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Convergence Going In, Divergence Coming Out: Default Risk Premiums and the Prospects for Stabilization in the Eurozone WP 24

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These spreads narrowed in the period leading up to the phasing in of the euro, as the EUR-11 successfully orchestrated the convergence of long term interest rates. [3] Then, on January 4, 1999, when financial markets switched over to the euro – new debt was issued in euros, and nearly all outstanding debt was redenominated in the new currency – it was widely expected that government bond yield spreads would narrow even further. This expectation rested on the notion that currency risk premiums – premiums that reflect the risk of inflation or devaluation – would disappear, since all member debt would be euro-denominated. Additionally, the creation of a single, massive euro-denominated bond market [4] was supposed to contribute to the narrowing of spreads by reducing the liquidity premium attached to the debts of smaller member governments. Without any country-specific risk of inflation or devaluation and a large euro-denominated bond market, many economists believed that "government debts issued by different countries of the same maturity [would] become almost perfect substitutes" (Mundell, 1998: 2).

But, as the Association for the Monetary Union of Europe (AMUE) has recognized, "the opposite has happened" (2000: 1). That is, the process of convergence that took place going into EMU has begun to reverse itself. This reversal has been recognized by William Emmons, who points out that "despite initial 'euphoria' at the outset of European monetary union, true bond-market convergence has failed to occur," noting that "after six months [under EMU], yield spreads on non-German euro-zone benchmark bonds were slightly higher than they were six months before monetary union took place" (1999: 1).

The purpose of this paper is threefold: (1) to explore the pattern of bond yield spreads on post-EMU member debt; (2) to relate the implications of these movements in long-term interest rates to the government's fiscal stance; and (3) to consider the extent to which the pricing of risk by financial markets might limit the potential for stabilizing other macro variables, such as output and employment.

Member Debt and the Convergence-Divergence Conundrum

As noted above, Mundell suggested that government bonds issued in the post-EMU era would become "almost" perfect substitutes. But financial markets clearly view the obligations of different member governments as different instruments, as evidenced by the persistent (and widening) bond yield spreads. Two things account for these yield differentials – liquidity premia and default risk premia. [5] Let us examine these in turn, beginning with liquidity premia.

Despite the fact that all member governments issue euro-denominated debt, "the size and liquidity of the national bond markets in the euro-zone have differed widely from one country to another" (Ascoli 1999: 5). Figure 1 shows the share of outstanding bonds, broken down by issuing country.

Figure 1



As Figure 1 reveals, Italy is the largest issuer, followed by Germany and France. Indeed, between them, Italy and Germany issue more than half the government bonds in the Eurozone. This means that bonds issued by Portugal, Ireland and Finland may be perceived as less liquid instruments than those issued by Germany, France or Italy. Thus, even though all member government debt is homogenous in terms of its denomination, bonds issued by smaller countries "will not have the same liquidity as those of larger countries" (ibid). [6] As a result, investors may penalize smaller member states by attaching a liquidity premium to their debts, thereby causing bond yield spreads to diverge.

Any additional widening of yield differentials must be attributable to perceived differences in country-specific default risk, since this is the only remaining characteristic that can be used to distinguish securities issued by different EMU members. As Benjamin Friedman notes, the default risk premium arises as a consequence of the fact that "government obligations, [are] no longer guaranteed by the ability of individual borrowing countries to print the money in which their bonds are denominated" (2001: 2). [7] Thus, the fact that debts have to be repaid in a currency that member governments cannot create at will (i.e. euros) implies that "the previously remote possibility of default becomes a significant risk" (Copeland and Jones, 1999: 3).

Initially, Copeland and Jones (1999) found that markets were calculating the probability of default at a much lower level than might have been expected, suggesting that investors were not terribly worried about credit risk. [8] They offered two possible explanations for this. First, it was possible that market participants, subscribing to the media's prognosis of "unhampered yield convergence among EMU members," failed to realize that the potential for default had actually changed (ibid.: 5). Second, it was possible that traders were "well aware of the credit risks of Euro-denominated repayments" but decided not attach significant premiums to compensate for these risks, since it was

unlikely that the EU would allow a member government to default (ibid.). [9] Whatever the reason, it appeared to Copeland and Jones that default risk premia would remain low so that bond yield spreads would mainly reflect differences in liquidity premia.

