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# Do budget balance rules anchor budget balance expectations? – Some international evidence

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This is the first study that analyzes whether budget balance expectations are anchored and whether budget balance rules effectively anchor expectations. To this end, we use a unique data set which covers budget balance expectations in 17 countries that implemented a budget balance rules. While our results are mixed concerning the general impact of budget balance rules on anchoring expectations, we do find that specific features of budget balance rules are important to successfully anchor budget balance expectations.

**JEL classification:** H62; H68; H11

**Keywords:** budget balance expectations; fiscal rules; anchoring

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# 1 Introduction

As advanced and emerging economies have moved into extended periods of heightened fiscal stress during the more recent past, policymakers have become more concerned about the sustainability of public finances. Many governments have run excessive and persistent fiscal deficits even since the 1970s causing public debt to increase rapidly (Krogstrup and Wyplosz 2010). As a result, the perception arose that new fiscal frameworks should be adopted. Therefore, in the past two decades a shift from discretionary fiscal policies towards the implementation of fiscal rules occurred both in emerging and advanced economies (Kopits 2004, IMF 2009, Schaechter et al. 2012).<sup>1</sup> Implementing fiscal rules has been regarded as a promising way to tackle the deficit bias. Fiscal rules define a numerical ceiling or target for an indicator of fiscal performance (e.g. the primary budget deficit) to constrain fiscal policy actions and are usually enshrined in a legal framework (Hagen 2006, Kopits and Symansky 1998, IMF 2005).

Various studies show that one of the most important characteristics of a budget balance rule is a credible signal that public debt can be put on a sustainable path (IMF 2009, Leeper 2009). The main economic argument for fiscal institutions to implement budget balance rules is the signalling and credibility gain that they convey to financial markets (Kopits 2001, Braun and Tommasi 2004, Drazen 2004). Such rules are supposed to provide guidance to financial market experts by increasing their awareness of government's commitment to fiscal discipline (IMF 2005). With heightened fiscal stress unanchored fiscal expectations also threaten to undermine central banks' ability to control the monetary transmission mechanism and hence inflation (Leeper 2010). Fiscal rules contribute to more transparency in the fiscal accounts (Manganelli and Wolswijk 2007). This, in turn, corrects the deficit bias, makes the government accountable for using discretionary fiscal policy and reduces government bond spreads easing the costs of government financing (IMF 2005, Iara and Wolff 2010). However, budget balance rules have to be designed and implemented properly to be credible and effective in anchoring expectations. As Ter-Minassin (2010) points out, this task is far from easy as governments have to face economic, political and institutional challenges when designing a budget balance rule.

Credible budget balance rules should help to anchor budget balance expectations. Like in a monetary policy framework, fiscal rules gain credibility through communication, transparency, and appropriate enforcement mechanisms. A clear commitment by authorities to a deficit target set by a budget balance rule should successfully anchor budget balance expectations. Leeper (2009) emphasizes that if authorities do not transparently communicate anticipated changes in fiscal policy households and firms may make bad consumption-savings decisions. Ultimately, these decisions can have an impact on inflation and real activity (Mertens and Ravn 2008, Leeper et al. 2008, 2009a, 2009b, Leeper 2009).

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<sup>1</sup>A recent example is the new fiscal compact treaty agreed among 25 EU member countries in January 2012, which introduces a (structural) budget balance rule to be adhered by all signatory countries (European Council 2012).

In this paper we address three research questions which to our knowledge have not been analyzed before: i) Are budget balance expectations anchored? ii) Do budget balance rules help to anchor budget balance expectations? and iii) What characteristics of a budget balance rule matter for anchoring expectations? Such an analysis has interesting policy implications. If budget balance expectations are anchored a temporary budget balance shock should not affect expectations regarding the future fiscal stance. Hence, a temporary deviation from the budget balance target (e.g. due to an unexpected adverse economic shock) should not result in financial market participants to demanding for higher risk premia on government bonds. If, on the contrary, expectations are not anchored, substantial and consecutive budget deficits could signal a weakening fiscal position and jeopardize fiscal sustainability, ultimately leading to higher bond spreads. If budget balance expectations are anchored excessive government deficit programs, as witnessed during the recent global economic crisis, should be regarded as temporary and hence should not crowd out households' intra-temporal consumption and saving decisions. Put differently, business cycle dynamics should be less pronounced under anchored budget balance expectations. Another policy implication is important in this context: if a balance is effective the government can stabilize budget balance expectations and hence avoid any distortive behavioral changes of economic agents. If, on the other hand, a budget balance rule does not help to anchor budget balance expectations it is important to determine the weaknesses and strengthen the rule by introducing enhanced features into the design. This study also addresses this question by looking at different characteristics of budget balance rules.

In our analysis, we make use of the literature and the methodology of studies analyzing the anchoring of inflation expectations (Levin et al. 2004, Demertzis et al. 2009, Demertzis and van der Cruijsen 2007). Expectations are anchored if they are disconnected from the realization of the underlying time series (Levin et al. 2004). In our context, budget balance expectations are referred to be anchored when shocks to the budget balance do not affect budget balance expectations. We argue that if budget balance rules are credible there should be a weak relationship between actual budget balances and expected budget balances. Moreover, one would expect that this relation is even weaker for long-term expectations since fiscal shocks are granted more time to be absorbed.

We use survey data for 17 economies for the period from 1994 to 2010 in order to analyze whether budget balance expectations were anchored. We also examine whether budget balance rules have helped to weaken the connection between budget balance expectations and actual budget balances. For this purpose we cover countries which have adopted either a national or supranational budget balance rule (IMF 2009).<sup>2</sup> As expectation data are available for budget balances but not for debt, expenditure or

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<sup>2</sup>Even though budget balance expectations are only available from 1994 onwards, we take into account the budget balance rule introduced by the Maastricht treaty for Germany, France, Italy and the United Kingdom in 1992. The reason is that this rule has been very important for the run-up to the EMU.

revenue we concentrate our study on rules referring to budget balances.<sup>3</sup> Furthermore, we focus only on budget balance rules that specify an explicit numerical target or ceiling.<sup>4</sup> This way private-sector forecasters can form their expectations based on officially announced targets communicated by the government which in turn allows us to evaluate the impact of such rules on budget balance expectations.

We also analyze whether rules with a specific institutional design are more effective in helping to anchor expectations than others. We focus on three characteristics: legal basis, enforcement mechanisms, and supporting procedures and institutions. We apply the analysis only to countries with national rules. To obtain information about the rule characteristics, we draw on the recently published IMF database on fiscal rules (Schaechter et al. 2012).

