Economics Bulletin

Volume 32, Issue 2

Fiscal Policy, Consumption and Current Account in the European Countries

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Abstract

This paper explores the relationship between fiscal deficit, trade deficit and private consumption in European countries in the years 1970-2010. The aim of the study is to test empirically the validity and rationale of the Keynesian proposition (conventional view or Twin Deficits hypothesis) and the Ricardian Equivalence hypothesis, as well as to analyze the relationship between fiscal policy and private consumption. The empirical findings of our study show mixed results. In fact, static panel data estimates suggest that a one per cent increase in fiscal deficit/GDP ratio tends to deteriorate the current account/GDP ratio of 0.21 per cent, although it increases the private consumption of 0.21 per cent. Furthermore, the dynamic estimates largely depend on the estimator chosen, since the GMM-Dif estimates show a significant effect of fiscal deficit both on trade balance and on private consumption, in line with TD hypothesis; on the contrary, GMM-Sys estimator suggests that these effects are irrelevant, supporting RE hy-pothesis. With regard to the former estimates, we observed that each euro rise in fiscal deficit is associated, on average, with a 22 cents decline in the current account, while the estimated rise in private consumption is smaller (11 cents). Finally, Granger causality tests show mixed results.

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Citation: Cosimo Magazzino, (2012) "Fiscal Policy, Consumption and Current Account in the European Countries", *Economics Bulletin*, Vol. 32 No. 2 pp. 1330-1344.
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Submitted: January 10, 2012. **Published:** May 01, 2012.

1. Introduction

The relationship between budget deficit and trade balance deficit has sparked a considerable amount of empirical work in recent years. According to the Ricardian view (Ricardo, 1888), deficits financed by either debt or taxation are economically equivalent. In fact, for a given expenditure path, substitution of debt for taxes has no effect on aggregate demand nor in interest rates. Starting from the Permanent Income-Life Cycle hypothesis (Friedman, 1957; Modigliani, 1976), and under the assumptions of an infinite horizon, non-distortionary taxes, a lack of liquidity constraints, farsighted and altruistic individuals, and a perfect capital market, a current tax cut will not yield an increase in consumption since non-myopic individuals will regard this policy as an increase of taxes in the future. Thus, government bonds represent a future tax liability.

An increase in the budget deficit will cause an increase in the aggregate demand and domestic real interest rates (Keynes, 1936). High interest rates will cause net capital inflow from abroad and result in appreciation of the domestic currency. This in turn will adversely affect net exports due to higher value of the domestic currency and thus there will be deterioration in the current account. Keynesian economists argue that deficits do not need to crowd out private investment. Therefore, a substitution of debt for taxes has a positive influence on private consumption and aggregate demand.

Furthermore, according to the Neo-Classical viewpoint, a country experiencing a financial or solvency crisis resulting from chronic, excessive current account deficits may face a situation in which large injections of public funds are required to rehabilitate troubled financial sectors, to improve the corporate governance system, and to attenuate a recession (Kim and Kim, 2006).

These different views yield very different policy implications. In fact, in a Ricardian economy, a fiscal financing scheme is irrelevant; only the level of government expenditures matters.

In Section 2 we briefly discuss the theoretical background, giving overall empirical evidence about these alternative theories. In Section 3 we present the econometric methodologies, the data and the empirical model. In Section 4 we present the econometric results, giving some policy implications in the last Section 5.

2. Overview of the related literature

Barro (1974) showed that if intergenerational altruism motivates consumers to leave bequests, then changes in the timing of lamp-sum taxes are irrelevant for the consumption decisions of individual consumers[1]. As Feldstein (1982) explained, consumers may correctly believe that a rise in current government spending is a good indicator of a higher level of future government spending. Bernheim and Bagwell (1988) review the assumptions on which the dynastic model is predicated, considering a world in which each generation consists of a large number of distinct individuals as opposed to one representative individual.