Following this line of reasoning, one is forced to conclude that the recent widening of yield spreads has primarily been due to perceived liquidity differences, since markets have not priced significant default risk. Before we turn to the question of liquidity versus credit risk as a determinant of bond yields, let us examine Figure 2, which shows the pattern of sovereign yield differentials on 10-year bonds issued by EUR-12 governments. [10]







The graphs depict the difference between yields on non-German-issued 10-year government bonds relative to the yields on 10-year benchmark German issues. A trend line has been fitted to each time series, indicating the general movement in the spread – upward, declining or flat. Although we are primarily interested in the behavior of government bond yield spreads in the post-EMU era, we have included data from the pre-EMU period so that each trend line reflects the evolution of a country's long-term interest rates relative to their pre-EMU convergence levels.

As the data in Figure 2 reveal, yields on Italian, Spanish, Austrian, Dutch, Belgian and Irish bonds have risen relative to those on German issues. Although most EUR-12 nations have experienced a widening of yield spreads, yields on Finnish and French issues have declined (modestly) relative to benchmark German issues, and yield differentials on Portuguese issues have remained essentially flat. Only Greek issues show any significant narrowing, but, of course, the Greek experience cannot be compared to the rest of the Eurozone, since Greece joined EMU a full two years after the other eleven countries.

It is impossible to determine precisely how much (if any) of each spread is due to liquidity risk premia and how much (if any) is due to credit risk premia; we only know that it must be one, the other, or some combination of the two. Recently, the European Commission, commenting on the widening of bond yield spreads during the second quarter of 2000, opined that at least part of the divergence was due to "the renewed focus on liquidity by major investors to the detriment of smaller bond issues from Member States with limited financing needs" (EC, 2000: 10). [11]

The perceived liquidity of any particular issuer's debt reflects the expected ease with which that issuer's bond can be converted into euros at a reasonably certain price. Liquidity is related to both the quantity of outstanding bonds (i.e. the stock) and the issuing volume of new debt (i.e. the flow). Figure 1 depicted each member's share of the total (stock) of outstanding euro-denominated government debt in October 1999. Below, Figure 3 shows the (flow) volume of new debt issued by each member government in 2000.

Figure 3



Source: Merrill Lynch Note: Data on Luxembourg is not available.

Compared to Germany, Italy, and France, Figure 3 shows that Austria, the Netherlands, Ireland, Portugal, Finland, Spain and Belgium all have limited issuing volume. As a result, it is reasonable to expect investors to demand a premium to compensate for the reduced liquidity of these issues.

In order to test the hypothesis that liquidity premia have contributed to the widening of bond yield spreads, we examine the yields on AAA-rated member debt in countries with limited issuing volume and compare them with the yield on benchmark (i.e. German) issues. [12] Since there is no reason to suppose that investors would expect one AAA-rated government to be more likely to default than another, any difference in yields should be entirely due to investors' perceptions about the relative liquidity of the issuing governments' debt. [13]

Looking at the AAA-rated bonds of Austria, the Netherlands, Ireland and Germany, Figure 2 shows that the spreads on Austrian, Dutch and Irish bonds widened following the introduction of the euro. Since all four governments enjoy the same AAA rating, it would appear that markets are demanding a higher yield in order to compensate for the reduced ease of selling Austrian, Dutch and Irish bonds. However, as the spreads on Finnish bonds reveal, this is not a hard and fast rule. Finland is a small, AAA-rated issuer, but the yields on Finnish bonds have actually declined relative to those on German-issued obligations.

