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STOCK-FLOW ADJUSTMENT – ONLY A RESIDUAL VALUE? EVIDENCE FROM EUROPEAN UNION COUNTRIES

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Abstract

The aim of the article is to investigate the fiscal determinants of stock-flow adjustment (SFA). Previous literature suggests that SFA may be used strategically to reduce budget deficit and public debt. As such, SFA impairs fiscal transparency and may endanger fiscal sustainability. Therefore, special attention should be paid by economists and policymakers. The study pertains to the European Union countries in the years 2005-2016. The empirical analysis supports the hypothesis that SFA is inversely related to public debt, whereas the inverse relationship between budget balance and SFA is not confirmed. The article contains additional analyses for selected components of SFA as well as narrower time and space coverage.

JEL classification: E62, H62, H63
Keywords: public debt, budget deficit, panel data analysis

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Introduction

The change in public debt consists of a budget balance and a stock-flow adjustment (SFA). Unlike a budget balance and public debt, SFA is not subject to fiscal rules and is usually omitted in the analysis of public debt sustainability (Jaramillo, Mulas-Granados & Kimani, 2017). This allows us to hypothesize that SFA is not only a residual value but can be used intentionally by public authorities. In fact, it is frequently treated as a proxy for fiscal gimmickry (Alt, Lassen & Wehner, 2014; Maltritz & Wüste, 2015; Reischmann, 2016; von Hagen & Wolff, 2006). The tactical use of SFA undermines two core features of prudent fiscal policy: transparency and sustainability. The paper shows that the threats of tactical use of SFA by the European Union countries to circumvent public debt are not ungrounded.

The article contributes to empirical literature on SFA as the element of fiscal policy. Countries under investigation – European Union countries – are subject to common reporting standards and regulatory framework. The study may be considered an extension of the analysis by Buti, Martins and Turrini (2007) concerning this group of countries in the years 1994-2004. In our case, we refer to data for the period 2005-2016 within which sovereign debt in EU countries (especially Eurozone countries) has been the topic of intense scholarly and political debate[2]. In our empirical study we address two main questions:

1) Do the EU countries exploit SFA to hide budget deficit?

2) Do the EU countries exploit SFA to reduce public debt?

In order to address these questions, we employ two-way panel FE and two-way panel IV FE estimation. Given the heterogeneity in the composition of SFA across countries, we additionally investigate whether the abovementioned relationships exist with respect to two components of SFA (i.e., non-foreign-exchange adjustment and the net acquisition of financial assets) upon which government authorities exert the greatest control. They are also especially prone to manipulation. As explained by Alt et al. (2014, p. 710, 711), the under-reporting of deliveries adds to the discrepancy between accrual and cash transactions (in our paper included in variable 'non-foreign-exchange adjustment'), while recording subsidies under the label of 'equity purchase' is reflected in the net acquisition of financial assets.

The paper is structured as follows. Section 2 explains the concept of SFA. Section 3 discusses related literature. The next two sections present empirical strategy and empirical results respectively. Section 6 offers some concluding remarks.

Stock-flow adjustment as a component of debt dynamics

Budget balance and public debt account for two fundamental measures of fiscal (im)balance. There are three main differences between them. First, whereas budget balance represents public money flows, public debt is a stock variable. Second, budget balance is recorded in net terms and public debt – in gross terms. Third, budget balance is measured on an accrual basis and public debt – on a cash basis (Wierts, 2007, p. 31, 32). Consequently, some of the budget operations (e.g. foreign exchange adjustments) do not affect deficit and debt simultaneously. For that reason, the change in public debt is not fully explained by budget balance:

change in public debt = - budget balance + stock flow adjustment

SFA (SFA, other: debt-deficit adjustment; stock-flow reconciliation) can achieve both positive and negative values. Its contribution to debt dynamics is presented in Table 1[3]. The main components of SFA are (Eurostat, 2017, p. 3):

1) adjustments – encompassing: transactions in financial derivatives, other accounts payable and other liabilities, valuation effects (e.g. issuances of debt below its nominal value), exchange rate adjustments, changes in sector classification, other volume changes in financial liabilities;

2) net acquisition of financial assets – net of acquisitions and disposals of financial assets;

3) statistical discrepancies – arising from compiling data with the use of various data sources.

