School of Economics and Management
TECHNICAL UNIVERSITY OF LISBON

Department of Economics

António Afonso

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António Afonso*

ISEG/TULisbon - Technical University of Lisbon, Department of Economics; UECE – Research Unit on Complexity and Economics, R. Miguel Lupi 20, 1249-078 Lisbon, Portugal. UECE is supported by FCT (Fundação para a Ciência e a Tecnologia, Portugal).

European Central Bank, Directorate General Economics, Kaiserstraße 29, D-60311 Frankfurt am Main Germany

Abstract

I use a panel of semi-annual vintages of growth and fiscal forecasts of the European Commission, covering the period 1998:II-2008:II, to assess its effects on 10-year government yields for 14 EU countries. Results show that yields increase with better growth forecasts, and with decreases in budget balance-to-GDP ratios, signalling that sovereigns may need to pay more to finance in the market higher budget deficits.

Keywords: interest rates, macro forecasts, EU.
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1. Introduction

The result that public deficits and public debt accumulation have implications for interest rates is a common feature in theoretical models and also constitutes an important part of policymakers' conventional wisdom. From a policymaking point of view the nexus between fiscal developments and interest rates s rendered timely in the current era when pressures for macroeconomic activism are exercised on fiscal authorities. Moreover, it is often argued that large fiscal imbalances may endanger the coherence of national macroeconomic policies and jeopardize price-stability oriented monetary policies.

The relationship between the debt/deficit and interest rates remains largely an empirical question. Studies done in the 1980s, largely focused on the US, in the context of crowding-out discussions are inspired by this debate.[1] Some recent studies for the US and for some EU countries, conclude that the reduction of yields and lower spreads of long-term rates over short-term rates follow more positive budget balance projections. For instance, Engen and Hubbard (2004), and Thomas and Wu (2009) have used fiscal projections for the US, and Heppke-Falk and Hüfner (2004) use fiscal projections for some European countries.

This paper contributes to the literature by using a panel of semi-annual vintages of fiscal and macro forecasts of the European Commission (EC), as the measure of the expectations for growth and fiscal stance, covering the 1998:II-2008:II, to assess its effects on 10-year government bond yields in 14 European Union (EU) countries. The paper is organized as follows. Section two explains the modelling strategy. Section three reports the empirical analysis. Section four concludes.

[1] See Evans (1985) and Wachtel, and Young (1987).

2. Model specification

The starting specification relates the changes, *cg*, in the 10-year government debt yields, *i*, to a set of possible explanatory factors, which include the information revealed via the EC half yearly macro and fiscal forecasts. Within a panel data framework the general testable model can be written as follows:

$$cg_{j,t} = \alpha_j + \alpha_1 \Delta cg_{j,t} + \beta_1 y^e_{j,t} + \beta_2 b^f_{j,t,k} + \beta_3 d^e_{j,t} + \gamma_1 \Delta i^{us}_t + \gamma_2 s_t + u_{jt}, \quad (1)$$

where the index *j* (*j*=1,…,*N*) denotes the country, the index *t* (*t*=1,…,*T*) indicates the period and α_j stands for the individual effects to be estimated for each country *j*. Moreover, we have: *i* – 10-year government bond yield; i^{us} – 10-year US government bond yield; *s* – stock market returns, computed as the logarithmic growth rate of the relevant stock price index, *P*,

$$s_t = \ln(P_t / P_{t-1}) \times 100 . \quad (2)$$

y^e is the difference between the EC forecasts for the real GDP growth rate and the growth rate in the last year, while d^e is the difference between the EC forecasts for the debt-to-GDP, and $b^f_{j,t,k}$ is the forecast in period *t* for the fiscal balance ratio in country *j* in year *k*. More precisely, and, for instance, for the real growth rate,

$$y^e_{j,t} = y^f_{j,t,t+1} - y^f_{j,t,t} , \quad (3)$$

with $y^{f}_{j,t,t}$ – the forecast in period t for the real growth rate in country j in year $t+1$, and $y^{f}_{j,t,t}$ – the forecast in period t for the real growth rate in country j in year t. Additionally, it is assumed that the disturbances u_{jt} in (1) are independent across countries.

As a departing point one could expect that forecasts of future increases in the debt-to-GDP ratio or in the deficit ratios may imply an increase in the long-term interest rate, since it may impinge negatively on the credit risk and quality of the outstanding sovereign debt liabilities. Indeed, market participants may perceive an additional risk stemming from the implied loosening of fiscal stance under such conditions.[2] On the other hand, capital markets may also value the increased liquidity associated to the existence of additional outstanding sovereign debt, and a decrease in the long-term yields cannot be discarded as well, given that default risk has been perceived as rather mitigated in the EU context.[3]

A direct effect may also be expected when higher real growth forecasts are known, implying a steeper slope of the yield curve. Additionally, increases in the rate of return of equities may decrease the demand for sovereign debt as investors readjust their portfolio allocation. Therefore, bond prices would decline and bond yields could rise.