So what are financial markets doing? According to Goldberg and Honikman, "the existence of these spreads indicates the market's perception of the credit-worthiness of the issuing sovereign" (1999: 4). In their view, "credit quality is the overriding means by which market participants differentiate between sovereign issuers within EMU" (ibid.). But this implies that liquidity premia are relatively unimportant. Is there any way to figure out what is causing spreads on Austrian, Belgian, Dutch, Italian, Irish and Spanish bonds to widen, while Finnish, French and Greek spreads continue to narrow?

These are difficult questions, since it is currently impossible to disentangle credit and liquidity risk premia. If, in the future, public debt issuance becomes a more cooperative activity, then the market fragmentation and associated liquidity premia attached to the bonds of smaller issuers may decline, making it easier to conclude that differences in bond yield spreads mainly reflect credit risk. Until then, we can try to infer the extent of the credit-risk premium by looking at the difference between government bond yields and the yields on corporate AAA-rated bonds. This method of inference was proposed by Mundell, who argued that "[g]overnment default risk appears when the yield on

government bonds rises relative to corporate bonds" (1998: 2). [14]

Figure 4 shows the yields on 10-year, AAA-rated, euro-denominated corporate bonds relative to the yields on member debt. Here, a *narrowing* of yield spreads indicates that interest rates on sovereign debts are rising relative to rates on AAA-rated corporate bonds. Each data series has been fitted with a trend line to reflect the general movement of the spread over time. As before, an upward-sloping trend line represents a divergence of yields (i.e. declining default risk premia) while a downward-sloping trend line reflects a narrowing of yields (i.e. rising default risk premia).

Figure 4





Prior to the introduction of the euro, Mundell noted that "Belgium and Italy, the two countries with the highest default risk as measured by the ratio of debt to gross domestic product, had higher yields on government bonds, relative to top-grade corporate bonds, than most of the other EU members" (1998: 2). As the data in Figure 4 indicate, Belgium and Italy are no longer alone. Yields on sovereign debt issued by every one of the original EUR-11 have risen relative to the yields on AAA-rated corporate bonds. Indeed, for several countries, corporate bond yields exceed government bond yields by fewer than 10 basis points. This suggests that markets have begun to attach fairly sizable default-risk premiums to *all* member debt since the introduction of the euro. [15]

In sum, the recent divergence of bond yields on member debt has surprised most analysts. Instead of continuing to narrow, Figure 2 shows that the yields on bonds issued by most member governments have tended to increase relative to the yields on benchmark German issues, indicating that markets may require sizable premiums to compensate for the perceived risk of certain holdings. In attaching risk premia, financial markets appear to be more concerned with the sustainability of member government debt than with the liquidity of the debt instruments themselves. Thus, default-risk premia appear to have emerged as the most important determinant of bond yield spreads.

Fiscal Competition and the Rationing of Credit

As long as investors perceive differences in credit and liquidity risk, they will continue to penalize (or reward) the various EMU governments by raising (or lowering) the premiums attached to their obligations. The purpose of this section is to examine the manner in which the pricing of risk by financial markets can impact the budgetary stance of member governments.

Two scenarios seem most plausible. First, policymakers might choose to pursue tight fiscal policy in the hope that rating agencies, such as Moody's or Standard and Poor's, will upgrade (or avoid downgrading) their issues. [16] Second, it is possible that some member governments will wish to implement expansionary policy (i.e. to increase their liabilities) but will be prevented from doing so by financial markets. To the extent that this occurs, financial markets, through their pricing of risk, will largely determine the country's budgetary stance. Under either scenario, the public finances of the EUR-12 are likely to be influenced by financial markets and their pricing of risk. Let us examine them in turn.

In order to see why policymakers might be motivated to adopt policies designed to protect or improve their credit rating, we must make clear the significance of a country's rating. Lonning (1998) studied the yield differences on Deutsche Mark-denominated bonds issued by various EU governments. He recognized that even though all nations were issuing bonds denominated in the same currency (DM), markets demanded a premium on non-German-issued paper, in order to compensate for the possibility of default. In his study, Lonning regressed bond yield spreads against a number of macro variables, including outstanding (net) government debt, the budget surplus/deficit, the structural surplus, the current account and the country's credit rating. What he

found was interesting: the only variable that yielded a statistically significant coefficient, regardless of the model being tested, was the country's credit rating.

