The Long Term Stability of the Euro—A Critical Review

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This paper deals with the stability of the euro since its inception and the structural weaknesses in the allocation of responsibility for monetary and fiscal policy in particular. Recent events reflect those weaknesses and, as a result, the survival of the euro zone in its current configuration is threatened. This paper examines the stability of the euro zone by focusing on interest rates [more specifically, the risk premia in the various troubled European Monetary Union (EMU) countries] and their determinants, and the stability of these premia which affect the price of government bonds. The conclusion is that the bond markets are quite unstable and that the instability was caused by budget profligacy. This paper looks at the entire period since the inception of the euro which covers the financial crisis of 2008 and beyond and asks whether moral hazard and the free rider problems in fiscal policy and the markets for sovereign debt have contributed to the current crisis. This includes examining the determinants of the risk premiums in the various countries making up the EMU, focussing on variables that are in the Maastricht Treaty charter such as budget deficits, cumulative debt in relation to GDP, rates of inflation, and monetary variables. The conclusion is inescapable: One cannot run a country or a union with 19 finance ministers where many have set aside the convergence criteria, and with a monetary policy that accommodates the extreme needs of some members instead of dealing decisively with serious structural problems that EU and the EMU especially, face. This paper examines the economic relationships in the troubled countries of the EMU in order to draw some lessons for policy makers.

Keywords: the euro, European Monetary Union, Maastricht Treaty weakness, stability of interest rates, stability of bond portfolios

Introduction

The recent success of the “Brexit” vote in the UK referendum bodes rather ill for the euro to the extent that it may encourage similar “copycat” moves elsewhere in the EU. It is worth noting that unlike most members of the European Union, the euro is not the official currency of the UK. One would therefore wonder why the impending exit of the UK from the EU should affect the euro. The problem is contagion. Much like the breakup that the UK itself is now facing the “Frexit” called by France’s National Front, the Dutch populist Geert Wilders’ “Nexit” call, the possibility of A “Five Star Movement” really capturing the Italian national polls next year etc.,

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and the ever-so-green threat of “Grexit” represents deeper concerns about the EMU and the EU. It is abundantly clear that the EU needs serious reforms in banking, in further developing and streaming a fiscal union, and stronger mechanisms for democratic accountability and the like. As such, the mostly Germany-backed insistence on fiscal prudence and austerity has, interestingly, raised seemingly derisive epithets like the “Fourth Reich” in some circles. On the positive side, “Brexit” may dampen that trend. The “Grexit” event continues to be quite likely, however, this contributes to the volatility of the euro at a time when the financial markets are already on edge.

The EMU-wide policy of austerity (or at least responsible fiscal policy) is enshrined in the Maastricht Treaty. It appears that no one told this to the demonstrators in Greece, Italy, and Spain. The budget rules were prescribed specifically and there were penalties for non compliance (a certain percentage of GDP for the violators). The net consequence for the violators turned out to be bailouts instead. The penalty was imposed by the financial markets, the IMF, and the financially strong countries of Europe. Wages were cut, new fiscal policies, and accountability measures were introduced, subsidies were slashed, new taxes were imposed, and retirement packages were realigned in some cases severely.

The European Community also has the euro firewalls and reserves to enforce them in order to further stabilize the financial system. All the measures and the strong moves by the IMF may have postponed the day of reckoning but did not quell the crisis. This followed massive early confusion about what to do with the worst offender: Greece. Ironically, everything that was finally agreed upon for Greece to be salvaged could have been introduced immediately after the crisis broke out. But the leaders of the EMU countries were stunned and confused the markets in the process.

The euro’s consequent loss of its shine further affected those countries that were already in difficulty. Unable to depreciate the euro as a policy measure to correct imbalances, they decided to use the only available measure: internal devaluation through lower wages and prices. The talk has now shifted to whether the fundamental structure of the euro is viable. Talks about “Grexit” or “the Greek exit”, whether voluntary or EMU-enforced, abound and possibly extend to the other member countries that fail to generate employment and prevent a larger percent of their citizens from slipping into poverty. Conversations about unscrambling the euro or even abandoning it altogether are also heard. The breakup of the euro would not be unprecedented, however, as there have been almost 70 currency breakups in the last century.