The rest of the paper is organized as follows. The second section describes the data set and provides some descriptive statistics. The third section discusses the empirical methodology and presents our empirical results. The fourth section concludes and provides some policy implications.

## 2 Data and Descriptive Statistics

### 2.1 Expected and Actual Budget Balances

For our study we use budget balance expectations in percent of GDP drawn from the survey of the Consensus Economics Forecast poll. Each month the survey requests private-sector forecasters to predict a number of macroeconomic variables including the growth rate or the budget balance. The data set has several advantages over other surveys and is, thus, less subject to some of the weaknesses often associated with survey data. First, the survey covers a substantial number of countries. In total, we analyze 17 countries, namely Argentina, Australia, Brazil, Canada, Czech Republic, France, Germany, Hungary, India, Italy, Mexico, New Zealand, Poland, Russia, Turkey, United Kingdom and the United States. This allows us to compare our results among different fiscal policy regimes.

Second, the data set is available for the sample period between 1994 and 2010 which covers potentially interesting dynamics in fiscal policy. Third, the participants of the poll are working for investment banks, commercial banks and consultancies in the respective country and are that kind of group one would expect to have a pretty good idea concerning the development of future macroeconomic variables.<sup>5</sup> Fourth, the individual forecasts are published together with the names of the forecasters' company which

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<sup>3</sup>Many countries have also implemented debt, expenditure or revenue rules, which, however, cannot be considered due to data availability. For example, Serbia has implemented a debt rule in 2011, Lithuania a revenue rule in 2008 and Denmark an expenditure rule in 1994.

<sup>4</sup>The Maastricht Treaty (and after EMU accession the Stability and Growth Pact), for example, binds Euro area members to a deficit-to-GDP ratio of 3%.

<sup>5</sup>A complete list of participants is available upon request and further information can be obtained from [www.consensuseconomics.com](http://www.consensuseconomics.com).

allows to evaluate the performance of the company and the quality of the forecasts can be expected to have an effect on the reputation of the forecasters.<sup>6</sup> This is expected to increase the incentives of the survey participants to submit their best rather than their strategic forecast (Keane and Runkle 1990). Fifth, unlike some other surveys, forecasters participating in the Consensus Economic Forecast poll do not only submit the direction of the expected change of the macroeconomic variable, but forecast a specific level which allows for more differentiation between individual forecasts. Finally, the survey data are readily available to the public which makes the data set an attractive source for policy makers and academics alike (Gorter et al. 2008). By the same token we argue that the forecasts reflect the financial market expectations. Since analysts are bound in their survey answers by their recommendations to clients, an analyst may find it hard to justify why he gave a recommendation different from the one in the survey.

Although the survey is conducted each month, we only use the forecasts reported in January<sup>7</sup> to avoid overlapping forecast horizons or increase of forecast accuracy simply because of a decreasing forecast horizon.<sup>8</sup> The survey data contain forecasts for two different forecast horizons, that is, for the current year and the next year. Since the monthly survey has a fixed forecast point, we limit our analysis to forecasts that have a one-year and two-year forecast horizon. By doing so, we also take advantage of the fact that the dispersion among the forecasters is reasonable large compared to forecasts submitted at the end of the year. Like any study using forecasts on budget balances, there are no data on long-term expectations available which are the focus of anchoring of inflation expectations. This is a drawback of our study is. However, in this context we do not focus on the anchoring of budget balance expectations but rather on the impact of budget balances rules on anchoring. This impact should also be reflected in short-term and medium-term forecasts. Moreover, comparing both forecast horizons might indicate whether the forecast horizon is actually important for our results.

Data for actual general government budget balances are taken from the World Economic Outlook Database and the OECD Economic Database.<sup>9</sup> Figure 1 plots the time series of (i) the cross-sectional average of one-year ahead forecasts (dashed lines), (ii) actual budget balance (squares), and, (iii) the cross-sectional scattering of forecasts as measured by the cross-sectional range of forecasts (shaded areas). Two things stand out. First, the cross-sectional average of forecasts moves in tandem with the actual budget balance indicating that dynamics of the budget balance transmit into budget balance ex-

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<sup>6</sup>Batchelor (2001) shows that the Consensus Economics forecasts are less biased and more accurate in terms of mean absolute error and root mean square error compared to OECD and IMF forecasts. He also shows that there is little information in the OECD and IMF forecasts that could be used to significantly reduce the error in the private sector forecasts.

<sup>7</sup>If January data are not available we use February data.

<sup>8</sup>Focusing on different months yields a lower forecast disagreement in terms of forecast range. Results based on different months are qualitatively similar and available upon request.

<sup>9</sup>Appendix A reports a detailed overview of our data set.

expectations. While for some countries, like France, Italy and the United States this relationship is fairly pronounced, for other countries such as Canada, India and Hungary, it is less pronounced. Second, in emerging economies the scattering of forecasts around the consensus forecast is substantial. For instance, in the Czech Republic (Argentina) in 2002 the forecasts ranged between  $-3.1$  and  $-9.4$  ( $-0.6$  and  $-5.9$ ) indicating substantial disagreement among the forecasters in developing countries. The forecasters' disagreement in the industrialized economies is less pronounced. To the best of our knowledge, disagreement of budget balance expectations has not been reported so far.

– Insert Figure 1 about here –

## 2.2 Budget Balance Rules

Recently, the International Monetary Fund (IMF) and the European Commission (EC) compiled data on fiscal rules<sup>10</sup> (IMF 2009, EC 2009, Schaechter et al. 2012). During the past 20 years the number of numerical budget balance rules has increased noticeable and policymakers expect the number to rise further (EC 2009). We allude to these databases when determining when budget balance rules came into force and what specific target or ceiling is associated with the rule. Appendix B summarizes the budget balance rules introduced since 1992 in countries that our study covers.

Two aspects with respect to our empirical analysis stand out: First, as data availability on budget balance expectations starts in 1994, we cannot infer whether the implementation of the Maastricht Treaty helped to anchor expectations. However, we can compare the Maastricht Treaty period with the Stability and Growth Pact period. Since the dissuasive arm of Stability and Growth Pact came into force on 1 January 1999, we consider this as the start date of the budget balance rule associated with the Stability and Growth Pact (Poplawski-Ribeiro 2009). We also account for the reform of the Stability and Growth Pact in 2005, when the main objective was to improve the fiscal rules set out in the Stability and Growth Pact. Here we investigate whether the link between actual and expected budget balances was further weakened.<sup>11</sup> Second, Argentina adopted a Fiscal Responsibility Law in 1999, which sets out a number of fiscal rules including also a budget balance rule. The law has been in effect since 2000 but was revised in 2001 and 2004. As the commencement of the law and the reforms were close to each other, we consider this as one single institutional reform.