A country's credit rating reflects the market's assessment of the likelihood of a debt-default, which, among other things, depends on the country's debt service burden. Thus, a high debt service burden may cause investors to calculate a higher probability of default and, hence, to demand a premium over benchmark rates. [17] These premiums generate differentials that might, at first blush, seem fairly insignificant. However, as John Winter, head of debt markets for Deutsche Bank in London, recognizes, "even a few basis points can be significant," especially when we are talking about hundreds of billions in outstanding debt (quoted in Capell, 1999). In order to reduce the default-risk premia that financial markets may attach to bonds issued by member states with relatively high debt-to-GDP ratios (e.g. Belgium, Greece and Italy), many EUR-12 governments may strive to balance their budgets (or run large surpluses) so that they can retire debt and improve their credit rating. [18] If they are successful, markets may reward them by reducing the rates required on new offerings. [19]

The second scenario is different. It suggests that policymakers actually want to *increase* their liabilities – i.e. to stimulate the economy through fiscal policy – but that financial markets might effectively prevent them from doing so. Here, the idea is that there is a demand for additional credit, but lenders are unwilling to supply additional finance without compensation for the (perceived) added risk. Thus, fiscal prudence may be assured through access to credit.

Suppose, for example, that Italy or Belgium – with debt-to-GDP ratios of 110.5 and 110.3, respectively, at the close of 2001 – decided to pursue expansionary fiscal policy in order to stimulate GDP and combat high domestic unemployment. [20] If capital markets demand high rates of interest in order to hold Italian or Belgian government debt, then it is easy to see how these governments could be forced to abandon expansionary policy. As Kregel (1999) notes, an attempt by Italy to expand domestic demand would lead to a deterioration of the Italian fiscal deficit and, hence, "credit risks rising on Italian securities" (40). Jordan states the implications succinctly:

The risk for the fiscal authorities of any member country is that the 'dismal arithmetic' of the budget constraint leaves few palatable alternatives. If the yield on government securities demanded by markets exceeds a country's nominal income growth, then interest expense on the outstanding debt must become a relatively larger burden (Jordan, 1997: 3).

In a country like the United States, this should never cause financial stress; the U.S. government can always meet any dollar-denominated commitment as it comes due. But markets clearly recognize that things work differently in the Eurozone, where governments are no longer able to "print money." As a result, the bonds issued by member governments now resemble those issued by state and local governments in the United States (or bonds issued by provinces in Canada or Australia), where yields often differ by a sizable amount. [21]

Several studies of state bond markets have shown that yields on state-issued bonds mainly reflect the market's assessment of default risk. For example, Goldstein and Woglom (1992) and Bayoumi, Goldstein and Woglom (1995) concluded that bond yield differences were correlated with the quantity of outstanding state debt and the state's fiscal balance. Specifically, it was found that when debt levels were relatively large lenders were likely to calculate the probability of default at a relatively high rate, thereby increasing premiums on bond issued by these states. Bayoumi, Goldstein and Woglom believe that if individual U.S. states interpret rising yields as a signal of market resistance, then default premia can play a "positive role in disciplining irresponsible, sovereign borrowers" (1995: 1).

Within the Eurozone, fiscal discipline is supposed to be ensured by the *Stability and Growth Pact*. The Pact, which was ratified at the June 1997 Amsterdamn Summit, strengthens the surveillance of member states by forbidding countries from running deficits in excess of 3 percent of GDP or carrying debts in excess of 60 percent of GDP. In the event that a country does not fulfill these

fiscal criteria, the excessive deficit procedure pursuant to Article 104(c) will apply. Under the *Excessive Deficit Procedure*, deficits exceeding 3 percent of GDP are subject to a fine as declared by the European Council upon a report by the European Commission and a judgement by the Monetary Committee.

