

Bonds' Spillover Effects on other Countries' Bonds*

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Abstract

This paper investigates the presence of negative financial spillovers among government bond yields and their relationships with fiscal imbalances. The study employs a number of different specifications and considers both fiscal variables and bond issues in testing the absorption hypothesis. The paper shows that little evidence emerges to relate this common dynamic to the fiscal positions of OECD countries. In the EMU, because this showed a larger shift in the fiscal and external position, one would expect it to result in a sensible movement. Contrary to the prediction, the evidence gives little support to the spillover hypothesis.

1. Introduction

This paper investigates the effects of positive/negative financial spillovers on other countries. The globalization and integration of the bond markets that occurred all over the world has rendered securities issues by governments' closer substitute. Returns on assets as influenced by different issues show a large degree of comovement. We can expect that security returns are driven by international factors. Globalization has been ongoing since the 1980s. Based on this, the financial spillovers hypothesis questions the ability of financial markets to price risk correctly among government bonds. In some cases, such an externality in returns produces a redistribution of costs.

Schiavo (2007) pointed out some interesting and important matters.

The negative financial spillover hypothesis is often regarded as one of the few theoretical foundations of the SGP. However, economic theory does not establish a clear-cut link between fiscal variables and the rate of interest.

This paper is organized as follows. Section 2 provides theoretical backgrounds on this topic. Section 3 postulates an empirical analysis, shows the results, and analyzes them. Finally, this paper ends with a brief summary.

2. Theoretical Backgrounds

Returns on bonds issued by different governments show a large degree of comovement in reality. From the view of the business and the real world, the negative financial hypothesis takes it for granted a relationship that links domestic fiscal variables and interest rates. However, whether or not the common dynamics can be found in the fiscal positions is a different problem with much room for investigation and should be fully discussed. There is much room for investigation.

The search for potential spillovers of fiscal policies on countries agrees with tests of the Ricardian equivalence hypothesis. Traditional means investigate the relation between fiscal deficits/debt and interest rates. Many studies have pursued to this problem, though empirical evidence is confused and gives many and varying results¹.

Ford and Laxton (1999) claimed that world debt matters in the determination of country-specific interest rates. They said that countries with high levels of government debt may impose negative externalities on others. Breedon et al. (1999) presented similar results; however, they claimed that the results are against financial markets. Ardagna et al. (2004) also investigated the relation between fiscal variables and interest rates and found that international factors are relevant though to a much

lesser extent than domestic factors.

However, theory alone does not provide clear-cut implications. Different models give different and interesting outcomes. Hence the issue of fiscal spillover problem remains an empirical one.

This paper considers OECD countries as a single economic entity and looks for a relation among aggregate measures of fiscal stance. The theoretical model is based on Schiavo (2007). Also, the paper provides some information on European currency integration.

In the first step, this paper takes the simplest specification as follows:

$$\text{Interest Rate}_t = \alpha_0 + \alpha_1 t + \alpha_2 (\text{surplus/GDP})_t + \alpha_3 (\text{debt/GDP})_t \quad (1)$$

where Interest Rate is an average yield on long-term bonds issued by OECD group governments, t means a time trend, surplus is a primary balance necessary to produce an indicator of discretionary fiscal policy. Primary balance is regressed by a constant, a time trend, and GDP growth.

$$\text{Primary Balance}_t = \beta_0 + \beta_1 t + \beta_2 \text{GDP Growth}_t \quad (2)$$

The estimated coefficients are used to build a growth-adjusted primary balance which is obtained by inserting the previous period GDP growth rate into the estimated equation (Schiavo, 2007). This is given as:

$$\text{Growth-Adjusted Primary Balance}_t = \gamma_0 + \gamma_1 t + \gamma_2 \text{GDP Growth Rate}_{t-1} \quad (3)$$

Next, the fiscal stance indicator is simply given by the difference between the growth-adjusted measure and the observed value of the primary balance:

$$\text{Fiscal}_t = \text{Growth-Adjusted Primary Balance}_t - \text{Primary Balance}_{t-1} \quad (4)$$

As it is surplus, a positive value of fiscal implies a fiscal restriction.

3. Empirical Analysis

This section provides the results of the equations in the previous section. The results of equation (2) are shown in Table 1.