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<sup>10</sup>The EC database concentrates only on the EU countries, whereas the IMF collected data for countries around the world.

<sup>11</sup>In an extraordinary meeting in March 2005, the EU finance ministers reached a deal on reforms to the Stability and Growth Pact that were made official in the EU summit of heads of state meeting in June of the same year. Such reform changed several items of the previous pact in its both preventive and corrective arm. For a description and analysis of the reformed Stability and Growth Pact see, among others, Buti et al. 2005, Chang 2006, Morris 2006, and Beetsma and Debrun 2007. Another round of Stability and Growth Pact reforms took place in 2010-11. However, due to limited data coverage, we cannot analyze the impact of this reform.

The IMF database on fiscal rules also provides information about the characteristics of different fiscal rules, among others the legal basis, enforcement mechanism, established supporting procedures and institutions (Schaechter et al. 2012). We will use the information about these three characteristics to analyze which characteristics of a budget balance rule matter for anchoring budget balance expectations. The database applies a score coding, mainly a binary coding for the different features. A higher score of a specific feature reflects higher effectiveness and credibility of the rule. However, as Schaechter et al. (2012) point out, it does not imply that the implementation of the feature is sound. Here we use only binary coding and also apply the following decision rule for the coding to construct dummies reflecting the different characteristics of the budget balance rules:

1. Legal basis ( $dummy_{legal}$ ): If the legal basis of the rule is statutory or constitutional, the dummy assumes the value of one and zero otherwise.
2. Enforcement ( $dummy_{enforce}$ ): If both formal enforcement procedures and monitoring mechanism of compliance outside the government are in place, the dummy is one and zero otherwise.
3. Supporting procedures and institutions ( $dummy_{support}$ ): If at least two of the following supporting procedures or institutions are in place, the dummy is one and zero otherwise. The procedures and institutions are: multi-year expenditure ceilings, fiscal responsibility law, independent body setting budget assumptions, independent body monitoring budget implementation.
4. Effectiveness ( $dummy_{effectiveness}$ ): In addition to the above specified dummies, we also create an effectiveness dummy, which is one when at least two of the above dummies assume the value of one. This dummy is supposed to indicate the presence of multiple features which are associated with higher effectiveness and credibility of the rule.

### 3 Budget Balance Rules and Expectations

#### 3.1 Empirical Methodology

To analyze whether inflation expectations are anchored, Levin et al. (2004) and Demertzis and van der Cruysen (2007) suggest to analyze the impact of changes in inflation dynamics on inflation forecasts. We follow this type of research strategy and methodology and analyze the link between actual and expected budget balances. To this end, we estimate the following equation for each country separately:

$$\mathbb{E}_{i,t}\Delta b_{i,t+h} = \alpha_{i,1} + \beta\Delta b_{t-1} + \epsilon_{i,t}, \quad (1)$$

where  $E_{i,t}\Delta b_{i,t+h}$  denotes the budget balance forecast of forecaster  $i$  in year  $t$  based on the one-year ( $h = 1$ ) and on the two-year ahead forecasts ( $h = 2$ ), respectively. Furthermore,  $\Delta b_{t-1}$  represents the

first difference of a two-year moving average of the actual budget balance in a country, ending at time  $t - 1$ . The  $\beta$  coefficient measures the impact of budget balance dynamics on budget balance expectations. It may not be unrealistic to assume that budget balance expectations are formed based on the lagged actual budget balance consistent with adaptive expectations. In this case, we expect  $\beta$  to be positive and even close to one. Furthermore, we expect with an increasing forecast horizon  $h$  the link between budget balance shocks and budget balance expectations should be weaker.  $\epsilon_{i,t}$  reflects a forecaster specific disturbance term and  $\alpha_{i,1}$  represents the cross-section (forecasters) fixed effect so that Equation (1) allows for unobserved heterogeneity.

To assess the impact of the implementation of a budget balance rule on the relationship between the actual and the expected budget balance we add a dummy  $brdummy_{j,t}$  to Equation (1) by interacting the dummy with  $\Delta b_{t-1}$ :

$$\mathbb{E}_{i,t}\Delta b_{i,t+h} = \alpha_{i,1} + \beta\Delta b_{t-1} + \sum_{j=1}^n \lambda_{j,t}(\Delta b_{t-1} \cdot brdummy_{j,t}) + \epsilon_{t,i}. \quad (2)$$

The dummy  $brdummy_{j,t}$  denotes periods of a budget balance rule in place with  $n$  representing the number of different balance budget rules implemented in a specific country. The dummy is specified as in Demertzis and van der Cruysen (2007):

$$brdummy_{j,t} = \begin{cases} 0 & \text{for } t = 1 \dots k_{j-1} \\ 1 & \text{for } t = k_j \dots l_j \end{cases}$$

where  $k_j$  indicates the start and  $l_j$  the end of the budget balance rule  $j$ . We expect  $\lambda_{j,t}$  to be negative as the implementation of a budget balance rule should tend to disconnect expected and actual budget balances and thus should anchor expectations to a larger extend, i.e.  $\beta + \lambda_{j,t} < \beta$ .

To assess what rule characteristics matter in general for expectation anchoring we pool the data and estimate the following equation for our panel of 17 countries:

$$\mathbb{E}_{m,t}\Delta b_{m,t+h} = \alpha_{m,1} + \beta\Delta b_{m,t-1} + \lambda_{m,t}(\Delta b_{m,t-1} \cdot cdummy_{m,t}) + \epsilon_{t,m}, \quad (3)$$

where  $E_{m,t}\Delta b_{m,t+h}$  denotes the average budget balance forecast in country  $m$  in year  $t$  based on the one-year ( $h = 1$ ) and on the two-year ahead forecasts ( $h = 2$ ), respectively. Furthermore,  $\Delta b_{m,t-1}$  represents the first difference of a two-year moving average of the actual budget balance in country  $m$ , ending at time  $t - 1$ . The term  $cdummy_{m,t}$  represents one of the different dummies reflecting the characteristics of the national budget rules as described above.

## 3.2 Empirical Results

In this section we first discuss the empirical results based on a disaggregated level for each individual country of specific geographical areas. Subsequently, we present the results of a country panel regression where we analyze the impact of different budget rule characteristics on expectation anchoring.