The mean of SFA for all European Union countries was not statistically different from 0 in the period 2005-2016 as well as 2013-2016[4] (see Table 2). At the same time,

[2] The European sovereign debt crisis has been discussed in detail in, for instance, (Lane, 2012).

[3] In their descriptive analysis of debt dynamics over long-term time spans, Eichengreen, El-Ganainy, Esteves and Mitchener (2019) discuss also the contribution of SFA.

[4] The results of two-sided t-test with null hypothesis that sfa = 0, which cannot be rejected at conventional levels

Table 1: Relationships between budget balance, SFA and change in debt

Type of budget balance	Sign of SFA	
	SFA > 0	SFA < 0
budget deficit	increase in public debt > budget deficit	increase in public debt < budget deficit
budget surplus	decrease in public debt < budget surplus	decrease in public debt > budget surplus

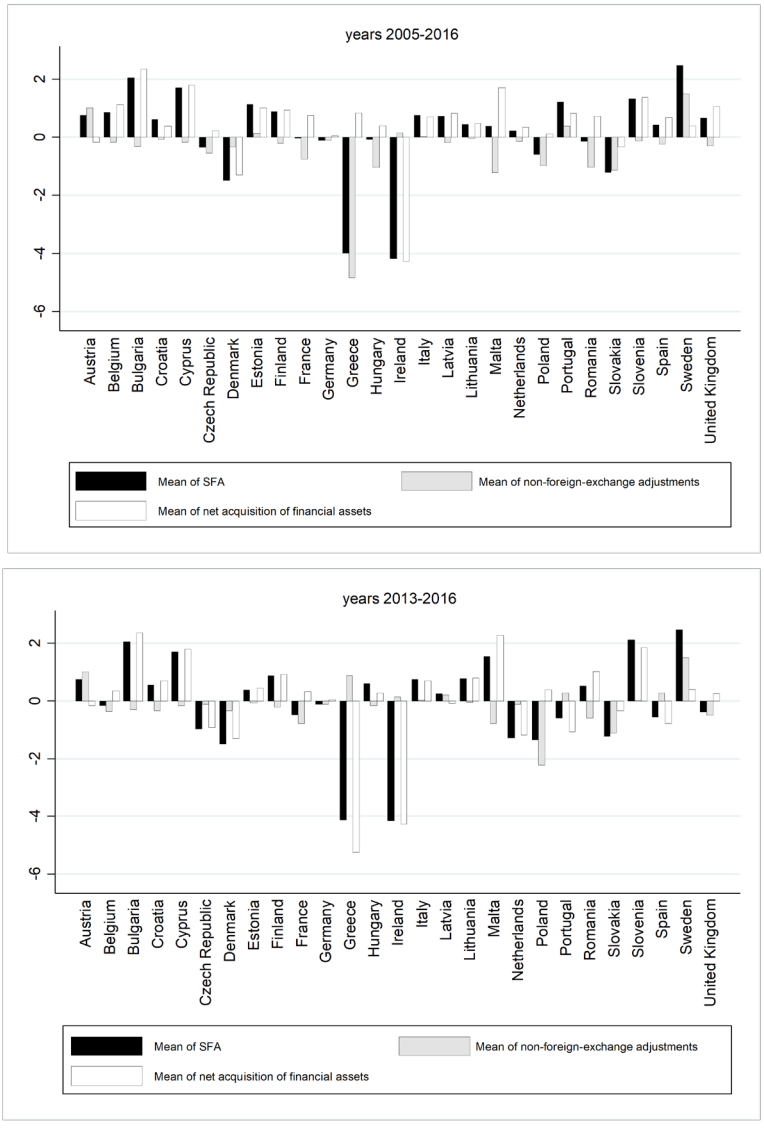
Note: These relationships are satisfied under the condition that |budget balance| > |SFA|.
Source: Banaszewska, 2012, p. 421