Table 1. *Impact of Fiscal Variables on Real Long-Term Yields: Quarterly Data: Level*

	Levels		
	(1)	(2)	(3)
Surplus/GDP	-0.046 (0.17)		-0.308 (0.41)
Fiscal/GDP		-0.057 (-0.44)	
Debt/GDP	0.123 (2.49)*	0.152 (2.31)*	-0.073 (-0.33)
Adjusted R ²	0.33	0.37	0.40

Note. t-statistics are in parentheses. ** significant at 1% and * significant at 5%.

Columns 1-3 of Table 1 present results for estimation of equation (2) in levels³. We can easily understand that fiscal imbalances do not have any impact on government bond yields. On the other hand, the stock of outstanding debt has a significant effect on the cost of borrowing. The reason is the risk premium. As unit root tests cannot reject a null of nonstationary, the same regression in first differences is performed. The results are shown in Table 2.

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Table 2. *Impact of Fiscal Variables on Real Long-Term Yields: Quarterly Data: Difference*

	Difference		
	(4)	(5)	(6)
Surplus/GDP	-0.128 (0.47)		-0.378 (0.70)
Fiscal/GDP		-0.204 (-0.32)	
Debt/GDP	-0.231 (-1.05)	-0.199 (-1.12)	-0.273 (-1.20)
Adjusted R ²	0.13	0.14	0.13

Note. t-statistics are in parentheses. * significant at 5% and ** significant at 1%.

The coefficients lost significance and the ratio of debt/GDP becomes negative but is not significant. Bond yields are not determined by fiscal variables.

Linkages across bond yields are the main topic of this paper. I conducted some empirical estimations. These results show that Granger-causality is never rejected for all variables and all equations and suggest that there is in fact codetermination of bond yields.

Deterministic elements of the sources of interaction among bonds have not been unclear in this paper. The negative financial spillover hypothesis suggests that at least part of the comovement is due to externalities stemming from the fiscal position.

To analyze the impact of fiscal variables on bond yields, it is necessary to move to lower frequencies. The estimating equation is as follows³:

$$\text{Swapit} = \beta_0 + \beta_1 t + \beta_2 \text{int}_t + \beta_3 \text{inf}_t + \beta_4 (\text{surplus}_t / \text{GDP}_t)_i + \beta_5 (\text{debt}_t / \text{GDP}_t)_i \quad (5)$$

The left-side of the equation employs a 10-year swap with respect to the US dollar. Investigating the presence of financial spillovers among EMU

countries, it is necessary to look for a reference country that is not part of the monetary union. I selected the US dollar because it influences the international bond market and shows remarkable historical stability. $\beta_6(\text{surplus}_t/\text{GDP}_t)^{\text{EMU-4}} + \beta_7(\text{deb}_t/\text{GDP}_t)^{\text{EMU-4}}$ are included in an investigation of EMU countries and are aggregated fiscal position of the other 11 EMU countries.

All variables have unit-roots (except for interest rate), so it is not appropriate to estimate on SUR in levels. Odd columns display the results differencing all nonstationary variables. Unfortunately, the results are not so good. This section investigates whether the fiscal position of the Euro area as a whole has any impact on the average yield of European government bonds. Even columns are the results that include foreign augmented fiscal conditions in EMU. Residual tests on the equations of the SUR give conflicting results. The results seem to be better than with the last one; however, signs often change with the insertion of EMU variables.

Table 3. *Impact on Domestic and Foreign Fiscal Variables on Yields*

	France		Germany		Australia		Japan	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Interest Rate	-0.041** (2.92)	-0.040 (2.71)	-0.020 (1.12)	-0.028* (2.12)	-0.003 (0.23)	-0.018 (1.01)	-0.044 (2.51)*	-0.060 (2.56)*
Δ Inflation	0.011 (0.60)	0.009 (0.39)	0.020 (1.24)	0.015 (0.88)	-0.101 (1.38)	-0.090 (1.31)	-0.003 (0.22)	0.008 (0.42)
Δ surplus/GDP ^a	-0.009 (0.44)	-0.008 (0.43)	0.015 (0.50)	0.009 (1.55)	0.008 (1.07)	0.013 (1.99) *	-0.005 (0.20)	-0.014 (0.76)
Δ debt/GDP _{em}	-0.018 (0.40)	-0.012 (0.63)	0.012 (0.50)	0.009 (0.48)	-0.008 (0.40)	-0.010 (0.73)	-0.003 (0.29)	-0.006 (0.34)
Δ surplus/GDP _{em}	-0.001 (0.02)	0.003 (0.06)	0.005 (0.11)	-0.066 (1.15)	-0.088 (1.02)	-0.342** (2.95)	0.013 (0.40)	0.009 (0.20)
Δ debt/GDP _{em}	0.030 (0.92)	0.020 (0.76)	-0.016 (0.93)	-0.022 (0.96)	-0.071 (1.32)	-0.089 (1.70)	-0.020 (0.66)	-0.025 (0.84)
Δ surplus/GDP _{em}		0.123 (1.30)		0.330 (1.66)		0.725** (3.64)		0.306 (1.55)