### 3.2.1 Do Rules Help to Anchor Expectations?

Tables 1 to 5 present the empirical results categorized according to geographical areas. The results are based on the Newey-West panel estimator which allows us to consider a serial correlation structure in the errors. Hence, standard errors reported below are robust against heteroskedasticity, autocorrelation in the error terms and cross-section correlation. Table 1 refers to the old EU members (Italy, Germany and France), which were signatories of the Maastricht Treaty and hence were part of the run-up to the European Monetary Union (EMU) accession from 1992 to 1998 as well as influenced the reform of the Stability and Growth Pact in 2005 to increase the *legitimacy of the EU fiscal framework* (European Commission 2005).

– Insert Table 1 about here –

Table 1 reports the results for the EMU members and indicates that Italy has benefited from the implementation of the Stability and Growth Pact. The coefficient  $\lambda_{1999}$  of about  $-.32$  indicates that once the Stability and Growth Pact was in place a shock in the fiscal balance translated to a lower extent to budget balance expectations compared to the period before the implementation of the Stability and Growth Pact. This implies that for Italy the Stability and Growth Pact helped to anchor budget balance expectations. Compared to this, the 2005 Stability and Growth Pact reform did not strengthen the anchoring. The results for Germany<sup>12</sup> and France, on the other hand, display a different picture. The positive  $\lambda$  coefficients indicate that the weak relationship between actual and expected budget balances during the EMU run-up period has been reversed after EMU accession. These findings are consistent with Fatás and Mihov (2003) and Hughes-Hallett and Lewis (2005), who find that the Stability and Growth Pact period has witnessed a fatigue in fiscal consolidation after a fiscal discipline period due to EMU run-up. Our results underline the fact that the excessive deficit procedure was annulled for Germany and France in 2003. The estimation results also indicate that the slope coefficient  $\beta$  is not significantly different from each other between the different forecast horizons. This indicates that budget balance expectations in European countries highly depend on past budget balances and are thus consistent with adaptive expectations.

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<sup>12</sup>Germany has also a golden rule in place since 1972, however due to data availability we cannot analyze whether this rule helped to anchor expectations.

Table 2 summarizes the results for the Anglo-Saxon countries (Canada, the United Kingdom and the United States). The United Kingdom like other EU member countries should comply with the Maastricht deficit procedure, yet, since it did not join the EMU we only consider here the anchoring effect of the national budget balance rule. To strengthen the fiscal framework the United Kingdom introduced a golden rule<sup>13</sup> for the budget balance in 1997, which became effective in 1998. Since May 2010 the rule focuses on achieving a cyclically adjusted budget balance by the end of a rolling five-year forecast period (Schaechter et al. 2012). Contrary to many budget balance rules in other countries' performance is measured over the economic cycle and hence expectations should be anchored on average over the cycle. Lack of data on long-term budget balance expectations will make it difficult to assess the credibility of the rule based on our chosen empirical methodology. Canada implemented a "balanced budget or better" rule in 1998 and abandoned it by changing the fiscal targets in 2006 (Schaechter et al. 2012). The United States had in place a PAYGO rule from 1990 until 2002, which affected both revenue and expenditure and hence set a limit on the budget deficit, though no specific numerical target was determined.<sup>14</sup>

– Insert Table 2 about here –

As expected, all Anglo-Saxon countries exhibit a weaker link between expected and actual values for two-years-ahead forecasts ( $h = 2$ ) compared to one-year-ahead forecasts ( $h = 1$ ) as indicated by the  $\beta$  coefficient. However, the  $\lambda$  coefficients are statistically insignificant in all specifications. This result is robust with respect to the forecast horizon. It is tempting to interpret this finding such that the budget balance rules in these countries are fairly weak and have not helped to anchor budget balance expectations. However, one should be cautious since the results are based on a particular and parsimonious specification which might be analyzed in more detail in future research.

Table 3 provides the empirical results for the three Latin-American countries (Argentina, Brazil, and Mexico). All of them have introduced Fiscal Responsibility Laws with concrete sets of numerical fiscal policy rules (see Appendix B). Argentina amended the Fiscal Responsibility Law in 2001 and 2004, but de facto suspended the rule since 2009 (Schaechter et al. 2012). Brazil's Fiscal Responsibility Law sets numerical multi-year targets for the budget balance, but with a main focus on limits on expenditure and debt and hence specifies rather an expenditure and debt rule than a budget balance rule (Schaechter et al. 2012). We still include Brazil to analyze whether the Fiscal Responsibility Law helped to anchor also budget balance expectations even though no explicit numerical target was specified for the balance. Mexico's Fiscal Responsibility Law includes a budget balance rule targeting a balanced budget on a cash basis (Schaechter et al. 2012).

– Insert Table 3 about here –

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<sup>13</sup>Under this rule the general government is only allowed to borrow for investment but not for current spending (IMF 2009).

<sup>14</sup>We include the dummy for the mentioned period to assess the impact of the PAYGO rule, though we are aware that strictly speaking it is not a budget balance rule.

The results for the three Latin-American countries are mixed. The implementation of the fiscal rule seems to be most successful in anchoring expectations in Argentina. The  $\lambda$  coefficient is significantly negative implying that forecasters consider the rule to be credible. Findings for Brazil do not lead to the same conclusion, although, as pointed out above the Fiscal Responsibility Law does not specify an explicit budget balance rule. For Mexico's Fiscal Responsibility Law which is quite recent, we do not find conclusive evidence that it is helpful in anchoring budget balance expectations. On the contrary, both  $\lambda$  coefficients are positive and statistically significant implying low credibility of the Fiscal Responsibility Law. For all Latin-American countries, the slope coefficient  $\beta$  is not statistically different between the two forecast horizons indicating that the forecast horizon does not seem to be important for anchoring budget balance expectations.

Table 4 presents our empirical findings for three new EU members (Czech Republic, Poland and Hungary) and two EU neighboring countries (Russia and Turkey). Russia had a budget balance rule in place for the non-oil balance from 2007, but abandoned it in 2009 due to the global financial crisis (Schaechter et al. 2012). As we consider the overall balance, we cannot include this rule in our analysis. Turkey has not implemented a budget balance rule in the past, but can serve as a benchmark country to be compared with the other Central and Eastern European countries. Since joining the EU in 2004, the Czech Republic, Poland and Hungary are expected to comply with the Stability and Growth Pact. In addition, Hungary adopted a national primary budget balance rule in 2004. In 2006, the Polish government adopted a national budget balance rule, which served to complement the EU budgetary framework (Rutkowski 2007), but the rule was suspended in 2008.

