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Should fiscal policy be relaxed
in the eurozone?

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Θα πρέπει να χαλαρώσει η δημοσιονομική πολιτική στην ευρωζώνη;

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Περίληψη

Σκοπός του άρθρου είναι να διερευνήσει την επίδραση της δημοσιονομικής πολιτικής στο εμπορικό ισοζύγιο. Για την εμπειρική ανάλυση χρησιμοποιούνται τριμηνιαία στατιστικά δεδομένα της περιόδου 2000-12, ενώ το δείγμα περιλαμβάνει τις χώρες της Ευρωζώνης. Ο FMOLS εκτιμητής χρησιμοποιείται για την οικονομετρική εκτίμηση των panel δεδομένων. Τα αποτελέσματα δείχνουν ότι η σύνθεση της συνολικής ζήτησης επιδρά στον εξωτερικό τομέα. Συγκεκριμένα, καταλήγουμε στο συμπέρασμα ότι μια αύξηση της δημόσιας δαπάνης οδηγεί σε αύξηση των εισαγωγών και ceteris paribus, αυτό μπορεί να προκαλέσει χειροτέρευση του εμπορικού ισοζυγίου.

Should fiscal policy be relaxed in the eurozone?

by

Ioanna Konstantakopoulou[1]

Abstract

The purpose of this paper is to study the impact of fiscal policy on the trade account. The empirical analysis is based on quarterly data of the euro area economies for the period 2000-2012. A fully modified OLS estimator is used for the econometric analysis. *We provide empirical indications that the composition of total demand affects the result of the external sector.* We find that an increase in government expenditures leads to an increase in imports; this implies that, ceteris paribus that it can lead to a deterioration of the trade balance.

Key words: Fiscal policy; current account; twin deficits; cointegration.

JEL classifications: F40, E62, H3.

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1. Introduction

Recent policy discussions point to the conclusion that fiscal discipline in the eurozone is perhaps too much of a straightjacket. In this paper we analyze the question using the effect, if any, of fiscal policy on the current account. Several studies have been conducted using different methodologies, samples of countries and time periods to investigate the relationship between fiscal policy and current account deficits. The possible link between the budget deficit and the current account deficit renders the investigation of such issues particularly interesting as, in the last years, the economies of southern Eurozone countries[2], which include the Greek economy, are characterized by twin deficits.

Therefore, the crucial question raised is whether and to what extent fiscal policy could solve the problem of external imbalances.

It is commonly held that changes in fiscal policy are associated with changes in the current account; however, the results of studies on the sing of the relationship are conflicting. More specifically, it is supported that low government expenditure and improvement in the fiscal balance lead to an improvement in the current account deficit and large budget deficits lead to high deficits in the current account, while other studies lead to negative relationship.

More specifically, Abbas et al. (2010) accept the existence of a relationship between fiscal policy and current account deficits, using a panel analysis of 124 countries and conclude that fiscal expansion worsens the current account. Beetsman et al. (2007), agree with the negative relationship using similar methodologies, on a sample of the EU-15. Also Monacelli and Perotti (2010), find strong evidence to support the case of twin deficits. They find that a rise in government spending causes a depreciation of the real exchange rate and a trade balance deficit. Miller and Russek (1992) argue that the expansion of budget deficit is associated with an increase in the current account deficit. Similar results have been obtained by Roubini (1988) and Summers (1986), while Bernheim (1988) associates any government budget surpluses with surpluses in the external sector. Finally, Corsetti and Muller (2006) argue that the effects of expansionary fiscal policy lead to a worsening external deficit.

In contrast, Khalid and Guan (1999) reject a relationship between budget and current account deficit for developed economies, while in developing countries this relationship holds. In the same direction, Kim and Roubini (2008), using panel cointegration analysis for 48

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2 In case of Italy, the result of the current account was positive.

countries, indicate that an increase in short-term government budget deficit leads to a marginal improvement in current account deficit.

This paper investigates the impact of fiscal policies on current account in the Eurozone using panel cointegration analysis. Specifically, we study the effects of a permanent change in public spending on the trade balance, as the latter is at the heart of the problem of current account deficits, by analyzing the relationship of public spending and imports.

We investigate the impact of the *composition* of total demand on the trade account deficit, or how the breakdown into public demand, private demand and export demand affect the size of the trade balance deficit. We focus on component imports because the demand for imports is determined by domestic demand factors, while exports depend on external demand factors. To understand the effects of fiscal policy, we do not follow the traditional methodology, which considers that total domestic spending affects imports and break down its components (domestic expenditure components): private consumption, private investment, public investment, and exports, allowing substantially different elasticities.

