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Fiscal Rules and Twin Deficits:

The Link between Fiscal and External Balances[*]

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Abstract

This paper investigates the relationship between countries' fiscal balances and current accounts with an emphasis on the role of fiscal rules. The direct effect of fiscal policy on the current account via aggregate (import) demand is potentially amplified by indirect effects, materializing through interest rate effects and inter-generational transfers that reduce savings. On the other hand, the implied positive relation between fiscal and external balances is potentially attenuated by offsetting changes in savings through Ricardian equivalence considerations. We expect this attenuation effect to be stronger in countries with more stringent fiscal rules and test this hypothesis using a panel of 73 countries over the period 1985-2012. As previous studies we find a positive effect of fiscal balances on the current account, supporting the twin deficit hypothesis. However, the effect of fiscal balances on the current account depends on the stringency of fiscal (budget balance or debt) rules in place; it is reduced by one third on average and virtually eliminated for countries with the most stringent fiscal rules.

Keywords Twin Deficits · Fiscal Policy · Fiscal Rules · Current Account
JEL Codes E62 · F32 · F41

1 Introduction

There is a large number of studies investigating the twin deficit hypothesis on the link between fiscal and external balances. Recently this topic has received additional attention, given the need of many countries for adjustments of both the fiscal and external balance in the wake of the financial an economic crisis. The standard rationale for the twin deficit hypothesis is that a government's fiscal deficit occurs together with a current account deficit through demand, interest rate and real exchange rate effects. Numerous empirical studies on the determinants of the current account have confirmed the positive relation between fiscal balances and current accounts.[1]

Most studies so far have assumed the relationship between fiscal and external balances to be homogeneous across countries; to the best of our knowledge none of the previous studies has considered the role of fiscal rules, which can affect both fiscal and external balances and the relationship between them. The public finance literature (see, e.g., Poterba (1994), Perotti and Kontopoulos (2002), Canova and Pappa (2006) and Fabrozio and Mody (2006)) shows that fiscal frameworks, characterized, e.g., by stringent budget and efficient auditing processes, can help to reduce fiscal deficits. And as outlined in more detail below, fiscal rules may have further effects on the current account operating through channels other than the fiscal balance (such as interest rates and savings). Against this background, fiscal rules may be an important variable to be considered in empirical studies on the twin deficit hypothesis, or more generally, the relation between fiscal and external balances.

The present study builds on standard empirical models on the determinants of the current account (Lee et al. 2008, Prat et al. 2010, and Lane and Milesi-Ferretti 2012) and augments these models by considering the role of fiscal rules. Based on a theoretical discussion of the potential linkages between fiscal rules, fiscal balances, and current accounts, we use a panel of 73 countries over the period 1985-2012 to test for both direct effects of fiscal rules on the current account and also consider, whether more stringent fiscal rules affect the relationship between the fiscal balance and the current account. Thereby, we make use of a novel dataset on the stringency of fiscal rules developed in Badinger and Reuter (2014).

There are three main results: i) Confirming the results of previous studies, we find a positive relationship between the fiscal balance and the current account. ii) There is no significant direct effect of fiscal rules on the current account. iii) The magnitude of the effect of the fiscal balance on the current account is significantly reduced, when stringent balanced budget or debt rules are in place.

The remainder of this paper is organized as follows: Section 2 outlines the theoretical background, Section 3 describes the corresponding empirical model. Section 4 provides a description of the data and the variables used in the empirical analysis. Section 5 summarizes the estimation results and Section 6 concludes.

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[1]'Current account' and 'external balance' are used interchangeably throughout this paper.

2 Theoretical Background

2.1 Twin Deficits: The Link between Budget and External Balances

A standard textbook representation (e.g., Obstfeld et al. 1996) of the current account is given by

$$CA = S - I + (T - G), \tag{1}$$

where CA is the current account, S and I are private savings and investments, and $(T-G)$ the fiscal balance (savings) of the public sector (taxes minus government spending).

The literature often attributes changes in the current account to public sector (in)stability, as private savings and investments are relatively stable in the medium run (see, e.g., Krugman 1979). The relationship between CA and $(T-G)$ is usually assumed (and empirically found) to be positive, which is discussed under the heading 'twin deficits' of fiscal and external balances. In addition to the 'direct' effect implicit in Eq. (1) (higher public expenditures lead to increased imports through higher demand), the literature presents arguments for 'indirect' effects of the fiscal balance on the current account.

The distinction between direct and indirect effects is somewhat imprecise, since – strictly speaking – all effects of fiscal on external balances are indirect. In the present context, we define indirect effects as those materializing through channels other than income related changes in import demand.

The first of these indirect effects materializes through the interest rate channel; fiscal balances and interest rates are usually (and especially for small economies) negatively related. E.g., in case of a fiscal expansion, higher interest rates are triggered by an increase in total demand and the financing of budget deficits by bonds issuance (Kumar and Baldacci 2010), which induces capital inflows and leads to an appreciation of the domestic currency and thus lower net exports.