Table 2: Descriptive statistics of SFA and its selected components in the European Union countries in the years 2005-2016 and 2013-2016 (in % of GDP)

Variable	2005-2016	2013-2016
SFA	0.14 (0.23)	-0.06 (0.28)
Non-foreign-exchange adjustments	-0.58 (0.27)	-0.16 (0.12)
Net acquisition of financial assets	0.62 (0.20)	-0.02 (0.28)

Note: Format of data: mean (standard deviation)
Source: Own elaboration on the basis of (Eurostat database)

Table 1: Mean of SFA and its selected components in the European Union countries in the years 2005-2016 and 2013-2016 (in % of GDP)



Note: No observations for Luxembourg
Source: Own elaboration on the basis of (Eurostat database)

in most countries SFA was – on average – greater than 0 (see Figure 1). The lowest mean of SFA was recorded by Ireland (-4.18% of GDP in the years 2013-2016) and the highest – by Sweden (2.48% of GDP in the years 2013-2016). When it comes to cash-accrual adjustments (non-foreign-exchange adjustments), they reached a negative, significant mean value over the years 2005-2016. On the contrary, the average value of net acquisition of financial assets exceeded 0 in that period. The observed country-year heterogeneity in SFA and its components among the European Union countries calls for more in-depth empirical analysis.

Literature review

As mentioned before, deficit and debt are standard, broadly used measures to assess the state and evolution of a fiscal situation. However, Milesi-Ferretti and Moriyama (2006) note that reduction in deficit or debt does not necessarily improve fiscal stance. If such change does not decrease the present value of the tax burden, it is called a 'nonstructural fiscal measure'. Koen and van den Noord (2005) and Irwin (2012) provide an overview of methods implemented to blur the actual stance of public finance. Seiferling (2013, p. 5) uses the term 'nonstructural adjustments' and distinguishes their two main categories. The first group consists of lawful transactions that lead to a short-term improvement in fiscal stance at the expense of long-term fiscal goals. The second group is composed of illegitimate budgetary accounting and reporting practices. Regardless of the type of nonstructural adjustments, their implementation may endanger fiscal sustainability.

Why can one associate SFA with fiscal gimmickry? For the broad samples of countries – including developed, emerging and developing economies – Campos, Jaimivich and Panizza (2006), Jaramillo et al., (2017) as well as Afonso and Jalles (2019) document that SFA accounts for the main component of large increases in debt-to-GDP ratio. Using the sample of 27 OECD countries in the years 1970-2011, Reischmann (2016) shows that SFA is tactically used in pre-election periods to attract voters by favorable deficit figures.

Somewhat adding to this evidence, Weber (2012) finds out that SFA is on average higher in countries with low transparency of fiscal policy. She concludes that the low quality of budgetary institutions create space for fiscal gimmickry. Similarly, an analysis of 14 EU countries in the years 1990-2007 by Alt et al. (2014) indicates that under the conditions of low transparency, SFA exhibits fluctuations over term-of-office, increases in non-favorable economic circumstances and is aggravated by fiscal rules. These results contradict Seiferling (2013) who reports a non-significant impact of fiscal transparency on SFA. Yet, one should consider that he exploits a much smaller sample (22 countries) than in (Weber, 2012) (163 countries). In addition, he uses a modified measure of SFA (so called 'complete SFA').