As clarified in Kim and Kim (2006), four possible causation linkages may be present between budget deficits and current account imbalances:

1. the Twin Deficits Keynesian (or conventional) view, based on the Mundell (1968) and Fleming (1962) model, with a chronic budget deficit that generates a trade

[1] For an exhaustive survey on the literature concerning the macroeconomic effects of government debt, see Elmendorf and Mankiw (1998). Seater (1993) and Ricciuti (2003) present rich surveys on RE.

deficit;
2. the Neo-classical view, if, in contrast to the previous case, chronic and excessive current account deficits may lead to budget deficits, in order to strengthen the recovery;
3. the Ricardian (or neutrality) view, which assume the absence of any causal relationship between trade deficits and budget deficits;
4. and, finally, the bi-directional hypothesis, according to which, whilst budget deficits may cause current account deficits, the existence of significant feedback may cause causality between the two variables to run in both directions.

Empirical investigation of the relationship between trade balance deficits and budget deficits provides contrasting results. Evans (1988), Miller and Russek (1989), Dewald and Ulan (1990), Enders and Lee (1990), and Becker (1997) supported the RE hypothesis. On the other hand, Bernheim (1987), Darrat (1988), Abell (1990), Zietz and Pemberton (1990), Rosensweig and Tallman (1993), Bahmani-Oskooee (1995), Egwaikhide (1999), Vamvoukas (1999), Chinn and Prasad (2000), Piersanti (2000), Akbostanci and Tunç (2002), Margani and Ricciuti (2004), Mohammadi (2004), Pattichis (2004), Saleh *et al.* (2005), Bartolini and Lahiri (2006), Parikh and Rao (2006), Baharumshah and Lau (2009), Hakro (2009), and Ratha (2010) argued in favour of the Keynesian proposition (the conventional view) that these twin deficits are closely linked and the budget deficit causes the trade deficit. The Neo-classical hypothesis received empirical support by Anoruo and Ramchander (1998), Bussière *et al.* (2005), Kim and Kim (2006), Marashdeh and Saleh (2006), Onafowora and Owoye (2006), and Kim and Roubini (2008). Islam (1998) and Mukhtar *et al.* (2007) contain results in line with the bilateral causality flow. Finally, very mixed results have been found in Enders and Lee (1990), Himarios (1995), Khalid (1996), Rockerbie (1997), Khalid and Guan (1999), Marinheiro (2001), Kouassi *et al.* (2004), Reitschuler and Cuaresma (2004), Hashemzadeh and Wilson (2006), Gruber and Kamin (2007), Nickel and Vansteenkiste (2008), and Daly and Siddiki (2009).

