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On the Stock Markets' Reactions to Taxation and Public Expenditure

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Abstract

In this paper a panel analysis is employed to investigate the effects of governments' expenditure and taxation on stock market indexes in 11 members of the Eurozone. A significant number of studies have focused on the effects of monetary policy on the Eurozone stock markets, while only a limited number of papers have investigated the effects of fiscal policy on the stock markets. Therefore, we know little, if anything, on the sign and the stability of the stock markets' reaction to taxation and public expenditure. Our results show that fiscal maneuvers influence stock markets and that, following an increase (decrease) in public deficit, stock markets indexes go down (up). Nevertheless, further analysis shows that the signs of the estimated stock markets' reactions are not constant over time and that they can change according to the surrounding macroeconomic scenario.

Keywords: Stock Market, Fiscal Policy, Eurozone

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1. Introduction

Over the last decades, important economic events have captured the attention of policy makers and academics towards the effects of fiscal policies. In the context of the Eurozone, relevant issues refer to the governments' deficit and debt limits coupled with the independency of national governments' fiscal policies, the sudden occurrence of the global financial crisis, and the sovereign debt crisis affecting some member countries. All these events have called for the assessment of the fiscal policy effects on the general level of economic activity, assets markets, credit markets and net exports.

As we know, stock price indexes reflect the net present value of future profits of large companies as opposed to overall economic performance. Then, such indexes also reflect the changes in macroeconomic fundamentals and policy maneuvers. Concerning the latter, several studies have analyzed the reaction of stock markets to monetary policies, while the number of contributions focusing on the effects of fiscal policies on stock markets is surprisingly limited. The aim of this paper is to examine the effects of changes in public expenditure and taxation on stock markets on the basis of a panel of 11 member countries of the Eurozone with quarterly data spanning the period 1999:Q1 – 2012:Q1.

The effects of fiscal policy on the level of economic activity are the subject of a long-lasting debate in economic theory. There are three ways of modeling such effects according to the fact that an economic system is intended to function in a Keynesian, Classical or Ricardian fashion. Keynesian economics focuses on the effects of the fiscal multiplier and assumes that increasing primary public deficits causes an increase in the level of economic activity. By applying a Ricardian view, another part of the economic theory assumes that fiscal policy has no effects on the level of economic activity. Based on the Ricardian view and on the Classical economics concept of the crowding out effect, another stream (called as the non-Keynesian view, NKV) provides evidence for possible contractionary effects of fiscal spending (non-Keynesian effects of fiscal policies).

Depending on the view adopted, the understanding and the prediction of the stock markets' reaction to fiscal policies change completely. If stock markets operators assume Keynesian effects of fiscal policies, the effects of public deficits expansions on stock markets are supposed to be positive. If stock markets agents assume a pure Ricardian vision, their choices should not be influenced by fiscal maneuvers and stock indexes should not vary in response to such policies. A negative reaction of stock markets can be expected if their operators intend the effects of an increase in public budget deficits as contractionary. An additional element that should affect the stock markets' reaction to fiscal policies is the dynamic of the level of public debt, as the more stock markets agents are worried about the level of public debt, the more stock markets indexes can react negatively to an increase in primary deficit.

In this regard, the main contributions of the paper to the existing literature can be described as follows. First, by employing panel DOLS estimations, we examine the effects of both governments' revenues and expenditures on the stock markets separately, considering also some additional control variables among which we include monetary policy. Second, we verify that stock markets react to fiscal maneuvers and thus public expenditures and revenues variations can be considered in order to avoid stock markets downturns as the ones occurring during the recent financial and debt crises in the Eurozone. Third, differently to previous studies, we also perform a time varying coefficients analysis in order to understand whether the estimated relation between stock markets indexes and fiscal policy is stable over time in our sample, or such relationship depends on the macroeconomic scenario.

As a first step, from the panel estimations we are able to confirm the results of recent studies showing that stock markets rise following fiscal consolidations and plunge after loose fiscal policies (Ardagna, 2009). Nevertheless, as our main contribution, we also show that in our panel such relationship does not hold during the global financial crisis, as in this period stock markets indexes rise following expansionary fiscal policies and go down after fiscal retrenchments.

