squared	0.1871	0.1672	0.172

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

As the effect of GDP growth on CAPB revision is of particular interest for us, we study it further by regressing CAPB and cyclically-adjusted net lending revisions only on GDP growth revision and lagged GDP growth, as reported in tables 9 and 10. Indeed, we confirm that GDP growth revisions (i.e. growth surprise) have a significant effect on CAB revisions and that this effect is positive and the strongest in vintage t-1. In this model, also lagged GDP growth appears to have a significant effect on CAPB revision. Its negative sign confirms the optimism hypothesis (similarly to Strauch et al. (2004) and von Hagen (2010) findings) while suggesting that with higher GDP growth, budgets tend to be revised downwards, ending up in higher deficit or lower surplus, as policymakers are overly optimistic about CAB.

Table 8: WLS: GDP growth as a determinant of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.32521* (0.13002)	-0.11477 (0.08261)	-0.10797* (0.04949)
GDP growth revision	0.22622*** (0.03901)	0.03462*** (0.02476)	-0.03284* (0.01486)
Lagged GDP growth	-0.06521* (0.03139)	-0.08241 (0.01977)	-0.05565*** (0.01177)
R-squared	0.08579	0.04421	0.06475
Adjusted R-squared	0.08114	0.03949	0.06025

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table 9: WLS: GDP growth as a determinant of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.15855 (0.13045)	-0.05074 (0.08387)	-0.11153* (0.04955)
GDP growth revision	0.26676*** (0.03923)	0.04300. (0.02514)	-0.0316* (0.01488)
Lagged GDP growth	-0.07543* (0.03163)	-0.08405*** (0.02007)	-0.05320*** (0.01179)
R-squared	0.1148	0.04641	0.05951
Adjusted R-squared	0.1103	0.0417	0.05499

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

6.2.1 Data revisions and institutions

Next, we add institutional variables to the model. We first add only indices of institutional quality, then also dummy depicting the existence of any fiscal rule and, in the end, we replace the dummy variable with four different dummy variables depicting different types of fiscal rules to know whether the distinction of different fiscal rules

makes a difference. The results are reported in tables A.11–A.16 of the Annex. For all weighted least estimations with institutional variables, the fiscal rule index is always positive and somewhat significant in at least one vintage, meaning that with stronger fiscal institutions, CAPB revisions are on average positive, resulting in smaller deficit or higher surplus. This confirms the finding of Beetsma et al. (2009) who state that higher scores on the index are associated with more ambitious fiscal consolidation plans and better adherence to those plans. A similar logic to that which we apply to FRI can be used for the quality of the medium-term budgetary framework, but only in two of the six regressions (see tables A.12 and A.16). Conducting the analysis only for the general presence of fiscal rule we see that fiscal rule presence significantly lowers CAPB revisions in vintages $t-1$ and $t+1$. We assume countries want to adhere to the fiscal rule and are more ambitious with their plans, which they cannot follow in the execution phase. Therefore, with these results, we cannot confirm the results of Pina and Venes (2011), i.e. that the presence of a fiscal rule in a fiscal framework leads countries to make more prudent forecasts. According to tables A.15 and A.16, this is especially the case of debt rule, whose presence results in CAPB lower by up to 0.38% of GDP cyclically-adjusted net lending lower by as much as 0.55% of GDP. Nonetheless, the confidence interval of fiscal rule estimates is broader, as opposed to output gap revision estimates which are significant at a 99.9% confidence level in at least one vintage.

The next step of our analysis is weighted least squares estimation of economic and political variables (see in tables A.17 and A.18). Contrary to Pina and Venes (2011) we find that countries have a tendency to overestimate their CABs in real time when an excessive deficit procedure is in place. The effect is more than twice higher in $t-1$ vintage, with approximately -0.9% of GDP, than in t vintage (with approximately -0.4% of GDP) for both response variables. Results on the presence of EDP suggest that during EDP, countries adopt ambitious budgets that they cannot stick to. We can confirm neither the significance of the proximity of elections (in line with von Hagen's (2010) findings, but opposite to the findings of Bruck and Stephan (2006), De Castro et al. (2013), Pina and Venes (2011) or Strauch et al. (2004)), nor left-right position of government (as suggested by Bruck and Stephan (2006)), nor previous opposition outturn (as resulted from Pina and Venes (2011) analysis).

Finally, we regress cyclically-adjusted primary balance and cyclically-adjusted net lending on all our explanatory variables (not including the existence of the fiscal rule in general as it is covered by the existence of different fiscal rules). The results can be found in tables 11 and A.19, respectively.

Table 10: WLS: Determinants of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.65803 (0.59239)	-0.31270 (0.3523)	-0.496371* (0.2250109)
Output gap revision	-0.22437** (0.07489)	-0.20190*** (0.0445)	-0.0824378** (0.0283166)
Lagged output gap	-0.10277. (0.06112)	-0.05833 (0.0365)	-0.055513* (0.0233284)
GDP growth revision	0.25885*** (0.06222)	0.07375* (0.0371)	-0.0310251 (0.023699)
Lagged GDP growth	0.05036 (0.04621)	0.00009 (0.0275)	-0.0003758 (0.0175402)
Volatility of economic cycle	0.09338 (0.07254)	0.06667 (0.0432)	0.071011* (0.0274889)
FRI	0.061 (0.21681)	0.18690 (0.1290)	0.0865728 (0.0824404)
MTBF	0.35977 (0.58405)	0.04227 (0.3469)	0.3948467. (0.2212569)
Budget balance rule	0.37151 (0.36108)	0.01967 (0.2150)	-0.1252022 (0.1375272)
Debt rule	-0.31535 (0.33309)	-0.32950. (0.1981)	-0.1976291 (0.1265495)
Expenditure rule	-0.30739 (0.29804)	0.08876 (0.1777)	0.0867605 (0.1137762)
Revenue rule	0.14873 (0.36704)	-0.03718 (0.2193)	-0.2545512. (0.1407709)
Proximity of elections	0.07972 (0.10594)	0.07693 (0.0631)	-0.0048021 (0.0403285)
Left-right position of government	-0.00638 (0.09935)	0.01442 (0.0592)	0.0306356 (0.037834)
Previous opposition reports outturn	0.13906 (0.29005)	-0.18150 (0.1727)	-0.0091473 (0.1104297)
Ongoing EDP	-0.77757* (0.31231)	-0.29780 (0.1859)	-0.1104875 (0.1187932)
R-squared	0.2181	0.237	0.2395
Adjusted R-squared	0.1792	0.1991	0.2018

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Similarly to our previous findings, economic variables are the most significant, with output gap revision being the only one significant across all three vintages for both response variables. The great magnitude of output gap revision and GDP growth revision effects in t-1 vintage is true only for cyclically-adjusted primary balance.

Cyclically-adjusted net lending estimates show the important effect of output gap revision in t vintage and, interestingly, a significant economic cycle volatility effect across all vintages. Otherwise, the results follow weighted least squares estimations done previously in this chapter. The most noticeable difference is the decrease in significance of the estimates. Nevertheless, we can still observe the significant positive effects of medium-term budgetary framework quality and the negative effects of debt and revenue rules and ongoing EDP.

Our results suggest output gap revision is the variable with the most important effect on CAPB revision, but given the significance of the output gap for calculation of the cyclical component of CAPB, we fear the presence of multicollinearity. Because of this possible multicollinearity, we repeat our regressions dropping out output gap revision and lagged output gap from explanatory variables. The results are reported below only for the regression of CAPB revision on all explanatory variables (Table 12), the rest of the results can be found in tables A.20 – A. 30 of the Annex. We confirm previous findings that economic variables are the most important determinants of CAPB revision with growth surprises being a strong positive determinant of $t-1$ vintage revision. Surprisingly, GDP growth is also a negative determinant of $t+1$ vintage revision, although the effect is much smaller in magnitude – this effect could probably be a compensation of budget overcorrection. Dropping output gap variables results in an increase in the significance of volatility in all our estimations, suggesting that with higher economic cycle volatility, CAB is more unpredictable. We also confirm the significant positive effect of FRI and, to a lesser extent, MTBF, and the negative effects of fiscal rules and of ongoing EDP.

Table 11: WLS: Determinants of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-1.479433** (0.562761)	-1.0208** (0.34301)	-0.814633*** (0.21546)
GDP growth revision	0.22162*** (0.042256)	0.02509 (0.02572)	-0.036175* (0.016119)
Lagged GDP growth	-0.047804 (0.036177)	-0.06978** (0.02205)	-0.045867** (0.013834)
Volatility of economic cycle	0.189064** (0.07108)	0.14328** (0.04335)	0.110952*** (0.027158)
FRI	0.172552 (0.220506)	0.28349* (0.13442)	0.129549 (0.084486)
MTBF	0.727074 (0.593945)	0.34037 (0.36143)	0.54735* (0.226675)
Budget balance rule	0.522237 (0.368562)	0.12769 (0.22488)	-0.058218 (0.141467)
Debt rule	-0.231797 (0.340713)	-0.27518 (0.20766)	-0.158792 (0.130483)
Expenditure rule	-0.273943 (0.306167)	0.1171 (0.18704)	0.099367 (0.117762)
Revenue rule	-0.042767 (0.374311)	-0.19528 (0.2292)	-0.331641* (0.144677)
Proximity of elections	0.102916 (0.108643)	0.09805 (0.06627)	0.004578 (0.041661)
Left-right position of government	-0.006772 (0.102106)	0.01457 (0.06229)	0.030473 (0.039175)
Previous opposition reports outturn	0.102585 (0.297445)	-0.21792 (0.18146)	-0.020998 (0.114116)
Ongoing EDP	-0.433997 (0.31064)	-0.02582 (0.18943)	0.035562 (0.119059)
R-squared	0.1685	0.1483	0.1792
Adjusted R-squared	0.133	0.1119	0.1441

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

6.3 Robustness: Fixed Effects Estimation

To perform a robustness check of our baseline model results and weighted least squares estimation results, we repeat the analysis from subchapter 5.2 with fixed effects estimation employing country and year-fixed effects. All the results are provided in the Annex. Tables A. 31 and A. 33 present the results of the first model, where cyclically-adjusted primary balance and cyclically-adjusted net lending are regressed on all of our economic explanatory variables. The revision of the output gap from estimation in year $t-1$ (the year of budget-making) to the final value has the most significant effect and also the largest effect in magnitude on both response variables – compared to WLS estimation, the effect is more than twice bigger. The effect is the most prominent in the $t-1$ vintage, showing that when planning the budget, an inaccurate estimation of the current stage of the economic cycle leads to large revision in CAPB. Specifically, when the output gap is revised upwards by 1% of GDP, CAPB is revised downwards by approximately 0.45%. The second effect that is significantly non-zero and negative in all three vintages is the lagged output gap, again confirming the optimism hypothesis. The third significant effect is GDP growth revisions – positive GDP growth revisions have a significantly negative effect on CAPB revisions, similarly to output gap revisions. The magnitude of the effect is though smaller than in the two previously mentioned variables. The results do not support the hypothesis that lagged GDP growth or economic cycle volatility somehow affect revisions. Therefore, similarly to WLS estimation, we analyse growth surprises more closely by regressing CAPB revisions on lagged GDP growth and GDP growth revision (tables A.35 and A.36). With the fixed effect estimation, we confirm the optimism hypothesis, but we cannot confirm the role of growth surprise in $t-1$ vintage.

Since we suspected that some of the country and year-fixed effects were heavily influenced by the stage of the economic cycle and the economic crisis, in tables A.32 and A.34 we also report country and year-fixed effects for both regressions. For the sake of brevity, we only report fixed effects that are significantly different from zero. Even when accounting for the stage of economic cycle and growth surprise by including output gap and GDP growth variables, the significant effect of the year 2009 is still present for both response variables. This suggests that the economic downturn of 2009 was not the only reason for the CAPB revision of the year. Besides the fixed effect of the year 2009, the fixed effects of Greece and Portugal are significant in all three vintages and even more negative in magnitude than in the baseline model. Since we control for changing economic conditions in this estimation, we conclude that these fixed effects represent some systematic bias present in these countries and years.

Similarly to subchapter 5.2, we add different variables to our setup. We start only with indices of fiscal rules and medium-term budgetary framework quality. Then we add a dummy variable representing the existence of any fiscal rule in a given country and year. The last regression we perform includes indices and four dummy variables representing the existence of four different fiscal rules to know whether the distinction of different fiscal rules makes a difference. The results (tables A.37 – A.45) show a less complex situation than was previously shown by WLS estimation. None of the regressions suggests that the quality of fiscal framework or the existence of fiscal rules have a significant effect on revision in CAPB. We cannot confirm that any of the political variables we used has an effect on revisions in either CAPB or cyclically-adjusted net lending. Finally, we also run a regression of cyclically-adjusted primary balance and cyclically-adjusted net lending on all of the explanatory variables and the results do not differ much from previous models. Given the insignificance of any of institutional or political variables, we cannot confirm the results of previous research suggesting institutions influencing revisions or existence of political forecast cycles with this model.

We assumed the global financial crisis hitting the euro area had a great effect on the reliability of CAPB estimates. In the previous model, we confirmed this assumption by reporting significant bias in 2009 CAPB estimates. We also observe the t-1 estimate of the year 2009 is an outlier in figure 2. Therefore, as a robustness check, we drop the year 2009 from our dataset and estimate the complete model with all explanatory variables (excluding the existence of fiscal rule). The results of the analysis are shown in tables A.49 and A.50 and show the robustness of our results.