The foundation of the euro that was set aside if not forgotten was the convergence criteria. Had all the countries behaved in accordance with it, the crisis may well have not arisen at all. The rigidities that were built into the system did not help either, nor did the expectation that all of the EMU should look the same through harmonization. Clearly, the euro zone is a diversified portfolio all right, for all practical purposes, albeit with no scope for portfolio balancing or risk-return optimization. The EMU is a monetary union but the fiscal policies of its member states are too politically irreconcilable to make the critically needed strict adherence to the convergence criteria difficult. Indeed, no talk of any centralization of the budgetary authority within the EMU will lead anywhere because, reasonable as it sounds, it will be political suicide for many countries to give up their fiscal independence. While the EMU issues fester, the countries that decided to stay outside the euro—Denmark, Sweden, and Britain—while not gloating, are saying “we told you so”, and Britain is already on the way out of the EU itself.

The Seeds of the Crisis

The current debt crisis within the euro zone represents a major challenge to the institutional set-up for monetary and fiscal policy within the EMU. The question that arises is whether the seeds to the crisis were

inherent in the institutional set up already in place before the financial crisis erupted in 2008. A potential source of instability to be particularly considered here is the interaction between financial markets and fiscal policy behavior. Central to this interaction is the sensitivity of interest rates to fiscal variables.

The EMU was established by the EU in the Maastricht Treaty in 1993. While the EU now has 28 member countries, the EMU has 19, up from 12 after the expansion of the EU to Central and Eastern Europe. Eleven members joined the euro zone on Jan. 1, 1999. Greece joined two years later leaving only Denmark, Sweden, and the UK outside among the 15 EU members at the time. After the expansion of the EU to the East, Slovenia joined the EMU on Jan. 1, 2007, Cyprus and Malta joined a year later, followed by Slovakia on Jan. 1, 2009 and Estonia on Jan. 1, 2011. The focus here is on the 10 original members, especially those that got in trouble.

The European Central Bank (ECB) is charged with maintaining price stability and a stable currency. Other institutions that potentially influence financial markets as well as macroeconomic policies in member states are the European Commission and the European Parliament.

The Maastricht Treaty requires that an EU member joining the EMU must satisfy the so called convergence criteria referring to price stability, interest rate differentials, budget deficits, and national debt levels. The national debt limit of 40 percent of GDP was violated by Italy and Belgium from the very beginning, but these countries qualified for EMU membership on the grounds that they had “credible” plans for reducing the debt level relative to GDP over time.

By being members of the EU, all EMU members maintain common trade policy, agricultural and fisheries’ policies, and regional development policies, and through membership in the Internal Market, they subscribe to the principle of freedom of movement of goods, labor, services, and capital. Those lagging in their institutional structures and policies must harmonize with the rest of the members. Each member state, nonetheless, has full control over its budget, the size of its deficit, and tax policy with a few exceptions. One constraint is the “Stability and Growth Pact” and another one is constraints on the use of Value Added taxes. The Stability and Growth Pact (SGP) was introduced to constrain EMU members from giving in to the temptation to run fiscal deficits without having to face consequences in interest rates, exchange rates, and inflation rates. It was thought that interest rates would be equalized within the EMU, although each country was individually responsible for its debt. Bail-outs of individual EU-members were explicitly ruled out. Thus, in principle, each country’s bond rate can include a country specific risk premium to the extent the no bail-out principle is fully credible. If it is not credible, there is a potential free rider problem in fiscal deficit policy. Under these circumstances, the constraints of the SGP are called for.

It is obvious by now that SGP has been ineffective. The largest countries within the EMU, Germany, and France, have violated the pact without repercussions. These violations have made it politically impossible to impose penalties, as called for in Maastricht, on other countries in violation of the pact.

The EMU is in effect a system of one central bank, the ECB, and 19 finance ministers in governments with independent fiscal powers. Each country’s central bank is represented on the board of the ECB, but within each country the central bank is constitutionally independent of the government. Thus, the system is set up to minimize the political influence over EMU-wide monetary policy. Further, central bankers in each member state keep an arm’s length relationship to the finance ministry.

One economic constraint on fiscal deficit spending within the EMU is that an individual government cannot expect to be able to inflate in the future in order to reduce the real value of the debt. The government in any country with a politically independent central bank faces a similar constraint but it can be expected to be

stronger within the EMU where the influence on monetary policy by individual governments is even smaller than that in one country with an independent central bank.