The rest of the paper is organized as follows. Section 2 reviews the literature that is relevant for this study. Section 3 describes the methodology employed. Section 4 presents the empirical findings. Section 5 concludes the paper along with some policy implications.

2. Related Literature

The theoretical understanding of stock markets' reaction to fiscal policies has been set out in a series of papers (see for instance Shah, 1964; Tobin, 1969; Blanchard, 1981; and Charpe et al., 2011). In these studies, fiscal policy affects stock markets thanks to its effects on the level of economic activity. Therefore, according to economic theory, these effects can be positive, negative or null depending on the assumption on the effects of fiscal policies on the level of economic activity (Keynesian, Classical or Ricardian; see Barnheim, 1989). Needless to say, this is the perfect premise for an empirical investigation. Nevertheless, the empirical literature on the effects of macroeconomic policies on stock markets has mainly focused on the role of monetary policy, while the number of analyses on the effects of fiscal policies is negligible.

In an early study, Darrat (1988) shows that Canadian stock market reacts positively to increasing public deficits, but that such reaction becomes negative when lagged values of public deficit are considered. Contrasting results are also shown in van Aerle et al. (2003), as after an increase in public deficit stock markets rise in the EMU-12, but they go down in the U.S. and Japan. Agnello and Sousa (2011), adopting a panel VAR for ten industrialized countries, show a negative reaction of stock markets to an increase in primary fiscal deficit, although this reaction seems to be only temporary. Similar results for the US are shown in Jansen et al. (1996).

Despite this mixed evidence, when the effects on stock markets of government's expenditures and revenues are analyzed separately, the results in the literature are more homogenous. Afonso and Sousa (2011) find that government's expenditures shocks have a negative effect on stock prices, while government's revenues shocks have a small and positive effect. Their VAR analysis also suggests that fiscal shocks play a minor role in the asset markets in the U.S. and Germany, and substantially increase the variability of stock prices in the U.K., while government's revenues shocks have increased volatility in Italy.

One of the main contributions to the literature is Ardagna (2009), where the author employs a panel of OECD countries from 1960 to 2002 to show that stock markets prices rise around times of substantial fiscal consolidations and plunge in periods of very loose fiscal policies. The magnitude of this effect depends on countries' fiscal conditions and on the type of fiscal consolidations. Fiscal policies occurring in country-years with high public deficit levels, that are implemented by cutting government spending, and that generate a permanent and substantial decrease in government debt are associated with larger increases in stock markets prices.

Therefore, these analyses seem to suggest that stock markets tend to favor reductions in primary balance rather than expansionary policies.

Although both fiscal and monetary policies seem to be important independent policy determinants of stock prices, their impact could also be in by their interaction. For example, Jansen et al. (1996) and Chatziantoniou et al. (2013) also analyze the effects on the stock markets of the interaction between fiscal and monetary policy. Both studies conclude that the effects of monetary policies vary with the state of fiscal deficits or surpluses and that the policy mix affects stock markets. Therefore, when the effects of fiscal policies on stock markets are analyzed, it seems worth controlling also for the effects of monetary policy.

3. Methodology

In order to estimate the effects of fiscal policy on stock markets we employ the panel DOLS estimator proposed by Mark and Sul (2003), that extends to panel data the single equation DOLS method introduced by Saikkonen (1991) and Stock and Watson (1993).

In this framework, the long-run regression is augmented by lead and lag differences of the variables in order to control for serial correlation and endogeneity of the regressors. Therefore, DOLS (as well as FMOLS) allows to generate unbiased estimates for cointegrated variables, even in the presence of endogenous regressors. Hlouskova and Wagner (2010) show that the panel DOLS estimator outperforms all other studied single equation and system estimators even for large samples. The same result is obtained by Montalvo (1995) in a similar analysis on small sample properties. Moreover, Harris and Sollis (2003) suggest that nonparametric approaches, such as FMOLS, show problems in cases in which the residuals have large negative moving average components and are less robust if the data have significant outliers. It has to be noted that both situations are quite common in macro time series data. It is also worth noting that DOLS estimator is superconsistent under cointegration, and it is robust to the omission of variables that do not form part of the cointegrating relation. Since all these characteristics are relevant for our analysis, our estimations are based on the following equation:

$$\ln S_{i,t} = \alpha_i + \beta_{1i} \ln G_{i,t} + \beta_{2i} \ln T_{i,t} + \beta_{3i} \ln Y_{i,t} + \beta_{4i} R_{i,t} + \beta_{5i} \ln M3_{i,t} + \varepsilon_{i,t} \quad (1)$$

where one lead and one lag of first differences of explanatory variables are used as instruments. Moreover, ln*S* is the logarithm of the stock market index, ln*G* and ln*T* represent public expenditures and revenues respectively, ln*Y* is the GDP growth rate, ln*M3* measures money supply and *R* is the long-term interest rate.[1]