The European Union countries and especially the members of the European and Monetary Union constitute a unique group of countries subject to a common fiscal regulatory framework. At the same time, this group presents considerable heterogeneity in terms of fiscal traditions and macroeconomic situation. Hence, the literature on the determinants of SFA includes the strand focused on the European Union countries. Milesi-Ferretti and Moriyama (2006) show that in the period preceding the establishment of the euro area highly indebted candidate countries resorted to asset sales in order to keep fiscal imbalance in check, thus general government net worth hardly improved. Again, for euro-area countries, von Hagen and Wolff (2006) show the strategic use of SFA in order to underreport deficits, which are closely monitored under the Stability and Growth Pact.

Maltritz and Wüste (2015) document a significant relationship between SFA and budget deficits in 27 European Union countries over the period 1991-2011. Apart from total SFA, Buti, Martins and Turrini (2007) investigate the determinants of its two components: cash-accrual adjustment and the acquisition of financial assets. They are utilized respectively to hide deficit and reduce debt. Their empirical analysis for the European Union countries in the years 1994-2004 shows that fiscal gimmickry increases with budget deficit and public debt.

The previous research leads to the following hypotheses:

Hypothesis 1: SFA is inversely related to budget balance.

Hypothesis 2: SFA is inversely related to public debt.

We add to the literature by exploiting a database that includes the pre-crisis period, 2007-2009 crisis as well as post-crisis period. Building on (Buti et al., 2007), we analyze not only total SFA but also refer to its selected components, which capture more precisely the discretional part of SFA.

Empirical model

The study covers the European Union countries in the years 2005-2016. The empirical analysis exploits data for the period from 2005 to 2016 (unbalanced panel) and from 2013 to 2016 (balanced panel). Since the Eurozone countries are subject to more stringent fiscal rules, we consider two samples: all EU countries and countries belonging to the euro area.

As SFA is composed of various ingredients of different nature, not only total SFA to GDP is considered. We also refer to its discretional components: non-foreign exchange adjustments and net acquisition of financial assets. In contrast to (Buti et al., 2007), we do not exclude privatization transactions from net asset purchases. It is because, due to financial crisis, some of the countries were forced to sell some assets in order to mitigate an adverse fiscal situation. Adjustments measure is netted from foreign exchange adjustments because they are typically beyond government control.

The independent variables of interest are: budget balance to GDP (net borrowing (–)/net lending (+)) and lagged public debt to GDP. In both cases we use data for the general government sector which reflects the scope of various fiscal rules (e.g. stemming from Maastricht Treaty, Stability and Growth Pact, Fiscal Compact). Taking into account the two-way causality between SFA and budget balance in a given budget year, we apply IV regressions. Four instrumental variables are employed: budget balance to GDP lagged by 1 and 2 years as well as real GDP growth rate lagged by 1 and 2 years. The baseline specification that uses fitted first-stage values of budget balance has the following formula:

$$SFA_{it} = \beta_0 + \beta_1 \widehat{budget\_balance}_{it} + \beta_2 debt\_t\_1_{it} + \mathbf{\gamma\ controls}_{it} + \mu_i + \delta_t + \varepsilon_{it} \quad (1)$$

where: μ_i - country FE,
δ_t - year FE,
ε_{it} - error term

Besides the main explanatory variables, we control for a country's macroeconomic situation. We introduce three control variables: real GDP growth rate, HICP inflation rate and unemployment rate. All data come from the Eurostat database.

The article uses a panel regression analysis with fixed effects for years and units of the study. Thanks to that, it is possible to control for the influence of time-constant individual effects and those common to all countries time effects.

Results

We conduct three regressions for each sample-period combination: i. including both deficit and debt, ii. including deficit only, iii. including debt only. As for (i) and (ii), second-stage IV regressions are presented. In the bottom panel we report the results of tests on instruments' exogeneity and relevance. To save space, we do not report FE for countries and years. The empirical results are displayed in Tables 3-8.