The second constraint on fiscal deficit spending in the EMU is that bail-outs of individual countries by the EMU as a whole are prohibited. Thus, the country with “excessive” national debt would have to face a risk-premium in its government bond yields. This risk premium should, in principle, discourage the excessive build up of debt. The EU has been able to render the no bail-out clause ineffective in the Greek crisis by avoiding the concept of bail-out for loans to an EU wide facility in support of financial stability. Thus, the European Financial Stability Facility (EFSF) was created in May 2010. All of this was not enough and Greece needed a special bail-out package that came with a large set of conditionalities.

This paper proceeds as follows. The following section discusses the sources of potential euro-zone instability in light of the Optimum Currency Area literature, the next section looks at the dynamics of interest rates and the intra EMU relationships across the rates. The section that follows looks at the determinants of country-specific risk premia, and the final section offers conclusions and recommendations.

Optimum Currency Areas and Potential Sources of Instability

While it is admittedly inspired by Mundell’s Optimum Currency Area concept (Mundell, 1961), the EMU is not really an optimum currency area (OCA) by any means and no one has argued that it is. But then, not being an OCA does not necessarily imply that a currency area needs to be a failure or that it will not work as well as a system of floating rates among the potential members.

The optimum currency area (OCA) literature sheds light on the need for convergence in different areas within a currency area (see, for example, Wihlborg & Willett, 1991; Wihlborg, Willett, & Zhang, 2010). The driving force for the euro, as many leading politicians have argued at various occasions, is political. The perception that there is strength in numbers dilutes further the economic argument in favor of the political.

At the time, the EMU was created on Jan. 1, 1999, EMU membership was formally reserved for those satisfying the Maastricht criteria with respect to inflation, interest rates, fiscal deficits, and government debt, but in reality, these criteria were not enforced.¹ At the time, the dominate view in the EU was that a more flexible approach to monetary harmonization should be avoided on the grounds that a “two-speed Europe” would be detrimental to the process of “ever increasing integration”. Nevertheless, the UK, Denmark, and Sweden remained outside the currency union because the domestic opposition to participation was strong. The UK and Denmark negotiated formal opt-out agreements. Greece entered the EMU in 2001 after a short delay.

The economic benefits of monetary harmonization were conceptualized in Delors’s (1989) report, “One Union, One Money”, published in 1988. It was built on Werner’s (1970) report and elaborated on the economic arguments in favor of a monetary union. Microeconomic benefits in the form of reduced transactions and information costs, as well as reduced exchange rate risk, were emphasized. Furthermore, the report emphasized that free capital flows make any exchange rate regime along the spectrum between irrevocably fixed rates in a monetary union and freely floating rates, unstable. If countries retain their rights to change pegged rates, speculative capital flows could threaten exchange rate stability. Credibility of fixed rates would be obtained only in a monetary union where no floating exchanges rates exist between the member countries. Thus, monetary institutions and policy should be fully harmonized.

¹ Both Italy and Belgium had government debts exceeding 100 percent of GDP while the Maastricht criteria specified 60 percent as the maximum.

Monetary harmonization has costs as well as benefits. Wyplosz (2006) pointed out that the disadvantages of a monetary union were glossed over rather lightly in Delors's (1989) report and called the omission of important elements of Optimum Currency Area (OCA) theory in the Commission's argumentation for a common currency "the Monetary Union's original sin". The OCA theory spells out criteria for a country's choice of exchange rate regime. This literature was rich already in the late 70s (see e.g. Tower & Willet, 1976). The most well-known and widely accepted criterion for a currency area is labor market flexibility in the form of either mobility within the area or flexibility of relative real wages across industries as well as countries. The second criterion is fiscal policy cooperation enabling transfers in case members that are in different phases of the business cycle. These criteria can be viewed as requirements for a currency union to work effectively without creating costs associated with inappropriate monetary policy relative to an individual country's legal, political, and cultural institutions in specific areas.