[1] See the data appendix for details about the single countries stock market indexes and other variables adopted.

In order to estimate equation (1) with PDOLS, the assessment of certain properties of the panel data is required. Unit root tests are necessary to study the stationarity of the series adopted, while panel cointegration tests are useful to verify the presence of a relation between the variables in our data set. We employ the standard ADF and the more refined Levin, Lin and Chu (see Levin et al., 2002) unit root tests (hereafter LLC test). We also adopt the cross-sectionally augmented Im, Pesaran and Shin (CIPS) panel unit root test proposed by Pesaran (2007).

The LLC test is employed given its high power in small samples (see Hlouskova and Wagner, 2006). It is worth noting that the LLC test may lead to spurious inference when the errors are not independent across i, as it assumes cross-sectional independence. Therefore, to tackle this potential problem, the CIPS panel unit root test is also performed. This test allows for cross-sectional dependence because it augments the standard ADF regression with the cross-section averages of lagged levels and first differences of the individual series. This test is based on the between-dimension approach and involves the estimation of separate cross sectional augmented ADF (CADF) regressions for each country, allowing for different autoregressive parameters for each panel member. Then, the CIPS statistic is calculated as the average of individual CADF statistics. The null hypothesis is that each series contains a unit root, while the alternative hypothesis is that at least one individual series is (trend) stationary.

Before estimating equation (1), we also perform some panel cointegration tests. As a first step we employ the standard Kao (1999) cointegration test. This test is one of the most commonly used test in empirical works conducted on homogeneous panels and it does not allow the coefficients to differ across individuals.

Since Monte Carlo simulations have proved that different test statistics perform in a different way depending on the panel dimension and the specific data generating process, it can be observed as a sign of robustness if different test statistics lead to the same test decision. Therefore, we also implement the Westerlund (2007) error-correction based test. This test does not only allow for numerous forms of heterogeneity, but also offers p-values which are robust against cross-sectional dependencies via bootstrapping. It is tested whether the null of no error correction can be rejected (either for the whole panel or for a non-zero fraction of the cross units, depending on whether a pooled or group-mean estimation is performed). If the null can be rejected, there is evidence in favor of cointegration. While two of the four tests are panel tests (*Pt* and *Pa*) with the alternative hypothesis that the whole panel is cointegrated, the other two tests are group-mean tests (*Gt* and *Ga*), which test against the alternative hypothesis that for at least one cross-section unit there is evidence of cointegration.

Both Kao (1999) and Westerlund (2007) tests allow us to check if the variables are cointegrated. Nevertheless, in order to adopt a PDOLS, it is necessary that there is one cointegrating vector among the variables. Then, we need an additional test able to verify this requirement. Hence, we perform the Larsson et al. (2001) methodology. This technique allows avoiding the normalization problem occurring in residual based cointegration tests (like Kao) by considering all variables as potentially endogenous. In the Larsson et al. (2001) procedure, the Johansen VECM for each country is estimated separately and then their results are standardized. The null hypothesis is that all N countries in the panel have a common cointegrating rank, while the alternative hypothesis is that all the cross-sections have a higher rank. It is worth noting that the Johansen trace statistics show tendency to bias towards rejecting the null hypothesis in small samples, and this may provoke overestimations of the cointegration rank. Thus, the same can occur with the Larsson et al. (2001). Therefore, the small sample correction factor proposed by Reinsel and Ahn (1992) has been applied to the standard trace statistics.