Table 1: An overview of empirical studies on RE and/or TD hypotheses

Author(s)	Countries	Time period
Afonso (2008)	EU-15	1970-2006
Akbostanci, Tunç (2002)	Turkey	1987-2001
Anoruo, Ramchander (1998)	India, Indonesia, Korea, Malaysia, the Philippines	1957-1993
Aristovnik, Djurić (2010)	EU countries	1995-2008
Baharumshah, Lau (2009)	Indonesia, Japan, Malaysia, Singapore, South Korea, the Philippines, Thailand	1980-2006
Bartolini, Lahiri (2006)	26 countries	1972-2003
Becker (1997)	U.S.A.	1960-1993
Bernheim (1987)	23 countries	1972-1983
Bohn (1992)	U.S.A.	1947-1989
Bussière et al. (2005)	21 OECD countries	1960-2003
Chinn, Prasad (2000)	18 industrial and 71 developing countries	1971-1995
Daly, Siddiki (2009)	23 OECD countries	1960-2000
Dewald, Ulan (1990)	U.S.A.	1954-1987
Drakos (2001)	Greece	1981-1996
Egwaikhide (1999)	Nigeria	1973-1993
Enders, Lee (1990)	U.S.A.	1947-1987
Evans (1988)	U.S.A.	1947-1985
Feldstein, Elmendorf (1990)	U.S.A.	1931-1985
Gruber, Kamin (2007)	61 countries	1982-2003
Hakro (2009)	Pakistan	1948-2005
Hashemzadeh, Wilson (2006)	Egypt, Iran, Jordan, Kuwait, Morocco, Oman, Syria, Turkey, Yemen	1982-2003
Himarios (1995)	U.S.A.	1953-1986
Hooper, Mann (1987)	U.S.A.	1969-1987
Islam (1998)	Brazil	1973-1991
Khalid (1996)	21 developing countries	1960-1988
Khalid, Guan (1999)	Australia, Canada, Egypt, France, India, Indonesia, Mexico, Pakistan, U.S.A., U.K.	1950-1994
Kim, Kim (2006)	South Korea	1970-2003
Kim, Roubini (2008)	U.S.A.	1973-2004
Kormendi (1983)	U.S.A.	1929-1976
Kouassi et al. (2004)	20 developed and developing countries	1969-1998
Marashdeh, Saleh (2006)	Lebanon	1970-2004
Margani, Ricciuti (2004)	18 developed countries	1973-1998
Marinheiro (2001)	Portugal	1953-1997
Mohammadi (2004)	63 countries	1975-1998
Mukhtar et al. (2007)	Pakistan	1975-2005
Nickel, Vansteenkiste (2008)	22 developed countries	1981-2005
Niple (2006)	U.S.A.	-
Normandin (1999)	Canada, U.S.A.	1950-1992
Onafowora, Owoye (2006)	Nigeria	1970-2001
Parikh, Rao (2006)	India	1970-2000
Pattichis (2004)	Lebanon	1982-1997
Piersanti (2000)	OECD countries	1970-1997
Ratha (2010)	India	1998-2009
Reitschuler, Cuaresma (2004)	26 OECD countries	1960-2002
Rockerbie (1997)	U.S.A.	1945-1991
Saleh et al. (2005)	Sri Lanka	1970-2003
Stanley (1998)	27 studies [a]	
Vamvoukas (1999)	Greece	1948-1994
Wroblowsky (2007)	33 studies [a]	

Note: a: meta-analysis studies.
Sources: our elaborations.

In the Table 1 above, we summarized some relevant empirical studies on RE and TD hypotheses.

3. Estimation procedure, data and the empirical model

In this paper, we used panel-type econometric methodologies. As for the static estimation methods, GLS-FE (*Generalized Least Squares-Fixed Effects*) model has been performed, while for the dynamic estimates we applied the GMM (*Generalized Method of Moments*) models.

Our sample consists of thirty-three European countries with annual data over the 1970-2010 period[2]. The data have been derived from World Bank[3] and AMECO[4] databases, freely downloadable on the internet.

The conventional view states that, given the path of government expenditures, substituting current taxes with budget deficits tends to reduce desired national savings, increase borrowing from abroad, and result in a current account deficit. In contrast, the RE hypothesis suggests that the decline in public savings is offset by an equal increase in desired private savings. Thus, national savings and the current account balance remain unchanged. An empirical approach that captures the essential features of both theories is presented in Bernheim (1987) and Bartolini and Lahiri (2006), and it can be given by (1) and (2)

$$CA_{i,t} = \alpha_0 + \alpha_1 Deficit_{i,t} + \alpha_2 GC_{i,t} + \alpha_3 Debt_{i,t} + \alpha_4 YG_{i,t} + \alpha_5 PopG_{i,t} \quad (1)$$

$$C_{i,t} = \beta_0 + \beta_1 Deficit_{i,t} + \beta_2 GC_{i,t} + \beta_3 Debt_{i,t} + \beta_4 YG_{i,t} + \beta_5 PopG_{i,t} \quad (2)$$

where $CA_{i,t}$ is a measure of current account balance for country i ($i = 1,\ldots,n$) at time t ($t = 1,\ldots,T$), $C_{i,t}$ is the private consumption, $Deficit_{i,t}$ is the fiscal deficit, $GC_{i,t}$ is the Government consumption, $Debt_{i,t}$ is the public debt, $YG_{i,t}$ is the income growth, and $PopG_{i,t}$ is the population growth.