Flexible wages within countries and high labor mobility between as well as within countries are not European characteristics. Thus, the importance of fiscal transfers among regions is in response to asymmetric shocks increases if living standards in different regions are to develop at a more or less equal rate. The fiscal transfer mechanism will not put much strain on the fiscal capabilities of different parts of the union as long as it is used to smooth consumption in a region with relatively high unemployment temporarily. However, if unemployment in one region is rising as a result of a permanent shock, a transfer to this region from regions with less unemployment may actually reduce the speed of adjustment of relative wages. If wage adjustment is slow already, the need for fiscal transfers will be needed for the long term. The strain on government budgets may become severe.

The above reasoning applies to fiscal transfers within countries within a currency area as well as to fiscal transfers between countries within a currency area. The EU has so far not developed a transfer mechanism between countries but individual members have well developed internal transfer mechanisms. Thus, asymmetric permanent shocks affecting regions within a member country are likely to put substantial strains on the fiscal capacity of the country. Relative cost levels must be adjusted sooner or later to reduce these strains.

The EMU is a system without an explicit exit strategy. A country may well choose to terminate its membership at any time without an explicit penalty. The political and economic consequences are not easily predicted, however. An unstable euro and an inability of the ECB to deal with a massive crisis may well encourage exiting as the preferred alternative for some countries. It remains to be seen how strong the political commitment of EMU membership is among members that must pay a high price in terms of fiscal austerity and unemployment to remain in the currency area. This may well explain the underlying factors for "Brexit".

The concerns with respect to the potential economic costs of EMU membership make the stability issue analyzed below more important. This issue refers to potential instability generated by the behaviour of fiscal authorities in the member states.

An old and a new "Impossible Trinity" under fixed exchange rates.

The well known "Impossible Trinity" refers to the combination of fixed exchange rates, capital mobility, and independent monetary policy. Within the euro zone, the independence of monetary policy has been given up to achieve the objectives of a common currency and high capital mobility among member states.

The sovereign debt crisis in the euro area has focused attention on another potential "Impossible Trinity". This refers to monetary harmonization, sovereign debt risk insurance, and independent fiscal policy. If

sovereign debt risk within the EMU is perceived to be implicitly insured while fiscal policy is run independently, financial market participants will not request a risk premium on sovereign bonds in proportion to the likelihood that the country will not service its debt. A moral hazard problem arises, therefore. Countries with weak political mechanisms for fiscal discipline are able to run deficits and increase their debt to GDP ratios without having to face market penalties. It appears that Greece, in particular, behaved this way until market participants discovered in early 2010 that Greece has a payment problem and that a bail-out may not be forthcoming. The empirical analysis below examines the extent to which markets for sovereign bonds of EMU countries incorporated sovereign risk in interest rates.

It seems that the financial crisis created conditions that led bond market participants to re-evaluate the implicit EU insurance of sovereign debt. Falling GDP in most countries, expansionary fiscal policies, bank bailouts, and large current account deficits associated with lack of competitiveness combined to make debt to GDP ratios unsustainable in Greece to begin with. The interest rates on sovereign bonds within the EMU are therefore analyzed over the 1999-2007 as also the 1999-2009 periods in order to see if market participants reevaluated sovereign risk as a result of the financial crisis.

Stability of Interest Rates and of the Bond Portfolios

Considering an EMU-type monetary union of three member countries and that an international investor holds a bond portfolio with weights equal to the weight of each country's debt to the total debt of the countries under consideration, i.e.,

$$W_1 = (\text{Debt})_1 / \sum_{i=1}^n (\text{Debt})_i = \text{Relative weight for the first country} \quad (1)$$

The variance (σ_p^2) of the portfolio of three securities (assuming one is stable, the other is potentially unstable, and the third is indeed unstable) is therefore given by:

$$\sigma_p^2 = \sum_{i=1}^n \sum_{j=1}^m W_i W_j \sigma_{ij} = (W_1^2 \sigma_1^2 + W_1 W_2 \sigma_{12}) + (W_2^2 \sigma_2^2 + W_1 W_3 \sigma_{13}) + (W_3^2 \sigma_3^2 + W_2 W_3 \sigma_{23}) \quad (2)$$

Thus, σ is effectively determined by the probability of default for $\sigma_1 > \sigma_2 > \sigma_3$.