4. Empirical Analysis

Table 1 shows the results from the three unit root tests adopted. For the variables R, ln$S$ and ln$T$ non stationarity in their levels is confirmed by all tests. Non stationarity in levels for ln$G$ and ln$M3$ is confirmed by ADF and CIPS tests. For ln$Y$ non stationarity is confirmed only by CIPS. Given the properties of the tests highlighted in the previous section, we mainly rely on the CIPS test and we can confidently conclude that all variables are non-stationary in their levels. The same tests are performed for the variables in their first differences and the lower panel in table 1 shows that they reject the null of non-stationarity for all the variables. Therefore, we can conclude that all the variables in our dataset are $I(1)$.

The cointegration tests results are reported in table 2. Kao and Westerlund tests clearly confirm the presence of cointegration among the variables in the dataset. Moreover, the trace test employed confirms the presence of cointegration and, most importantly, also shows that there is one cointegrating vector.

The results obtained by unit root tests and cointegration analysis are crucial for our study because Stock and Watson (1993) demonstrated that DOLS procedure is valid only for $I(1)$ variables with a single cointegrating vector. Then, we can proceed with the estimation of equation (1).

Table 1. Panel Unit Root Tests

Series	*Tests*		
	ADF	*LLC*	*CIPS*
$\ln S$	29.730	-0.241	0.933
$\ln G$	20.998	$-2.679^{\star}$	0.326
$\ln T$	22.572	-0.746	3.38
$\ln Y$	$208.22^{\star}$	$-9.684^{\star}$	3.81
$\ln M3$	15.304	$-3.238^{\star}$	0.154
R	14.143	5.864	11.029
	ADF	*LLC*	*CIPS*
$\Delta \ln S$	$140.96^{\star}$	$-11.529^{\star}$	$-13.329^{\star}$
$\Delta \ln G$	$380.35^{\star}$	$-15.068^{\star}$	$-12.283^{\star}$
$\Delta \ln T$	$348.33^{\star}$	$-2.539^{\star}$	$-13.204^{\star}$
$\Delta \ln Y$	$373.09^{\star}$	$-13.212^{\star}$	$-10.944^{\star}$
$\Delta \ln M3$	$134.37^{\star}$	$-6.745^{\star}$	$-11.788^{\star}$
ΔR	$197.64^{\star}$	$-10.659^{\star}$	$-6.702^{\star}$

Notes: * rejects the null at 5%.
ADF Fisher χ^2 (ADF), Lin et al, (LLC) and Pesaran, 2007 (CIPS).

Table 2. Panel Cointegration Tests

Kao	*Westerlund*		*Larsson et al Rank*	
$-4.668^{\star}$	G_t	$-1.456^{\star}$	$r = 0$	$7.494^{\star}$
	G_a	$-4.854^{\star}$	$r \leq 1$	$2.252^{\star}$
	P_t	$-5.616^{\star}$	$r \leq 2$	0.499
	P_a	$-4.984^{\star}$	$r \leq 3$	-0.207
			$r \leq 4$	-0.318
			$r \leq 5$	0.129

Notes: * rejects the null at 5%.

Table 3 summarizes the results of several PDOLS estimations based on equation (1), where all the estimated coefficients are statistically highly significant. All specifications (regressions (1) – (7)) show that stock markets go down following an increase in public expenditures or a reduction in public revenues. Therefore, the signs of our estimated reactions of stock markets to fiscal policies are in line with recent studies like Ardagna (2009) and Afonso and Sousa (2011). Regressions (1)– (4) show that the inclusion of additional control variables reduces the estimated coefficients of ln$G$ and ln$T$. According to the full equation estimation (4), we can conclude that the elasticity of the stock markets indexes to changes in public expenditures and revenues are ◎–1.447 and 1.349 respectively. Since stock markets react to both public expenditures and revenues, we can conclude that financial markets agents do not take a pure Ricardian perspective following fiscal maneuvers. Therefore, governments should take into account the consequences of their fiscal maneuvers in terms of stock markets' reaction. Furthermore, based on the evidence of non-neutrality of fiscal policies on stock markets, variations in public expenditures and revenues should be considered as possible additional tools to monetary policy to smooth excessive financial markets oscillations. More specifically, fiscal policy can be considered in order to prevent stock markets downturns that normally characterize financial and debt crises. This is also important as during financial crises the stock markets spillovers to the real economy increase (see Caporale and Spagnolo, 2003).