The primary distinction between the RE and TD theories concerns the sign and significance of α_1 which is the response of the current account balance to a unit variation in fiscal deficit, *ceteris paribus*. The conventional view suggests that a rise in *Deficit* tends to deteriorate *CA*, giving $\alpha_1<0$, whilst private consumption should increase in response to an increase in the fiscal deficit, so that $\beta_1>0$. On the other hand, the Ricardian view predicts that $\alpha_1=\beta_1=0$, that is, neither current account nor the consumption should respond to changes in the fiscal deficit.

Furthermore, we expect that Government consumption, public debt (via increasing interest rate and exchange rate), income growth (through an increase of disposable income and aggregate demand) and population growth (having an effect on aggregate demand) would have a negative impact on trade balance, but a positive effect towards private consumption.

[2] Our sample includes 33 countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and UK.

[3] See the website: http://data.worldbank.org/topic.

[4] See the website: http://ec.europa.eu/economy_finance/ameco/user/serie/.

4. Empirical results

In Table 2 the variables of the estimated models are described.

Table 2: List of variables

Variable	Explanation	Source
CA	Current account balance, % of GDP	WB
C	Private consumption, % of GDP	WB
Deficit	Fiscal deficit, % of GDP	AMECO
GC	Government consumption, % of GDP	WB
Debt	Public debt, % of GDP	AMECO
YG	GDP growth, annual %	WB
PopG	Population growth, annual %	WB

In Table 3 we show some preliminary descriptive statistics.

Table 3: Exploratory data analysis

Variable	Mean	Median	Standard Deviation	Skewness	Kurtosis	Range
CA	-1.3656	-1.1564	5.6542	-0.5257	7.4135	61.4834
C	59.2038	58.1772	9.1833	0.6489	5.0513	84.2636
Deficit	-2.4884	-2.6755	4.6958	-0.1432	8.1627	51.5103
GC	18.3071	18.8038	4.5729	-0.2597	2.6663	23.8631
Debt	47.7175	45.2945	28.0833	0.6982	3.2409	139.0154
YG	3.0073	3.2786	3.8984	-1.7861	15.0376	52.3849
PopG	0.4521	0.4303	0.7631	-1.9905	24.1734	12.3042

Correlation coefficients summarized in Table 4 below indicate, especially, a low positive correlation between current account balance and fiscal deficit (r=0.26); also the correlation between private consumption and fiscal deficit is low, but negative (r=-0.30). In general, none of these correlations exceed ±0.50.

Table 4: Correlation matrix

	CA	C	Deficit	GC	Debt	YG	PopG
CA	1						
C	-0.4510	1					
Deficit	0.2613	-0.2991	1				
GC	0.0642	-0.3264	0.0274	1			
Debt	-0.1245	0.0211	0.1411	-0.1125	1		
YG	0.1154	-0.1240	0.1343	-0.1721	0.1820	1	
PopG	0.1105	0.0255	-0.4187	0.2176	-0.2261	0.0333	1

Notes: Bonferroni adjustment applied.

The estimates of the static panel methods, summarized in Table 5, suggest that, where the dependent variable is *CA*, the coefficient of fiscal deficit is negative and statistically significant, supporting the TD (or conventional) hypothesis. Thus, a one per cent increase in the fiscal deficit/GDP ratio tends to deteriorate the current account/GDP ratio of 0.21 per cent. Interestingly, the coefficients of public debt and population growth are negative and statistically significant (-0.06 and -2.25, respectively), while Government consumption and income growth are not significant. As for the regression on private consumption, fiscal deficit shows the expected positive sign. The coefficient is equal to 0.21, thus we can state that each dollar rise in fiscal deficits in our sample countries is associated with an average rise in private con-

sumption of 21 cents. In regard to the other regressors, our estimates underline that a one per cent increase in the Government consumption corresponds to a raise of private consumption/GDP ratio of 0.39 per cent. Finally, as in the previous regression, population growth exhibits a positive and significant coefficient (2.48).