The remainder of this paper is organized as follows. Section 2 describes the model. Section 3 presents the econometric method and empirical results. Section 4 presents the conclusions.

2   Specification of the model

Our analysis focuses on the impact of fiscal policy on the trade balance, since, as we mentioned, in many Eurozone countries the latter is the main component of the current account deficit. We base the analysis on an extension of the traditional model of trade balance. More specifically, the basic trade model consists of an import and an export equation, which relates import and export volumes to domestic and foreign real income and relative prices.

Exports

$$X_t = a_0 Y_t^{*a_1} rp_t^{a_2},$$

in logs $x_t = a_0 + a_1 y_t^* + a_2 rp_t$ $\qquad\qquad\qquad\qquad$ (1)

Imports $M_t = \beta_0 Y_t^{\beta_1} rp_t^{\beta_2},$

in logs $m_t = \beta_0 + \beta_1 y_t + \beta_2 rp_t$ $\qquad\qquad\qquad\qquad$ (2)

where a_1 and β_1 are the income elasticities, a_2 and β_2 are the price elasticities of exports and imports, y_t are the real income, which equals the sum of the demand components (private

consumption, public spending, private investments and net exports), y_t^* is the foreign real income and rp_t denotes relatives prices.

Previous empirical studies have found that demand for imports is not determined only by the level of domestic income and the final expenditure but also by the composition of expenditure (Abbort and Seddighi 1996, Giovannetti 1989, and Mohhammad and Tang 2000). A basic result arising from literature is that at least private consumption and public expenditure elasticities present common elasticities. Thus, *the impact of fiscal policy measures in import demand is not taken into account by the existing literature*. The model that we analyze allows us to measure the effect of a change in public expenditure on imports because we analyze the domestic real income in the components of demand and view private and public consumption expenditure separately.

The extended import equation has the following form:

$$M_t = \gamma_0 C_t^{\gamma_1} I_t^{\gamma_2} G_t^{\gamma_3} X_t^{\gamma_4} RP_t^{\gamma_5}$$

in logs $\qquad m_t = \gamma_0 + \gamma_1 c_t + \gamma_2 i_t + \gamma_3 g_t + \gamma_4 x_t + \gamma_5 rp_t$ (3)

Equation (3) permits different import elasticities for private consumption and government expenditure. We estimate equation (3) in order to investigate long-term equilibrium relationship between variables.

3. Econometric Analysis

3.1 Introduction

Our econometric analysis is conducted as follows. First, we detect the nature of the underlying time-series properties using panel unit root tests. Second, we use panel cointegration tests because they offer beneficial results in terms of power. Cointegration vectors are estimated by means of the fully modified (FM) OLS estimation technique for heterogeneous cointegrated panels (Pedroni 2000).

All data are derived from the International Monetary Fund (IFS), for the period 2000:I-2012:IV, for the eurozone countries: Germany, France, Italy, Spain, the Netherlands, Greece, Belgium, Portugal, Austria, Finland, Ireland and Luxembourg. The variables chosen for our analysis are: volume of imports, real exports, real income, real private consumption, real public spending and the relative prices.

3.2 Testing for Integration

To test for stationarity of the time series, four panel unit root tests are used: Levin, Lin and Chu (2002) - hereafter the LLC test, the IPS test of Im, Pesaran and Shin (2003), the MW test of Maddala and Wu (1999), and a test belonging to the same category, the Choi (2001) test. These tests have non-stationarity (i.e., the existence of a unit root) as the null hypothesis. The results of the panel unit roots tests for each variable are shown in Table I.

We fail to reject the null hypothesis of unit root for all variables in log levels, but we reject it for their first differences.

Table I: Panel Cointegration tests		
	Panel cointegration statistics	Group-mean panel cointegration statistics
Variance ratio	-2.98***	
PP rho-statistics	-4.95***	-2.95***
PP t-statistics	-7.10***	-5.16***
ADF statistics	-6.66***	-3.9***

Note: *** indicate a rejection of the null hypothesis of no cointegration at the 1% level.
All test statistics are asymptotically normally distributed.