Estimations (2) – (4) also show that all the control variables estimated parameters signs are in line with expectations based on economic theory. An increase in R generates a reduction in the stock markets indexes. The increase in the interest rate causes a decrease in the prices of bonds, as a result, the demand for bonds goes up and less capital flows to stock markets. An increase in ln$Y$ generates an increase in stock markets indexes due to the expansion in the level of economic activity. The positive coefficient for ln$M3$ relies on several channels (see Mishkin, 1995). One of the main channels through which monetary policy propagates in the economy is the interest rate channel. This channel suggests that a change in money supply (via its effects on interest rates) will have an impact on the corporate cost of capital, which will eventually influence the present value of firms' future net cash flows. Consequently, lower money supply (higher interest rates) leads to lower present values of future net cash flows, which, in turn, lead to lower stock prices. An additional transmission mechanism is via the wealth effect, which suggests that a rise in interest rates will cut the value of long-lived assets, i.e. stock prices. Finally, according to the Tobin's Q theory of investment, lower money supply, by increasing the interest rates, will lead to lower stock valuation.

Table 3. PDOLS Estimations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\ln G$	-1.734^{***}	-1.442^{***}	-1.401^{***}	-1.447^{***}			
	(0.156)	(0.171)	(0.166)	(0.202)			
$\ln T$	2.179^{***}	1.996^{***}	1.788^{***}	1.349^{***}			
	(0.213)	(0.212)	(0.210)	(0.243)			
$\ln Y$		0.061^{***}	0.047^{***}	0.046^{***}			
		(0.011)	(0.011)	(0.011)			
R			-0.067^{***}	-0.058^{***}			-0.063^{***}
			(0.012)	(0.012)			(0.011)
$\ln M3$				0.331^{**}			0.424^{***}
				(0.147)			(0.145)
lnG_{-1}					-1.647^{***}	-1.306^{***}	-1.321^{***}
					(0.167)	(0.170)	(0.196)
$\ln T_{-1}$					1.975^{***}	1.762^{***}	0.988^{***}
					(0.216)	(0.211)	(0.246)
$\ln Y_{-1}$						0.071^{***}	0.057^{***}
						(0.011)	(0.010)
C	3.662^{***}	2.412^{**}	4.528^{***}	7.733^{***}	4.916^{***}	3.445^{***}	9.707^{***}
	(1.006)	(1.031)	(1.085)	(1.746)	(1.018)	(1.025)	(1.767)

Notes: ***, ** and * reject the null at 1%, 5% and 10% respectively.

Considering that real markets variables (such as G, T and Y) are normally published with lags, we have also estimated our relation using lagged observations for ln$G$, ln$T$ and ln$Y$. The results for these estimations are reported in table 3 (5) – (7). They confirm the sign and the values for the coefficients from estimations (1) – (4) with the only exception of the elasticity of ln$T$ that becomes slightly less than 1.

As already stressed in the previous sections, the most sensitive aspect in the literature is the sign of the stock markets indexes' reaction to fiscal maneuvers. Therefore, we investigate if our results depend on the methodology adopted. In order to do so, we perform some additional regressions based on equation (1) using different estimation methods and we report these results in table 4. In these additional estimations we have performed simple panel OLS ((1) – (4)), GMM (5) and Instrumental Variables[2] (6) regressions. By serving also as a robustness check, all these estimations confirm the signs of the coefficients reported in table 3 with high levels of significance but with smaller elasticities and semi-elasticities.

Table 4. Alternative Panel Estimations

	POLS				GMM	IV
	(1)	(2)	(3)	(4)	(5)	(6)
$\ln(G)$	−0.892***	−0.863***	−0.829***	−1.041***	−1.072***	−1.041***
	(0.125)	(0.125)	(0.119)	(0.147)	(0.065)	(0.147)
$\ln(T)$	1.001***	0.947***	0.871***	0.777***	0.793***	0.777***
	(0.148)	(0.151)	(0.144)	(0.149)	(0.065)	(0.149)
$\ln(Y)$		0.009***	0.007**	0.010***	0.011***	0.010***
		(0.004)	(0.004)	(0.004)	(0.002)	(0.004)
R			−0.061***	−0.056***	−0.057***	−0.057***
			(0.008)	(0.008)	(0.004)	(0.008)
$\ln(M3)$				0.263**	0.267***	0.263**
				(0.109)	(0.048)	(0.109)
C	7.221***	7.489***	8.221***	9.945***	10.102***	9.945***
	(0.831)	(0.863)	(0.829)	(1.091)	(0.485)	(1.091)

Notes: ***, ** and * reject the null at 1%, 5% and 10% respectively.