To obtain an unbiased and consistent estimator of β1, instrumental variables have to be uncorrelated with an error term and correlated with an instrumented variable (Wooldridge, 2013, p. 513, 514). The set of instrumental variables passes an orthogonality test (p-values for Hansen J statistic exceed 0.1). By contrast, instruments are not

Table 3: Determinants of SFA in the European Union countries

Variables	Years: 2005-2016			Years: 2013-2016		
	(1)	(2)	(3)	(4)	(5)	(6)
budget balance	-0.499*	-0.436		0.127	0.502	
	(0.290)	(0.318)		(0.301)	(0.377)	
debt_t_1	-0.09***		-0.11***	-0.21***		-0.20***
	(0.035)		(0.030)	(0.056)		(0.050)
unemployment	-0.127	-0.3***	-0.0027	-0.258	-0.335	-0.313
	(0.143)	(0.108)	(0.114)	(0.349)	(0.374)	(0.332)
inflation	-0.0143	-0.0531	0.0409	0.194	0.361	0.228
	(0.190)	(0.190)	(0.173)	(0.481)	(0.521)	(0.486)
GDP	0.00894	-0.0435	-0.0460	-0.0247	-0.212	-0.0109
	(0.105)	(0.108)	(0.093)	(0.138)	(0.157)	(0.137)

constant	4.260**	2.102	5.55***	18.2***	5.760	17.4***
	(1.892)	(1.616)	(1.608)	(5.089)	(4.139)	(4.896)
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	237	237	237	108	108	108
R-squared	0.032	0.016	0.167	0.290	0.130	0.242
Number of code	27	27	27	27	27	27
First-stage diagnostic test						
Kleibergen-Paap rk Wald F	26.176	25.935		4.272	2.078	
statistic						
Anderson-Rubin Wald test				(0.008)	(0.001)	
Stock-Wright LM S statistic				(0.073)	(0.064)	
Hansen J statistic	5.671	4.308		4.167	4.091	
	(0.129)	(0.230)		(0.244)	(0.252)	

*Note:*The top panel of table presents the second-stage results of panel FE IV regression (columns: 1, 2, 4, 5) and the results of panel FE regression (columns: 3, 6). Standard errors in parentheses. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.1. The bottom panel reports first-stage diagnostic tests. P-values in parentheses.

Source: Own elaboration

Table 4: Determinants of SFA in the European Union countries

Variables	Years: 2005-2016			Years: 2013-2016		
	(1)	(2)	(3)	(4)	(5)	(6)
budget balance	-0.0197	-0.268		0.600**	0.812**	
	(0.430)	(0.519)		(0.274)	(0.357)	
debt_t_1	-0.12**		-0.12**	-0.2***		-0.2***
	(0.0560)		(0.0476)	(0.0581)		(0.0608)
unemployment	0.0248	-0.253	0.0282	0.321	0.0993	-0.0343
	(0.221)	(0.182)	(0.208)	(0.436)	(0.516)	(0.472)
inflation	0.602	0.729	0.598	0.166	0.479	0.187
	(0.631)	(0.656)	(0.622)	(0.678)	(0.828)	(0.790)
GDP	0.0451	0.0533	0.0427	0.00345	-0.156	0.0473
	(0.186)	(0.199)	(0.177)	(0.148)	(0.181)	(0.170)
constant	5.751	0.257	5.861	17.9***	2.582	15.07**
	(4.349)	(3.469)	(3.596)	(6.279)	(6.289)	(7.160)
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	126	126	126	65	65	65
R-squared	0.199	0.116	0.201	0.460	0.167	0.249
Number of code	17	17	17	17	17	17
First-stage diagnostic test						
Kleibergen-Paap rk Wald F	12.537	8.617		8.898	5.496	
Anderson-Rubin Wald test		(0.001)		(0.000)	(0.000)	
Stock-Wright LM S statistic		---		(0.008)	(0.012)	
statistic						
Hansen J statistic	---[a]	---		3.749	2.456	

	---	---		(0.290)	(0.483)	

Note: The top panel of the table presents the second-stage results of panel FE IV regression (columns: 1, 2, 4, 5) and the results of panel FE regression (columns: 3, 6). Standard errors in parentheses. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.1. The bottom panel reports first-stage diagnostic tests. P-values in parentheses.
[a] Statistic not computable.
Source: Own elaboration

always found to be sufficiently strong, i.e. Kleibergen-Paap rk Wald F statistic does not exceed 10. In the case of weak instruments, the significance of coefficient on budget balance is assessed with the use of the Anderson-Rubin Wald test and Stock-Wright LM S statistic. Their null hypothesis states that the coefficient on instrumented variable is not different from 0.