3.3. Testing for Cointegration

We conduct panel cointegration tests to examine whether there is a cointegatining relationship between the variables. The panel cointegration tests offer beneficial results in terms of power. Moreover, these tests allow for heterogeneity in the slopes of the cointegrating equation. Pedroni (1999, 2004) proposes seven tests that follow asymptotically standard normal distributions. First of all, he constructs three non-parametric tests that correct for serial correlation, a non-parametric variance ratio statistic, a test analogous to the Phillips and Perron (PP) rho-statistic and, a test analogous to the PP t-statistic. These panel statistics are based on pooling the data along the within dimension of the panel. He also constructs a fourth parametric test similar to the ADF-type test. The other three panel cointegration statistics are based on a group mean approach. The first two of the group-mean panel cointegration statistics are panel versions of the Phillips and Perron rho and t-statistics, respectively. The third is a group-mean ADF test analogous to the Im, Pesaran, and Shin (2003) panel unit root test. In all seven tests, the null hypothesis is of no cointegration, with different alternative hypothesis. The results of the Pedroni tests are presented in Table II. They support the hypothesis that there exists a long-run relationships between variables.

Table II: Panel Unit Roots Tests												
	Intercept and trend											
Log	**Exports**				**Imports**				**Government expenditure**			
Total	Level		Differences		Level		Differences		Level		Differences	
	Test statistic	Prob.	Test statistic	Prob.	Test statistic	Prob.	Test statistic	Prob.	Test statistic	Prob.	Test statistic	Prob.
IPS	-0,92	0,367	-3,2	0,000	0,587	0,621	-5,5	0,000	0,714	0,762	-14,2	0,000
ADF-Fisher	19,27	0,467	62,01	0,000	19,45	0,727	71,07	0,000	23,29	0,502	130,22	0,000
PP-Fisher	27,05	0,105	47,95	0,000	16,73	0,559	220,87	0,000	34,09	0,210	190,43	0,000

	Intercept and trend											
Log	**Consumption**				**Relative Prices**				**Investments**			
Total	Level		Differences		Level		Differences		Level		Differences	
	Test statistic	Prob.	Test statistic	Prob.	Test statistic	Prob.	Test statistic	Prob.	Test statistic	Prob.	Test statistic	Prob.
IPS	-0,16	0,434	-14,76	0,000	1,84	0,967	-9,76	0,000	-1,09	0,080	-4,04	0,000
ADF-Fisher	21,15	0,629	210,87	0,000	8,82	0,989	129,8	0,000	21,87	0,351	60,04	0,000
PP-Fisher	27,08	0,232	280,82	0,000	2,71	0,977	174,62	0,000	19,87	0,108	112,16	0,000

Notes: a) Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality, b) Assume Ho: No unit root

3.4 Estimation of the cointegration vector

To estimate the long-run relationship between variables there is a variety of estimators. These include within-group and between-group fully modified OLS (FMOLS) estimators and dynamic OLS (DOLS) estimators. FMOLS is a non-parametric approach to dealing with correlation for serial correlation. DOLS is a parametric approach in which lags and leads are introduced to cope with the problem irrespectively of the order of integration and the existence or absence thereof of cointegration[3].

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[3] Pedroni (2001) has suggested a between-dimension, group-means panel DOLS estimator that incorporates corrections for endogeneity and serial correlation parametrically. He used the following regression model which

includes lead and lag dynamics: $y_{it}=\alpha_i+\beta_i x_{it}+\sum_{j=-K_I}^{K_I}\gamma_{ik}\Delta x_{i,t-k}+e_{it}$ where

$\hat{\beta}_{i,DOLS}=\left[N^{-1}\sum_{i=1}^{N}\left(\sum_{t=1}^{T}z_{it}z_{it}'\right)^{-1}\left(\sum_{t=1}^{T}z_{it}\bar{y}_{it}\right)\right]_1$ (*) and z_{it} is the $2(k+1)\times 1$ vector of regressors

$z_{it}=\{(x_{it}-\bar{x}_i),\ \Delta x_{it-k,......}\Delta x_{it+K}\}$; $\tilde{y}_{it}=y_{it}-\bar{y}_i$; the subscript 1 outside the brackets in (*) indicate that only the first element of the vector is taken to obtain the pooled slope coefficient.