Now assuming that countries 1 and 2 are the trouble countries, with $\sigma_1 > \sigma_2$ and that σ_3 is for the solid country in this portfolio. Poor economic policies by countries 1 or 2, or both, then translate in higher debt issuance by these countries. This means that W_1 and W_2 will rise and W_3 will fall. Also, σ_1 and/or σ_2 will then rise, and so will σ_p .

Considering that trade and inter country investments take place among these three countries, that the market expects the stronger country to bail out the weaker ones, and that one bad country could actually lead another to profligate behavior through what is referred to as moral hazard problem, the covariance structure amongst the countries' rates of return will indeed become more positive thus adding to the market portfolio risk. If the bad conduct is not checked, a bubble in financial asset prices could form and the instability which would lead to a crisis.

This leads to: $(W_1, W_2) \uparrow$ and $W_3 \downarrow$
 $(\sigma_1, \sigma_2) \uparrow$ and $\sigma_3 \uparrow$ (this is the free rider problem)

This is the price of providing a safety net to the troubled countries, while $(\sigma_{12}, \sigma_{13}, \sigma_{23}) \uparrow$ is the moral hazard issue.

Therefore, $\sigma_p \uparrow$ and hence $E(R_p)$ would rise as well as shown in Figure 1.

Figure 1. The trade-off between risk and return.

It is clear that as the returns on risky bonds get larger, the price will have to fall to accommodate the higher required returns. A rise in the risk of bonds will lead to a series of concerns about contagion effects. This is when rescue packages come into effect and half, the Greek debt, for example, will have to be written off. There indeed was a price bubble for Greek debt.

It is reasonable to hypothesize, therefore, that the stability of the desired portfolio of bonds issued in different countries within the EMU depends primarily on the country specific risk and the stability of the covariance matrix for bond rates. Differences among country bond rates would depend on differences in risk premia rather than monetary conditions which are determined on the EMU level.

With this background, the stability of the covariance matrix for bond rates within the EMU can be now examined. Table 1 shows a very unstable variance/covariance structure reflecting. The huge uncertainty in the market place about the EMU structure and the policies that have been instituted to deal with the crisis is amply reflected here.

As can be noticed in Table 1(a), for instance, the marked increase in variances of each of the bond markets, especially those of the GIIPS (Greece, Ireland, Italy, Portugal, and Spain) countries, when compared with the variances in Table 1(b). The larger variances explain the free rider problem where countries could collectively come to the conclusion that they can come to the market and borrow with impunity. The increased covariances indicate the moral hazard problem: that one poorly managed country behavior induces others to imitate. One must remember with clarity the explosion in Spanish debt. They saw what happened in Greece and they thought they could do the same.

The sources of the differences between Tables 1(a) and 1(b) are documented in Table 1(c) that covers the crisis period of 2008-2012. For example, the large increase in variances of GIIPS countries and the covariances between them and Germany speak volumes of the transformation of attitudes toward risk and how the financial markets were pricing it.

Table 1

Variance-covariance Matrix of Long-term Monthly Yields for Selected Members of the European Monetary Union