Given our concerns about the multicollinearity of the CAPB and output gap, we repeat the FE estimations dropping lagged output gap and output gap revision from explanatory variables. Most notably, the most significant variable affecting CAPB is now the volatility of the economic cycle. Our results suggest that with higher volatility, the revision are on average positive. The significance of GDP growth revision is confirmed only for t+1 vintage, but not for t-1 (as is the case of all fixed effects estimations). As lagged GDP growth is significant in all vintages and all estimations, we confirm the optimism hypothesis.

7 Conclusion

This thesis explores the topic of cyclically-adjusted primary balance real-time estimates reliability. The main motivation behind the analysis is the previously reported unreliability of real-time fiscal data, together with the importance of cyclically-adjusted primary balance within the European Union fiscal surveillance framework. Before us, many researchers studied the reliability of real-time data on budget balance (disregarding the cyclical component of budgets) and its determinants, finding the presence of significant bias influenced by a number of variables like GDP growth surprises, quality of fiscal rules or proximity of elections. Using a broader dataset than other authors, this thesis attempts to build on previous studies by conducting a comprehensive analysis of cyclically-adjusted primary balances with respect to a number of economic, institutional and political factors.

For the empirical analysis, data on 28 European Union member states in the period 2003–2018 are gathered from the European Economic Forecast, various other European Commission sources and the Comparative Political Dataset by Armingeon et al. (2019). Two response variables are analysed – revision in the cyclically-adjusted primary balance as our primary variable of interest, and revision in cyclically-adjusted net lending, which we use for a sensitivity check and so that we can reflect on the difference that interest payments make in cyclically-adjusted budget balance revisions. We consider three estimation vintages reflecting different years in which the CAPB estimations were produced. The basis for the analysis in the thesis is summary statistics on both response variables. Summary statistics suggest that on average, governments plan on having cyclically-adjusted budgets balanced or in surplus only when disregarding their interest payments. Irrespective of their plans, both cyclically-adjusted primary balance and cyclically-adjusted net lending end up on average in deficit after negative revision. We show the highest average revision of CAPB estimate is the revision from $t-1$ vintage. As standard deviations are quite high, we divide the countries to four groups (core countries, periphery countries and two groups of non-EA countries according to the time they joined the EU) and find that substantial differences in the magnitude of the planned balance and its revision exist among different country groups in the EU.

The first models estimated in the thesis are regressions of cyclically-adjusted primary balance revisions and cyclically-adjusted net lending revision on (1) country dummies,

obtaining country-fixed effects, (2) country and year dummies, obtaining country- and time-fixed effects. The baseline model reveals there is a significant positive bias in CAPB revisions in 10 countries out of 28 and significant negative bias in 2 countries. Importantly, the bias is present across all three vintages and thus impacts all data which countries submit to the European Commission within the fiscal surveillance framework. We can observe a changing magnitude and sign of bias across the observed period and great explanatory power of time-fixed effects. Thus, we confirm that there is a link between the bias in cyclically-adjusted primary balances and economic cycle and that the link corresponds to the previously formulated optimism hypothesis – in bad times, governments conduct even more restrictive policy than previously planned, and in good times, they are overly optimistic and overshoot their expected cyclically-adjusted budget balances on regular basis. We test differences in reliability across different country groups and conclude that the bias is greatest in periphery countries and non-EA countries joining in or after 2004, as opposed to core countries and non-EA countries joining prior to 2004. The disparities between countries and years are also confirmed by fixed effects estimation.

In the second part of the analysis, we focus on determinants of the revisions in CAPB using weighted least squares and fixed effects estimations. Both models show slightly different pictures, particularly regarding the effect of institutional variables. In weighted least squares models, the quality of institutions seems to have positive effect on CAPB revisions (with a higher quality of institutions, the cyclically-adjusted primary balance is on average higher than estimated in real-time), while the existence of certain fiscal rules and ongoing EDP procedure has a negative effect on CAPB revisions (the presence of these indicators results in lower cyclically-adjusted primary balance than estimated in real-time). We conclude that these significantly negative effects may be the result of overly ambitious plans, which then cannot be fulfilled. On the other hand, fixed effects estimations suggested that only economic variables affect revisions in CAPB and none of the institutional or political determinants is significant. Therefore, we cannot conclusively confirm, that high-quality institutions are connected to smaller revisions and low-quality institutions are connected to larger revisions.

Two similarities can be observed in both models – political variables do not affect CAPB revisions and, more importantly, economic variables are both the most significant determinants of CAPB revisions and the ones with the greatest effect in magnitude. Our results show that with large economic uncertainty (i.e. ex-post revisions in the output gap and GDP growth and increasing volatility of the economic cycle), large revisions in cyclically-adjusted primary balance can be expected. Lagged output gap and lagged GDP growth confirm the optimism hypothesis. We also

discover, that in t-1 vintage, growth surprises are significantly positively correlated with CAPB revisions. Given the significance and magnitude of effects of economic variables on CAPB revision compared to other, institutional and political variables, we conclude that economic conditions are the most important determinant of cyclically-adjusted primary balance revision and institutional and political determinants have negligible effect. Given these circumstances, we need to ask ourselves two important questions. Firstly, if the effect of institutions is negligible, is there any sense in the existence of such complex fiscal framework, as is the one embedded in the Stability and Growth Pact? And secondly, if we continue to use the current framework, can we improve our economic forecasting methods, and thus improve the reliability of CAPB estimates (and with that, the soundness of the SGP fiscal framework)? Nevertheless the answers, both WLS and FE models suggest that the bias goes beyond the unpredictable economic conditions and is systematic. The recommendation for future research is therefore to further examine the possible sources of bias in CAPB data and attempt to confirm the existence of systematic bias. And if systematic bias is confirmed, it should be accounted for when creating a new fiscal framework in the EU or adjusting the current one.

Annex

Table A.1: Summary statistics of plans, outcomes and implementation error of cyclically-adjusted primary balance (in per cent of GDP, including data from 2017–2018)

	Mean	Sd	Min	Max	N
t-1 vintage					
Planned balance	0.484	2.305	-11.5	5.4	395
Final balance	0.020	3.078	-30.2	6.3	395
Revision	-0.467	2.384	-18.7	6.6	395
t vintage					
Planned balance	0.262	2.824	-30.2	4.8	409
Final balance	-0.010	3.052	-30.2	6.3	409
Revision	-0.275	1.502	-9.6	4.6	409
t+1 vintage					
Ex-post expectation of balance	0.193	3.067	-29.3	5.3	423
Final balance	-0.025	3.017	-30.2	6.3	423
Revision	-0.218	0.916	-10.0	2.8	423

Note: 'Sd' = standard deviation, 'Min' = minimum value in the sample, 'Max' = maximum value in the sample, 'N' = number of observations. All data were gathered from the autumn edition of European Economic Forecast. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007. The final balance statistics were computed in different vintages from the data on years and countries for which the planned balance was available. Therefore, the N is different in each vintage.

Table A. 2: Summary statistics of plans, outcomes and implementation error of cyclically-adjusted net lending (in per cent of GDP, including data from 2017–2018)

	Mean	Sd	Min	Max	N
t-1 vintage					
Planned balance	-1.872	2.375	-8.7	7.6	394
Final balance	-2.200	3.275	-27.2	9.4	394
Revision	-0.328	2.432	-19.0	5.6	394
t vintage					
Planned balance	-1.996	2.937	-27.2	8.7	409
Final balance	-2.210	3.247	-27.2	9.4	409
Revision	-0.214	1.528	-9.3	3.8	409
t+1 vintage					
Ex-post expectation of balance	-1.996	3.254	-26.2	9.3	423
Final balance	-2.210	3.222	-27.2	9.4	423
Revision	-0.217	0.916	-9.9	2.7	423

Note: 'Sd' = standard deviation, 'Min' = minimum value in the sample, 'Max' = maximum value in the sample, 'N' = number of observations. All data were gathered from the autumn edition of European Economic Forecast. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007. The final balance statistics were computed in different vintages from the data on years and countries for which the planned balance was available. Therefore, the N is different in each vintage.

Table A. 3: Summary statistics of plans, outcomes and implementation error of cyclically-adjusted primary balance in different groups of countries (in per cent of GDP, excluding 2017–2018)

Core					
	Mean	Sd	Min	Max	N
t-1 vintage					
Planned balance	0.417	2.04012	-6.9	5.9	174
Final balance	0.078	2.378	-9.2	5.8	174
Revision	-0.339	1.999	-9.8	4.9	174
t vintage					
Planned balance	0.282	2.134	-6.5	6.4	181
Final balance	0.079	2.339	-9.2	5.8	181
Revision	-0.203	1.406	-7.6	3.8	181
t+1 vintage					
Ex-post expectation of balance	0.246	2.398	-9.8	6.5	189
Final balance	0.089	2.298	-9.2	5.8	189
Revision	-0.157	0.800	-3.1	2.1	189
Periphery					
	Mean	Sd	Min	Max	N
t-1 vintage					
Planned balance	1.167	2.880	-8.2	7.3	70
Final balance	-0.626	4.849	-27.2	9.4	70
Revision	-1.760	3.518	-19	5.6	70
t vintage					
Planned balance	0.144	4.545	-27.2	8	70
Final balance	-0.626	4.849	-27.2	9.4	70
Revision	-0.770	1.676	-6.3	3.5	70
t+1 vintage					
Ex-post expectation of balance	-0.353	4.763	-26.2	8.5	70
Final balance	-0.626	4.849	-27.2	9.4	70
Revision	-0.273	1.061	-3.3	2.7	70

Non-EU countries joining the EU during or after 2004					
	Mean	Sd	Min	Max	N
t-1 vintage					
Planned balance	-0.470	2.136	-4.2	7.6	54
Final balance	-1.002	2.692	-8.1	4	54
Revision	-0.531	2.415	-8.6	2.8	54
t vintage					
Planned balance	-0.667	2.484	-6.5	8.7	60
Final balance	-1.108	2.659	-8.1	4	60
Revision	-0.442	1.785	-9.3	1.8	60
t+1 vintage					
Ex-post expectation of balance	-0.795	2.724	-7.8	9.3	66
Final balance	-1.127	2.597	-8.1	4	66
Revision	-0.332	1.382	-9.9	1.2	66

Non-EU countries joining the EU prior to 2004					
	Mean	Sd	Min	Max	N
t-1 vintage					
Planned balance	0.819	2.915	-8.7	5.9	42
Final balance	0.736	2.897	-7.5	6.5	42
Revision	-0.083	1.651	-4.9	4.1	42
t vintage					
Planned balance	0.771	3.156	-8.6	6.2	42
Final balance	0.736	2.897	-7.5	6.5	42
Revision	-0.036	1.112	-2.6	2.3	42
t+1 vintage					
Ex-post expectation of balance	1.212	3.232	-7	7.1	42
Final balance	0.736	2.897	-7.5	6.5	42
Revision	-0.476	0.761	-2	1.4	42

Note: 'Sd' = standard deviation, 'Min' = minimum value in the sample, 'Max' = maximum value in the sample, 'N' = number of observations. All data were gathered from the autumn edition of European Economic Forecast. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007. The final balance statistics were computed in different vintages from the data on years and countries for which the planned balance was available. Therefore, the N can be different in each vintage.

Table A. 4: Country FE: Cyclically-adjusted primary balance revision estimates

	t-1 vintage	t vintage	t+1 vintage
Austria	-0.2625 (0.57806)	-0.08125 (0.36821)	-0.2875 (0.22712)
Belgium	-0.6875 (0.57806)	-0.63125 (0.36821)	-0.325 (0.22712)
Bulgaria	-0.70909 (0.69717)	-0.48333 (0.42517)	-0.007692 (0.251968)
Croatia	2.04* (1.03407)	0.96667 (0.60129)	0.2 (0.343374)
Cyprus	-0.03846 (0.6413)	-0.47857 (0.39364)	0.173333 (0.234569)
Czechia	0.35385 (0.6413)	0.13571 (0.39364)	-0.08 (0.234569)
Denmark	0.725 (0.57806)	0.3 (0.36821)	-0.6** (0.22712)
Estonia	-0.32308 (0.6413)	-0.62143 (0.39364)	-0.446667. (0.234569)
Finland	-0.3625 (0.57806)	-0.225 (0.36821)	-0.325 (0.22712)
France	-0.88125 (0.57806)	-0.44375 (0.36821)	-0.375. (0.22712)
Germany	-0.03125 (0.57806)	-0.1 (0.36821)	-0.11875 (0.22712)
Greece	-2.475*** (0.57806)	-1.24375*** (0.36821)	-0.28125 (0.22712)
Hungary	-0.13077 (0.6413)	-0.87143* (0.39364)	-0.926667*** (0.234569)
Ireland	-2*** (0.57806)	-0.36875 (0.36821)	-0.16875 (0.22712)
Italy	-0.6875 (0.5786)	-0.49375 (0.36821)	-0.34375 (0.22712)
Latvia	-0.15 (0.61797)	-0.2 (0.39364)	0.073333 (0.234569)
Lithuania	-0.33077 (0.6413)	-0.13571 (0.39364)	-0.12 (0.234569)
Luxembourg	1.42143* (0.61797)	0.95333* (0.38029)	0.0875 (0.22712)
Malta	0.20769 (0.6413)	0.28571 (0.39364)	-0.033333 (0.234569)
Netherlands	-0.4125 (0.57806)	-0.10625 (0.36821)	-0.20625 (0.22712)
Poland	-1.45385* (0.6413)	-0.49286 (0.39364)	-0.446667. (0.234569)
Portugal	-1.63125** (0.57806)	-1.125** (0.36821)	-0.55625* (0.22712)
Romania	-0.41818 (0.69717)	-0.4416 (0.42517)	-0.1 (0.251968)
Slovakia	-0.57692 (0.6413)	0.1 (0.39364)	0.16 (0.234569)
Slovenia	-0.87692 (0.6413)	-0.92143* (0.39364)	-0.246667 (0.234569)