Table 5: Static panel data estimates

	Dependent Variable	
	CA	C
Constant	4.4568	66.3459 ***
	(4.9911)	(3.5758)
Deficit	-0.2079 *	0.2099 ***
	(0.1213)	(0.0671)
GC	-0.3660	0.3885 **
	(0.2321)	(0.1636)
Debt	-0.0605 **	0.0106
	(0.0246)	(0.0176)
YG	-0.1503	0.1645
	(0.1107)	(0.1018)
PopG	-2.2473 *	2.4798 ***
	(1.2178)	(0.8403)
F	4.63	4.35
	(0.0027)	(0.0039)
R^2_{within}	0.1363	0.1809
BIC	3414.697	2519.864
Modified Wald test	2323.74 (0.0000)	15397.06 (0.0000)
Wooldridge test	124.249 (0.0000)	12.623 (0.0012)
RMSE	2.4706	2.1223

Notes: Number of groups=33. Asymptotic Standard Errors in parentheses. For the diagnostic tests P-Values are reported. Significance levels: * 10%, ** 5%, *** 1%.

In Table 6 are shown the results for the dynamic panel estimates. The second and third columns contain the results for the Arellano and Bond Difference GMM estimator, which treats the model as a system of equations, one for each time period; the equation differs only in their instrument/moment condition sets. The predetermined and endogenous variables in first differences are instrumented with suitable lags of their own levels. The dependent variable is specified in levels ($CA_{i,t}$ and $C_{i,t}$). We included the second lag of current account balance and private consumption, plus contemporaneous and lagged values of the explanatory variables in the instrument set. Only the equations in first-differences are used in estimation. While, in the last two columns the GMM-System estimates are shown. GMM-Sys is the augmented version of GMM outlined in Arellano and Bover (1995) and fully developed in Blundell and Bond (1998). Since lagged levels are often poor instruments for first differences, the original equations in levels can be added to the system, so that the additional moment conditions could increase efficiency. In these equations, predetermined and endogenous variables in levels are instrumented with suitable lags of their own first differences[5].

The autocorrelation test and the robust estimates of the coefficient standard errors assume no correlation across individuals in the idiosyncratic disturbances. Time dummies make this assumption more likely to hold. Moreover, we computed standard errors that are asymptoti-

[5] Blundell and Bond (1998) show that the lagged-level instruments in the Arellano and Bond (1991) estimator become weak as the autoregressive process becomes too persistent or the ratio of the variance of the panel-level effects to the variance of the idiosyncratic error it becomes too large.

cally robust to both heteroskedasticity and serial correlation, using the finite-sample correction proposed by Windmeijer (2005).

As we can observe from the GMM estimates, in the regression of *CA*, the lags of dependent variable are significant. Moreover, past values of public deficit affect the current account in the GMM-Dif estimates but not in the GMM-Sys one. So that we reach a contrasting result, since the former estimator would support the TD hypothesis, while the latter seems to be in favour of the RE. Moreover, the second lag of Government consumption ($GC_{i,t-2}$), the current value of public debt ($Debt_{i,t}$), the current and past values of income growth ($YG_{i,t}$ and $YG_{i,t-1}$), and the current and second lag of population growth ($PopG_{i,t-2}$) exhibit a negative and statistically significant sign.

In addition, our estimation results show that private consumption depends on its own current and past values. Yet, as in the previous case, we find mixed results as for the effect of fiscal deficit; in fact, in the Difference GMM estimates the second lag of *Deficit* has a positive and significant effect on *C*, whilst in the GMM-System estimates neither the current value nor the lags of fiscal deficit influence private consumption. Therefore, the conclusions largely depend on which estimator we adopt. Furthermore, these estimates diverge also about the effect of the other regressors, because of the significance of public debt, income growth and population growth is questioned by GMM-Dif estimates in the consumption equation. Nevertheless, our major finding may support the argument that consumption responds significantly to fiscal policy changes.