Some groups (e.g. the European Council) adamantly believe in the necessity of these limits, arguing that they "mark an essential condition for sustainable and non-inflationary growth and a high level of employment" (quoted in Spiegel, 1997: 1). Others (Eichengreen and von Hagen, 1995; DeGrawe, 1996; Pasinetti, 1997; Arestis and Sawyer, 1998; Arestis, Khan and Luintel, 2002.) have suggested that the limits are too restrictive and that member states should be free to pursue independent fiscal policy without arbitrary limits or penalties. But there is a third group (Wray 1998; Mosler 1999; Bell 2002), which believes that the *Stability and Growth Pact* and the *Excessive Deficit Procedure* probably don't do much to constrain government spending so that increasing (or dispensing with) the arbitrary limits would do little to increase fiscal freedom. The argument is based on the notion that financial markets, through their pricing of risk, are likely to discipline member governments even *before* the Maastricht limits are reached.

The Market Discipline Hypothesis

The reason that some have argued that specific deficit-to-GDP and debt-to-GDP limits probably do little to constrain government spending is that default premia and credit constraints may be powerful enough to limit these ratios. The argument is captured by the market discipline hypothesis, which maintains that there is a nonlinear relationship between yields and debt variables. Using data on U.S. municipal bond yields, Bayoumi, Goldstein and Woglom (1995) test the market discipline hypothesis by estimating the supply curve faced by sovereign borrowers. They found that when a state runs large and persistent deficits, the default premium may increase at an increasing rate (i.e. the relationship between debt variables and yields in nonlinear). Beyond some point, they conclude, credit may become rationed, leaving the borrowing state unable to increase its liabilities. [22]

This seems intuitive. Financial institutions must decide which households to lend to; which small business loans to underwrite; whether to rollover debt or increase the overdraft accounts of corporate customers; how much state, local and federal government debt to hold; etc. In making these decisions, they project whom, among their would-be borrowers, is the most likely to meet interest and principal payments as scheduled. When the perceived risk of default increases, lenders will raise the premium added to certain obligations, which might discourage additional borrowing. Thus, we should not be surprised if, beyond some point, lenders within the Eurozone, like lenders within the United States, refuse to accommodate the demand for additional loans. When this occurs, capital markets will, in effect, dictate a nation's fiscal stance.

The Prospects for Stabilization

Currently, it appears that few countries, despite their high unemployment rates, have attempted to stabilize their economies through expansionary fiscal policy. Figure 5 shows seasonally adjusted unemployment rates for the EUR-12.

Figure 5: EUR-12 Seasonally Adjusted Unemployment Rates

Seasonally Adjusted Unemployment Rates (%), Third Quarter, 2001		
Country	% Unemployed	
Austria	3.9	
Belgium	6.8	
Finland	9.1	
France	9.0	

Germany	7.9	
Greece		
Ireland	3.8	
Italy	9.4	
Luxembourg	2.5	
Netherlands	2.2	
Portugal	4.3	
Spain	13.0	

Source: OECD (Data not available for Greece)

One might expect that in countries like Belgium, Finland, France, Germany, Italy and Spain, where unemployment rates range from nearly 7% to 13%, member governments would at least have taken advantage of their legal right to run deficits of up to 3 percent of GDP. But as Figure 6 shows, only half of these countries – France, Germany and Italy – were actually predicted to run deficits, and only Germany's, at 2.5% of GDP, at 2.5% of GDP would even come close to the running up against the Maastricht limit.

Figure 6



Source: OECD Economic Outlook, December 2001

It is impossible to know whether each member's budgetary position reflects its preferred stance or whether market discipline prevented larger deficits from being run. It may well be that Spain, Finland and Belgium, with unemployment rates of 13.0%, 9.1% and 6.8%, respectively, all chose to run balanced budgets or surpluses in 2001. But it is also possible that some them were dissuaded from taking a more expansionary stance.