Second, Obstfeld et al. (1996), using an overlapping generations model, show that fiscal deficits lead to a redistribution of income from future to present generations, thereby decreasing savings and thus negatively affecting the current account. This relationship is stronger the more agents are liquidity constrained.[2]

Both channels are expected to amplify the direct effect of the fiscal balance on the current account, increasing the magnitude of their (positive) relationship. There is one potentially important channel counteracting the emergence of twin deficits by weakening the effect of the fiscal balance on the current account. In models using the Ricardian equivalence hypothesis (e.g., Barro 1989) an increase in budget deficits will be offset by an increase in private savings because the private sector fully discounts future tax liabilities associated with the fiscal deficit.[3] If Ricardian equivalence is incomplete, the effect of the fiscal balance on the current account will be reduced rather then eliminated.

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[2]A survey of sixty empirical studies on these direct and indirect effects is provided by Gale and Orszag (2002).

[3]Ferretti and Razin (2000) and Nickel and Vansteenkiste (2008) argue that the link between the deficits (current account and public sector) may be weaker the higher the public debt is, due to the private sector displaying Ricardian features and therefore internalizing the government budget constraint.

2.2 Fiscal Institutions and Twin Deficits

The stringency of fiscal frameworks is expected to influence the current account in several ways: Obviously, fiscal rules may affect the current account through their effect on fiscal balances. Several empirical studies suggest that stringent fiscal frameworks (in terms of budget preparation, implementation, rules, transparency requirements) have a positive effect on the fiscal balance (e.g., Von Hagen 1992, Bohn and Inman 1996, Alesina et al. 1999, Gleich 2003, Hallerberg 2003, Wagner 2003, Filc and Scartascini 2004, Debrun et al. 2008, Nerlich and Reuter 2013). However, since fiscal balances are included as a key explanatory variable in our empirical model on the determinants of the current account, this channel is not subject of the present study.

In addition, fiscal rules may affect the current account through channels other than the fiscal balance. i) Stricter fiscal frameworks may increase the trust of agents into fiscal forecasts, medium-term budgetary plans and the sustainability of public finances. This leads to lower uncertainty about future fiscal policy and decreases precautionary savings of the agents.[4]

ii) Several studies have shown that stringent fiscal institutions lead to lower interest rates on government bonds and thus lower interest rates in general (see Johnson and Kriz 2005, Hallerberg and Wolff 2008, and Iara and Wolff 2014). One the one hand, this reduces foreign direct investment and capital flows; on the other hand, it boosts consumption and investment and leads to a depreciation of the currency (see Baxter 1995 and Abbas et al. 2011). These (potentially offsetting) effects suggest a possible direct relationship between fiscal rules and current accounts, though the relevance and direction of the net effect is ambiguous and remains to be determined empirically.

iii) Finally, fiscal rules may affect the current account through Ricardian equivalence, operating through the effect of fiscal deficits on private savings and thus the current account as evident from Eq. (1). The stricter fiscal institutions are (or agents believe they are), the stronger should be the reaction of private agents to changes in public finances. E.g., with stricter fiscal rules, an increase in a government's expenditures is more likely to be met by a decrease in expenditures or increases in taxes in the future, and private agents will thus increase their savings in anticipation to future changes in fiscal policy.

These arguments regarding the effects of fiscal institutions on the current account and the channels constituting the twin deficit theories warrant an inclusion of variables measuring the stringency of fiscal rules in empirical models of the current account. The aforementioned effects of fiscal rules on the current account materializing through channels i) and ii) can be regarded as direct effects of fiscal rules, i.e., effects unrelated to the twin deficit channels, materializing independently and also without a change in the fiscal balance.

In contrast, channel iii), reflecting Ricardian equivalence considerations, is relevant only if there is a change in the fiscal balance and may thus be termed as indirect effect of fiscal rules on the current account.

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[4]Empirical evidence on the role of uncertainty for saving and investment is surveyed by Carruth et al. (2000) and Carmignani (2003).

As with the effects of the fiscal balance on the current account, the distinction between direct and indirect effects of fiscal rules is somewhat imprecise, since all effects of fiscal rules are indirect in the sense that they operate through intermediate channels. Notwithstanding these semantic subtleties, the discussion above has several testable implications that will be taken up in the empirical analysis on the determinants of the current account. First, as it is standard in the literature, we expect a positive effect of the fiscal balance on the current account, which comprises both direct and indirect effects in the sense defined above.

Second, we will test for both direct effects of fiscal rules on the current account (channels i) and ii)), as well as whether fiscal rules have an indirect effect on the magnitude of the relationship between the fiscal balance and the current account (channel iii)). The latter effect reflects the hypothesis that stricter fiscal rules enhance Ricardian features of an economy, thereby offsetting demand side effects of changes in the fiscal stance on the external balance and hence attenuating the twin-deficit relation. In other words, the more stringent fiscal rules are, the smaller the effect of the fiscal balance on the current account.