With regard to the diagnostic checks, as shown in Arellano and Bond (1991), only for a homoskedastic error term the Sargan test has an asymptotic chi-squared distribution. Here, we cannot reject the null hypothesis that the over-identifying restrictions are valid (at a 1% significance level). When the idiosyncratic errors are independently and identically distributed (i.i.d.), the first-differenced errors are first-order serially correlated. So, as expected, the output below presents strong evidence against the null hypothesis of zero autocorrelation in the first-differenced errors at order 1. Serial correlation in the first-differenced errors at an order higher than 1 implies that the moment conditions used by GMM are not valid. Yet, the Arellano and Bond test for second order serial correlation doesn't reject H_0.

Table 6: Dynamic panel data estimates

	Dependent variable			
	GMM-Dif		GMM-Sys	
	CA	C	CA	C
Constant			1.1424	13.8280 ***
			(2.3936)	(5.3047)
$CA_{i,t-1}$	0.7495 ***		0.5448 ***	
	(0.0427)		(0.0429)	
$CA_{i,t-2}$	0.0078		0.1615 **	
	(0.0609)		(0.0744)	
$C_{i,t-1}$		0.5419 ***		0.4379 ***
		(0.0943)		(0.0886)
$C_{i,t-2}$		0.0832 **		0.4061 ***
		(0.0408)		(0.0439)
$Deficit_{i,t}$	-0.0800	0.0737	-0.1654	0.0062
	(0.0857)	(0.0973)	(0.1015)	(0.1170)
$Deficit_{i,t-1}$	-0.2175 **	0.0071	-0.0559	-0.0126
	(0.0871)	(0.0554)	(0.0687)	(0.0505)
$Deficit_{i,t-2}$	0.0123	0.1106 *	0.0380	0.1102
	(0.0501)	(0.0651)	(0.0521)	(0.0754)
$GC_{i,t}$	-0.0761	0.4482 *	-0.1135	0.5089 *
	(0.2209)	(0.2610)	(0.2339)	(0.2944)
$GC_{i,t-1}$	-0.0233	0.2695	-0.1767	0.3346 *
	(0.2238)	(0.2073)	(0.1946)	(0.1787)
$GC_{i,t-2}$	-0.0953	-0.0557	-0.2987 ***	0.0105
	(0.1246)	(0.1083)	(0.1145)	(0.1481)
$Debt_{i,t}$	-0.1478 *	0.0616	-0.0954	0.0444
	(0.0871)	(0.0579)	(0.0956)	(0.0729)
$Debt_{i,t-1}$	0.2042	-0.0707	0.1948	-0.1220
	(0.1407)	(0.0672)	(0.1350)	(0.0866)
$Debt_{i,t-2}$	-0.0491	0.0013	-0.0808	0.0598 **
	(0.0618)	(0.0237)	(0.0574)	(0.0246)
$YG_{i,t}$	-0.3049 ***	-0.1040	-0.3351 ***	-0.0906
	(0.0962)	(0.1739)	(0.1157)	(0.2044)
$YG_{i,t-1}$	-0.1922 ***	0.1744	-0.2918 ***	0.2407 **
	(0.0478)	(0.1331)	(0.0654)	(0.1203)
$YG_{i,t-2}$	0.0416	0.0321	-0.0547	0.0302
	(0.1165)	(0.0401)	(0.0487)	(0.0370)
$PopG_{i,t}$	0.5705	0.4379	-0.6926 *	0.5192 **
	(0.3545)	(0.3246)	(0.3986)	(0.2546)
$PopG_{i,t-1}$	-0.6330	0.0286	-0.3681	0.0349
	(0.4171)	(0.2874)	(0.2851)	(0.3386)
$PopG_{i,t-2}$	-0.6760 *	-0.3831	-0.2617	0.5148 **
	(0.4116)	(0.4033)	(0.4178)	(0.2616)
Wald	(0.000)	(0.000)	(0.000)	(0.000)
A.-Bond AR(1)	(0.000)	(0.060)	(0.000)	(0.024)
A.-Bond AR(2)	(0.139)	(0.394)	(0.052)	(0.059)
Dif. Sargan	(0.902)	(0.873)	(0.915)	(0.948)

Notes: Number of groups=33. Asymptotic Standard Errors in parentheses. For the diagnostic tests P-Values are reported. Significance levels: * 10%, ** 5%, *** 1%.