Germany, which was projected to run deficits equal to just 2.5% of GDP, has recently come under fire for its expansionary stance. In a series of articles run by the *Financial Times*, financial experts have announced that markets may be preparing to downgrade German issues (Stephens 2002; Barber and Major 2002). If this occurs, Germany will lose its benchmark status and will face penalties in the form of increased risk premiums.

While some (e.g. Eichengreen and von Hagen, 1995) have argued that member states can still service higher debt levels because they retain the power to alter tax rates, others recognize that EUR-12 governments are seriously constrained in this regard. Jordan, for example, argues that "the

prospect of higher taxes would cause the factors of production to migrate . . . [so that] . . . higher tax rates could, eventually, shrink the tax base" (1997, p. 3). [23] Taylor also disagrees with Eichengreen and von Hagen, suggesting that, despite "their substantial revenue-raising powers," member states will "be increasingly constrained by the pressure of 'fiscal competition'" (1999, p. 16).

This "fiscal competition" is the direct result of Article 104. Because member states can no longer create spendable deposits internally (i.e. "print" money), they must compete for euros by selling bonds to private investors (including private banks), who clearly do not view the various obligations as perfect substitutes. Thus, governments must float bonds on the capital market, where they must compete with debt instruments offered by other government (and non-government) entities. Some nations will compete for benchmark status (e.g. Germany and France), while others will compete for relative advantages in the pricing of risk. To the extent that policymakers pursue these objectives vigilantly, they may assign other goals, such as the stabilization of output and employment, a less important role.

Conclusion

Following the switch over to the euro, most economists expected yields on sovereign bonds issued by EUR-12 governments to continue to converge. With a massive, euro-denominated market for sovereign debt, no country-specific exchange rate risk and no currency risk, dealers were expected to view the issues of different EUR-12 governments as more-or-less homogeneous. But things did not unfold as expected.

As explained above, markets continue to differentiate among issues on the basis of liquidity risk. Evidence of this follows from the fact that AAA-rated bonds issued by small governments with limited issuing volume "are still obliged to offer investors a spread over bonds from benchmark issuers" (European Commission, 2000: 3). While this probably accounts for some of the *persistence* in yield differentials, it seems clear that credit risk has emerged as the primary cause of the *divergence* of bond yield spreads. And, since ratings agencies such as Moody's have made it clear that possible future increases in fiscal deficits are to be taken into account when assigning credit ratings to member governments, the intensification of fiscal competition seems assured.

Countries that wish to compete for benchmark status, or to improve the terms on which they borrow, will have an incentive to reduce fiscal deficits or strive for budget surpluses. In countries where this becomes the overriding policy objective, we should not be surprised to find relatively little attention paid to the stabilization of output and employment. In contrast, countries that attempt to eschew the principles of "sound" finance may find that they are unable to run large, counter-cyclical deficits, as lenders refuse to provide sufficient credit on desirable terms. Until something is done to enable member states to avert these financial constraints (e.g. political union and the establishment of a federal (EU) budget or the establishment of a new lending institution, designed to aid member states in pursuing a broad set of policy objectives), the prospects for stabilization in the Eurozone appear grim.

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Notes:

[1] The Eurozone refers to the 12 countries that have adopted the euro. On January 1, 2001, Greece became the twelfth member of the Eurozone.

[2] For example, in 1995, the gap between Italian and German sovereign debt was more than 600 basis points (bp).

[3] By the February 24, 1999, interest rates on Italy's 10-year bond had fallen to 4.11% compared to Germany's 3.9%, thereby reducing the Italian-German yield spread to 21 bp.

[4] The market in euro-denominated bonds became the second largest bond market in the world. The U.S. dollar bond market is the largest.

[5] Emmons (1999) adds the possibility that a member government might abandon the euro and devalue its new currency. Since this is specifically prohibited under the rules of the Maastricht Treaty, this form of risk is not explored here. Neil Record (1999) attempts to price "break-up" or "opting-out" risk premia.