The 10-year US government debt yield measures international factors that might have an impact on the determination of the long-term 10-year EU yields. One would expect the 10-year US yield to fall if there is a raise in the demand for US government debt. Assuming the existence of spillover effects to the European government bond market, there might also be a raise in the demand for European long-term bonds. This leads to rising prices, declining 10-year government bond yields, and the associated

[2] See Alesina et al. (1992).
[3] See Codogno et al. (2003), Bernoth et al. (2004), and Afonso and Strauch (2007).

decrease of European 10-year yields. Furthermore, it is assumed that the US long-term interest rate does not react to changes in the European long-term interest rates.

3. Empirical analysis

3.1. The data set

I use the semi-annual vintages of the fiscal and macro forecasts of the EC in the period 1998:2-2008:2, as well as the compatible data for 10-year long-term interest rates and for the measure of the stock market index returns. 14 EU countries are included in the analysis: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Ireland, the Netherlands, Portugal, Spain Sweden, and UK.

The publication dates of the semi-annual vintage EC forecasts, the so-called spring and autumn economic forecasts, varied in the past between March and April in the first case, and between October and November in the second case. Table 1 reports the dates of such publications. Since these economic forecasts are regularly produced and are public, one may expect market participants to incorporate this information in their views towards the level of long-term interest rates.

Table 1 – EC semi-annual forecast vintages

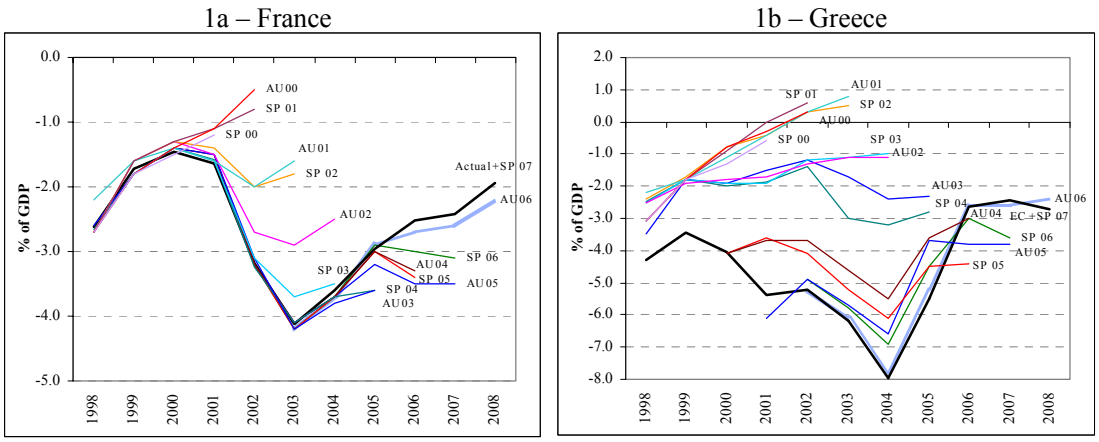
	2008:2	2008:1	2007:2	2007:1	2006:2	2006:1	2005:2	2005:1
Publication date	23-Oct	15-Apr	24-Oct	23-Apr	24-Oct	24-Apr	07-Nov	18-Mar
Month	10	4	10	4	10	4	11	3
	2004:2	2004:1	2003:2	2003:1	2002:2	2002:1	2001:2	2001:1
Publication date	18-Oct	29-Mar	20-Oct	28-Mar	04-Nov	12-Apr	12-Nov	06-Apr
Month	10	3	10	3	11	4	11	4
	2000:2	2000:1	1999:2	1999:1	1998:2			
Publication date	26-Oct	21-Mar	Nov	Apr	Oct			
Month	10	3	11	4	10			

Source: European Commission.

As an example, Figure 1 illustrates the differentials between EC budget deficits forecasts and outcomes for the cases of France and Greece during the period 1998-2008.

It is clear that differences occurred regularly throughout the period under analysis for these two examples, and the same is true for the other EU countries. For instance, during that period, the average difference between the maximum and the minimum forecasted and observed values was 1 percentage point (pp) and 2.6 pp, respectively for France and for Greece. However, such differences were as high as 2.2 pp in 2002 for France and 7.0 pp in 2003 for Greece.

Figure 1 – Budget balance EC forecast vintages



Source: EC semi-annual vintages of fiscal forecasts. AU – autumn; SP – spring.