– Insert Table 4 about here –

The Czech Republic and Hungary have comparably small and mostly insignificant  $\beta$  coefficients indicating that budget balance expectations were anchored during the EU accession period.<sup>15</sup> But similarly to the EMU run-up of the old EU members, fatigue took also place in these two countries after accession with the  $\lambda$  coefficients being positive and for Hungary also highly significant, even though it was a national rule in place in addition to the supranational rule. Poland portrays a different picture: During the EU accession period forecasts for the budget balance, obviously depended highly on the actual budget balance. However, the EU membership and hence the compliance with the Maastricht Treaty clearly benefited Poland<sup>16</sup>. Expectations became much more anchored reflected in the negative  $\lambda$  coefficient. Additionally, the adopted national budget balance rule positively affected the anchoring of expectations, even though it was only a political declaration and not a law. Russia and Turkey have statistically significant positive  $\beta$  coefficients and hence show no sign of a disconnect between ex-

<sup>15</sup>Data on budget balance expectations are only available from 1999.

<sup>16</sup>In order to become a member of the Euro area Poland has to fulfill the Maastricht criteria.

pectations and actual values. However, as expected, the relationship is weaker for the longer time horizon.

Finally, Table 5 reports the results for Asian and Pacific countries (Australia, India and New Zealand). All countries have implemented a budget balance rule. Due to the global financial crisis, India's rule was suspended in 2009. Australia's Fiscal Responsibility Law requires achieving a budget surplus on average over the business cycle. Our results suggest that the Australian rule contributed to credibly anchor expectations indicated the negative  $\lambda$  coefficient.<sup>17</sup> In the case of India, which adopted a fiscal rule in 2004 specifying a balanced budget target, the results indicate that this rule did not anchor budget balance expectations as indicated by the insignificant  $\lambda$  coefficient. The result might be driven by the limited data availability for India and the fact that an escape clause in the fiscal rule law allows the government not to comply with the targets under exceptional circumstances in the short term making the rule less credible. New Zealand's Fiscal Responsibility Act sets out a budget balance rule under which the government has to run surpluses annually until "prudent" debt levels are achieved (Schaechter et al., 2012). Data availability constrains us to analyze whether the adoption of the budget balance rule helped to anchor expectations in New Zealand<sup>18</sup>, however the results show that there is still a strong relationship between expectations and actual values and hence, with high probability, an anchoring of expectations did not take place.

– Insert Table 5 about here –

To visualize the effect of the implementation of a fiscal rule on budget balance expectations, Figure 2 plots for the one-year-ahead forecasts the degree of anchoring without ( $\beta$ ) and with ( $\beta + \lambda$ ) a budget balance rule on the horizontal and vertical axis, respectively. The countries can be classified into three groups. Countries located close to the dotted line (Italy, the United Kingdom, the United States, and Canada) do not exhibit an effect through the implementation of the rule, because the degree of anchoring before and after the rule did not change. Countries located in the upper-left of the dotted line (Germany, Hungary, Czech Republic)<sup>19</sup> show a stronger anchoring without the budget balance rule, while countries located in the lower-right of the dotted line (Australia, Argentina and Poland) have a higher degree of anchoring, once the rule was implemented. In sum, Figure 2 reports that our results are mixed concerning the question whether a budget balance rule anchors budget balance expectations. Hence, we now turn to the question of how a budget balance rule should be designed to anchor budget balance expectations. To this end, we focus on the characteristics of budget balance rules.

<sup>17</sup>However, it should be kept in mind that the empirical methodology applied here does not capture whether the rules helps to anchor expectations over a business cycle.

<sup>18</sup>Data are only available from 1995 onwards.

<sup>19</sup>It should be noted that these countries experienced anchoring to the run-up to the EMU or EU, but then fatigue took place even though the Stability and Growth Pact was in place.

### 3.2.2 What Rule Characteristics Matter?

In order to analyze whether specific features of a budget balance rule make the rule more credible and, hence, are more successful in anchoring budget balance expectations, we run an unbalanced panel regression for the ten countries with national budget balance rules. Table 6 reports the results for the regressions with the different dummies as defined above. For the one-year-ahead forecasts ( $h = 1$ ), the  $\lambda$  coefficient is statistically insignificant except for the regression including *dummy<sub>support</sub>* implying that in the short term, irrespective of any features, the adoption of a national budget balance rule has not helped to anchor expectations effectively. For the medium-term, on the other hand, the  $\lambda$  coefficients are statistically significant if strong enforcement mechanisms and/or at least two supporting procedures and institutions are in place as confirmed by the effectiveness dummy. In this case, the introduction of a national budget balance rule seems to anchor expectations in the medium term, which ultimately is important to signal credibly to financial markets, firms and households government's intention of fiscal discipline. The legal basis does not seem to matter as much as the other features. However, the results are weakly statistically significant and reflect mainly the findings from the individual countries. That means, budget balance rules frameworks currently in place exhibit strong institutional weaknesses and there is a need to overhaul these.

– Insert Table 6 about here –

## 4 Conclusion and Policy Implications

In examining whether budget balance rules anchor budget balance expectations, our empirical analysis does not provide a clear answer. The results suggest that just having adopted a budget balance rule is not enough. On the one hand, we find that both supranational and national rules led to expectation anchoring of budget balances in some countries (e.g. Argentina and Poland), but, on the other hand, for some other countries we do not find this evidence (e.g. India and Mexico).

The reasons for these findings are manyfold: First, a genuine political commitment to fiscal discipline is needed (IMF, 2005). For example, empirical results suggest that in the run-up to the EMU governments were genuinely committed to meet the Maastricht criteria. However, once in the EMU they loosened their fiscal stance again (e.g. Germany and France). Second, the design of the budget balance rule matters. Budget balance rules differ in their accountability, enforcement mechanisms, transparency, flexibility, coherence with their final goal, and compatibility with structural reforms (Filc and Scartascini 2004, von Hagen 2006, Schuknecht 2004, Ayuso-i-Casals et al. 2006, Koptis and Symansky 1998, Schaechter et al. 2012). A good example is the Stability and Growth Pact, whose design has been widely criticized as weak due to a complicated excessive deficit procedure, weak enforcement of sanctions, and generally low compliance by governments with the pact (e.g. Kuhn 2011). Third, additional institutional

reforms can enhance the rules's effectiveness (IMF 2005, Schaechter et al. 2012). Setting up adequate institutions to monitor and enforce compliance supports the credibility and effectiveness of rules (IMF 2005, Schaechter et al. 2012). Fiscal responsibility laws and independent fiscal agencies are two examples of such institutional settings. This is confirmed by our results that budget balance rules with strong enforcement mechanisms and/or supporting procedures and institutions help anchoring expectations in the medium term.