		BE	DE	IR	GR	SP	FR	IT	NL	AT	PT	FN
(a) Jan 2001–Feb 2012 (134 months)	BE	0.3138	0.3217	0.1382	-0.1318	0.2574	0.3091	0.2639	0.3216	0.3203	0.1699	0.3367
	DE	0.3217	0.6165	-0.5949	-2.234	0.0667	0.4636	0.0493	0.5478	0.4675	-0.8409	0.5563
	IR	0.1382	-0.5949	2.9628	6.1469	0.7996	-0.2728	0.6433	-0.4257	-0.263	3.1549	-0.4156
	GR	-0.1318	-2.2340	6.1469	19.2959	1.6402	-1.2129	1.6380	-1.8419	-1.2625	8.9339	-1.8124
	SP	0.2574	0.0667	0.7996	1.6402	0.4019	0.1464	0.3697	0.1045	0.1521	0.9703	0.1192
	FR	0.3091	0.4636	-0.2728	-1.2129	0.1464	0.3832	0.1496	0.4305	0.3921	-0.3668	0.4424
	IT	0.2639	0.0493	0.6433	1.6380	0.3697	0.1496	0.4150	0.0949	0.1573	0.9903	0.1130
	NL	0.3216	0.5478	-0.4257	-1.8419	0.1045	0.4305	0.0949	0.5058	0.4449	-0.6564	0.5169
	AT	0.3203	0.4675	-0.2630	-1.2625	0.1521	0.3921	0.1573	0.4449	0.4127	-0.3985	0.4592
	PT	0.1699	-0.8409	3.1549	8.9339	0.9703	-0.3668	0.9903	-0.6564	-0.3985	4.5089	-0.6375
	FN	0.3367	0.5563	-0.4156	-1.8124	0.1192	0.4424	0.1130	0.5169	0.4592	-0.6375	0.5309
(b) Jan 2001 – June 2008 (90 months)		BE	DE	IR	GR	SP	FR	IT	NL	AT	PT	FN
	BE	0.3532	0.3406	0.2579	0.1216	0.3317	0.3388	0.3091	0.3542	0.3632	0.2510	0.3749
	DE	0.3406	0.4146	0.0029	-0.4357	0.2597	0.3695	0.2434	0.3972	0.3806	-0.0013	0.4137
	IR	0.2579	0.0029	0.9402	1.7660	0.4272	0.1261	0.3937	0.0997	0.1764	0.9239	0.1245
	GR	0.1216	-0.4357	1.7660	3.7994	0.5287	-0.1571	0.4832	-0.2365	-0.0744	1.7437	-0.2077
	SP	0.3317	0.2597	0.4272	0.5287	0.3580	0.2885	0.3320	0.2939	0.3194	0.4190	0.3157
	FR	0.3388	0.3695	0.1261	-0.1571	0.2885	0.3467	0.2700	0.3677	0.3635	0.1208	0.3856
	IT	0.3091	0.2434	0.3937	0.4832	0.3320	0.2700	0.3110	0.2748	0.2984	0.3871	0.2950
	NL	0.3542	0.3972	0.0997	-0.2365	0.2939	0.3677	0.2748	0.3919	0.3840	0.0948	0.4101
	AT	0.3632	0.3806	0.1764	-0.0744	0.3194	0.3635	0.2984	0.3840	0.3848	0.1708	0.4039
	PT	0.251	-0.0013	0.9239	1.7437	0.4190	0.1208	0.3871	0.0948	0.1708	0.9119	0.1183
	FN	0.3749	0.4137	0.1245	-0.2077	0.3157	0.3856	0.2950	0.4101	0.4039	0.1183	0.4312
(c) Jul 2008 – Feb 2012 (44 months)		BE	DE	IR	GR	SP	FR	IT	NL	AT	PT	FN
	BE	0.2333	0.2830	-0.1065	-0.6502	0.1055	0.2484	0.1714	0.2549	0.2326	0.0040	0.2585
	DE	0.2830	1.0297	-1.8177	-5.9123	-0.3280	0.6562	-0.3477	0.8557	0.6453	-2.5582	0.8479
	IR	-0.1065	-1.8177	7.0998	15.1079	1.5614	-1.0888	1.1538	-1.5003	-1.1619	7.7183	-1.5203
	GR	-0.6502	-5.9123	15.1079	50.9934	3.9137	-3.3725	4.0001	-5.1257	-3.6927	23.6410	-5.0947
	SP	0.1055	-0.3280	1.5614	3.9137	0.4915	-0.1443	0.4469	-0.2828	-0.1902	2.0981	-0.2827
	FR	0.2484	0.6562	-1.0888	-3.3725	-0.1443	0.4578	-0.0966	0.5589	0.4506	-1.3643	0.5586
	IT	0.1714	-0.3477	1.1538	4.0001	0.4469	-0.0966	0.6277	-0.2731	-0.1313	2.2241	-0.2593
	NL	0.2549	0.8557	-1.5003	-5.1257	-0.2828	0.5589	-0.2731	0.7388	0.5695	-2.1929	0.7352
	AT	0.2326	0.6453	-1.1619	-3.6927	-0.1902	0.4506	-0.1313	0.5695	0.4696	-1.5628	0.5722
	PT	0.0040	-2.5582	7.7183	23.6410	2.0981	-1.3643	2.2241	-2.1929	-1.5628	11.8665	-2.1835
	FN	0.2585	0.8479	-1.5203	-5.0947	-0.2827	0.5586	-0.2593	0.7352	0.5722	-2.1835	0.7347

Figure 2 further documents the very substantial shift in the riskiness of the financial markets as measured by the variability of interest rates. The increases in variability came in the last four years after the crisis in the international financial markets set in.