As discussed above, our estimates reveal mixed results both as regards the relationship between fiscal deficit and trade balance and that of between private consumption and fiscal deficit. Notwithstanding, each euro rise in the fiscal deficit is associated, on average, with a 22 cents decline in the current account, while the estimated rise in the private consumption is smaller (11 cents).

The empirical findings on the TD relationship are in line with that of previous studies. In fact, previous evidence has put the range of the fiscal deficit's impact on the trade balance

from a high of 0.65 in Hooper and Mann (1987) to a middle of 0.35 to 0.50 in Congressional Budget Office (1989) and Mohammadi (2000) to a low of 0.30 in Bernheim (1987), Arora and Dua (1993), Mohammadi (2004) and Bartolini and Lahiri (2006), and close to zero in Enders and Lee (1990).

Indeed, our estimates on the impact of the fiscal deficit on the trade balance substantially differ to that of calculated by Bernheim (1987) – which put this increase in the range of 40 to 50 cents – and by Bartolini and Lahiri (2006), of about 33 to 37 cents, suggesting that the effects of fiscal policy changes on consumption and saving may have weakened over time.

In Table 7 we report the results of dynamic estimations having run the regressions after removing the fiscal deficit at time *t* to detect potential reverse causality in the previous empirical findings[6]. Notwithstanding, the new estimates roughly confirm those in Table 6, inasmuch as the only difference is the statistical significance of $Deficit_{i,t-2}$ in the GMM-Sys regression for consumption. The test for autocorrelation presents no evidence of model misspecification.

Table 7: Dynamic panel data estimates (without current fiscal deficit at time t)

	Dependent variable			
	GMM-Dif		GMM-Sys	
	CA	C	CA	C
Constant			1.0302	13.8280 ***
			(2.3485)	(5.3047)
$CA_{i,t-1}$	0.7451 ***		0.5462 ***	
	(0.0438)		(0.0510)	
$CA_{i,t-2}$	0.0164		0.1603 **	
	(0.0623)		(0.0714)	
$C_{i,t-1}$		0.5424 ***		0.4226 ***
		(0.0937)		(0.0961)
$C_{i,t-2}$		0.0802 **		0.3923 ***
		(0.0400)		(0.0400)
$Deficit_{i,t-1}$	-0.1744 ***	0.0462	-0.0229	-0.0058
	(0.0521)	(0.0523)	(0.0707)	(0.0451)
$Deficit_{i,t-2}$	0.0146	0.1072 *	0.0516	0.1305 **
	(0.0501)	(0.0620)	(0.0538)	(0.0591)
Wald	(0.000)	(0.000)	(0.000)	(0.000)
A.-Bond AR(1)	(0.000)	(0.061)	(0.000)	(0.019)
A.-Bond AR(2)	(0.136)	(0.402)	(0.084)	(0.066)
Dif. Sargan	(0.908)	(0.858)	(0.935)	(0.953)

Notes: Number of groups=33. Asymptotic Standard Errors in parentheses. For the diagnostic tests P-Values are reported. Significance levels: * 10%, ** 5%, *** 1%.

As a final step, in order to analyze potential reverse causality in the previous regressions, we perform Granger causality tests. Their results suggest a bi-directional flow (with a feedback mechanism) for current account balance and fiscal deficit in four countries. TD hypothesis (if causality runs form budget deficit to trade balance) is confirmed in seven cases. On the other hand, we find a unidirectional causality, running from fiscal deficit to current account balance in line with Neo-Classical view, for six countries. While thirteen countries exhibit the absence of any causal relationship between trade deficits and budget deficits, as predicted by RE hypothesis[7]. The empirical findings do not change deeply when the consumption-fiscal

[6] In order to save space, we show only the relevant coefficients and SEs, while the complete output of these estimates is available upon request.

[7] Croatia, Macedonia and Turkey are missed because of data availability.

deficit relationship is investigated.