Spain	-0.7125 (0.57806)	-0.05 (0.36821)	0.1375 (0.22712)
Sweden	0.025 (0.57806)	-0.10625 (0.36821)	-0.46875* (0.22712)
United Kingdom	-0.5625 (0.57806)	-0.125 (0.36821)	-0.16875 (0.22712)
Multiple R-squared	0.156	0.1314	0.1284
Adjusted R-squared	0.09174	0.06758	0.06658

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 year after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 5: Country FE: Cyclically-adjusted net lending revision estimates

	t-1 vintage	t vintage	t+1 vintage
Austria	-0.125 (0.5924)	-0.0625 (0.37453)	-0.325 (0.22626)
Belgium	-0.6 (0.5924)	-0.60625 (0.37453)	-0.35625 (0.22626)
Bulgaria	-0.6364 (0.7145)	-0.45 (0.43247)	-0.04615 (0.25102)
Croatia	2.62* (1.0598)	1.2. (0.61161)	0.2 (0.34208)
Cyprus	-0.15 (0.6841)	-0.44286 (0.40039)	0.14 (0.23368)
Czechia	0.5 (0.6572)	0.18571 (0.40039)	-0.05333 (0.23368)
Denmark	0.7188 (0.5924)	0.3125 (0.37453)	-0.63125** (0.22626)
Estonia	-0.2692 (0.6572)	-0.62143 (0.40039)	-0.45333. (0.23368)
Finland	-0.2563 (0.5924)	-0.21875 (0.37453)	-0.35625 (0.22626)
France	-0.7125 (0.5924)	-0.3875 (0.37453)	-0.38125. (0.22626)
Germany	0.1562 (0.5924)	0 (0.37453)	-0.08125 (0.22626)
Greece	-2.1438*** (0.5924)	-1.09375** (0.37453)	-0.21875*** (0.22626)
Hungary	-0.2154 (0.6572)	-1* (0.40039)	-0.96667 (0.23368)
Ireland	-1.7312** (0.5924)	-0.2375 (0.37453)	-0.2 (0.22626)
Italy	-0.525 (0.5924)	-0.35625 (0.37453)	-0.24375 (0.22626)
Latvia	0.2692 (0.6572)	-0.14286 (0.40039)	0.04667 (0.23368)

Lithuania	-0.1692 (0.6572)	-0.02857 (0.40039)	-0.13333 (0.23368)
Luxembourg	1.4429* (0.6333)	0.94667* (0.38682)	0.0625 (0.22626)
Malta	0.5077 (0.6572)	0.47857 (0.40039)	0.07333 (0.23368)
Netherlands	-0.1625 (0.5924)	0.0625 (0.37453)	-0.1375 (0.22626)
Poland	-1.2923. (0.6572)	-0.42143 (0.40039)	-0.44. (0.23368)
Portugal	-1.5125* (0.5924)	-1.0625** (0.37453)	-0.56875* (0.22626)
Romania	-0.2818 (0.7145)	-0.28333 (0.43247)	-0.06154 (0.25102)
Slovakia	-0.4846 (0.6572)	0.13571 (0.40039)	0.17333 (0.23368)
Slovenia	-0.8923 (0.6572)	-0.87143* (0.40039)	-0.25333 (0.23368)
Spain	-0.5938 (0.5924)	-0.04375 (0.37453)	0.125 (0.22626)
Sweden	0.2375 (0.5924)	-0.04375 (0.37453)	-0.525. (0.22626)
United Kingdom	-0.5125 (0.5924)	-0.14375 (0.37453)	-0.16875 (0.22626)
Multiple R-squared	0.1315	0.1197	0.134
Adjusted R-Squared	0.06504	0.05499	0.0726

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$, '**' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 6: Country- and time-FE: Cyclically-adjusted net lending revision estimates

	t-1 vintage	t vintage	t+1 vintage
Austria	0.43051 (0.64345)	-0.0807 (0.4212)	-0.098926 (0.251073)
Belgium	-0.04449 (0.64345)	-0.62445 (0.4212)	-0.130176 (0.251073)
Bulgaria	-0.1522 (0.72733)	-0.53929 (0.4623)	0.120796 (0.268392)
Croatia	2.33795* (0.98948)	0.66905 (0.60112)	0.092347 (0.337077)
Cyprus	0.46934 (0.70576)	-0.49371 (0.43898)	0.356324 (0.256095)
Czechia	1.02421 (0.68666)	0.13486 (0.43898)	0.162991 (0.256095)
Denmark	1.27426* (0.64345)	0.2943 (0.4212)	-0.405176 (0.251073)
Estonia	0.25498 (0.68666)	-0.67229 (0.43898)	-0.237009 (0.256095)
Finland	0.29926 (0.64345)	-0.23695 (0.4212)	-0.130176 (0.251073)
France	-0.15699 (0.64345)	-0.4057 (0.4212)	-0.155176 (0.251073)
Germany	0.71176 (0.64345)	-0.0182 (0.4212)	0.144824 (0.251073)
Greece	-1.58824* (0.64345)	-1.11195** (0.4212)	0.007324 (0.251073)
Hungary	0.30882 (0.68666)	-1.05086* (0.43898)	-0.750342** (0.256095)
Ireland	-1.17574. (0.64345)	-0.2557 (0.4212)	0.026074 (0.251073)
Italy	0.03051 (0.64345)	-0.37445 (0.4212)	-0.017676 (0.251073)
Latvia	0.79344 (0.68666)	-0.19371 (0.43898)	0.262991 (0.256095)
Lithuania	0.35498 (0.68666)	-0.07943 (0.43898)	0.082991 (0.256095)
Luxembourg	1.95615** (0.67048)	0.916* (0.42956)	0.288574 (0.251073)
Malta	1.0319 (0.68666)	0.42771 (0.43898)	0.289658 (0.256095)
Netherlands	0.39301 (0.64345)	0.0443 (0.4212)	0.088574 (0.251073)
Poland	-0.7681 (0.68666)	-0.47229 (0.43898)	-0.223676 (0.256095)
Portugal	-0.95699 (0.64345)	-1.0807* (0.4212)	-0.342676 (0.251073)
Romania	0.20234 (0.72733)	-0.37262 (0.4623)	0.105412 (0.268392)
Slovakia	0.03959 (0.68666)	0.08486 (0.43898)	0.389658 (0.256095)

Slovenia	-0.3681 (0.68666)	-0.92229* (0.43898)	-0.037009 (0.256095)
Spain	-0.03824 (0.64345)	-0.06195 (0.4212)	0.351074 (0.251073)
Sweden	0.79301 (0.64345)	-0.06195 (0.4212)	-0.298926 (0.251073)
United Kingdom	0.04301 (0.64345)	-0.16195 (0.4212)	0.057324 (0.251073)
2003	-0.97248 (0.68658)	-0.16886 (0.44949)	-0.372324 (0.261717)
2004	-0.72962 (0.68658)	-0.252 (0.43898)	-0.323258 (0.223305)
2005	-0.37139 (0.67048)	0.07829 (0.37436)	-0.751258*** (0.223305)
2006	-0.44448 (0.57142)	-0.43771 (0.37436)	-1.133617*** (0.218575)
2007	-1.04448 (0.57142)	-1.04559** (0.36638)	-1.033617*** (0.218575)
2008	-2.89119*** (0.55918)	-1.62337*** (0.36638)	-0.074358 (0.218575)
2009	-3.62082*** (0.55918)	0.0433 (0.36638)	-0.159543 (0.218575)
2010	-0.12452 (0.55918)	0.39515 (0.36638)	-0.03732 (0.218575)
2011	-0.23193 (0.55918)	-0.24559 (0.36638)	-0.485469* (0.218575)
2012	0.19029 (0.55918)	0.36182 (0.36638)	0.321429 (0.216298)
2013	-0.05785 (0.55918)	0.83571* (0.36249)	0.15 (0.216298)
2014	-0.18214 (0.55307)	0.08929 (0.36249)	0.167857 (0.216298)
2015	0.18214 (0.55307)	0.68214. (0.36249)	0.167857 (0.216298)
2016	0.79286 (0.55307)	0.825* (0.36249)	-0.007143 (0.216298)
2017	0.61738 (0.55859)	0.75357* (0.36249)	-0.046429 (0.216298)
2018	-	-	-
Multiple R-squared	0.3648	0.3069	0.3338
Adjusted R-squared	0.287	0.2254	0.2584

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 7: Country- and time-FE: Cyclically-adjusted primary balance revision estimates (core countries)

	t-1 vintage	t vintage	t+1 vintage
Austria	-0.02163 (0.61529)	-0.47288 (0.4828)	-0.14464 (0.2248)
Belgium	-0.44663 (0.61529)	-1.02288* (0.4828)	-0.18214 (0.2248)
Cyprus	0.06703 (0.6435)	-0.92755. (0.49661)	0.31476 (0.22787)
Estonia	-0.21758 (0.6435)	-1.07041* (0.49661)	-0.30524 (0.22787)
Finland	-0.12163 (0.61529)	-0.61663 (0.4828)	-0.18214 (0.2248)
France	-0.64038 (0.61529)	-0.83538. (0.4828)	-0.23214 (0.2248)
Germany	0.20962 (0.61529)	-0.49163 (0.4828)	0.02411 (0.2248)
Latvia	0.01319 (0.63258)	-0.64898 (0.49661)	0.21476 (0.22787)
Lithuania	-0.22527 (0.6435)	-0.58469 (0.49661)	0.02143 (0.22787)
Luxembourg	1.58462* (0.63258)	0.55156 (0.4892)	0.23036 (0.2248)
Malta	0.31319 (0.6435)	-0.16327 (0.49661)	0.1081 (0.22787)
Netherlands	-0.17163 (0.61529)	-0.49788 (0.4828)	-0.06339 (0.2248)
Slovakia	-0.47143 (0.6435)	-0.34898 (0.49661)	0.30143 (0.22787)
Slovenia	-0.77143 (0.6435)	-1.37041** (0.49661)	-0.10524 (0.22787)
2003	-0.85128 (0.84304)	0.23955 (0.662)	-0.16429 (0.29207)
2004	-0.71795 (0.84304)	-0.25918 (0.62671)	-0.14286 (0.23587)
2005	-0.91319 (0.76244)	0.53571 (0.50573)	-0.72857** (0.23587)
2006	-0.17857 (0.6435)	0.02143 (0.50573)	-1.07143*** (0.23587)
2007	-0.63571 (0.6435)	-0.64286 (0.50573)	-1.02143*** (0.23587)
2008	-2.19286*** (0.6435)	-0.89286. (0.50573)	0.18571 (0.23587)
2009	-2.45714*** (0.6435)	0.82143 (0.50573)	-0.15 (0.23587)
2010	1.08571. (0.6435)	0.94286. (0.50573)	0.20714 (0.23587)
2011	0.23571 (0.6435)	0.57857 (0.50573)	-0.02143 (0.23587)
2012	0.57143 (0.6435)	0.85714. (0.50573)	0.38571 (0.23587)

2013	-0.14286 (0.6435)	0.66429 (0.50573)	0.19286 (0.23587)
2014	0.49286 (0.6435)	0.37857 (0.50573)	0.19286 (0.23587)
2015	0.42857 (0.6435)	0.95. (0.50573)	0.10714 (0.23587)
2016	0.62857 (0.6435)	1* (0.50573)	-0.13571 (0.23587)
2017	0.79286 (0.6435)	1.07143* (0.50573)	-0.12143 (0.23587)
R-squared	0.3579	0.2708	0.4171
Adjusted R-squared	0.2503	0.1533	0.3272

Note: Note: p-value of the tests: ‘***’ $p < 0.001$, ‘**’ $p < 0.01$ ‘*’, $p < 0.05$, ‘.’ $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 8: Country- and time-FE: Cyclically-adjusted primary balance revision estimates (periphery countries)

	t-1 vintage	t vintage	t+1 vintage
Greece	-0.7138 (1.5496)	-0.59 (0.70)	-0.03875 (0.42219)
Ireland	-0.2388 (1.5496)	0.29 (0.70)	0.07375 (0.42219)
Italy	1.0737 (1.5496)	0.16 (0.70)	-0.10125 (0.42219)
Portugal	0.13 (1.5496)	-0.47 (0.70)	-0.31375 (0.42219)
Spain	1.0487 (1.5496)	0.61 (0.70)	0.38 (0.42219)
2003	-1.8 (1.9601)	-1.32 (0.89)	-0.96. (0.53404)
2004	-1.82 (1.9601)	-0.86 (0.89)	-0.68 (0.53404)
2005	-1 (1.9601)	-0.58 (0.89)	-0.56 (0.53404)
2006	-0.42 (1.9601)	-0.72 (0.89)	-1.16* (0.53404)
2007	-2.04 (1.9601)	-1.90* (0.89)	-1.32* (0.53404)
2008	-4.9* (1.9601)	-2.88** (0.89)	-0.46 (0.53404)
2009	-6.8*** (1.9601)	-1.18 (0.89)	-0.06 (0.53404)
2010	-4.06* (1.9601)	-0.96 (0.89)	-0.46 (0.53404)
2011	-1.42 (1.9601)	-1.20 (0.89)	-0.26 (0.53404)
2012	-0.96 (1.9601)	0.00 (0.89)	1.28* (0.53404)
2013	-1.42 (1.9601)	1.42 (0.89)	-0.14 (0.53404)
2014	-0.58 (1.9601)	-0.92 (0.89)	0.28 (0.53404)