Our study shows that many adopted budget balance rules fail to anchor expectations and, hence, fail to credibly signal government's intention to achieve or maintain fiscal sustainability. Such a missed opportunity can have detrimental effects on government's borrowing costs and, as a consequence, also on the economy, as has been observed during the recent European debt crisis. Steps have already been taken in some countries to overhaul or introduce new budget balance rule with the aim to make them more effective (see Schaechter et al. (2012) for an overview on what type of new rules have been implemented since 2010).

Overall, the results suggest for policymakers that the rules' effectiveness in anchoring expectations is very country-specific and depends on each country's economic, political and institutional environment. As Ter-Minassin (2010) puts it "there is no 'one-size-fits-all' approach". When implementing or overhauling budget balance rules, governments should fulfill some prerequisites as pointed out by Ter-Minassin (2010): genuine political commitment, a stable macroeconomic environment, appropriate public finance management capacity, independent fiscal agencies, and suitable enforcement mechanisms.

This paper is a first attempt to analyze whether adopting budget balance rules is effective in anchoring expectations, but some venues for future research remain. First, the academic debate favors rules targeting a cyclically adjusted budget balance or a balanced budget over the business cycle (Debrun et al. 2008, IMF 2005, IMF, 2009), which some countries have already introduced (e.g. Chile and Australia). Unfortunately, data for expected cyclically adjusted budget balances as well as for a longer time horizon (e.g. four years) are not available. Hence, we cannot analyze whether such rules anchor expectations. Second, recent concerns about fiscal sustainability in some euro area countries triggered more progress towards more effective reforms for fiscal discipline (e.g. fiscal compact treaty). Whether these various reforms are effective in anchoring fiscal expectations remains a question for future research. Another interesting avenue for future research to analyze whether a certain fiscal environment makes the implementation of a fiscal rule more likely. For instance, a stable future fiscal outlook might increase the government's willingness to bind themselves through a fiscal rule.

Our empirical results are mixed. On the one hand, some countries (for example Poland, Australia, and Argentina) have benefited from adopting a budget balance rule as it helped them to anchor expectations.

On the other hand, in some countries adopting a budget balance rule has failed to anchor expectations. We also find that the longer the time horizon the weaker the relationship between budget balance expectations and actual values. One reason might be the weak commitment, design and implementation of some of the rules in these countries. This is confirmed by the findings that if the budget balance rules feature strong enforcement mechanisms and/or have in place supporting institution or procedures like a fiscal responsibility law or an independent body monitoring budget implementation, then the adoption of a budget balance rule anchors expectations in the medium term. Ultimately, this implies that budget balance rules then credibly signal to financial markets, firms and households that the government has committed to embark on a sustainable fiscal path.

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Table 1: Estimates of Expectation Anchoring in EMU Members

Country	Italy		Germany		France	
Horizon $h$	1	2	1	2	1	2
$\alpha$	-.06 (.06)	-.02 (.08)	-.00 (.05)	.01 (.07)	-.01 (.05)	-.05 (.06)
$\beta$	.87*** (.08)	.76*** (.10)	-.16*** (.05)	-.15** (.05)	.49*** (.16)	.48*** (.17)
$\lambda_{1999}$	-.32** (.12)	-.21 (.16)	.61*** (.06)	.56*** (.07)	.39** (.17)	.44** (.19)
$\lambda_{2005}$	.31*** (.12)	.30** (.14)	1.24*** (.08)	1.03*** (.12)	.19* (.11)	.00 (.11)
$R^2$	0.65	0.49	0.62	0.50	0.64	0.67
F-Test	99.85	51.33	148.84	67.08	119.70	91.78
Observations	143	111	292	231	219	133

Notes: The table reports the estimation results of Equation (3):  $E_{m,t}\Delta b_{m,t+h} = \alpha_{m,1} + \beta\Delta b_{m,t-1} + \lambda_{m,t}(\Delta b_{m,t-1} * c dummy_{m,t}) + \epsilon_{t,m}$  based on the Newey-West estimator with heteroscedasticity and autocorrelation robust standard errors.

\*/\*\*/\*\*\* indicate significance at the 10/5/1-% significance level. Robust standard errors are in parentheses.

Table 2: Estimates of Expectation Anchoring in Anglo-Saxon Countries

Country	Canada		United States		United Kingdom	
Horizon $h$	1	2	1	2	1	2
$\alpha$	.04 (.05)	.08* (.04)	.14** (.07)	.09 (.07)	-.34*** (.07)	-.29*** (.10)
$\beta$	.45*** (.04)	.38*** (.03)	1.16*** (.10)	.91*** (.09)	1.07*** (.19)	.82*** (.19)
$\lambda_{1998-2010}$	...	...	...	...	-.12 (.52)	-.05 (.18)
$\lambda_{1998-2005}$	-.07 (.08)	-.14 (.09)	...	...	...	...
$\lambda_{1990-2002}$	...	...	-.19 (.14)	-.03 (.14)	...	...
$R^2$	0.57	0.54	0.67	0.63	0.64	0.45
Observations	139	124	249	202	279	244

Notes: \*/\*\*/\*\*\* indicate significance at the 10/5/1-% significance level. Robust standard errors are in parentheses.

Table 3: Estimates of Expectation Anchoring in Latin-American Countries

Country Horizon $h$	Argentina		Brazil		Mexico	
	1	2	1	2	1	2
$\alpha$	.21** (.09)	.16 (.11)	.00 (.15)	-.01 (.14)	-.02 (.03)	-.05 (.04)
$\beta$	1.56*** (.17)	1.36*** (.19)	.94** (.36)	.75** (.33)	.27*** (.05)	.32*** (.06)
$\lambda_{2000}$	...	...	-.26 (.39)	-.17 (.37)	...	...
$\lambda_{2000-2008}$	-1.37*** (.19)	-1.25*** (.19)	...	...	...	...
$\lambda_{2006}$	...	...	...	...	.58*** (.11)	.34** (.16)
$R^2$	0.37	0.29	0.15	0.14	0.60	0.37
Observations	143	111	127	116	224	195

Notes: \*/\*\*/\*\*\*/indicate significance at the 10/5/1-% significance level. Robust standard errors are in parentheses.