3   Estimation Framework

Before investigating the effect of fiscal rules, we re-estimate specifications used in recent empirical studies on the twin deficit (Lee et al. 2008, Prat et al. 2010, and Lane and Milesi-Ferretti 2012) using a larger dataset with more cross-sectional observations (at least 73 countries, compared with 54 in Lee et al. 2008, 33 in Prat et al. 2010 and 65 in Lane and Milesi-Ferretti 2012) and a more recent time period (1985-2012 compared with 1973-2004 in Lee et al. 2008, 1970-2008 in Prat et al. 2010 and 1969-2008 in Lane and Milesi-Ferretti 2012). Equation (2) shows our baseline empirical model on the determinants of the current account, which is in line with previous studies:

$$CA_{i,t} = \alpha + \beta BB_{i,t} + \boldsymbol{x}'_{i,t}\boldsymbol{\gamma} + \eta_i + \varepsilon_{i,t}, \tag{2}$$

where $CA_{i,t}$ is the current account of country i in year t and $BB_{i,t}$ is the fiscal balance (both variables expressed relative to GDP); η_i denotes country-specific fixed effects and $\varepsilon_{i,t}$ is the idiosyncratic error term. The vector $\boldsymbol{x}_{i,t}$ includes a set of control variables, as suggested by Lee et al. (2008), Prat et al. (2010) and Lane and Milesi-Ferretti (2012), which can be grouped into two subsets: determinants of saving/investment and structural control variables.

The set of determinants of saving and investment contains five variables: i) two age dependency ratios (less than 25 and more than 65 years old), as suggested in Gudmundsson and Zoega (2014), to control for different saving-patterns depending on the age structure of a country's population; ii) the stock of net foreign assets (NFA), following Lee et al. (2008), to control for whether a) a country is wealthy (high stock of NFA) and can afford deficits and therefore a lower trade balance or b) a country receives high net foreign income flows improving the current account; iii) population growth, measuring the extent

to which a country will a have young work force in the future, which is expected to have smaller savings; iv) GDP growth, as proxy for new income potentials and perhaps reduced saving behaviour (worsening the current account) and v) income relative to the US, as a proxy of a country's development stage (as already emphasized in Obstfeld et al. (1996), large developed countries have a lower saving-investment balance than developing countries, thus implying a negative effect on the current account).

The set of structural control variables contains: i) the ratio of foreign direct investment (FDI) to output as suggested in Prat et al. (2010) (which should have a negative effect on the current account since FDI allows a more sustainable financing of deficits); ii) the ratio of net exports of oil to output (controlling for oil-exporter countries whose current account balances strongly depend on oil prices); and iii) the terms of trade that helps to account for world market prices (which are expected to have a positive effect).

Additionally, three dummy variables are included: i) a Eurozone crisis dummy, controlling for the 2008-2011 financial crisis and the following disruption in access to capital markets (Lane and Milesi-Ferretti 2012, p.8; expected to have a positive effect on the current account); ii) an Asian crisis dummy for the 1997-2000 Asian financial crisis (expected to be positively correlated with the current account due to the macroeconomic contraction); and iii) a financial center dummy, accounting for countries being a major actor in financial trade (expected to have a positive effect on the current account).

After re-estimating and comparing the baseline model replicating the specifications in previous studies, we investigate the 'direct' and 'indirect' effects of fiscal rules on the current account. In particular, Eq. (2) is augmented by adding measures of the stringency of fiscal rules (FR) as explanatory variable and its interaction with the fiscal balance $(BB_{i,t} \times FR_{i,t})$[5]

$$CA_{i,t} = \alpha + \beta BB_{i,t} + \rho FR_{i,t} + \phi BB_{i,t} \times FR_{i,t} + \boldsymbol{x}_{i,t}\boldsymbol{\gamma} + \eta_i + \varepsilon_{i,t}. \qquad (3)$$

The parameter ρ represents the direct effect of fiscal rules on the current account, which is ambiguous from a theoretical perspective as outlined above. Since the effect of BB on CA is given by $\beta + \phi FR$, the parameter ϕ reflects the indirect effect of fiscal rules on the (relation between the fiscal balance and the) current account. Assuming the twin deficit hypothesis holds ($\beta > 0$), the discussion above would suggest that the sign of ϕ is negative, i.e., more stringent fiscal rules reduce the effect of the fiscal balance on the current account.

Finally, since we do not expect all effects of the fiscal balance and fiscal rules to materialize contemporaneously, we also consider a dynamic version of Eq.(3), which includes one lag of the dependent variable ($CA_{i,t-1}$).

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[5] Multi-collinearity does not seem to be an issue in in our sample, as the correlation between the fiscal balance ($BB_{i,t}$) and balanced budget (FR^{BR}) or debt rules (FR^{DR}) only amounts to 0.10 and 0.04 repectively.