2015	-1.76 (1.9601)	-0.56 (0.89)	0.52 (0.53404)
2016	0.7 (1.9601)	0.88 (0.89)	0.16 (0.53404)
2017	0.1 (1.9601)	0.28 (0.89)	-0.06 (0.53404)
R-squared	0.4693	0.5286	0.4878
Adjusted R-squared	0.2924	0.3714	0.3171

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 9: Country- and time-FE: Cyclically-adjusted primary balance revision estimates (non-EA countries joining during and after 2004)

	t-1 vintage	t vintage	t+1 vintage
Bulgaria	0.17497 (0.88563)	0.007778 (0.702331)	0.26267 (0.58897)
Croatia	2.14333* (1.0308)	0.644444 (0.794308)	0.04048 (0.65225)
Czechia	1.30271 (0.86869)	0.744683 (0.690566)	0.24661 (0.58027)
Hungary	0.81809 (0.86869)	-0.26246 (0.690566)	-0.60006 (0.58027)
Poland	-0.50498 (0.86869)	0.116111 (0.690566)	-0.12006 (0.58027)
Romania	0.46588 (0.88563)	0.049444 (0.702331)	0.17037 (0.58897)
2004	-	-	-0.70883 (0.87571)
2005	-	-1.532778 (1.032878)	-0.67549 (0.87571)
2006	-2.30527. (1.28596)	-1.099444 (1.032878)	-1.2319 (0.74368)
2007	-0.30527 (1.28596)	-0.851111 (0.876688)	-0.7519 (0.74368)
2008	-2.77133* (1.09089)	-2.571111** (0.876688)	-0.0119 (0.74368)
2009	-3.87133*** (1.09089)	-1.451111 (0.876688)	-0.2919 (0.74368)
2010	-1.89133. (1.09089)	-0.571111 (0.876688)	-0.3719 (0.74368)
2011	-0.79133 (1.09089)	-2.231111* (0.876688)	-1.9719* (0.74368)
2012	0.02867 (1.09089)	-0.151111 (0.876688)	0.13333 (0.70451)

2013	0.08867 (1.09089)	0.7 (0.829628)	0.41667 (0.70451)
2014	-2.11667* (1.0308)	-0.233333 (0.829628)	0.26667 (0.70451)
2015	0.51667 (1.0308)	0.766667 (0.829628)	0.16667 (0.70451)
2016	0.8 (1.0308)	0.466667 (0.829628)	0.11667 (0.70451)
2017	0.28333 (1.0308)	0.233333 (0.829628)	0.01667 (0.70451)
R-squared	0.5522	0.4673	0.3435
Adjusted R-squared	0.3842	0.2763	0.1171

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 10: Country- and time-FE: Cyclically-adjusted primary balance revision estimates (non-EA countries joining prior to 2004)

	t-1 vintage	t vintage	t+1 vintage
Denmark	1.295833. (0.662303)	0.27708 (0.54123)	-0.1875 (0.43113)
Sweden	0.595833 (0.662303)	-0.12917 (0.54123)	-0.05625 (0.43113)
United Kingdom	0.008333 (0.662303)	-0.14792 (0.54123)	0.24375 (0.43113)
2003	-2.8** (0.883071)	-0.9 (0.72164)	-0.63333 (0.57483)
2004	-1.433333 (0.883071)	-0.26667 (0.72164)	-0.86667 (0.57483)
2005	-0.133333 (0.883071)	-0.26667 (0.72164)	-1.13333. (0.57483)
2006	-1.2 (0.883071)	-1.36667. (0.72164)	-1.16667. (0.57483)
2007	-1.9* (0.883071)	-0.93333 (0.72164)	-0.93333 (0.57483)
2008	-1.766667. (0.883071)	-0.73333 (0.72164)	-0.33333 (0.57483)
2009	-2.5** (0.883071)	0.6 (0.72164)	-0.26667 (0.57483)
2010	1.833333* (0.883071)	1.26667. (0.72164)	0.26667 (0.57483)
2011	0.633333 (0.883071)	1.2 (0.72164)	-0.03333 (0.57483)
2012	-0.466667 (0.883071)	-0.73333 (0.72164)	-0.7 (0.57483)
2013	0.133333 (0.883071)	-0.03333 (0.72164)	-0.23333 (0.57483)
2014	-0.5 (0.883071)	0.56667 (0.72164)	-0.33333 (0.57483)
2015	-0.433333 (0.883071)	0.63333 (0.72164)	-0.23333 (0.57483)
2016	0.5 (0.883071)	0.46667 (0.72164)	-0.06667 (0.57483)
2017	0.9 (0.883071)	0.86667 (0.72164)	0.06667 (0.57483)
R-squared	0.7134	0.5729	0.5543
Adjusted R-squared	0.5414	0.3167	0.2868

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 11: WLS: Economic and institutional determinants (indices of institutional quality) of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.9605* (0.41565)	-0.37308 (0.246017)	-0.5622508*** (0.1566693)
Output gap revision	-0.19332** (0.07327)	-0.196254*** (0.043352)	-0.0826262** (0.0275797)
Lagged output gap	-0.08378 (0.06005)	-0.041737 (0.035699)	-0.0472227* (0.0228344)
GDP growth revision	0.24403** (0.06191)	0.069914. (0.036743)	-0.0303833 (0.0234757)
Lagged GDP growth	0.04533 (0.04493)	-0.001365 (0.026635)	-0.0006687 (0.0169859)
Volatility	0.07253 (0.07086)	0.056074 (0.042023)	0.0691327* (0.026741)
FRI	0.21097 (0.14401)	0.206368* (0.085095)	0.044139 (0.0541757)
MTBF	0.35407 (0.57482)	-0.020054 (0.340061)	0.3167701 (0.21667)
R-squared	0.1882	0.2145	0.2191
Adjusted R-squared	0.17	0.1969	0.2015

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$ '**', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 12: WLS: Economic and institutional determinants (indices of institutional quality) of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.95432 (0.41675)	-0.4014351 (0.2512113)	-0.584202*** (0.15829)
Output gap revision	-0.19408*** (0.07355)	-0.2114811*** (0.0442677)	-0.085091** (0.027865)
Lagged output gap	-0.10239 (0.06011)	-0.0384202 (0.0364529)	-0.03913. (0.023071)
GDP growth revision	0.273. (0.06201)	0.0849994* (0.0375188)	-0.025275 (0.023719)
Lagged GDP growth	0.04574 (0.04504)	-0.0002614 (0.0271972)	-0.001891 (0.017162)
Volatility	0.08853 (0.07113)	0.067029 (0.0429099)	0.066246* (0.027018)
FRI	0.21159* (0.14399)	0.1945337* (0.0868915)	0.052285 (0.054736)
MTBF	0.43909 (0.57544)	0.0676844 (0.3472409)	0.363267. (0.218911)
R-squared	0.2262	0.2272	0.2093
Adjusted R-squared	0.2088	0.2098	0.1915

Note: Note: p-value of the tests: '****' p < 0.001, '***' p < 0.01, '**' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 13: WLS: Economic and institutional determinants (indices of institutional quality, existence of fiscal rule) of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.50463 (0.47406)	-0.1981934 (0.2812812)	-0.3584* (0.1779)
Output gap revision	-0.18499* (0.07306)	-0.1929571*** (0.0433852)	-0.07880** (0.0274)
Lagged output gap	-0.09272 (0.05994)	-0.0451856 (0.0357648)	-0.05123* (0.0227)
GDP growth revision	0.2378*** (0.06171)	0.067424. (0.0367574)	-0.03333 (0.0233)
Lagged GDP growth	0.047 (0.04473)	-0.0007424 (0.0266123)	0.00003 (0.0169)
Volatility	0.06672 (0.0706)	0.0539436 (0.0420131)	0.06661* (0.0266)
FRI	0.36964* (0.16443)	0.2678059** (0.0976546)	0.11630. (0.0619)
MTBF	0.37959 (0.57233)	-0.009843 (0.3398096)	0.32920 (0.2152)
Fiscal rule	-0.73288* (0.37203)	-0.2826959 (0.2211502)	-0.3307* (0.1402)
R-squared	0.1982	0.2186	0.2328
Adjusted R-squared	0.1776	0.1985	0.2131

Note: Note: p-value of the tests: ‘***’ p < 0.001, ‘**’ p < 0.01 ‘*’, p < 0.05, ‘.’ p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 14: WLS: Economic and institutional determinants (indices of institutional quality, existence of fiscal rule) of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.50413 (0.47531)	-0.1985104 (0.2870002)	-0.357035* (0.179419)
Output gap revision	0.18554* (0.07336)	-0.2076553*** (0.0442673)	-0.080822** (0.027658)
Lagged output gap	-0.11128. (0.06002)	-0.0424214 (0.036492)	-0.043597. (0.022923)
GDP growth revision	0.26668*** (0.06182)	0.0821102* (0.0375048)	-0.028561 (0.023535)
Lagged GDP growth	0.04737 (0.04484)	0.0004608 (0.0271534)	-0.001109 (0.017007)
Volatility	0.08307 (0.07087)	0.0645567 (0.0428673)	0.06344* (0.026792)
FRI	0.36773* (0.16438)	0.2658217** (0.0996402)	0.132725* (0.062397)
MTBF	0.46243 (0.57302)	0.0795322 (0.3467189)	0.377169. (0.216971)
Fiscal rule	-0.72287. (0.37236)	-0.3280188 (0.2256469)	-0.368477** (0.141337)
R-squared	0.2355	0.2324	0.2262
Adjusted R-squared	0.2158	0.2126	0.2063

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 15: WLS: Economic and institutional (indices of institutional quality, existence of different fiscal rules) determinants of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-1.00601* (0.44735)	-0.37301 (0.264936)	-0.497796** (0.16803)
Output gap revision	-0.19651** (0.07367)	-0.196674*** (0.043635)	-0.078621** (0.027651)
Lagged output gap	-0.08671 (0.06065)	-0.048784 (0.036087)	-0.052172* (0.022984)
GDP growth revision	0.24821*** (0.06204)	0.072236. (0.03686)	-0.031573 (0.023462)
Lagged GDP growth	0.05674 (0.04589)	0.006428 (0.027219)	0.001055 (0.017283)
Volatility	0.10169 (0.07199)	0.066295 (0.042727)	0.071017** (0.027077)
FRI	0.25261 (0.20142)	0.253115* (0.119527)	0.116044 (0.076039)
MTBF	0.26652 (0.5783)	-0.039996 (0.342526)	0.354725 (0.217425)
Budget balance rule	0.39677 (0.35684)	0.075926 (0.211932)	-0.105229 (0.134928)
Debt rule	-0.46627 (0.32621)	-0.379777. (0.193548)	-0.222127. (0.123083)
Expenditure rule	-0.31974 (0.29719)	0.070807 (0.176689)	0.086045 (0.112572)
Revenue rule	0.11682 (0.36615)	-0.048006 (0.218222)	-0.258476. (0.139395)
R-squared	0.2009	0.225	0.2353
Adjusted R-squared	0.1723	0.1973	0.208

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 16: WLS: Economic and institutional (indices of institutional quality, existence of different fiscal rules) determinants of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.96091* (0.44828)	-0.346806 (0.270415)	-0.4929208** (0.1697327)
Output gap revision	-0.19805** (0.07392)	-0.212744*** (0.044538)	-0.0812138** (0.0279316)
Lagged output gap	-0.10851. (0.0607)	-0.047905 (0.036833)	-0.0444615. (0.0232167)
GDP growth revision	0.27791*** (0.06211)	0.087773* (0.037623)	-0.026577 (0.0236995)
Lagged GDP growth	0.05961 (0.04596)	0.008956 (0.027782)	-0.0002131 (0.0174586)
Volatility	0.11856 (0.07224)	0.076256. (0.04361)	0.067466* (0.0273512)
FRI	0.29157 (0.20127)	0.284914* (0.121999)	0.1429939. (0.0768094)
MTBF	0.35675 (0.57866)	0.061789 (0.349611)	0.4097528. (0.2196287)
Budget balance rule	0.31832 (0.35649)	-0.047896 (0.216316)	-0.1621269 (0.136296)
Debt rule	-0.55054. (0.32635)	-0.408198* (0.197551)	-0.2080573. (0.1243309)
Expenditure rule	-0.31454 (0.29775)	0.05175 (0.180343)	0.0556333 (0.1137131)
Revenue rule	0.10656 (0.36576)	-0.055066 (0.222736)	-0.2671256. (0.1408082)
R-squared	0.2389	0.2381	0.226
Adjusted R-squared	0.2117	0.2109	0.1984