As a further investigation on the estimated relation between fiscal policies and stock markets indexes, we also evaluate the stability of the estimated elasticities. Therefore, we investigate if the signs of the estimated elasticities of ln$S$ with respect to ln$G$ and ln$T$ are stable over time. In order to achieve this

[2] In this specification we have instrumented R with inflation.

task, we run a sequence of regressions for a moving window of three quarters based on specification (4) of table 1. Some interesting results are obtained and we report them in figure 1.[3] The series of the time varying coefficients confirm only partially the results obtained from our estimations as, at a certain point in time, there is a switch in the sign of the $\ln G$ and $\ln T$ elasticities. According to our exercise, starting from the third quarter of 2007 the reaction of stock indexes to an increase in public expenditure becomes positive, while it becomes negative with respect to taxation. The conclusion that can be drawn from this evidence is that stock markets' reactions to fiscal policies depend on the surrounding macroeconomic scenario. It is worth noting that the switch in the sign of these coefficients coincides with the beginning of the international financial crisis (whose period is delimited between the two vertical lines in figure 1 (a) and (b)). Therefore, our results seem to suggest that stock markets react negatively to expansionary fiscal policies under normal macroeconomic conditions, but they react positively to the same maneuver during a financial crisis. It can be explained with the following reasoning. Under normal macroeconomic conditions, financial markets operators take into account the possible recessionary effects of fiscal policies and react as predicted by the NKV. Under financial stress, they require support from the fiscal authorities and react positively to an increase in public primary deficit. The time varying coefficients series also cover the debt crisis of some member countries of the Eurozone, and it seems that under these circumstances the elasticities of stock markets indexes tend towards inverting their sign again. It can be assumed that during the sovereign debt crisis the dominating effect linking fiscal policies and stock markets rely on the sustainability of public debt. Therefore, an increase in public deficit is not welcomed by financial markets operators. Nevertheless, given the limited amount of observations referring to the

[3] The estimated coefficients are represented by the dots, while the confidence interval is represented by upper and lower plus.

sovereign debt crisis, our results on the last part of the coefficients has to be considered with caution.

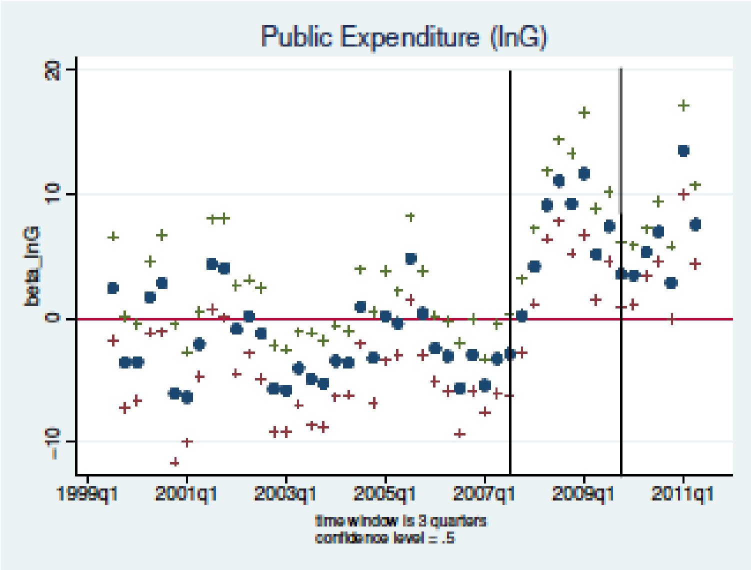
5. Conclusion

In this paper we have empirically analyzed the effects of fiscal policies on stock markets over the period 1999-2012 for a panel of 11 countries of the Eurozone. The results of our analysis have provided some important insights.