In regressions with SFA as a dependent variable (Tables 3 and 4), the coefficient on public debt is consistently negative and statistically significant. This result supports Hypothesis 2. On the contrary, we do not find the empirical confirmation of Hypothesis 1. The expected negative sign loses statistical significance in specification (2) for the whole sample and specification (1) for the euro area. In addition, for both groups of countries in the years 2013-2016, we obtain an unexpected, significantly positive effect of budget balance on SFA. Maltritz and Wüste (2015) reported an analogous result.

Table 5: Determinants of non-foreign exchange adjustments in the European Union countries

Variables	Years: 2005-2016			Years: 2013-2016		
	(1)	(2)	(3)	(4)	(5)	(6)
budget balance	-0.533	-0.469		-0.00952	-0.00210	
	(0.360)	(0.390)		(0.146)	(0.168)	
debt_t_1	-0.0541		-0.08**	-0.0355		-0.0364
	(0.043)		(0.039)	(0.027)		(0.023)
unemployment	-0.0647	-0.185	0.0701	0.0140	-0.0184	0.0181
	(0.178)	(0.131)	(0.147)	(0.169)	(0.166)	(0.156)
inflation	0.0876	0.0620	0.151	0.00491	0.0429	0.00236
	(0.234)	(0.231)	(0.222)	(0.233)	(0.232)	(0.228)
GDP	0.190	0.155	0.135	-0.0100	-0.0327	-0.0111
	(0.128)	(0.130)	(0.118)	(0.067)	(0.07)	(0.064)
constant	0.528	-0.578	1.769	2.458	0.315	2.514
	(2.279)	(1.989)	(2.044)	(2.471)	(1.841)	(2.296)
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	229	229	229	108	108	108
R-squared	0.035	0.035	0.097	0.074	0.048	0.079
Number of code	27	27	27	27	27	27
First-stage diagnostic test						
Kleibergen-Paap rk Wald F	22.931	23.294		4.272	2.078	
Anderson-Rubin Wald test				(0.580)	(0.039)	
Stock-Wright LM S statistic				(0.011)	(0.082)	
Hansen J statistic	3.760	3.939		2.123	2.685	
	(0.289)	(0.268)		(0.547)	(0.443)	

Note: The top panel of the table presents the second-stage results of panel FE IV regression (columns: 1, 2, 4, 5) and the results of panel FE regression (columns: 3, 6). Standard errors in parentheses. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.1.The bottom panel reports first-stage diagnostic tests. P-values in parentheses.
Source: Own elaboration

Table 6: Determinants of non-foreign-exchange adjustments in the Eurozone countries

Variables	Years: 2005-2016			Years: 2013-2016		
	(1)	(2)	(3)	(4)	(5)	(6)
budget balance	0.145	-0.0174		0.110	0.0781	
	(0.619)	(0.725)		(0.106)	(0.116)	
debt_t_1	-0.114		-0.103	-0.042*		-0.0321
	(0.079)		(0.065)	(0.022)		(0.021)
unemployment	0.223	-0.0532	0.199	0.199	0.126	0.134
	(0.303)	(0.239)	(0.284)	(0.168)	(0.168)	(0.160)
inflation	1.083	1.160	1.100	-0.270	-0.218	-0.266
	(0.857)	(0.862)	(0.849)	(0.261)	(0.270)	(0.268)
GDP	0.217	0.212	0.233	0.0157	-0.0048	0.0237
	(0.252)	(0.260)	(0.241)	(0.057)	(0.059)	(0.058)
constant	1.676	-2.947	0.971	2.161	-0.554	1.648
	(5.768)	(4.573)	(4.882)	(2.415)	(2.051)	(2.431)
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	118	118	118	65	65	65
R-squared	0.182	0.158	0.182	0.224	0.140	0.159
Number of code	17	17	17	17	17	17
First-stage diagnostic test						
Kleibergen-Paap rk Wald F	13.765	7.339		8.898	5.496	
Anderson-Rubin Wald test		(0.108)		(0.186)	(0.011)	
Stock-Wright LM S statistic		(0.002)		(0.019)	(0.074)	
Hansen J statistic	---[a]	---		1.646	2.252	
	---	---		(0.649)	(0.522)	