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 17: WLS: Economic and political determinants of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.2741 (0.39724)	-0.279279 (0.248939)	-0.398553** (0.152366)
Output gap revision	-0.22093*** (0.06534)	-0.196002*** (0.040676)	-0.09928*** (0.024784)
Lagged output gap	-0.12271* (0.05572)	-0.071472* (0.034913)	-0.046189* (0.021384)
GDP growth revision	0.24506*** (0.05639)	0.066944. (0.035321)	-0.019355 (0.021611)
Lagged GDP growth	0.04015 (0.04207)	-0.002502 (0.026334)	-0.002426 (0.016086)
Volatility	0.06905 (0.06332)	0.060465 (0.039644)	0.079941** (0.02417)
Proximity of elections	0.07227 (0.09251)	0.060718 (0.057815)	0.005587 (0.03537)
Left-right position of government	0.01278 (0.08463)	0.04499 (0.053026)	0.031896 (0.032469)
Previous opposition reports outturn	0.01916 (0.25937)	-0.122515 (0.161719)	0.033867 (0.09893)
Ongoing EDP	-0.91452*** (0.24086)	-0.401345** (0.150506)	-0.141014 (0.092055)
R-squared	0.194	0.1861	0.2029
Adjusted R-squared	0.1742	0.1661	0.1833

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 18: WLS: Economic and political determinants of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.20116 (0.39723)	-0.2245421 (0.2525175)	-0.381609* (0.153457)
Output gap revision	-0.23442*** (0.06553)	-0.2162591*** (0.0412604)	-0.106656*** (0.024961)
Lagged output gap	-0.13659* (0.05571)	-0.0673153. (0.0354152)	-0.037821. (0.021537)
GDP growth revision	0.28185*** (0.05642)	0.0839589* (0.0358287)	-0.011258 (0.021766)
Lagged GDP growth	0.04099 (0.04211)	-0.0008606 (0.0267124)	-0.00258 (0.016202)
Volatility	0.07628 (0.06348)	0.0626843 (0.0402135)	0.074475** (0.024343)
Proximity of elections	0.05928 (0.09286)	0.0501739 (0.0586463)	0.004254 (0.035623)
Left-right position of government	0.02681 (0.08466)	0.0494637 (0.0537884)	0.034173 (0.032701)
Previous opposition reports outturn	0.04478 (0.25913)	-0.0980736 (0.164044)	0.058003 (0.099639)
Ongoing EDP	-0.89395*** (0.24098)	-0.3968547** (0.15267)	-0.14944 (0.092714)
R-squared	0.2278	0.1967	0.191
Adjusted R-squared	0.2087	0.1769	0.1711

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 19: WLS: Determinants of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.496371* (0.2250109)	-0.300854 (0.359863)	-0.511982* (0.227295)
Output gap revision	-0.0824378** (0.0283166)	-0.218861*** (0.045427)	-0.085618** (0.028604)
Lagged output gap	-0.055513* (0.0233284)	-0.057223 (0.037236)	-0.047571* (0.023565)
GDP growth revision	-0.0310251 (0.023699)	0.089803* (0.037856)	-0.025208 (0.02394)
Lagged GDP growth	-0.0003758 (0.0175402)	0.002473 (0.028077)	-0.002008 (0.017718)
Volatility of economic cycle	0.071011* (0.0274889)	0.077225. (0.044089)	0.068232* (0.027768)
FRI	0.0865728 (0.0824404)	0.21479 (0.131759)	0.108129 (0.083277)
MTBF	0.3948467. (0.2212569)	0.144996 (0.354327)	0.445801* (0.223503)
Budget balance rule	-0.1252022 (0.1375272)	-0.101531 (0.219614)	-0.17824 (0.138923)
Debt rule	-0.1976291 (0.1265495)	-0.352015. (0.202348)	-0.176176 (0.127834)
Expenditure rule	0.0867605 (0.1137762)	0.072113 (0.181509)	0.058857 (0.114931)
Revenue rule	-0.2545512. (0.1407709)	-0.042108 (0.224034)	-0.2587. (0.1422)
Proximity of elections	-0.0048021 (0.0403285)	0.066004 (0.064431)	-0.004315 (0.040738)
Left-right position of government	0.0306356 (0.037834)	0.027141 (0.060425)	0.039397 (0.038218)
Previous opposition reports outturn	-0.0091473 (0.1104297)	-0.178311 (0.17639)	-0.001904 (0.111551)
Ongoing EDP	-0.1104875 (0.1187932)	-0.302556 (0.189842)	-0.123674 (0.119999)
R-squared	0.2395	0.2489	0.2305
Adjusted R-squared	0.2018	0.2116	0.192

Note: Note: p-value of the tests: '****' p < 0.001, '***' p < 0.01, '**' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 20: WLS: Economic determinants of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.72317** (0.22755)	-0.45955** (0.14529)	-0.44554*** (0.08741)
GDP growth revision	0.23646*** (0.0391)	0.03936 (0.02487)	-0.02804. (0.01489)
Lagged GDP growth	-0.04447 (0.03201)	-0.06705** (0.02037)	-0.04447*** (0.01220)
Volatility	0.14575* (0.06223)	0.12408** (0.03964)	0.11794*** (0.02374)
R-squared	0.1029	0.06436	0.1172
Adjusted R-squared	0.09573	0.05685	0.1101

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 21: WLS: Economic determinants of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.62083** (0.22864)	-0.43035** (0.14805)	-0.43745*** (0.08800)
GDP growth revision	0.27445*** (0.03941)	0.04750. (0.02534)	-0.02692. (0.01499)
Lagged GDP growth	-0.05595. (0.03222)	-0.06792** (0.02075)	-0.04160*** (0.01228)
Volatility	0.16024* (0.06269)	0.13093** (0.04039)	0.11172*** (0.02390)
R-squared	0.1325	0.06784	0.1046
Adjusted R-squared	0.1255	0.06037	0.09743

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 22: WLS: Economic and institutional determinants (indices of institutional quality) of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-1.43365*** (0.38247)	-0.85285*** (0.23271)	-0.76348*** (0.14616)
GDP growth revision	0.21563*** (0.04136)	0.0204 (0.02515)	-0.03671* (0.01579)
Lagged GDP growth	-0.04274 (0.03398)	-0.06626** (0.02069)	-0.04467*** (0.013)
Volatility	0.16062* (0.06861)	0.13172** (0.04184)	0.10984*** (0.02627)
FRI	0.29674* (0.14511)	0.28363** (0.08812)	0.08223 (0.05532)
MTBF	0.74629 (0.57795)	0.32024 (0.35125)	0.50112* (0.22059)
R-squared	0.1482	0.1301	0.1595
Adjusted R-squared	0.1347	0.1163	0.1462

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 23: WLS: Economic and institutional determinants (indices of institutional quality) of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-1.42858*** (0.38479)	-0.91852*** (0.23841)	-0.79159*** (0.14712)
GDP growth revision	0.25286*** (0.04157)	0.02847 (0.02577)	-0.03642* (0.01589)
Lagged GDP growth	-0.05304 (0.03419)	-0.0665** (0.0212)	-0.04187** (0.01309)
Volatility	0.18266** (0.06911)	0.14652*** (0.04286)	0.10525*** (0.02644)
FRI	0.30016* (0.14562)	0.27647** (0.09028)	0.08965 (0.05568)
MTBF	0.85577 (0.58052)	0.42552 (0.35986)	0.54026* (0.22204)
R-squared	0.1827	0.1384	0.1553
Adjusted R-squared	0.1697	0.1247	0.1418

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 24: WLS: Economic and institutional determinants (indices of institutional quality, existence of fiscal rule) of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.96235* (0.45352)	-0.66069* (0.27649)	-0.55422** (0.1726)
GDP growth revision	0.21665*** (0.04119)	0.02076 (0.02513)	-0.03636* (0.01569)
Lagged GDP growth	-0.04432 (0.03385)	-0.06691** (0.02068)	-0.04539*** (0.01292)
Volatility	0.15497* (0.06839)	0.1295** (0.04183)	0.10739*** (0.02612)
FRI	0.45259** (0.16586)	0.34765*** (0.10118)	0.15252* (0.06327)
MTBF	0.77159 (0.57566)	0.33085 (0.35098)	0.5132* (0.21925)
Fiscal rule	-0.725. (0.37878)	-0.29682 (0.23123)	-0.32443* (0.14461)
R-squared	0.1581	0.1347	0.1728
Adjusted R-squared	0.1419	0.1181	0.157

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 25: WLS: Economic and institutional determinants (indices of institutional quality, existence of fiscal rule) of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.96555* (0.45648)	-0.69482* (0.28306)	-0.55593** (0.17339)
GDP growth revision	0.25382*** (0.04141)	0.0289 (0.02573)	-0.03602* (0.01576)
Lagged GDP growth	-0.05458 (0.03407)	-0.06726** (0.02117)	-0.04268** (0.01298)
Volatility	0.17731* (0.06889)	0.14393*** (0.04282)	0.10248*** (0.02624)
FRI	0.45243** (0.1664)	0.351*** (0.10358)	0.1688** (0.06356)
MTBF	0.87848 (0.57835)	0.43787 (0.35932)	0.55387* (0.22025)
Fiscal rule	-0.71031. (0.38036)	-0.34556 (0.23672)	-0.36536* (0.14527)
R-squared	0.1918	0.1442	0.172
Adjusted R-squared	0.1762	0.1278	0.1562

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 26: WLS: Economic and institutional (indices of institutional quality, existence of different fiscal rules) determinants of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-1.53157*** (0.41753)	-0.88699*** (0.25445)	-0.71148*** (0.15895)
GDP growth revision	0.2154*** (0.04181)	0.02221 (0.02548)	-0.03626* (0.01591)
Lagged GDP growth	-0.03607 (0.03429)	-0.06454** (0.02092)	-0.04597*** (0.01308)
Volatility	0.18523** (0.07024)	0.13905** (0.04289)	0.10911*** (0.02677)
FRI	0.27539 (0.20476)	0.28174* (0.12495)	0.12245 (0.07826)
MTBF	0.6674 (0.58135)	0.31221 (0.35409)	0.53865* (0.22125)
Budget balance rule	0.52651 (0.36229)	0.177 1(0.2213)	-0.04294 (0.13872)
Debt rule	-0.3305 (0.33017)	-0.27611 (0.20152)	-0.15642 (0.12622)
Expenditure rule	-0.28132 (0.30334)	0.10677 (0.18546)	0.1033 (0.11632)
Revenue rule	-0.05986 (0.37092)	-0.20776 (0.22736)	-0.33654* (0.143)
R-squared	0.1609	0.1395	0.1771
Adjusted R-squared	0.1365	0.1145	0.1532

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 27: WLS: Economic and institutional (indices of institutional quality, existence of different fiscal rules) determinants of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-1.49648*** (0.4201)	-0.90147*** (0.26087)	-0.71116*** (0.15999)
GDP growth revision	0.25419*** (0.04203)	0.03142 (0.02612)	-0.0358* (0.01601)
Lagged GDP growth	-0.04602 (0.03451)	-0.06503** (0.02145)	-0.04341** (0.01316)
Volatility	0.20879** (0.07077)	0.15359*** (0.04397)	0.10416*** (0.02695)
FRI	0.3103 (0.20544)	0.31663* (0.1281)	0.15106. (0.07877)
MTBF	0.78732 (0.58407)	0.43645 (0.36302)	0.58749** (0.2227)
Budget balance rule	0.46276 (0.36339)	0.05816 (0.22688)	-0.10426 (0.13963)
Debt rule	-0.39962 (0.33165)	-0.29986 (0.20661)	-0.14736 (0.12704)
Expenditure rule	-0.27032 (0.30508)	0.09029 (0.19014)	0.07269 (0.11708)
Revenue rule	-0.08104 (0.37199)	-0.22571 (0.23309)	-0.34362* (0.14393)
R-squared	0.1944	0.1465	0.173
Adjusted R-squared	0.171	0.1217	0.149

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 28: WLS: Economic and political determinants of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.57403 (0.39387)	-0.56798* (0.25163)	-0.54131*** (0.15219)
GDP growth revision	0.23602*** (0.03907)	0.03996 (0.02491)	-0.02783. (0.01501)
Lagged GDP growth	-0.07284* (0.03323)	-0.08193*** (0.02123)	-0.04818*** (0.0128)
Volatility	0.17081** (0.06273)	0.1391*** (0.04012)	0.12265*** (0.02417)
Proximity of elections	0.09798 (0.09572)	0.08477 (0.06105)	0.01831 (0.03689)
Left-right position of government	0.02668 (0.08772)	0.05594 (0.05612)	0.03787 (0.03395)
Previous opposition reports outturn	-0.02109 (0.26855)	-0.16465 (0.17091)	0.01323 (0.1033)
Ongoing EDP	-0.77597** (0.24781)	-0.29798. (0.15812)	-0.08247 (0.09554)
R-squared	0.1286	0.08244	0.1229
Adjusted R-squared	0.112	0.06499	0.1063

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$ '**', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 29: WLS: Economic and political determinants of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
Intercept	-0.517739 (0.396039)	-0.54795* (0.25673)	-0.53988*** (0.15317)
GDP growth revision	0.274704*** (0.039357)	0.04836. (0.02542)	-0.02634. (0.0151)
Lagged GDP growth	-0.082443* (0.033461)	-0.08213*** (0.02166)	-0.04523*** (0.01289)
Volatility	0.185764** (0.063292)	0.14592*** (0.04093)	0.11675*** (0.02433)
Proximity of elections	0.083711 (0.096689)	0.07643 (0.06229)	0.01761 (0.03713)
Left-right position of government	0.043562 (0.088274)	0.06101 (0.05726)	0.04006 (0.03417)
Previous opposition reports outturn	0.003467 (0.269948)	-0.14502 (0.17437)	0.03537 (0.10396)
Ongoing EDP	-0.740049** (0.2494)	-0.28975. (0.16132)	-0.09365 (0.09616)
R-squared	0.1549	0.08383	0.1111
Adjusted R-squared	0.1387	0.0664	0.09421