Figure 2. Mean values of interest rates and their variances for 11 major eurozone economies.

The next section shows the determinants of the risk premia that investors witnessed in the financial markets.

Further Analysis of Risk Premia for the GIIPS Countries

Considering now the simple proposition that countries borrow money primarily for the following purposes:

- (1) Financing a budget deficit;
- (2) Financing a current account deficit;
- (3) Priming the pump in the event of demand deficiency (output gap), that is, institute a stimulus package;
- (4) Undertaking needed infrastructure developments, and unfortunately;
- (5) Paying interest on the debt.

Table 2 shows the results of the regression analysis. Risk premium (country's own rate minus the German rate) is used as the dependent variable here and the following are independent variables:

- (1) The consumer price index (CPI) for each country;
- (2) Current account deficit as percent of GDP;
- (3) Quarterly change in GDP growth rate. This is used as a proxy for the output gap: the difference between the actual growth rate and the steady "full employment rate (which was actually a constant)";
- (4) Cumulative debt as percent of GDP;
- (5) Annual deficit as percent of GDP.

The data used here are quarterly, typically covering the period of 2000-2011.

The results are very consistent in terms of the debt variables. The current budget deficit and the cumulative budget deficit have a significant impact on the risk premium in all GIIPS cases. The R squares are strong for all the GIIPS countries. The results are instructive when compared with the anchor country: Germany. Here, the debt level had no effect on the risk premium as Germany lived largely within the convergence criteria and as it was island of instability and the lender of last resort, along with the ECB for all the troubled countries. The results for Germany remain surprising. It seems that the financial markets concluded that all Germany had to do is to figure out a stimulus package to address the lagging economic growth. Germany did that.

The inflation rate and the current account deficit did not seem to have affected the risk premium, except for Greece and Portugal—two countries with little export potential and large current account deficits.

Table 2

Regression Results for the DETERMinants of Risk Premia Relative to German Long-term Rates for the Five Heavily Indebted Members of the European Monetary Union