Note: The top panel of the table presents the second-stage results of panel FE IV regression (columns: 1, 2, 4, 5) and the results of panel FE regression (columns: 3, 6). Standard errors in parentheses. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.1. The bottom panel reports first-stage diagnostic tests. P-values in parentheses.
[a] Statistic not computable.
Source: Own elaboration

Tables 5 and 6 show regressions that explain the variation in adjustments other than due to foreign exchange fluctuations. In the majority of specifications budget balance and debt are not significant at conventional levels. A few exceptions include: the negative sign of lagged debt for EU-27 in the years 2005-2016 and EMU countries in the years 2013-2016, the negative sign of budget balance in EU-27 in the years 2013-2016, the positive sign of budget balance in EMU countries in the years 2013-2016.

Net acquisition of financial assets is found to be significantly dependent on the analyzed fiscal variables only over the period 2013-2016 (Tables 7 and 8). In line with Hypothesis 2, we document statistically significant and negative impact of lagged public debt to GDP. In 3 out of 4 regressions, budget balance to GDP is positively related to net acquisition of financial assets, which contrasts with Hypothesis 1.

The regressions explain up to 46% of within-country variance of SFA, 22.4% – of non-foreign-exchange adjustments and 39.3% – of net acquisition of financial assets. In 17 out of 36 specifications R-squared lies between 10 and 20%.

As for control variables, in all but a few cases unemployment rate, HICP inflation and real GDP growth rate do not differ significantly from zero.

Table 7: Determinants of net acquisition of financial assets in the European Union countries

Variables	Years: 2005-2016			Years: 2013-2016		
	(1)	(2)	(3)	(4)	(5)	(6)
budget balance	-0.0449	-0.0557		0.142	0.526	
	(0.246)	(0.269)		(0.286)	(0.357)	
debt_t_1	-0.0345		-0.0365	-0.18***		-0.17***
	(0.030)		(0.027)	(0.053)		(0.047)
unemployment	-0.0807	-0.165*	-0.0693	-0.303	-0.349	-0.364
	(0.122)	(0.090)	(0.104)	(0.330)	(0.354)	(0.314)
inflation	-0.107	-0.128	-0.101	0.147	0.282	0.185
	(0.160)	(0.159)	(0.157)	(0.455)	(0.494)	(0.460)
GDP	-0.18**	-0.20**	-0.19**	-0.0196	-0.191	-0.0042
	(0.087)	(0.089)	(0.083)	(0.131)	(0.148)	(0.130)
constant	3.635**	2.858**	3.740**	16.7***	5.910	15.8***
	(1.559)	(1.370)	(1.440)	(4.820)	(3.918)	(4.633)
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	229	229	229	108	108	108
R-squared	0.157	0.148	0.164	0.288	0.128	0.241
Number of code	27	27	27	27	27	27
First-stage diagnostic test						
Kleibergen-Paap rk Wald F	22.931	23.294		4.272	2.078	
Anderson-Rubin Wald test				(0.240)	(0.014)	
Stock-Wright LM S statistic				(0.068)	(0.059)	
Hansen J statistic	3.022	4.183		3.384	2.362	
	(0.388)	(0.242)		(0.336)	(0.501)	