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$ '**', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

**Table A. 30: WLS: Determinants of cyclically-adjusted net lending revision
(output gap dropped)**

	t-1 vintage	t vintage	t+1 vintage
Intercept	-1.497742** (0.566019)	-1.06289** (0.35193)	-0.833449*** (0.216907)
GDP growth revision	0.259907*** (0.042546)	0.03432 (0.02639)	-0.035191* (0.016228)
Lagged GDP growth	-0.055464 (0.036425)	-0.07005** (0.02263)	-0.04386** (0.013927)
Volatility of economic cycle	0.213319** (0.071699)	0.15859*** (0.04448)	0.106914*** (0.02734)
FRI	0.221483 (0.221591)	0.31878* (0.13792)	0.151642. (0.085054)
MTBF	0.834993 (0.597625)	0.46237 (0.37083)	0.594577** (0.228197)
Budget balance rule	0.462539 (0.370203)	0.01107 (0.23073)	-0.116121 (0.142417)
Debt rule	-0.307517 (0.342821)	-0.29651 (0.21306)	-0.141287 (0.131359)
Expenditure rule	-0.264597 (0.308361)	0.10265 (0.1919)	0.071596 (0.118553)
Revenue rule	-0.062799 (0.375926)	-0.21102 (0.23516)	-0.334703* (0.145648)
Proximity of elections	0.083238 (0.109875)	0.08882 (0.06799)	0.005264 (0.041941)
Left-right position of government	0.009778 (0.102788)	0.02737 (0.06391)	0.039341 (0.039438)
Previous opposition reports outturn	0.104857 (0.299021)	-0.21841 (0.18618)	-0.015158 (0.114882)
Ongoing EDP	-0.365207 (0.312898)	-0.01424 (0.19436)	0.017024 (0.119858)
R-squared	0.1996	0.1541	0.1751
Adjusted R-squared	0.1653	0.1179	0.1399

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 31: Country- and time-FE: Economic determinants of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.447397*** (0.082174)	-0.1712388** (0.0550934)	-0.086159** (0.033116)
Lagged output gap	-0.121923. (0.063268)	-0.1316401** (0.042875)	-0.069325** (0.025772)
GDP growth revision	0.09047 (0.064025)	-0.0454197 (0.0433945)	-0.059316* (0.026084)
Lagged GDP growth	0.068648 (0.054647)	0.0101377 (0.0370341)	-0.017912 (0.022261)
Economic cycle volatility	0.092213 (0.107746)	0.0081722 (0.0728167)	0.026282 (0.04377)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.15998	0.12115	0.13941
Adjusted R-squared	0.042888	-0.00053474	0.019811

Note: Note: p-value of the tests: ‘***’ $p < 0.001$, ‘**’ $p < 0.01$, ‘*’ $p < 0.05$, ‘.’ $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 32: Country- and time-FE on cyclically-adjusted primary balance revision estimation (economic variables, only significant fixed effects)

	t-1 vintage	t vintage	t+1 vintage
Cyprus		-0.7394609. (0.4134679)	
Denmark	0.929847. (0.557864)		-0.693168** (0.227112)
Finland			-0.454882. (0.249589)
Greece	-3.859174*** (0.65874)	-2.1147196*** (0.4464472)	-0.911687*** (0.268356)
Ireland	-2.415422** (0.755062)		
Italy			-0.391323. (0.224272)
Luxembourg	1.296768* (0.644625)	0.9938274* (0.4297353)	
Poland	-1.212407* (0.595209)		
Portugal	-1.651182** (0.55602)	-1.2456475** (0.3764666)	-0.631453** (0.226292)

Slovenia	-1.196139. (0.657105)	-1.0759906* (0.4449938)	
Spain	-1.588631** (0.565047)		
Sweden			-0.438058. (0.232961)
2004	-1.121256* (0.538571)	-0.597243. (0.359414)	-0.5144238* (0.2160413)
2005			-0.5840285** (0.2235146)
2006			-0.6378379** (0.2013689)
2007			-0.3802945. (0.2267456)
2008	-0.942423. (0.568381)	-0.884891* (0.384685)	
2009	-4.170753*** (0.653698)	-0.754349. (0.443327)	-0.7057314** (0.266481)
2010			
2011		-0.699875. (0.413145)	-0.5906222* (0.248339)
2013	-1.107275* (0.546867)		
2014	-1.146697* (0.540733)	-0.689675. (0.365942)	

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 33: Country- and time-FE: Economic determinants of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.444563*** (0.083329)	-0.1785319** (0.0560747)	-0.081267* (0.033434)
Lagged output gap	-0.142982* (0.064134)	-0.1310905** (0.0436387)	-0.058182** (0.026019)
GDP growth revision	0.119577. (0.064906)	-0.0342926 (0.0441674)	-0.055938* (0.026335)
Lagged GDP growth	0.07141 (0.055522)	0.0161667 (0.0376937)	-0.018697 (0.022475)
Volatility	0.093773 (0.109664)	0.0055515 (0.0741137)	0.023106 (0.04419)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.16738	0.11623	0.11749
Adjusted R-squared	0.050964	-0.006592	-0.0051589

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 34: Country- and time-FE on cyclically-adjusted net lending revision estimation (economic variables, only significant fixed effects)

	t-1 vintage	t vintage	t+1 vintage
Denmark			-0.710752** (0.229293)
Finland			-0.483652. (0.251985)
Greece	-3.58069*** (0.66857)	-1.99946*** (0.454399)	-0.815198** (0.270933)
Hungary		-0.809473. (0.428014)	-0.985355*** (0.255201)
Ireland	-2.22939** (0.76799)		
Luxembourg	1.28831* (0.65464)	0.988191* (0.43739)	
Poland	-1.07076. (0.60404)		
Portugal	-1.59302** (0.56393)	-1.173622** (0.383172)	-0.638183** (0.228464)
Slovenia	-1.23333. (0.66728)	-1.02534* (0.45292)	
Spain	-1.54516** (0.5734)		
Sweden			-0.473368* (0.235198)
2004			-0.414306. (0.218115)
2005			-0.554041* (0.225661)
2006			-0.658667** (0.203302)
2007			-0.439996. (0.228922)
2008		-0.919424* (0.391537)	
2009	-3.97393197*** (0.66396466)		-0.678668* (0.269039)
2010			
2011		-0.7156. (0.420504)	-0.611744* (0.250723)
2014	-1.05868755. (0.54963867)	-0.63526. (0.37246)	

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 35: Country- and time-FE: GDP growth as a determinant of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.0098871 (0.0529346)	-0.041771 (0.034082)	-0.05165* (0.020028)
Lagged GDP growth	-0.1172973** (0.0436486)	-0.107942*** (0.028093)	-0.079315*** (0.016385)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.02016	0.044821	0.080507
Adjusted R-squared	-0.10267	-0.070959	-0.027668

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 36: Country- and time-FE: GDP growth as a determinant of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.0098871 (0.0529346)	-0.041771 (0.034082)	-0.05165* (0.020028)
Lagged GDP growth	-0.1172973** (0.0436486)	-0.107942*** (0.028093)	-0.079315*** (0.016385)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.02016	0.044821	0.080507
Adjusted R-squared	-0.10267	-0.070959	-0.027668

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 37: Country- and time-FE: Economic and institutional determinants (indices of institutional quality) of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.511914*** (0.089692)	-0.178474** (0.059534)	-0.087601* (0.038087)
Lagged output gap	-0.107114 (0.066664)	-0.125209** (0.044249)	-0.07795** (0.028309)
GDP growth revision	0.119772. (0.067484)	-0.04249 (0.044794)	-0.063774* (0.028657)
Lagged GDP growth	0.086859 (0.056312)	0.015119 (0.037378)	-0.015694 (0.023913)
Volatility	0.090489 (0.129412)	0.058645 (0.085899)	0.026025 (0.054955)
FRI	0.214399 (0.220142)	0.125747 (0.146122)	-0.08451 (0.093482)
MTBF	0.290777 (0.635265)	0.072968 (0.421667)	0.287965 (0.269763)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.20525	0.14832	0.15935
Adjusted R-squared	0.074727	0.0084419	0.021291

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 38: Country- and time-FE: Economic and institutional determinants (indices of institutional quality) of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.490375*** (0.09142)	-0.178364** (0.06094)	-0.077729* (0.03846)
Lagged output gap	-0.135506* (0.067948)	-0.129674** (0.045294)	-0.071827* (0.028586)
GDP growth revision	0.138364* (0.068785)	-0.035727 (0.045851)	-0.065435* (0.028937)
Lagged GDP growth	0.088959 (0.057527)	0.020079 (0.038261)	-0.017265 (0.024147)
Volatility	0.107531 (0.132796)	0.064737 (0.087928)	0.026016 (0.055492)
FRI	0.275555 (0.224385)	0.102107 (0.149573)	-0.077171 (0.094397)
MTBF	0.406649 (0.64983)	0.12369 (0.431625)	0.300178 (0.272404)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.21111	0.14343	0.14223
Adjusted R-squared	0.081068	0.0027473	0.00136

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 39: Country- and time-FE: Economic and institutional determinants (indices of institutional quality, existence of fiscal rule) of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.512268*** (0.089815)	-0.178379** (0.05964)	-0.087911* (0.038079)
Lagged output gap	-0.113446. (0.067875)	-0.123513** (0.045072)	-0.083505** (0.028777)
GDP growth revision	0.116274. (0.067915)	-0.041553 (0.045098)	-0.066844* (0.028794)
Lagged GDP growth	0.089872 (0.05669)	0.014312 (0.037644)	-0.01305 (0.024035)
Volatility	0.091567 (0.129603)	0.058356 (0.086061)	0.026972 (0.054948)
FRI	0.256419 (0.235047)	0.114491 (0.156079)	-0.047641 (0.099653)
MTBF	0.331049 (0.640905)	0.06218 (0.425583)	0.323301 (0.271725)
Fiscal rule	-0.227894 (0.442425)	0.061048 (0.293786)	-0.199961 (0.187575)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.20602	0.14845	0.16284
Adjusted R-squared	0.072239	0.004967	0.021778

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 40: Country- and time-FE: Economic and institutional determinants (indices of institutional quality, existence of fiscal rule) of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.490564*** (0.091578)	-0.178297** (0.061051)	-0.078057* (0.038444)
Lagged output gap	-0.138977* (0.069211)	-0.128476** (0.046138)	-0.077706** (0.029053)
GDP growth revision	0.136441* (0.069252)	-0.035065 (0.046165)	-0.068683* (0.02907)
Lagged GDP growth	0.090553 (0.057912)	0.019509 (0.038535)	-0.014467 (0.024265)
Volatility	0.107891 (0.133027)	0.064533 (0.088097)	0.027018 (0.055475)
FRI	0.298586 (0.239691)	0.094155 (0.159772)	-0.03815 (0.100608)
MTBF	0.427905 (0.655452)	0.116069 (0.435652)	0.337577 (0.274329)
Fiscal rule	-0.124967 (0.451776)	0.043127 (0.300736)	-0.211632 (0.189373)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.21133	0.14349	0.14614
Adjusted R-squared	0.077949	-0.00083021	0.0022663

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 41: Country- and time-FE: Economic and institutional determinants (indices of institutional quality, existence of different fiscal rules) of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.505117*** (0.0904202)	-0.167718** (0.059882)	-0.082194* (0.038315)
Lagged output gap	-0.0946944 (0.0677376)	-0.121784** (0.04486)	-0.07949** (0.028704)
GDP growth revision	0.1130193. (0.0676796)	-0.044358 (0.044821)	-0.063646* (0.028679)
Lagged GDP growth	0.0704937 (0.0580676)	0.01484 (0.038456)	-0.011058 (0.024606)
Volatility	0.1050599 (0.130973)	0.08073 (0.086738)	0.040579 (0.055499)
FRI	-0.0012589 (0.3107466)	-0.013098 (0.205795)	-0.118071 (0.131678)
MTBF	0.2058161 (0.6483792)	-0.043649 (0.429395)	0.222363 (0.274748)
Budget balance rule	0.4575262 (0.4741606)	0.591801 (0.314017)	0.323769 (0.200924)
Debt rule	0.3780904 (0.4363983)	-0.14979 (0.289008)	-0.238089 (0.184922)
Expenditure rule	0.118062 (0.4032476)	0.20581 (0.267054)	0.101205 (0.170875)
Revenue rule	-1.2256314 (0.8483111)	-0.438459 (0.561801)	-0.124965 (0.359468)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.21649	0.16416	0.17475
Adjusted R-squared	0.074293	0.012476	0.024981

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 42: Country- and time-FE: Economic and institutional (indices of institutional quality, existence of different fiscal rules) determinants of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.484291*** (0.092264)	-0.1696475** (0.0614161)	-0.073015. (0.038735)
Lagged output gap	-0.126938. (0.069119)	-0.1275723** (0.0460095)	-0.07346* (0.029018)
GDP growth revision	0.132582. (0.069059)	-0.0374747 (0.04597)	-0.065425* (0.028993)
Lagged GDP growth	0.077947 (0.059336)	0.020624 (0.0394413)	-0.01279 (0.024875)
Volatility	0.12776 (0.134485)	0.0854503 (0.0889609)	0.038902 (0.056107)
FRI	0.108043 (0.317116)	-0.0064593 (0.2110686)	-0.10746 (0.13312)
MTBF	0.321707 (0.663738)	0.0196163 (0.440399)	0.233442 (0.277757)
Budget balance rule	0.472546 (0.483836)	0.5209101 (0.3220644)	0.307622 (0.203124)
Debt rule	0.20201 (0.445738)	-0.1641362 (0.2964151)	-0.230505 (0.186947)
Expenditure rule	0.106821 (0.411579)	0.1575848 (0.2738981)	0.064446 (0.172746)
Revenue rule	-1.219844 (0.866)	-0.4538025 (0.5761989)	-0.091233 (0.363405)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.2206	0.15606	0.156
Adjusted R-squared	0.078628	0.0028952	0.0028344