We follow the FMOLS method appropriate for heterogeneous cointegrated panels (Pedroni, 2000). This does not have the drawbacks of the OLS method of estimation, which, as Pedroni noted, are associated with the fact that a standard panel OLS estimator is asymptotically biased and that its distribution is dependent on nuisance parameters associated with the dynamics underlying processes of variables. To eliminate the problem of bias due to the endogeneity of the regressors, Pedroni developed the group-means FMOLS estimator, by incorporating the Phillips and Hansen (1990) semi-parametric correction into the OLS estimator. The technique also accounts fully for heterogeneity in short-run dynamics as well as for fixed effects. Consider the following cointegrated system for a simple two variable panel of $i = 1,.......N$ members,

$$y_{it} = a_{it} + \beta x_{it} + u_{it} \tag{4}$$

The FMOLS estimator is:

$$\hat{\beta}_{i,FMOLS} = N^{-1} \sum_{i=1}^{N} \left(\sum_{t=1}^{T} (x_{it} - \bar{x}_i)^2 \right)^{-1} \left(\sum_{t=1}^{T} (x_{it} - \bar{x}_i) y_{it}^* - T\hat{y}_i \right) \tag{5}$$

where

$$y_{it}^* = (x_{it} - \bar{x}_i) - \frac{\hat{\Omega}_{21i}}{\hat{\Omega}_{22i}} \Delta x_{it} \tag{6}$$

$$\hat{\gamma}_{it} = \hat{\Gamma}_{21i} - \hat{\Omega}_{21i}^0 - \frac{\hat{\Omega}_{21i}}{\hat{\Omega}_{22i}} \left(\hat{\Gamma}_{22i} - \hat{\Omega}_{22i}^0 \right) \tag{7}$$

$\hat{\Omega}$ and $\hat{\Gamma}$ are covariances and sums of autocovariances obtained from the long-run covariance matrix for model (4).

Panel cointegration regression is estimated by imposing common time dummies on the regression. The common time dummies allow for more general dynamic structure. FMOLS estimates of the cointegrating relationships are presented in Table III on a per country basis and for the panel as a whole. For the panel estimates, including the time dummies, the coefficients of all variables are statistically significant. Moreover, *an increase in the government expenditures by 1 percent leads to an increase in goods imports by about 0.42 percent in the eurozone*. Thus, the application of an expansionary fiscal policy leads to a deterioration of the trade balance.

Table III: FMOLS Results

	Government expenditure		Consumption		Investments		Exports		Relative Prices	
Germany	0,09	[3,51]	0,96	[3,51]	0,54	[8,54]	0,07	[2,45]	-0,12	[-2,05]
France	0,13	[3,31]	0,43	[3,35]	0,34	[2,12]	0,79	[6,24]	-0,09	[-1,95]
Italy	0,41	[2,78]	1,23	[4,99]	0,10	[3,38]	0,53	[4,41]	-0,01	[-4,44]
Spain	-0,35	[-1,03]	0,88	[3,48]	0,43	[3,33]	0,53	[3,04]	-0,03	[-2,95]
Netherlands	0,18	[3,08]	-0,16	[-3,84]	0,43	[5,92]	0,70	[14,99]	-0,01	[-2,85]
Greece	0,36	[4,56]	0,83	[7,62]	0,52	[7,51]	0,11	[8,53]	0,00	[1,80]
Belgium	0,47	[1,25]	0,37	[1,33]	0,56	[3,90]	0,86	[13,68]	0,00	[-2,23]
Portugal	0,12	[1,76]	0,89	[8,05]	0,78	[8,28]	0,44	[5,08]	0,00	[-1,65]
Austria	0,11	[2,21]	0,09	[1,12]	0,55	[9,19]	0,75	[17,29]	0,00	[1,09]
Finland	0,51	[1,87]	0,18	[4,26]	0,45	[3,56]	0,65	[10,35]	-0,01	[-1,47]
Ireland	0,68	[4,08]	0,71	[3,98]	0,30	[4,50]	0,67	[6,50]	-0,01	[-4,33]
Luxembourg	0,69	[23,07]	0,02	[0,43]	0,00	[-2,2]	-0,02	[-7,31]	-0,02	[-7,31]
	0,42	**[7,72]**	**0,53**	**[9,46]**	**0,46**	**[14,65]**	**0,62**	**[15,99]**	**-0,08**	**[-8,66]**

Note: Figures in brackets are t-statistics.

4. Conclusions

This paper examines the empirical relationship between fiscal policy and current account deficits. The results show that the implemented fiscal policy affects the trade balance. Previous studies did not take into consideration that the components of private and public demand in the import equation would have different long-term elasticities. Using panel cointegration analysis for the Eurozone countries, we find that an increase in public spending has a significant effect on imports; particularly an increase in public spending by 1 percent will result in an increase in imports of 0.42 percent. Therefore, keeping other factors constant would lead to a worsening trade balance.

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