Table 4: Estimates of Expectation Anchoring in New EMU Members and EU Neighboring Countries

Country Horizon $h$	Czech Republic		Hungary		Poland		Russia		Turkey	
	1	2	1	2	1	2	1	2	1	2
$\alpha$	-.06 (.22)	.02 (.18)	-.31** (.12)	-.21* (.12)	.54*** (.14)	.45** (.13)	.12 (.18)	.11 (.17)	.53*** (0.19)	.27 (.20)
$\beta$	-.24 (.70)	.28 (.36)	.23* (.13)	.04 (.10)	1.79*** (.16)	1.31*** (.17)	.64*** (.07)	.37*** (.06)	.40*** (.08)	.23** (.11)
$\lambda_{2004}$	.58 (.72)	.01 (.39)	.75*** (.17)	.64*** (.16)	-1.46*** (.17)	-1.04*** (.17)	...	...	...	...
$\lambda_{2006-2007}$	...	...	...	...	-.38* (.22)	-.28 (.20)	...	...	...	...
$R^2$	0.03	0.06	0.52	0.32	0.55	0.46	0.51	0.29	0.22	0.07
Observations	107	99	136	129	134	120	115	105	85	73

Notes: \*/\*\*/\*\*\*/indicate significance at the 10/5/1-% significance level. Robust standard errors are in parentheses.

Table 5: Estimates of Expectation Anchoring in Pacific Countries

Country Horizon $h$	Australia		India		New Zealand	
	1	2	1	2	1	2
$\alpha$	-.04 (.08)	-.04 (.10)	-.18 (.16)	-.14 (.17)	.03 (.08)	.09 (.07)
$\beta$	1.48*** (.17)	1.13*** (.12)	.21 (.17)	.28 (.20)	... ...	... ...
$\lambda_{1998}$	-1.05*** (.18)	-.64*** (.14)	... ...	... ...	... ...	... ...
$\lambda_{2004-2008}$	... ...	... ...	.27 (.30)	.19 (.34)	... ...	... ...
$\lambda_{1994}$	... ...	... ...	... ...	... ...	.81*** (.10)	.74*** (.13)
$R^2$	0.57	0.39	0.23	0.28	0.50	0.35
Observations	116	109	41	33	138	133

Notes: \*/\*\*/\*\*\*/indicate significance at the 10/5/1-% significance level. Robust standard errors are in parentheses.

Table 6: Budget Balance Rules Characteristics

Characteristic Horizon $h$	Legal basis		Enforcement		Supporting institutions		Effectiveness	
	1	2	1	2	1	2	1	2
$\alpha_{m,1}$	-.02 (.09)	-.03 (.08)	.00 (.08)	.00 (.08)	.02 (.09)	.01 (.08)	.01 (.09)	.01 (.09)
$\beta_{m,t}$	.47*** (.14)	.36*** (.12)	.55*** (.11)	.45*** (.11)	.59*** (.12)	.47*** (.11)	.56*** (.12)	.46*** (.11)
$\lambda_{m,t}$	.05 (.21)	.04 (.20)	-.22 (.19)	-.27* (.16)	-.34** (.17)	-.32** (.16)	-.24 (.19)	-.27* (.16)
$R^2$	0.33	0.25	0.35	0.28	0.37	0.29	0.35	0.28
Observations	135	133	139	133	134	133	133	133

Notes: \*/\*\*/\*\*\*/indicate significance at the 10/5/1-% significance level. Robust standard errors are in parentheses.

## Appendices (not for publication)

### A Definitions and Sources of Data

Actual budget balance as percent of GDP ( $bb_{t,i}$ )

Nominal general government budget balance as percent of GDP. Due to data restrictions we can obtain only yearly data on the actual budget balance. Moreover, the sample periods for the countries range from 1991-2010 and sources are the OECD Economic Database and the WEO Database.

First difference in actual budget balance ( $\Delta b_{t-1,i}$ )

We take the first difference of a 2-year moving average of the actual budget balance, ending at time  $t-1$ .

Budget Balance expectations ( $b_{t,i}$ )

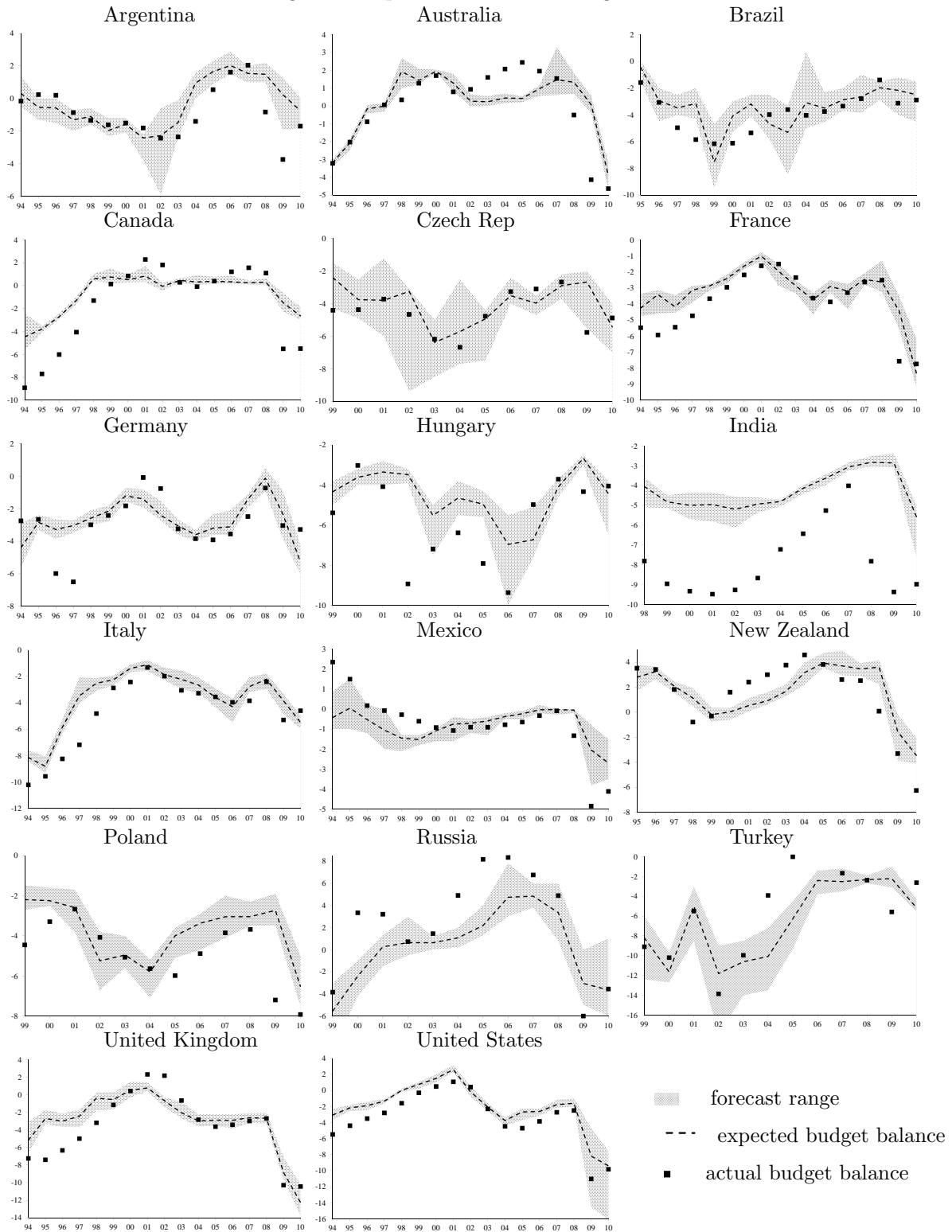
Expectations on the budget balance are from the Consensus Economic Forecasts for one ( $b1$ ) and two years ( $b2$ ) ahead. No longer time horizons are available for fiscal data. Fiscal expectations are measured in January or February depending on the country.