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$\Delta \text{debt}/\text{GDP}_{\text{for}}$		-0.004 (0.57)		-0.008 (1.40)		-0.026** (2.99)		-0.007 (0.95)
Adjusted R ²	0.12	0.15	0.22	0.19	0.19	0.20	0.15	0.13

Note. **significant at 1%; * at 5%

Nonetheless, the estimation of SUR by dynamic GLS (DGLS) is employed⁴. Results are reported in Table 4.

Table 4. *DGLS Estimates of the Cointegrating Relation*

	France	Germany	Australia	Japan
	(1)	(2)	(3)	(4)
Interest Rate	-0.048** (4.99)	-0.070** (3.52)	0.009 (0.56)	-0.208** (4.02)
$\Delta \text{Inflation}$	0.047** (2.31)	-0.108** (6.05)	0.034 (0.50)	-0.087** (3.99)
$\Delta \text{surplus}/\text{GDP}$	0.035 (1.07)	-0.128** (6.55)	0.108 (1.40)	-0.140** (4.20)
$\Delta \text{debt}/\text{GDP}_{\text{for}}$	0.210** (5.55)	0.027 (1.09)	-0.088** (4.18)	-0.132** (3.69)
$\Delta \text{surplus}/\text{GDP}_{\text{dom}}$	-0.088** (2.17)	0.211** (10.28)	-0.230 (1.54)	0.182** (3.68)
$\Delta \text{debt}/\text{GDP}_{\text{for}}$	-0.202** (5.62)	-0.044** (4.14)	-0.050** (3.18)	0.090** (6.55)
Adjusted R ²	0.80	0.91	0.93	0.83

Note. **significant at 1%; * at 5%

The results are better than those reported in Table 3. Many coefficients are significantly from zero.

The fact that every country reacts differently to changes in its own fiscal position and that of other countries may be taken as a clue that financial markets can efficiently discriminate among different borrowers. This implies that each country faces a cost of borrowing that depends on the status it enjoys in financial markets and on other characteristics of its

own economic system and that financial spillovers are not particularly relevant⁵.

It is interesting to note that the spillover effects cannot be found in EMU countries⁶. Because this showed a larger shift in the fiscal and external positions, one would expect it to result in a sensible movement. Contrary to the prediction, evidence gives little support to the spillover hypothesis.

4. Conclusions

This paper investigated the presence of financial spillovers among the government bond yields and their relationships with fiscal imbalances. Although returns on bonds issued by different governments show a large degree of comovement, little evidence emerges to relate this common dynamic to the fiscal positions not only of EMU countries but also of other countries.

Theory does not provide clear-cut indications, so this paper used different types of models. However, the results are not so clear. In the EMU, the results are the same. Evidence provides little support for the spillover hypothesis and shows that fiscal deterioration affected only domestic interest rates.

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Notes

1. It is possible to observe no correlation between fiscal policy and interest rates for reasons that have little to do with Ricardian equivalence. Seater (1993) is

often cited on this issue.

2. One major caveat applies to these estimates. Unit root tests cannot reject a null of nonstationary for most of the variables involved in the regression. This suspicion is confirmed by residual-based tests for cointegration. Regression residuals are not stationary and therefore point to the lack of any long-run equilibrium relation.
3. See Afonso and Strauch (2004) and Ardagna et al. (2004). For a comprehensive analysis of the role of fiscal policy in the neoclassical model, see Barro (1989).
4. Stock and Watson (1993) suggested this.
5. Stock variables are employed in this analysis as the proxy for market depth and liquidity. However, the results are not so different.
6. Common fiscal and debt rules have been exercised in the union.

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