4 Data

Data on the countries' fiscal balances and current accounts are from the World Economic Outlook database (IMF 2014), data source of the control variables is the World Development Indicators Database (World Bank 2014). The appendix provides a detailed description of the variables, the data sources, as well as summary statistics (Tables A1 and A2).

As measures of the stringency of fiscal rules we use data from Badinger and Reuter (2014). They derive measures for the stringency of fiscal rules, based on the IMF fiscal rules database, which covers national and supranational numerical fiscal rules in 81 countries from 1985-2012. It provides information on the type of fiscal rules as well as their characteristics, such as the legal basis, enforcement, coverage, escape clauses, provisions for cyclical adjustments and supporting features like independent monitoring bodies or fiscal responsibility laws. From a methodological perspective, they use partially ordered set (POSET) theory, which provides an attractive alternative to the composite index approach commonly applied in the literature. This approach does not require the assignment of (cardinal) values to the various elements of fiscal frameworks, takes the ordinal nature of the data seriously, and exploits all the information provided by the data. It has rarely been used in the social sciences so far (other than in the natural and technical sciences) and has first been applied to the measurement of fiscal rules in Badinger and Reuter (2014) and compared with standard composite indices of fiscal frameworks in Bachträgler et al. (2014).

In the present study, we will consider two alternative indices of the most common fiscal rules: i) budget balance rules (FR^{BR}) aiming at balancing the fiscal budget or keeping it within certain boundaries, ii) debt rules (FR^{DR}) aiming at stabilising or reducing public debt.

Each fiscal rule index ranges from 0 and 1 and is increasing in stringency, broadly defined in terms of their hierarchy of the legal basis, coverage, and transparency and accountability. Some summary statistics are given in Table A3 in the Appendix and Figure 1 shows the development of the two indices over time. Both point to a general increase in the usage and stringency of fiscal rules over time. Furthermore, industrialized countries typically have more (stringent) rules in place.

[Figure 1 here]

5 Results

We split the discussion of our results into three parts. First, we compare the least squares dummy variables (LSDV) estimates of the standard specification from previous studies given by Eq. (2) with those obtained for our extended sample of 73 countries over the period 1985-2012. Second, we turn to the LSDV estimates of the augmented model including our our measures of fiscal rules as described in Eq. (3). Third, we estimate the

dynamic variant of Eq. (3) using a generalized methods of moments (GMM)approach and provide several robustness checks.

5.1 Basic Model

We begin by re-estimating the empirical models used in previous studies (Lee et al. 2008, Prat et al. 2010, and Lane and Milesi-Ferretti 2012) to set the stage for adding further variables and check if the results hold up for a larger sample of countries and the most recent time period. Columns (1) to (3) of Table 1 show the coefficients as reported in the respective studies. According to their results, a one percentage point of GDP increase in the fiscal balance leads to a 0.19 (in Lee et al. 2008), 0.48 (in Prat et al. 2010) and 0.28 (in Lane and Milesi-Ferretti 2012) percentage point of GDP increase in the current account.

Columns (4) and (5) use the same set of variables but a larger cross-section of 160 countries and time periods 1985-2008 and 1985-2012 respectively. Overall, the results obtained in previous studies holds up for our dataset, particularly the parameter estimate of the fiscal balance, which is of main interest in the present context. The coefficient of BB is statistically significant and positive, confirming a positive association between the fiscal balance and current account. In terms of magnitude, the coefficients amount to 0.147 (column (4)) and 0.203 (column (5)), which is in the lower range of the effects obtained in previous studies.

[Table 1 here]

5.2 Adding Fiscal Institutions

As a next step, we investigate whether the stringency of fiscal rules directly or indirectly affects the current account through the channels discussed in Section 2. Table 2 reports the LSDV estimates of the baseline model (Eq. (2)) and the extended model (Eq. (3)) including fiscal rules. First, we test for direct effects of fiscal balance and debt rules by including the variables FR^{BR} and FR^{DR} respectively. Second, we also test for indirect effects of both types of fiscal rules (on the effect of the fiscal balance on the current account) by adding interaction terms between the fiscal balance and the respective fiscal rule, i.e., $BB \times FR^{BR}$ and $BB \times FR^{DR}$ respectively.

This yields five models: a baseline model without fiscal rules (column (1)), two models for budget balance rules (column (2a) and column (2b)) and two models for debt rules (column (3a) and column (3b)), all of which are estimated for the same (unbalanced) panel of 73 countries from 1985-2012, which is determined by availability of data on fiscal rules.