## B Fiscal rules since 1992

Country	Year	Fiscal rule	Source
Germany	1972	National rule: "Golden rule" which limits net borrowing to the level of investment except in times of a "disturbance of the overall economic equilibrium."	Schaechter et al. (2012)
Germany	1992	Supranational rule: General government deficit-to-GDP ratio of 3%.	Schaechter et al. (2012)
Italy	1992	Supranational rule: General government deficit-to-GDP ratio of 3%.	Schaechter et al. (2012)
France	1992	Supranational rule: General government deficit-to-GDP ratio of 3%.	Schaechter et al. (2012)
United Kingdom	1992	Supranational rule: General government deficit-to-GDP ratio of 3%.	Schaechter et al. (2012)
United Kingdom	1999-2010	National rule: General government borrowing only allowed for investment, not to fund current spending. Performance against the rule is measured by the average surplus on the current budget as % of GDP over the economic cycle.	Schaechter et al. (2012)
United States	1990-2002	The PAYGO rule was adopted in 1990 and allowed to lapse at the end of FY 2002. The PAYGO's immediate objective was to limit the deficit although precise numerical targets were only determined for the expenditure and revenue.	Schaechter et al. (2012)
Canada	1998-2005	National rule: There are no legislated rules, but the government had a 'balanced budget or better' policy from 1998 until it was abandoned in 2006.	Schaechter et al. (2012)
Hungary	2004	Supranational rule: General government deficit-to-GDP ratio of 3%.	Schaechter et al. (2012)
Poland	2004	Supranational rule: General government deficit-to-GDP ratio of 3%.	Schaechter et al. (2012)
Poland	2006-2007	National rule: Anchor of budget balance in nominal terms (around 3% of GDP in 2006). In force only until 2007.	EC (2009)
Czech Republic	2004	Supranational rule: General government deficit-to-GDP ratio of 3%.	Schaechter et al. (2012)
Turkey	-	budget balance rule does not refer to a specific target	-
Russia	-	budget balance rule does not refer to a specific target	-

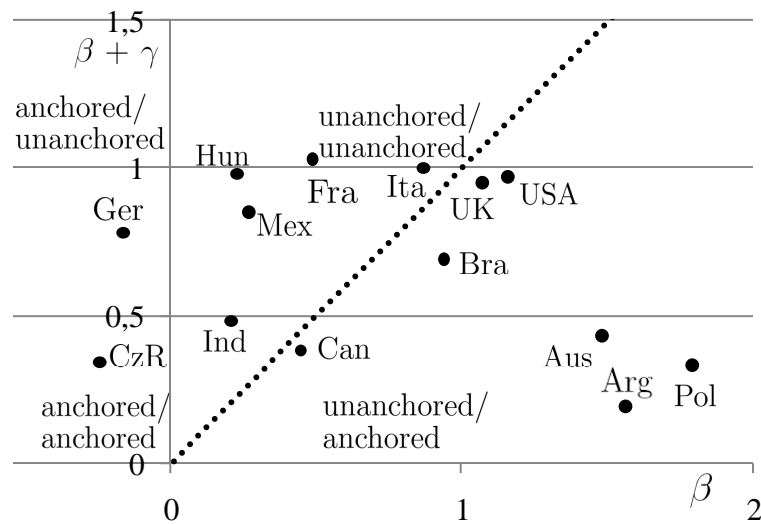
Country	Year	Fiscal rule	Source
Argentina	2000-2008	National rule: Fiscal rules are set out in the Fiscal Responsibility Law adopted in 1999 and then revised in 2001 and 2004. From 2009, the rules and the Fiscal Responsibility Law were de facto suspended. Under the budget balance rule all jurisdictions were required to balance revenue and expenditure.	Schaechter et al. (2012)
Brazil	2000	National rule: A Fiscal Responsibility Law is in place. The law sets out a number of numerical fiscal indicators among others a golden budget balance rule (borrowing only allowed to finance capital spending),. The government sets numerical multiyear targets for the budget balance, expenditure and debt.	Schaechter et al. (2012)
Mexico	2006	National rule: Balanced budget on a cash basis introduced under the Budget and Fiscal Responsibility Law.	Schaechter et al. (2012)
Australia	1998	National rule: The Fiscal Responsibility Law provides a framework for the conduct of fiscal policy. One of the key elements of the fiscal strategy is to achieve budget surpluses on average over the cycle. The medium-term strategy does not require that the budget remain in surplus every year over the economic cycle.	Schaechter et al. (2012)
India	2004-2008	National rule: Current primary balance target enshrined in the Fiscal Responsibility and Budget Management Act. Originally the target was to reduce the fiscal deficit to 3 percent of GDP by 2008. The rule was suspended in 2009.	Schaechter et al. (2012)
New Zealand	1994	The Fiscal Responsibility Act sets out the principles for responsible fiscal management. The Fiscal Responsibility Act also includes principle rules for the budget and debt: (i) the government needs to run operating surpluses annually until "prudent" debt levels are achieved, (ii) prudent debt levels need to be maintained on average over a reasonable period, and (iii) a buffer against adverse events should be established.	Schaechter et al. (2012)

Figure 1: Expected and Actual Budget Balance



Notes: Figure 1 shows the mean of the one-year-ahead budget balance expectations (dashed line), the actual budget balance (squares), and the forecast range (shaded area) in percent of GDP. Actual budget balances in percent of GDP are taken from the OECD Economic Database and Datastream.

Figure 2: Budget balance coefficients for the (Pre-)budget balance rule period



Notes: Figure 2 plots for 14 countries for the one-year-ahead forecasts the degree of anchoring without ( $\beta$ ) and with ( $\beta + \gamma$ ) a fiscal rule on the horizontal and vertical axis, respectively. For the EMU countries which are subject to two different fiscal rules we estimated Equation (3) by setting  $\lambda_{2005} = 0$ . New Zealand, Russia and Turkey are left out of the figure due to data availability.