Note: The top panel of the table presents the second-stage results of panel FE IV regression (columns: 1, 2, 4, 5) and the results of panel FE regression (columns: 3, 6). Standard errors in parentheses. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.1.The bottom panel reports first-stage diagnostic tests. P-values in parentheses.
Source: Own elaboration

Table 8: Determinants of net acquisition of financial assets in the Eurozone countries

Variables	Years: 2005-2016			Years: 2013-2016		
	(1)	(2)	(3)	(4)	(5)	(6)
budget balance	-0.113	-0.294		0.477*	0.713**	
	(0.421)	(0.498)		(0.289)	(0.355)	
debt_t_1	-0.0093		-0.0173	-0.2***		-0.15**
	(0.054)		(0.044)	(0.061)		(0.060)
unemployment	-0.184	-0.205	-0.165	0.117	-0.0474	-0.165
	(0.206)	(0.164)	(0.191)	(0.460)	(0.514)	(0.468)
inflation	-0.536	-0.517	-0.550	0.449	0.721	0.466
	(0.582)	(0.593)	(0.570)	(0.716)	(0.825)	(0.785)
GDP	-0.174	-0.153	-0.186	-0.0073	-0.151	0.0274
	(0.171)	(0.179)	(0.162)	(0.156)	(0.181)	(0.169)
constant	4.722	3.975	5.275	16.47**	3.314	14.24*

	(3.917)	(3.144)	(3.277)	(6.626)	(6.264)	(7.111)
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Observations	118	118	118	65	65	65
R-squared	0.186	0.142	0.205	0.393	0.166	0.252
Number of code	17	17	17	17	17	17
First-stage diagnostic test						
Kleibergen-Paap rk Wald F	13.765	7.339		8.898	5.496	
Anderson-Rubin Wald test		(0.000)		(0.013)	(0.000)	
Stock-Wright LM S statistic		(0.002)		(0.011)	(0.007)	
Hansen J statistic	---[a]	---		2.951	1.873	
	---	---		(0.399)	(0.599)	

Note: The top panel of the table presents the second-stage results of panel FE IV regression (columns: 1, 2, 4, 5) and the results of panel FE regression (columns: 3, 6). Standard errors in parentheses. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.1. The bottom panel reports first-stage diagnostic tests. P-values in parentheses.
[a] Statistic not computable.
Source: Own elaboration

Conclusions

The paper offers an empirical analysis of fiscal determinants of total SFA and its selected components: non-foreign-exchange adjustments and net acquisition of financial assets. Taking into account data availability and comparability, the study considers the European Union countries in the years 2005-2016. The study exploits panel FE estimation and panel FE IV estimation. To test for robustness, baseline specification is supplemented with regressions over a shorter period (the years 2013-2016) and across a narrower sample (euro area countries).

There is no consistent empirical evidence in favor of Hypothesis 1. In various regressions the coefficients on budget balance are significantly negative, insignificant and significantly positive. The reason behind these discrepancies might be that we do not differentiate between for example: structural and cyclical balance, primary balance and interest payments. These inconclusive results offer an avenue for future research.

In line with (Buti et al., 2007), we find that SFA is negatively related to public debt (Hypothesis 2). In a wide sense, we conclude that among the EU countries SFA cannot be treated as a mere residual value. In a narrow sense, this result suggests that more indebted European Union countries are more inclined to keep public debt in check with the use of off-budget operations. Despite the fact that the reduction of extremely high public debt in some countries (especially Greece and Ireland) should be among the top priorities of fiscal policy, such measures are not likely to represent long-term structural reforms.

The study supports appeals for adopting a comprehensive approach to the assessment of fiscal policy stance. SFA should be given in-depth scrutiny. Otherwise, fiscal rules based exclusively on conventional measures of fiscal imbalance: budget deficit and public debt will be repeatedly circumvented through various accounting tricks.

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