The twin deficit hypothesis is once again confirmed by the positive and significant coefficients of the fiscal balance, which range from 0.186 and 0.212. Due to the smaller country sample (73 countries in Table 2 instead of 160 countries in Table 1), some changes in the estimates of the control variables can be observed. Age dependency ratios, oil balance and the dummy controlling for the Asia crisis have no statistically significant

impact on the current account anymore.[6] Furthermore, the effect of net foreign assets (NFA) is reversed and remains only moderately significant at the 10% level. Finally, relative income becomes significant and shows the expected negative effect on the current account (see Prat et al. 2010).

In the present context, the variables of main interest are the two fiscal rule indices (FR^{BR}, FR^{DR}), representing their direct effect, and their interaction terms with the fiscal balance ($BB \times FR^{BR}$, $BB \times FR^{DR}$), representing their indirect effects on the current account. The direct effects of fiscal rules, when included alone turn out significant at 10 percent (FR^{BR}, column (2a)) or insignificant (FR^{DR}, column (3a)); when included along with the interaction terms, both variables are rendered insignificant. This suggests that fiscal rules themselves do not appear to be significantly associated with the current account. In contrast, the indirect effects of fiscal rules (on the effect of the fiscal balance on the current account) show a significant negative effect; this holds for both budget balance rules (column (2b)) and debt rules (column (3b)).

Evaluated at the sample mean of FR^{BR} (FR^{DR}), the coefficient linking the fiscal balance to the current account is reduced from 0.212 to 0.159 (from 0.203 to 0.156); for countries with the most stringent fiscal rules the effect is reduced to 0.010 (-0.105), which is not significantly different from zero. This implies that the effect of the fiscal balance on the current account is not homogeneous but differs across countries, and that fiscal institutions turn out to be an important driver of the cross-country heterogeneity. Stringent fiscal rules weaken the link between the fiscal balance and the current account, for countries with the most stringent fiscal rules the effect of the fiscal balance is virtually eliminated.

[Table 2 here]

5.3   Dynamic Specification and Robustness

Table 3 contains the estimation results of the dynamic version of the Eq. (3) for budget balance and debt rules. All models are estimated by the two-step generalized method of moments estimator in first-differences by Arellano and Bond (1991). For the purpose of testing the robustness of the results, four specifications are considered for both budget balance rules (columns (1a–6a)) and debt rules (columns (1b–6b)): First, we re-estimate the specification in columns (1a–1b), restricting the time period up to 2007, excluding the financial and economic crisis (columns (2a–2b)). We next exclude observations where the current account exceeds the thresholds of -15% and 15% of GDP (columns (3a–3b)). In columns (4a–4b) we exclude outliers defined as observations with standardized residuals larger than two. Finally, in columns (5a–5b and 6a–6b) we split the sample into industrialized and non-industrialized countries (as defined by the IMF).

As in the static models, the coefficient of the fiscal balance turns out positive and significant, with one exception: the fiscal balance is not significant for industrialized

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[6]In this context it is worth noting that numerous Asian countries that suffered from the 1997-2000 crisis are not included in the smaller sample of 73 countries.

countries in the specification including balanced budget rules. The estimated short-run effects range from 0.113 to 0.210, the long-run effects implied by the dynamic specification from 0.196 to 0.433. The results from the LSDV estimates in Table 2 regarding the direct and indirect effects of budget balance and debt rules on the current account are overall confirmed by the GMM specifications. The effect of the budget balance on the current account is mitigated by fiscal rules, for countries with the most stringent fiscal rules its effect is virtually eliminated.

And as with the LSDV estimates, indirect effects of fiscal rules are negative and statistically significant in almost all specifications. A somewhat differentiated picture emerges when splitting the sample between industrialized and non-industrialized countries: it seems that balanced budget rules do have a stronger effect in non-industrialized, while debt rules a stronger in industrialized countries. The estimates of the indirect effect range from -0.080 to -0.299 for budget balance rules and from -0.296 to -0.462 for debt rules. In terms of magnitude, averaged over all specifications and evaluated at the sample mean of the respective fiscal rule, budget balance (debt) rules reduce the estimated long-run effect of the fiscal balance on the current account from 0.248 to 0.135 (0.324 to 0.119).

[Table 3 here]

6   Concluding Remarks

This paper investigates the relationship between fiscal and external balances with an emphasis on the role of fiscal rules. If Ricardian equivalence is incomplete, one would expect fiscal deficits to translate partly into current account deficits through reduced savings. The hypothesis considered in this paper is that credible fiscal rules may enforce Ricardian features of economies, thereby reducing the effect of fiscal policy on the current account.

Accordingly, we test for direct effects of fiscal rules on the current account as well as for indirect effects of fiscal rules on the relationship between the fiscal balance and the current account, using a panel of 73 countries over the period 1985-2012 and indices on the stringency of budget balance and debt rules.

In line with previous studies, we confirm a positive association between the fiscal balance and the current account, which is supportive of the twin deficit hypothesis. Regarding the role of fiscal rules, we find no robust evidence for a direct effect on the current account. However, the interaction between fiscal rules and the fiscal balance turns out to have a statistically and economically significant effect on the current account: Stringent balanced budget and debt rules reduce the effect of the fiscal balance on the current account by roughly one third on average, for countries with the most stringent fiscal rules, the effect of the fiscal balance on the current account is essentially eliminated.