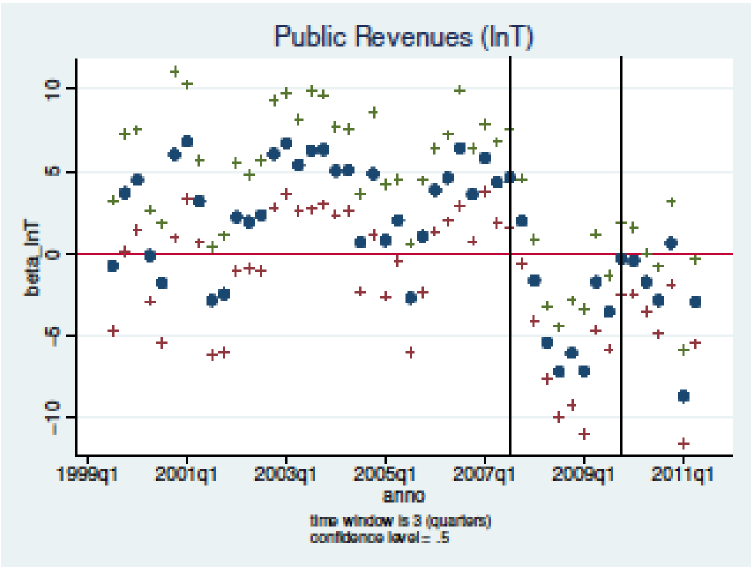
As we have demonstrated that stock markets react to both public expenditures and revenues, we can exclude that financial markets agents take a pure Ricardian perspective following fiscal maneuvers. It implies that national governments have to take into account also the consequences of their fiscal policies in terms of stock markets' reaction. Moreover, based on the evidence of non-neutrality of fiscal policies on stock markets, variations in public expenditures and revenues should be considered as possible additional tools to monetary policy to smooth excessive financial markets oscillations. More specifically, fiscal policy can be considered in order to avoid stock markets downturns that normally characterize financial and debt crises.

Furthermore, our results have highlighted the fact that the kind of fiscal maneuvers to be implemented depends on the macroeconomic scenario. Previous studies have mainly focused on providing clear-cut evidence on the sign of the reaction of stock markets. It can be interpreted as assessing that stock markets react assuming pure Keynesian or NKV effects of fiscal policies on the level of economic activity.

Figure 1: Estimated Coefficients from Window Regressions



(a)



(b)

Nevertheless, there is not complete agreement on such aspect in the literature. With respect to previous studies investigating such relationship, our dataset also covers the global financial crisis. This has allowed us to shed some lights on the reaction of stock markets to fiscal maneuvers. In normal times stock markets welcome fiscal consolidations and they behave as predicted by the NKV. This relationship seems to hold also during periods of sovereign debt troubles, as stock markets require more fiscal discipline. Nevertheless, when financial markets are troubled and are not self-sufficient, they do not seem to follow this approach and behave as expected from a pure Keynesian perspective by reacting positively following expansionary fiscal policies. As a result, in order to stabilize (or stimulate) stock markets, the fiscal authorities are required to be very careful in order to assess the effects of the fiscal maneuvers. For instance, austerity measures seem to be a dangerous tool in periods of financial troubles, as they should not be able to smooth the financial cycle and, on the contrary, they may increase the negative trend in stock markets.

In a broader perspective concerning the economic and financial stability in the Eurozone, our results show the necessity that fiscal policy is interpreted and conducted on the basis of the financial, debt and output cycles simultaneously.

Data Appendix

We adopt a panel of 11 member countries of the Eurozone, based on the 10 forming members plus Greece. Our balanced panel dataset is based on quarterly observations spanning the period 1999:Q1 – 2012:Q1.

For the 11 European countries in the panel, the stock markets indexes (S) considered are the following: *ibex35* (Spain), *dax* (Germany), *mib storico* (Italy), *cac40* (France), *athex composite* (Greece), *bel20* (Belgium), *atx* (Austria), *aex* (Netherlands), *psi20* (Portugal), *iseq overall* (Ireland) and *hex pic* (Finland). These series are obtained by individual indexes and national stock exchanges websites.

All countries' public expenditures (*G*) and revenues (*T*) data are from the EuroStat database. Money is represented by *M3, R* refers to the 10-year treasury bills, while for constructing the GDP growth *Y*, real GDP has been adopted. These three variables are from the IMF database. All series are considered in logarithms, except *R*.

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