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$, '**' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 43: Country- and time-FE: Economic and political determinants of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.45837*** (0.083099)	-0.1754386** (0.0556615)	-0.088457** (0.033471)
Lagged output gap	-0.124011. (0.06381)	-0.1321396** (0.0432278)	-0.06995** (0.025994)
GDP growth revision	0.097721 (0.064518)	-0.0412624 (0.0437158)	-0.059085* (0.026287)
Lagged GDP growth	0.069717 (0.055152)	0.0093572 (0.0373866)	-0.016537 (0.022481)
Volatility	0.094268 (0.109791)	0.012016 (0.0742222)	0.030085 (0.044632)
Proximity of elections	0.090552 (0.084234)	0.06151 (0.0568522)	-0.029315 (0.034187)
Left-right position of government	0.091449 (0.083363)	0.0723988 (0.0564438)	0.017981 (0.033941)
Previous opposition reports outturn	-0.081904 (0.243286)	-0.0955144 (0.1634168)	0.070297 (0.098266)
Ongoing EDP	-0.165931 (0.300713)	-0.0701117 (0.2037814)	-0.033209 (0.122539)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.16765	0.12967	0.14375
Adjusted R-squared	0.039201	-0.0042288	0.012021

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 44: Country- and time-FE: Economic and political determinants of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.457748*** (0.084225)	-0.183844** (0.056679)	-0.088457** (0.033471)
Lagged output gap	-0.14527* (0.064656)	-0.13172** (0.044018)	-0.06995** (0.025994)
GDP growth revision	0.127958. (0.065378)	-0.029632 (0.044515)	-0.059085* (0.026287)
Lagged GDP growth	0.072778 (0.056018)	0.01554 (0.03807)	-0.016537 (0.022481)
Volatility	0.098148 (0.111733)	0.010655 (0.075579)	0.030085 (0.044632)
Proximity of elections	0.079112 (0.085718)	0.051528 (0.057892)	-0.029315 (0.034187)
Left-right position of government	0.107965 (0.084578)	0.075242 (0.057476)	0.017981 (0.033941)
Previous opposition reports outturn	-0.070492 (0.246547)	-0.0805 (0.166404)	0.070297 (0.098266)
Ongoing EDP	-0.17968 (0.305567)	-0.088459 (0.207507)	-0.033209 (0.122539)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.17565	0.12379	0.12274
Adjusted R-squared	0.048043	-0.01101	-0.012219

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 45: Country- and time-FE: Determinants of cyclically-adjusted primary balance revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.516205*** (0.091683)	-0.171905** (0.0607337)	-0.085055* (0.038791)
Lagged output gap	-0.103656 (0.06845)	-0.124941** (0.0453438)	-0.078275** (0.028961)
GDP growth revision	0.117636. (0.068262)	-0.0428083 (0.0452191)	-0.062782* (0.028882)
Lagged GDP growth	0.073824 (0.05872)	0.0144307 (0.0388983)	-0.010394 (0.024845)
Volatility	0.087317 (0.135513)	0.0878266 (0.0897681)	0.049999 (0.057336)
FRI	0.030329 (0.317524)	-0.0229569 (0.2103386)	-0.144964 (0.134345)
MTBF	0.214102 (0.65519)	-0.0048986 (0.4340196)	0.23533 (0.277212)
Budget balance rule	0.327976 (0.487478)	0.522954 (0.3229214)	0.35248 (0.206253)
Debt rule	0.416502 (0.440511)	-0.1445096 (0.291809)	-0.247489 (0.186381)
Expenditure rule	0.155566 (0.411157)	0.2266372 (0.2723636)	0.094297 (0.173961)
Revenue rule	-1.131378 (0.861936)	-0.42797 (0.5709744)	-0.104043 (0.364686)
Proximity of elections	0.092443 (0.093155)	0.0691856 (0.0617089)	-0.046292 (0.039414)
Left-right position of government	0.102212 (0.096131)	0.0486494 (0.0636804)	0.013921 (0.040673)
Previous opposition reports outturn	-0.075341 (0.264548)	-0.1523694 (0.1752452)	0.042416 (0.111931)
Ongoing EDP	0.038409 (0.353991)	-0.1232866 (0.2344954)	-0.11333 (0.149774)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.22429	0.17202	0.18215
Adjusted R-squared	0.068563	0.0057962	0.01796

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 46: Country- and time-FE on cyclically-adjusted primary balance revision estimation (all variables, only significantly non-zero fixed effects)

	t-1 vintage	t vintage	t+1 vintage
Bulgaria	-1.966591. (1.109305)		
Denmark			-1.035245** (0.395206)
Germany		-0.97723. (0.57598)	
Greece	-4.846308*** (0.947471)	-2.7273*** (0.62764)	-1.146809** (0.400877)
Hungary		-1.33293* (0.57426)	-1.22735*** (0.366785)
Ireland	-4.253649*** (1.088564)	-1.35199. (0.7211)	
Poland	-2.341898** (0.871981)		
Portugal	-2.902302** (0.879582)	-2.12049*** (0.58266)	-0.879199* (0.372153)
Romania	-1.890892. (1.123484)		
Slovenia	-2.14691* (0.935774)	-1.79612** (0.61989)	
Spain	-3.337634*** (0.968843)	-1.64398* (0.64179)	
Sweden			-0.770715. (0.449581)
2006			-0.83748** (0.31009)
2008		-1.45466** (0.53831)	
2009	-4.788028*** (0.85461)	-1.3085* (0.56612)	-0.85093* (0.36159)
2010			
2011		-1.24263* (0.58046)	-0.79954* (0.37075)
2013	-1.90648* (0.823578)		
2014	-2.177109* (0.859519)	-1.46669* (0.56937)	
2015	-1.79195* (0.868729)		

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 47: Country- and time-FE: Determinants of cyclically-adjusted net lending revision

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.497224*** (0.093558)	-0.175235** (0.062303)	-0.076186. (0.039231)
Lagged output gap	-0.135797. (0.06985)	-0.130745** (0.046515)	-0.072528* (0.02929)
GDP growth revision	0.138041* (0.069657)	-0.035097 (0.046387)	-0.063863* (0.029209)
Lagged GDP growth	0.081368 (0.060005)	0.020394 (0.039903)	-0.01189 (0.025126)
Volatility	0.113616 (0.139482)	0.095154 (0.092087)	0.051886 (0.057986)
FRI	0.131571 (0.324119)	-0.021706 (0.215773)	-0.138704 (0.135869)
MTBF	0.33356 (0.670995)	0.058121 (0.445233)	0.244057 (0.280356)
Budget balance rule	0.350535 (0.497471)	0.458741 (0.331265)	0.341325 (0.208592)
Debt rule	0.238776 (0.449813)	-0.159033 (0.299349)	-0.240567 (0.188495)
Expenditure rule	0.154497 (0.41963)	0.188835 (0.279401)	0.07158 (0.175934)
Revenue rule	-1.121269 (0.880469)	-0.43662 (0.585727)	-0.070895 (0.368822)
Proximity of elections	0.080013 (0.095592)	0.057971 (0.063303)	-0.04561 (0.039861)
Left-right position of government	0.111456 (0.098358)	0.057729 (0.065326)	0.019112 (0.041134)
Previous opposition reports outturn	-0.077527 (0.270074)	-0.145058 (0.179773)	0.049328 (0.1132)
Ongoing EDP	-0.013802 (0.362817)	-0.159917 (0.240554)	-0.158657 (0.151473)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.22827	0.16393	0.16523
Adjusted R-squared	0.072751	-0.0039127	-0.0023575

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 48: Country- and time-FE on cyclically-adjusted net lending revision estimation (all variables, only significantly non-zero fixed effects)

	t-1 vintage	t vintage	t+1 vintage
Bulgaria	-2.142101. (1.135649)		
Denmark			-1.075304** (0.399687)
Greece	-4.64715*** (0.968272)	-2.7107531*** (0.6438522)	-1.1701048** (0.405423)
Hungary		-1.4531454* (0.589097)	-1.251379*** (0.370944)
Ireland	-4.065512*** (1.116177)	-1.2252873. (0.7397318)	
Poland	-2.210012* (0.891385)		
Portugal	-2.967578** (0.897891)	-2.0512176*** (0.5977179)	-0.90473* (0.376373)
Romania	-1.986544. (1.15172)		
Slovakia	-1.811568. (.074414)		
Slovenia	-2.219676* (0.957686)	-1.7657373** (0.6359034)	
Spain	-3.556711*** (0.990049)	-1.6583607* (0.6583751)	
Sweden			-0.839325. (0.454679)
2006			-0.859062** (0.313608)
2007			-0.583664. (0.331922)
2008	-1.44061. (0.83164)	-1.4802** (0.55221)	
2009	-4.67171*** (0.87486)	-1.20285* (0.58075)	-0.828832* (0.365687)
2011		-1.27812* (0.59546)	-0.830195* (0.374951)
2013	-1.8606* (0.8432)		
2014	-2.31192** (0.88028)	-1.41064* (0.58408)	
2015	-1.91875* (0.89055)		

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$ '**', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 49: Country- and time-FE: Determinants of cyclically-adjusted primary balance revision (year 2009 dropped)

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.49562*** (0.100967)	-0.140151* (0.067709)	-0.0921279* (0.0442731)
Lagged output gap	-0.088407 (0.072722)	-0.13882** (0.048768)	-0.0774991* (0.0318878)
GDP growth revision	0.160939* (0.072464)	-0.073555 (0.048595)	-0.0806166* (0.0317749)
Lagged GDP growth	0.103427. (0.061024)	0.03011 (0.040923)	-0.0118726 (0.0267585)
Volatility	0.093192 (0.138571)	0.111971 (0.092927)	0.0816173 (0.0607621)
FRI	0.030178 (0.337537)	-0.167049 (0.226354)	-0.115638 (0.1480065)
MTBF	0.102367 (0.67345)	-0.168852 (0.451619)	0.1701538 (0.2953006)
Budget balance rule	0.267127 (0.518525)	0.676982. (0.347726)	0.3694993 (0.2273678)
Debt rule	0.23006 (0.479309)	-0.100737 (0.321427)	-0.3441216 (0.2101717)
Expenditure rule	0.208616 (0.424901)	0.263841 (0.284941)	0.0992193 (0.1863144)
Revenue rule	-0.991626 (0.887632)	-0.170342 (0.59525)	-0.1107336 (0.389217)
Proximity of elections	0.055561 (0.096646)	0.045533 (0.064811)	-0.052483 (0.042378)
Left-right position of government	0.125097 (0.10101)	0.04369 (0.067738)	0.018592 (0.0442917)
Previous opposition reports outturn	-0.029527 (0.274114)	-0.120714 (0.183822)	-0.0037943 (0.1201959)
Ongoing EDP	-0.137112 (0.368982)	-0.246576 (0.247441)	-0.1419038 (0.1617946)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.19466	0.16026	0.19238
Adjusted R-squared	0.018703	-0.023212	0.015925

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 50: Country- and time-FE: Determinants of cyclically-adjusted net lending revision (year 2009 dropped)

	t-1 vintage	t vintage	t+1 vintage
Output gap revision	-0.4664591*** (0.1022859)	-0.137348* (0.069011)	-0.07958436. (0.04481331)
Lagged output gap	-0.111103 (0.0736645)	-0.142991** (0.049705)	-0.07311266* (0.03227687)
GDP growth revision	0.1859136* (0.0734087)	-0.064358 (0.049529)	-0.08016774* (0.03216259)
Lagged GDP growth	0.1048098. (0.0619153)	0.036571 (0.04171)	-0.01204423 (0.02708499)
Volatility	0.1201178 (0.1416809)	0.121968 (0.094713)	0.08114977 (0.06150349)
FRI	0.0992903 (0.3421867)	-0.179537 (0.230705)	-0.11456077 (0.14981249)
MTBF	0.1677016 (0.6847664)	-0.11172 (0.4603)	0.18589989 (0.29890383)
Budget balance rule	0.3424343 (0.5253225)	0.616045. (0.354409)	0.36680995 (0.23014217)
Debt rule	0.0793022 (0.486039)	-0.110394 (0.327605)	-0.32698898 (0.21273624)
Expenditure rule	0.2004001 (0.4304641)	0.224033 (0.290417)	0.07486569 (0.18858781)
Revenue rule	-0.9094862 (0.8999403)	-0.135455 (0.606692)	-0.08460089 (0.3939662)
Proximity of elections	0.0464184 (0.0985546)	0.030294 (0.066057)	-0.05068462 (0.04289514)
Left-right position of government	0.1342962 (0.102656)	0.06016 (0.06904)	0.02547117 (0.04483216)
Previous opposition reports outturn	-0.0064634 (0.2777626)	-0.102906 (0.187355)	0.00051463 (0.12166254)
Ongoing EDP	-0.1722759 (0.3759115)	-0.295246 (0.252197)	-0.17894226 (0.16376884)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
Multiple R-squared	0.20222	0.15077	0.17191
Adjusted R-squared	0.027183	-0.034774	-0.0090177