As a consequence, effective and stringent fiscal rules, besides their direct effect on the fiscal balance, can play a role as automatic stabilizers of the current account by dampening a deterioration (improvement) of the current account during periods of fiscal

deficits (consolidations).

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World Bank (2014) World Development Indicators 2014

Appendix

[Table A1 here]

[Table A2 here]

[Table A3 here]

Table 1: Results from Previous Studies and LSDV Estimates of Eq. (2)

	(1)	(2)	(3)	(4)	(5)
BB	0.190***	0.482***	0.243***	0.147***	0.203***
	(0.039)	(0.060)	(0.028)	(0.025)	
Young age dep.		−0.055**		−0.010***	−0.054**
		(0.022)		(0.002)	(0.025)
Old age dep.	0.140**	−0.040	−0.150*	−0.136	−0.142
	(0.107)	(0.060)	(0.199)	(0.205)	
NFA	0.020***	0.063***	0.049**	0.091***	0.045**
	(0.007)	(0.010)	(0.026)	(0.020)	
Pop. growth	−1.220***	−0.069	−0.740	0.169	0.184
	(0.241)	(0.470)	(0.203)	(0.208)	
GDP growth	−0.210***	−0.184***	−0.072	−0.016	−0.071**
	(0.039)	(0.090)	(0.041)	(0.033)	
FDI		−0.159		−0.236***	−0.248***
		(0.101)		(0.028)	(0.025)
Oil balance	0.230***	0.223***	0.239***	0.060***	0.070***
	(0.035)	(0.060)	(0.018)	(0.016)	
Terms of trade			0.010	0.051***	0.036***
			(0.010)	(0.006)	(0.005)
Relative income	0.020*	−0.005	0.027*	−0.033	−0.035
	(0.003)	(0.010)	(0.129)	(0.082)	
Asia crisis	0.060***	0.046***	0.037***	0.084**	0.087**
	(0.010)	(0.010)	(0.033)	(0.036)	
Eurozone crisis	0.010*		0.018**	−0.012	−0.064
		(0.010)	(0.010)	(0.079)	
Financial center	0.030***		0.014	0.101***	0.116***
		(0.010)	(0.032)	(0.027)	
R^2	NA	0.37	0.45	0.76	0.73
First year	1973	1970	1969	1985	1985
Last year	2004	2008	2008	2008	2012
Countries	54	33	65	160	160
Observations	NA	1,044	503	1,576	1,980

Notes: Dependent variable is current account relative to GDP (CA); country fixed effects are included in all specifications; robust standard errors in parentheses; significance levels: *** 1%, ** 5%, * 10%. (1) Lee et al. (2008), standard errors, R^2, and number of observations are not reported in this paper, (2) Prat et al. (2010), (3) Lane and Milesi-Ferretti (2012), (4) results for period 1985-2008, (5) results for period 1985-2012. BB: fiscal balance, NFA: net foreign assets, FDI: foreign direct investment.

Table 2: LSDV Estimates of Eq. (2) and Eq. (3) for Budget Balance and Debt Rules

	(1) Base- line	(2a) Model BR	(2b) Model BR	(3a) Model DR	(3b) Model DR
BB	0.187***	0.186***	0.212***	0.187***	0.203***
	(0.058)	(0.058)	(0.067)	(0.058)	(0.062)
Young age dep.	0.043	0.063*	0.065*	0.035	0.045
	(0.035)	(0.037)	(0.037)	(0.037)	(0.038)
Old age dep.	−1.513	−1.721	−1.869	−1.501	−1.716
	(1.394)	(1.416)	(1.380)	(1.415)	(1.359)
NFA	−0.312	−0.299	−0.310	−0.295	−0.318
	(0.202)	(0.202)	(0.200)	(0.202)	(0.202)
Population growth	1.975	2.152	2.300	1.963	2.157
	(1.423)	(1.444)	(1.408)	(1.445)	(1.387)
GDP growth	−0.151**	−0.153**	−0.146**	−0.150**	−0.143**
	(0.063)	(0.063)	(0.064)	(0.063)	(0.063)
FDI	−0.165***	−0.166***	−0.161***	−0.165***	−0.164***
	(0.048)	(0.048)	(0.048)	(0.048)	(0.046)
Oil balance	0.014	0.012	0.011	0.0157	0.015
	(0.018)	(0.018)	(0.018)	(0.018)	(0.019)
Terms of trade	0.019**	0.018**	0.020**	0.019**	0.019**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Relative income	−0.411***	−0.412***	−0.422***	−0.416***	−0.419***
	(0.115)	(0.113)	(0.111)	(0.116)	(0.115)
Asia crisis	0.061	0.138	0.142	0.044	0.069
	(0.382)	(0.389)	(0.386)	(0.382)	(0.382)
Eurozone crisis	−0.555	−0.519	−0.571	−0.587	−0.563
	(0.493)	(0.489)	(0.486)	(0.491)	(0.491)
Financial center	0.208**	0.206***	0.209***	0.206***	0.209***
	(0.034)	(0.034)	(0.034)	(0.034)	(0.035)
F^{BR}		1.201*	0.747		
		(0.663)	(0.734)		
$BB \times F^{BR}$			−0.202**		
			(0.103)		
F^{DR}				−0.520	−1.074
				(0.686)	(0.769)
$BB \times F^{DR}$					−0.308**
					(0.152)
R^2	0.755	0.756	0.757	0.755	0.756