In the baseline regressions, and for the endogenous change in the long-term bond yields, this is computed as the change between the 10-year interest rate between month 2 and 3 and between month 9 and 10. Naturally, it is not easy to exactly select both the months and the data to use regarding such higher frequency data to align with the semi-annual macro data. Indeed, several irregularities can play a role, for instance, some forecast vintages are coming out instead at the beginning of months 4 and 11, while some data can already be know by the public and capital market participants in advance of its public announcement. I use both end of the month data and monthly averages.

Regarding interest rates, these are the 10-year government benchmark bond yields taken from Reuters, end of month observations and monthly averages, both for the EU countries and for the US. To compute the stock market returns I used the Dow Jones Euro STOXX price index data.[4]

3.2. Results

Table 2 reports the results for the change in the 10-year government bond yield for the period 1998:II-2008:II, using as the months to anchor the capital markets data March and October.[5] Table 2 presents estimation results using monthly average yields.

Table 2 – Estimation for the change in the 10-year government yield ($cg_{j,t} = i_t - i_{t-1}$)
(Monthly average yields , 1998:II-2008:II)

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.0114 *	0.0104	-0.0010	0.0131 *	0.0115 *	0.0035
	(1.7)	(1.5)	(-0.1)	(1.9)	(1.7)	(0.3)
$\Delta cg_{j,t}$	0.4535 ***	0.4679 ***	0.4678 ***	0.4526 ***	0.4689 ***	0.4695 ***
	(17.8)	(16.5)	(16.3)	(18.0)	(16.6)	(16.6)
Δi_t^{us}	0.0434 ***	0.0356 **	0.0355 **	0.0450 ***	0.0360 **	0.0358 **
	(3.0)	(2.4)	(2.4)	(3.1)	(2.4)	(2.4)
$y_{j,t,t+1}^f - y_{j,t,t}^f$	0.0352 ***	0.0361 ***	0.0383 ***	0.0364 ***	0.0370 ***	0.0386 ***
	(4.0)	(4.1)	(4.5)	(4.2)	(4.3)	(4.4)
$b_{j,t,t}^f$	-0.0128 **	-0.0112 *	-0.0117 **			
	(-2.1)	(-1.8)	(-2.1)			
$b_{j,t,t+1}^f$				-0.0104 *	-0.0094	-0.0137 *
				(1.7)	(-1.5)	(-1.7)
s_t		0.0005 *	0.0003 *		0.0006 **	0.0005 *
		(1.8)	(1.7)		(2.0)	(1.9)
$d_{j,t,t}^f - d_{j,t,t-1}$			-0.0052			-0.0037
			(-1.0)			(-0.7)
Adj. R2	0.52	0.52	0.52	0.51	0.52	0.52
Observations	267	267	267	267	267	267

Notes: The t statistics are in parentheses. *, **, *** - statistically significant at the 10, 5, and 1 percent level respectively. Panel Least Squares, cross-section fixed effects, white diagonal standard errors and covariance. *y* – real growth, *d* – debt ratio, *b* – budget balance ratio, *s* – Dow Jones STOXX returns.

The results show a positive relationship between the behaviour of the bond yields in the EU and the 10-year US yields. Better real growth forecasts also push

[4] Euro area (changing composition) - Equity/index - Dow Jones STOXX - Price index - Historical close, end of period - Euro, provided by the ECB.
[5] Panel unit roots tests reject the unit root null for the change in the yield.

upwards the long-term yields while stock returns show an opposite effect. More interestingly, it is possible to observe a statistically significant direct dependence of long-term bond yields on the forecasts of the fiscal balance-to-GDP ratios. Using either forecasts for budget balances for period *t*, made in year *t* (columns 1 to 3 in Table 2), or forecasts for budget balances for period *t*+1, made in year *t* (columns 4 to 5 in Table 2), provide quite similar results.

Therefore, such evidence implies that new forecasts provided by the EC on lower government budget balances (higher deficits) push up the price paid by sovereigns to raise financing in the capital markets. On the other hand, the relationship between the vintages of government debt ratios and the developments in long-term yields is not statistically significant.

4. Conclusion

This paper assessed the effects of macroeconomic and fiscal forecasts on long-term government bond yields for a panel of 14 EU countries. I used the semi-annual vintages of fiscal and macro forecasts of the EC as the measure of the markets' expectations for economic growth and for the fiscal policy developments, covering the period 1998:II-2008:II. Results show that 10-year general government yields increase with better growth forecasts, and with decreases in the budget balance-to-GDP ratios, signalling that sovereigns then need to pay a higher price to finance higher forecasted budget deficits. In other words, the results suggest that market discipline may arise via the expected budget deficit on a given year.

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