[6] The liquidity of any particular issuer's debt is often evaluated on the basis of the bid-offer spread, where a narrow spread indicates a relatively high degree of liquidity. Ascoli (1999) constructs euro yield curves, using 40 bp as the liquidity benchmark. Thus, a bond with a bid-offer spread in excess of 40 bp is considered relatively illiquid, while a bond is considered very liquid if the bid-offer spread does not exceed this mark.

[7] Article 104 of the Maastricht Treaty prohibits the ECB and the national central banks (NCBs) of all member governments from purchasing securities directly from any member state. This effectively prevents member governments from "printing" euros to service their euro-denominated debts, making the risk of debt-default a legitimate possibility.

$$P_t = 1(1 - p_t)^N = \sum_{j=1}^N p_t (1 - p_t)^{j-1} ,$$

, where N gives the

[8] The probability of default is calculated as $\overline{j_{t-1}}$, where N gives the number of coupon payments still outstanding and p_t indicates the probability of default at time t. See Copeland and Jones (1999) for more on this.

[9] This implies that the Treaty's no-bailout clause – the provision that neither the Community nor any member state shall be "liable for or assume the commitments of central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of any Member State, without prejudice to mutual financial guarantees for the joint execution of a specific project" (The Treaty on Monetary Union: Article 104b) – was not perceived as credible.

[10] Ideally, a default-risk-free instrument would be assigned benchmark status. But, since such an instrument no longer exists, something else must be used. We have chosen to calculate spreads using the yield on 10-year German bunds (i.e. German bonds), since they have become the *de facto* benchmark in the 10-year-sector euro bond market.

[11] This is consistent with the findings of Copeland and Jones, who concluded that markets were not pricing significant default risk.

[12] Moody's rates the debts of Austria, Germany, the Netherlands, Ireland, Finland and France as AAA.

[13] The idea is to hold credit risk constant and treat any difference in yields as liquidity risk.

[14] Lemmen and Goodhart (1999) infer default risk premia by comparing yields on domestic government bonds with interest rate swap yields.

[15] Greece, which is not shown in Figure 4, is the only exception. But this makes sense, since the euphoria that caused yield spreads on Greek and German bonds to narrow may have some lingering effects. Additionally, markets may be rewarding the Greek government for reducing its deficit from 10.2 percent of GDP in 1995 to 1.1 percent of GDP in 2000.

[16] Obviously, policymakers might adopt restrictive policies for purely political reasons as well.

[17] Charging a premium to compensate for the risk of default makes sense when "the central bank's ability to act as lender of last resort is limited due to a currency board regime, dollarization, or membership in a monetary union" (Moody's, 2001: 1). As Wray (2002) explains, it makes little sense to rate government bonds denominated in a local currency that is not tied to one of these monetary regimes as anything other than AAA.

[18] Indeed, Parguez expects this kind of behavior, arguing that markets will prefer to the debt of a government that "pledge[s] to balance its budget, to get a zero ex post deficit, so as to protect the banks against the risk of accumulating public debt" (1999: 72).

[19] Ironically, however, some of this reward may be offset by the emergence of a "scarcity premium," which might be demanded in order to compensate for the diminished liquidity of the market. This was recognized in a study by the Giovannini Group, which argued that "the liquidity premium ... is likely to grow in importance as budgetary consolidation reduces the supply of public debt across the area as a whole" (2000:2).

[20] The seasonally adjusted unemployment rate was 7.0% in Belgium and 9.3% in Italy in October 2001 (Eurostat).

[21] Yields on state-issued bonds differed by as much as 84 basis points in 1989, down from a high of 170 basis points in 1982 (Lonning, 1998).

[22] The yield on state-issued bonds was found to rise by about 23 basis points each time debt increased by one percentage point above the mean level of debt. At one standard deviation above the mean, yields rose to over 35 basis points, and credit became rationed at debt levels that exceeded 25 percent above the highest debt level in the sample (Bayoumi, Goldstein and Woglom, 1995).

[23] Jordan's scenario seems fairly implausible since labor has been extremely immobile within the Eurozone.

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