Table 8: Summary of Granger causality tests

Deficit and Current Account		
Hypothesis	Causality direction	Countries
Ricardian Equivalence	Deficit⇎CA	13: Denmark, Estonia, Finland, France, Germany, Italy, Lithuania, Luxembourg, Malta, Norway, Poland, Portugal, UK
Twin Deficits	Deficit→CA	7: Austria, Bulgaria, Cyprus, Czech Republic, Slovakia, Slovenia, Sweden
Neo-Classical	CA→Deficit	6: Hungary, Iceland, Latvia, the Netherlands, Spain, Switzerland
Feedback mechanism	Deficit↔CA	4: Belgium, Greece, Ireland, Romania
Deficit and Consumption		
Ricardian Equivalence	Deficit⇎C	10: Austria, Czech Republic, Denmark, Estonia, Germany, Malta, Norway, Romania, Sweden, UK
Twin Deficits	Deficit→C	9: Cyprus, Finland, France, Iceland, Italy, Latvia, Luxembourg, the Netherlands, Spain
Neo-Classical	C→Deficit	5: Hungary, Portugal, Slovakia, Slovenia, Switzerland
Feedback mechanism	Deficit↔C	6: Belgium, Bulgaria, Greece, Ireland, Lithuania, Poland

In Table 8 we summed up the empirical findings due to causality analyses for an easier reading[8]. Although in no way a pattern may be detected given the heterogeneity nature of the country groups, it could be underlined that only for twelve countries causality flow assumes the same direction both for deficit-current account relationship and for deficit-consumption one, while for Iceland, Latvia, Lithuania, the Netherlands, Poland, Romania, Slovakia, Slovenia, and Spain the two relationship reach opposite conclusions.

5. Concluding remarks

We used static and dynamic panel estimators in order to revise the effects of fiscal deficit on trade balance and private consumption in the Euroarea countries, in the years 1970-2010. In general, we found mixed results. In fact, static panel data estimates suggest that a one per cent increase in the fiscal deficit/GDP ratio tends to deteriorate the current account/GDP ratio of 0.21 per cent, although it promotes private consumption of 0.21 per cent. Moreover, FE estimator confirms the TD hypothesis, since the coefficient of fiscal deficit is statistically significant ($\alpha_1<0$). Yet, the dynamic estimates reach contrasting results, so that the conclusions largely depend on which estimator we choose. In fact, GMM-Dif estimates signal a significant effect of fiscal deficit both on trade balance and on private consumption, in line with TD hypothesis; on the contrary, the GMM-Sys method suggests that these effects are irrelevant, supporting RE hypothesis. As to the former estimates, we observed that each euro rise in the fiscal deficit is associated, on average, with a 22 cents decline in the current account, while the estimated rise in private consumption is smaller (11 cents). The results on the effect of fiscal deficit on current account are broadly consistent in respect to that of shown in previous applied studies, while the estimated rise in private consumption is smaller than the increase previously calculated suggesting that the effects of fiscal policy changes on consumption and saving may have weakened over time, and they could depend on the sample countries. This difference in the results might due to the different properties of the adopted estimator. We stress the findings of GMM-Sys estimator since it uses additional moment conditions. Nevertheless, this point could be the object of new research program. Finally, Granger causality

[8] Causality tests details results are available upon request.

tests reach mixed results.

Therefore, RE remains controversial because it depends on assumptions about the public's foresight and grasp of the fiscal system closely related to the rational-expectations hypothesis and on debatable assumptions about the incidence of taxes and expenditure (Laffer, 1981; Armey, 1995; Forte and Magazzino, 2011; Magazzino, 2011).

Acknowledgements

The Author is especially grateful to Francesco Forte (Sapienza-University of Rome), Mauro Costantini (Brunel University) and Gian Cesare Romagnoli (Roma Tre University) as well as the anonymous referees and the Editors of *Economics Bulletin* for their helpful and valuable comments. However, the usual disclaimer applies.

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Appendix

Figure 1: Current account balance and private consumption in European countries (% of GDP)