Notes: Dependent variable is CA; all models are based on the same sample (73 countries, 1985-2012) and a total of 967 observations; country fixed effects are included in all specifications; robust standard errors in parentheses; significance levels: *** 1%, ** 5%, * 10%. Baseline: without fiscal rules, Model BR: budget balance rule, Model DR: debt rule. FR^{BR}: budget balance rule, FR^{DR}: debt rule.

Table 3: Two-step GMM Estimates, Dynamic Specification of Eq. (3)

	(1a) Full sample	(2a) 1985-2007	(3a) ±15%	(4a) $2 \times \sigma_\varepsilon$	(5a) Ind.	(6a) Non-Ind.	(1b) Full sample	(2b) 1985-2007	(3b) ±15%	(4b) $2 \times \sigma_\varepsilon$	(5b) Ind.	(6b) Non-Ind.
CA_{t-1}	0.452***	0.332***	0.420***	0.425***	0.641***	0.257***	0.474***	0.341***	0.395***	0.377***	0.552***	0.353***
	(0.018)	(0.011)	(0.009)	(0.014)	(0.038)	(0.069)	(0.014)	(0.014)	(0.019)	(0.012)	(0.065)	(0.059)
BB	0.184***	0.169***	0.113***	0.209***	−0.069	0.154***	0.168***	0.179***	0.119***	0.170***	0.194***	0.210***
	(0.015)	(0.007)	(0.011)	(0.025)	(0.084)	(0.046)	(0.011)	(0.006)	(0.012)	(0.015)	(0.056)	(0.036)
F^{BR}	−0.722	−0.578	−0.591	−1.031	5.485	−1.882						
	(0.642)	(0.540)	(0.678)	(0.688)	(4.762)	(1.746)						
$BB \times F^{BR}$	−0.181***	−0.080**	−0.131***	−0.268***	0.181	−0.299***						
	(0.033)	(0.040)	(0.040)	(0.036)	(0.203)	(0.098)						
F^{DR}							−0.421	0.772	0.157	0.044	−1.578	−0.338
							(0.626)	(0.612)	(0.690)	(0.831)	(1.923)	(1.703)
$BB \times F^{DR}$							−0.397***	−0.342***	−0.296***	−0.462***	−0.343**	0.352
							(0.070)	(0.122)	(0.095)	(0.117)	(0.167)	(0.623)
R^2	0.156	0.247	0.168	0.304	0.492	0.141	0.277	0.202	0.160	0.190	0.074	0.225
First year	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985
Last year	2012	2007	2012	2012	2012	2012	2012	2007	2012	2012	2012	2012
Observations	865	606	813	833	380	494	865	606	813	830	380	494