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 51: Country- and time-FE: Economic determinants of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.022805 (0.053899)	-0.035752 (0.035734)	-0.053134* (0.021277)
Lagged GDP growth	-0.098381* (0.043953)	-0.100783*** (0.029162)	-0.075438*** (0.017364)
Volatility	0.368506*** (0.104254)	0.147890* (0.069128)	0.097860* (0.041160)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.055988	0.054918	0.091523
Adjusted R-squared	-0.069122	-0.069958	-0.028516

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$ '**', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 52: Country- and time-FE: Economic determinants of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.061572 (0.054705)	-0.026839 (0.036375)	-0.053180* (0.021355)
Lagged GDP growth	-0.107276* (0.044726)	-0.096058** (0.029685)	-0.068954*** (0.017428)
Volatility	0.375191*** (0.106467)	0.148672* (0.07036)	0.087637* (0.041312)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.061983	0.04896	0.079259
Adjusted R-squared	-0.062708	-0.076703	-0.042401

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$ '**', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 53: Country- and time-FE: Economic and institutional determinants (indices of institutional quality) of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.02105 (0.055836)	-0.038763 (0.035897)	-0.054785* (0.022754)
Lagged GDP growth	-0.081416. (0.046017)	-0.090396** (0.029584)	-0.076278*** (0.018752)
Volatility	0.481462*** (0.122327)	0.233199** (0.078643)	0.118882* (0.04985)
FRI	0.235103 (0.235268)	0.125553 (0.151251)	-0.085997 (0.095874)
MTBF	0.609515 (0.677262)	0.228853 (0.435403)	0.37288 (0.275991)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.08429	0.079449	0.108
Adjusted R-squared	-0.058375	-0.06397	-0.030966

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$, '**' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 54: Country- and time-FE: Economic and institutional determinants (indices of institutional quality) of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.058074 (0.056764)	-0.030031 (0.036726)	-0.056304* (0.022848)
Lagged GDP growth	-0.089848. (0.046954)	-0.087793** (0.030267)	-0.07244*** (0.01883)
Volatility	0.496075*** (0.125456)	0.241161** (0.08046)	0.109567* (0.050057)
FRI	0.292599 (0.239172)	0.10153 (0.154745)	-0.078714 (0.096272)
MTBF	0.727679 (0.691)	0.281793 (0.445463)	0.37688 (0.277138)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.095779	0.075085	0.099968
Adjusted R-squared	-0.045608	-0.069014	-0.040254

Note: Note: p-value of the tests: '****' $p < 0.001$, '***' $p < 0.01$ '**', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 55: Country- and time-FE: Economic and institutional determinants (indices of institutional quality, existence of fiscal rule) of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.021218 (0.055964)	-0.037788 (0.035929)	-0.055056* (0.0228)
Lagged GDP growth	-0.081329. (0.046108)	-0.089891** (0.029602)	-0.076418*** (0.018785)
Volatility	0.480659*** (0.122829)	0.228524** (0.078856)	0.12018* (0.050041)
FRI	0.226923 (0.250442)	0.0779 (0.160784)	-0.072765 (0.102032)
MTBF	0.600906 (0.684308)	0.178703 (0.439328)	0.386805 (0.278793)
Fiscal rule	0.044917 (0.464959)	0.261646 (0.298505)	-0.072649 (0.189428)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.084321	0.082014	0.10848
Adjusted R-squared	-0.062188	-0.064864	-0.034162

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 56: Country- and time-FE: Economic and institutional determinants (indices of institutional quality, existence of fiscal rule) of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.058731 (0.056881)	-0.029099 (0.036766)	-0.056654* (0.022891)
Lagged GDP growth	-0.089431. (0.047042)	-0.087311** (0.030291)	-0.072622*** (0.01886)
Volatility	0.49328*** (0.125881)	0.236695** (0.080693)	0.111248* (0.05024)
FRI	0.260773 (0.25457)	0.056008 (0.164529)	-0.061573 (0.102438)
MTBF	0.695337 (0.697603)	0.233887 (0.449559)	0.394919 (0.279901)
Fiscal rule	0.174824 (0.473247)	0.249942 (0.305457)	-0.094115 (0.190181)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.096229	0.077332	0.10077
Adjusted R-squared	-0.048902	-0.070295	-0.043108

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$, '*' $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 57: Country- and time-FE: Economic and institutional (indices of institutional quality, existence of different fiscal rules) determinants of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.0074776 (0.056309)	-0.041779 (0.03613)	-0.054133* (0.022964)
Lagged GDP growth	-0.0906817. (0.0467332)	-0.088074** (0.029986)	-0.072323*** (0.019059)
Volatility	0.472678*** (0.1242472)	0.237527** (0.079721)	0.125036* (0.050671)
FRI	-0.2094421 (0.3265492)	-0.147075 (0.209525)	-0.197948 (0.133174)
MTBF	0.4153959 (0.6892936)	0.049294 (0.442274)	0.273032 (0.281109)
Budget balance rule	0.8720791. (0.4984864)	0.809184* (0.319846)	0.447784* (0.203294)
Debt rule	0.6263514 (0.4582814)	0.029272 (0.294049)	-0.129151 (0.186897)
Expenditure rule	0.3256234 (0.4277917)	0.292351 (0.274486)	0.14748 (0.174463)
Revenue rule	-0.9707407 (0.9019241)	-0.314577 (0.578705)	-0.055649 (0.367825)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.10546	0.10424	0.12729
Adjusted R-squared	-0.049107	-0.050543	-0.023506

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 58: Country- and time-FE: Economic and institutional (indices of institutional quality, existence of different fiscal rules) determinants of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.046447 (0.057327)	-0.033038 (0.037064)	-0.055788* (0.023096)
Lagged GDP growth	-0.096368* (0.047708)	-0.085873** (0.030761)	-0.068771*** (0.019168)
Volatility	0.494029*** (0.127508)	0.245737** (0.081783)	0.115022* (0.050961)
FRI	-0.117478 (0.332487)	-0.145127 (0.214944)	-0.180461 (0.133937)
MTBF	0.531672 (0.704033)	0.114763 (0.453713)	0.279188 (0.282719)
Budget balance rule	0.901892. (0.507506)	0.744666* (0.328118)	0.420301* (0.204458)
Debt rule	0.478581 (0.467028)	0.021677 (0.301654)	-0.130687 (0.187967)
Expenditure rule	0.312933 (0.435641)	0.245977 (0.281585)	0.106109 (0.175462)
Revenue rule	-0.959601 (0.918648)	-0.326589 (0.593673)	-0.02842 (0.369931)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.11416	0.095133	0.11667
Adjusted R-squared	-0.039472	-0.061223	-0.035959

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 59: Country- and time-FE: Economic and political determinants of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.026011 (0.054462)	-0.033707 (0.036054)	-0.0538739* (0.0214742)
Lagged GDP growth	-0.099598* (0.044419)	-0.102583*** (0.02943)	-0.0748324*** (0.0175284)
Volatility	0.369727*** (0.107125)	0.151336* (0.070934)	0.1017068* (0.0422484)
Proximity of elections	0.092945 (0.089181)	0.062019 (0.058779)	-0.0291839 (0.0350093)
Left-right position of government	0.050756 (0.088038)	0.055657 (0.058272)	0.0094467 (0.0347071)
Previous opposition reports outturn	-0.088133 (0.256873)	-0.131719 (0.168687)	0.0511234 (0.1004705)
Ongoing EDP	-0.079431 (0.31821)	-0.035797 (0.210734)	-0.0157416 (0.125514)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.060133	0.061896	0.094546
Adjusted R-squared	-0.078252	-0.075808	-0.038364

Note: Note: p-value of the tests: '***' p < 0.001, '**' p < 0.01, '*' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 60: Country- and time-FE: Economic and political determinants of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.065285 (0.055282)	-0.024559 (0.036726)	-0.0533977* (0.0215703)
Lagged GDP growth	-0.108849* (0.045213)	-0.097997** (0.029978)	-0.0683214*** (0.0176069)
Volatility	0.379946*** (0.109433)	0.153856* (0.072256)	0.0931329* (0.0424375)
Proximity of elections	0.079252 (0.090913)	0.052316 (0.059875)	-0.0293283 (0.035166)
Left-right position of government	0.06757 (0.089489)	0.057887 (0.059358)	0.0090097 (0.0348625)
Previous opposition reports outturn	-0.081904 (0.260774)	-0.116575 (0.17183)	0.0698107 (0.1009202)
Ongoing EDP	-0.088069 (0.323886)	-0.052837 (0.214661)	-0.0428779 (0.1260757)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.065874	0.054901	0.083072
Adjusted R-squared	-0.07209	-0.083829	-0.051523

Note: Note: p-value of the tests: '***' $p < 0.001$, '**' $p < 0.01$ '*', $p < 0.05$, '.' $p < 0.1$. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 61: Country- and time-FE: Determinants of cyclically-adjusted primary balance revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.01061 (0.057101)	-0.041431 (0.036586)	-0.0553626* (0.0231835)
Lagged GDP growth	-0.091933. (0.047487)	-0.090116** (0.030427)	-0.0711025*** (0.0192803)
Volatility of economic cycle	0.465442*** (0.129542)	0.249249** (0.083002)	0.1363279* (0.0525956)
FRI	-0.188405 (0.334516)	-0.162613 (0.214336)	-0.2262224. (0.1358171)
MTBF	0.41646 (0.698685)	0.087464 (0.447673)	0.2855739 (0.283674)
Budget balance rule	0.795198 (0.512919)	0.766428* (0.328645)	0.48894* (0.2082506)
Debt rule	0.651962 (0.464618)	0.025673 (0.297697)	-0.1465848 (0.1886399)
Expenditure rule	0.34075 (0.43785)	0.302237 (0.280546)	0.1342377 (0.1777718)
Revenue rule	-0.941678 (0.919703)	-0.338585 (0.589287)	-0.0550463 (0.3734093)
Proximity of elections	0.097958 (0.099276)	0.064706 (0.06361)	-0.0496577 (0.0403072)
Left-right position of government	0.033203 (0.101923)	0.015869 (0.065306)	-0.0040807 (0.0413821)
Previous opposition reports outturn	-0.035646 (0.282125)	-0.149027 (0.180768)	0.0422726 (0.1145461)
Ongoing EDP	0.033659 (0.377951)	-0.128284 (0.242167)	-0.1164248 (0.1534523)
Country-fixed effects	Yes		Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.10899	0.11022	0.13494
Adjusted R-squared	-0.061847	-0.060374	-0.030918

Note: Note: p-value of the tests: '****' p < 0.001, '***' p < 0.01, '**' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted primary surplus, negative numbers depict cyclically-adjusted primary deficit. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

Table A. 62: Country- and time-FE: Determinants of cyclically-adjusted net lending revision (output gap dropped)

	t-1 vintage	t vintage	t+1 vintage
GDP growth revision	0.049657 (0.058158)	-0.032307 (0.037549)	-0.0562284* (0.0233287)
Lagged GDP growth	-0.097704* (0.048515)	-0.088024** (0.031227)	-0.0675861** (0.0194011)
Volatility of economic cycle	0.492994*** (0.133281)	0.261031** (0.085187)	0.1301616* (0.0529251)
FRI	-0.10615 (0.340811)	-0.166567 (0.219976)	-0.2132746 (0.136668)
MTBF	0.54174 (0.714172)	0.153207 (0.459452)	0.2897294 (0.2854511)
Budget balance rule	0.83582 (0.522441)	0.710219* (0.337293)	0.4659033* (0.2095553)
Debt rule	0.503004 (0.473522)	0.01788 (0.305531)	-0.1477327 (0.1898217)
Expenditure rule	0.337929 (0.446039)	0.266421 (0.287928)	0.1077276 (0.1788855)
Revenue rule	-0.930518 (0.937729)	-0.344523 (0.604792)	-0.0263081 (0.3757487)
Proximity of elections	0.083409 (0.101685)	0.053168 (0.065284)	-0.0487943 (0.0405598)
Left-right position of government	0.040671 (0.104084)	0.023947 (0.067024)	0.0027256 (0.0416413)
Previous opposition reports outturn	-0.043697 (0.287478)	-0.14202 (0.185524)	0.0489351 (0.1152637)
Ongoing EDP	-0.021734 (0.386644)	-0.165139 (0.248539)	-0.1615201 (0.1544136)
Country-fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
R-squared	0.11686	0.1007	0.12588
Adjusted R-squared	-0.053104	-0.071722	-0.041712

Note: Note: p-value of the tests: '****' p < 0.001, '***' p < 0.01, '**' p < 0.05, '.' p < 0.1. Standard errors in parentheses. Positive numbers depict cyclically-adjusted net lending, negative numbers depict cyclically-adjusted net borrowing. t-1 vintage depicts CAB of year t, as estimated in the autumn of the preceding year, t vintage depicting CAB of year t, as estimated in the autumn of the same year, t+1 vintage depicting CAB of year t, as estimated in the autumn of the following year, final vintage depicting CAB of year t, as estimated in the last available estimation (4 years after for majority of the sample). E.g. for the balance of the year 2003, the t-1 vintage CAB was collected in 2002, t vintage CAB was collected in 2003, t+1 vintage CAB was collected in 2004 and final vintage CAB was collected in 2007.

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