Notes: Dependent variable is CA; unbalanced panels comprising 73 countries and 28 years (1985-2012), making a total of 967 observations; country fixed effects and control variables are included in all specifications but not reported; standard errors in parentheses; significance levels: *** 1%, ** 5%, * 10%. (1a)–(1b): Baseline, (2a)–(2b): sub-sample for years up to 2007, (3a)–(3b): sub-sample for current account not larger than 15% of GDP in absolute value, (4a)–(4b) sub-sample for residuals of (1) not larger than $2 \times \sigma_\varepsilon$ in absolute value, (5a)–(5b) sub-sample for only industrialized countries as defined by the IMF, (6a)–(6b) sub-sample for only non-industrialized countries as defined by the IMF. CA: current account, BB: fiscal balance, FR^{BR}: budget balance rule, FR^{DR}: debt rule.
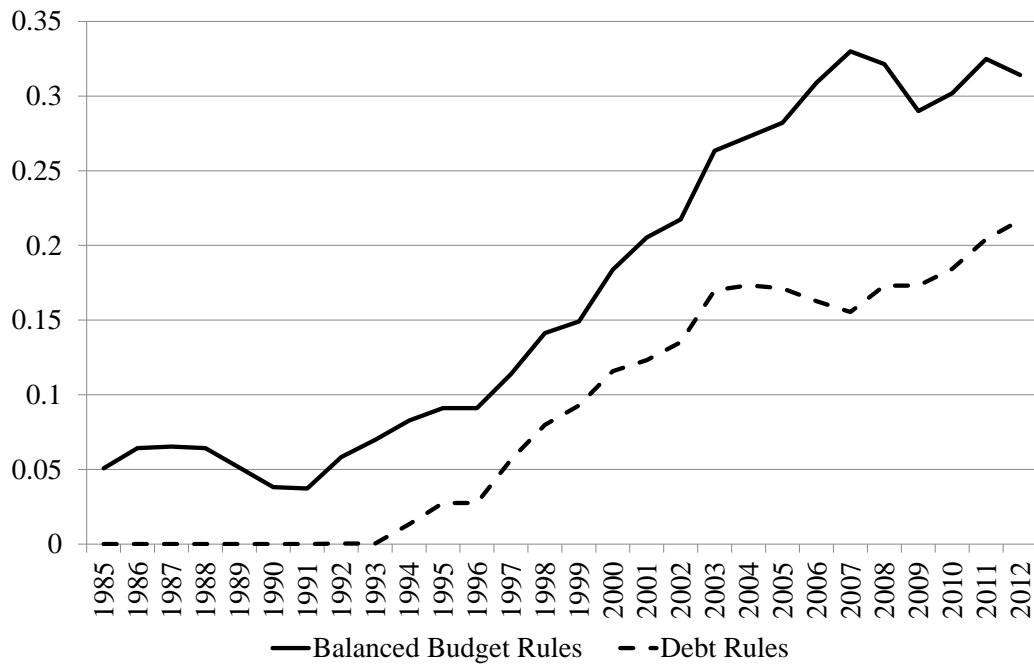
Figure 1: Development of Fiscal Rule Indices over time

Table A1: Description of Variables

Name	Definition	Source
CA	Current account (ratio to GDP)	WEO
BB	Fiscal balance (ratio to GDP)	WEO
Asia crisis	Dummy crisis in Asia	Prat et al. (2010)
Eurozone crisis	Dummy crisis in Eurozone	-
Financial centre	Dummy for important Financial Centre	Lane and Milesi-Ferretti (2012)
Young age dep.	Old age dependency ratio	WDI
Old age dep.	Young age dependency ratio	WDI
NFA	Net Foreign Assets (ratio to GDP)	WDI
Pop. growth	Population Growth	WDI
GDP growth	GDP Growth	WDI
FDI	Foreign direct investment	WDI
Oil balance	Oil balance (share of total trade)	WDI
Terms of trade	Terms of trade	WDI
Relative income	Relative income to the US (in % of GDP)	WDI

Notes CA: current account, BB: fiscal balance, NFA: net foreign assets, FDI: Foreign direct investment, WEO World Economic Outlook, WDI World Development Indicators.

Table A2: Summary Statistics

	Mean	Std. Dev.	Min	Max
CA	-0.026	0.076	-0.331	0.253
BB	-0.021	0.049	-0.305	0.403
Young age dep.	0.461	0.239	0.159	1.054
Old age dep.	0.146	0.078	0.048	0.375
NFA	-0.002	0.014	-0.070	0.172
Pop. growth	0.146	0.078	0.048	0.375
GDP growth	0.021	0.037	-0.166	0.147
FDI	0.046	0.072	-0.551	0.747
Oil balance	0.112	0.189	0.000	0.997
Terms of trade	0.351	0.083	0.072	1.000
Relative income	0.039	0.118	0.000	1.000
Asia crisis	0.161	0.381	0.000	1.000
Eurozone crisis	0.075	0.263	0.000	1.000
Financial center	0.060	0.238	0.000	1.000
F^{BR}	0.266	0.396	0.000	1.000
F^{DR}	0.152	0.325	0.000	1.000

Notes: Statistics refer to baseline sample (73 countries, 1985-2012, 967 observations). CA: current account, BB: budget balance, NFA: net foreign assets, FDI: foreign direct investment, FR^{BR}: budget balance rule, FR^{DR}: debt rule.

Table A3: Statistics - Fiscal Rules Indices

	F^{BR}			F^{DR}		
	1985-2012	1985-2000	2000-2012	1985-2012	1985-2000	2000-2012
All	0.178	0.089	0.280	0.093	0.028	0.167
Industrialized	0.272	0.160	0.414	0.107	0.060	0.173
Non-Industrialized	0.145	0.061	0.234	0.088	0.016	0.165
Western Hemisphere	0.142	0.026	0.284	0.067	0.010	0.138
Europe	0.210	0.112	0.307	0.101	0.041	0.166
Asia and Pacific	0.517	0.369	0.705	0.225	0.078	0.407
Middle East and Central Asia	0.208	0.000	0.448	0.208	0.000	0.448
Africa	0.010	0.000	0.021	0.041	0.006	0.082

Notes: Statistics refer to full sample (81 countries, 1985-2012). Classification 'Industrialized' according to Prat et al. (2010) and Regions according to IMF (2012).