ITALY	Coefficients	Std. Error	t Statistic	P-Value	Lower 95%	Upper 95%
<i>Intercept</i>	-16.2174	3.7955012	-4.272795	1.08E-04	-23.87703	-8.557767
<i>CPI (=100 in 2005)</i>	0.029697	0.0271385	1.09426	0.280077	-0.025071	0.084464
<i>Current Account as % of GDP</i>	-0.021913	0.0845716	-0.259108	0.796817	-0.192586	0.148759
<i>Quarterly GDP Change (%)</i>	-0.375489	0.1010342	-3.716462	0.000591	-0.579385	-0.171594
<i>Debt as % of GDP</i>	0.126217	0.0175779	7.180479	8.03E-09	0.090744	0.161691
<i>Deficit—Surplus as % of GDP</i>	0.041925	0.0279638	1.499252	0.141288	-0.014508	0.098358
Adjusted R Square =	0.0615982			Data Coverage:	2000Q1 - 2011Q4	
GREECE	Coefficients	Std. Error	t Statistic	P-Value	Lower 95%	Upper 95%
<i>Intercept</i>	-18.20202	3.236059	-5.624748	2.21E-06	-24.76505	-11.63898
<i>CPI (=100 in 2005)</i>	0.033892	0.036492	0.928763	0.359198	-0.040117	0.107901
<i>Current Account as % of GDP</i>	0.123185	0.044613	2.761187	0.009007	0.032705	0.213664
<i>Quarterly GDP Change (%)</i>	-0.245509	0.126661	-1.938309	0.060458	-0.502389	0.011372
<i>Debt as % of GDP</i>	0.161954	0.012484	12.972789	3.88E-15	0.136635	0.187273
<i>Deficit—Surplus as % of GDP</i>	0.199835	0.051719	3.863842	0.000448	0.949429	0.304726
Adjusted R Square =	0.8869			Data Coverage:	2000Q4 - 2011Q1	
PORTUGAL	Coefficients	Std. Error	t Statistic	P-Value	Lower 95%	Upper 95%
<i>Intercept</i>	19.8429	3.109602	6.384496	1.11E-07	13.57781	26.12867
<i>CPI (=100 in 2005)</i>	-0.2589	0.032502	-7.953919	0.359198	-0.040117	0.107901
<i>Current Account as % of GDP</i>	0.2421	0.047362	5.112722	7.38E-06	0.146567	0.337726
<i>Quarterly GDP Change (%)</i>	-0.1021	0.112386	-0.905311	0.370466	-0.328548	0.125061
<i>Debt as % of GDP</i>	0.1366	0.006622	20.510049	1.68E-23	0.123198	0.150088
<i>Deficit—Surplus as % of GDP</i>	0.1319	0.026037	5.065559	8.60E-06	0.079346	0.184434
Adjusted R Square =	0.9215			Data Coverage:	2000Q1 - 2011Q4	
IRELAND	Coefficients	Std. Error	t Statistic	P-Value	Lower 95%	Upper 95%
<i>Intercept</i>	-5.109324	1.4839	-3.443183	1.34E-03	-8.106112	-2.112536
<i>CPI (=100 in 2005)</i>	0.021842	0.0159	1.371215	0.177767	-0.010327	0.054011
<i>Current Account as % of GDP</i>	-0.034606	0.0602	-0.574835	5.69E-01	-0.156186	0.086974
<i>Quarterly GDP Change (%)</i>	-0.037523	0.0569	-0.657998	0.514217	-0.152689	0.077644
<i>Debt as % of GDP</i>	0.093594	0.0057	16.303509	1.60E-19	0.082	0.105187
<i>Deficit—Surplus as % of GDP</i>	0.046002	0.0134	3.420672	1.43E-03	0.018843	0.073161
Adjusted R Square =	0.907439			Data Coverage:	2000Q2 - 2011Q4	
SPAIN	Coefficients	Std. Error	t Statistic	P-Value	Lower 95%	Upper 95%
<i>Intercept</i>	-14.37716	2.012139	-7.145	1.82E-08	-18.45414	-10.300181
<i>CPI (=100 in 2005)</i>	0.081032	0.019881	4.076	2.33E-04	0.040749	0.121315
<i>Current Account as % of GDP</i>	-0.135637	0.037386	-3.628	8.57E-04	-0.211387	-0.059886
<i>Quarterly GDP Change (%)</i>	-0.413204	-0.110669	-3.734	6.33E-04	-0.637442	-0.199067
<i>Debt as % of GDP</i>	0.125769	0.010319	12.191	1.61E-14	0.104858	0.146682
<i>Deficit—Surplus as % of GDP</i>	0.031606	0.019177	1.648	1.08E-01	-0.007249	0.070461
Adjusted R Square =	0.878078			Data Coverage:	2001Q2 - 2011Q4	
GERMANY	Coefficients	Std. Error	t Statistic	P-Value	Lower 95%	Upper 95%
<i>Intercept</i>	1.935586	3.314751	0.583931	5.62E-01	-4.753851	8.625023
<i>CPI (=100 in 2005)</i>	-0.016349	0.029381	-0.556468	5.81E-01	-0.075642	0.042944
<i>Current Account as % of GDP</i>	0.031316	0.036656	0.854323	3.98E-01	-0.042659	0.105292
<i>Quarterly GDP Change (%)</i>	-0.269626	0.063273	-4.261521	1.00E-04	-0.397309	-0.141942
<i>Debt as % of GDP</i>	-0.009984	0.013086	-0.762967	4.51E-01	-0.036393	0.016424
<i>Deficit—Surplus as % of GDP</i>	-0.018763	0.021278	-0.881761	3.83E-01	-0.061704	0.024179
Adjusted R Square =	0.240249			Data Coverage:	2000Q1 - 2011Q4	

The quarterly growth in GDP influenced the risk premia negatively. This is not surprising given the expansive monetary policy of the European Central Bank buttressed by the expansion of monetary policy in the United States. The negative coefficient means that when the growth rate is lower than the long term, full employment interest rates would fall. This is the monetary stimulus.

Estimation of Risk Premia and Fiscal Behavior in EMU Countries

The above analysis adds to the substantial literature on the dependence of interest rates on fiscal variables as well as on factors determining fiscal behavior in the EU in particular. There are papers focusing on individual countries as well as panel studies covering a variety of country groups. Few papers study the determination of interest rates and fiscal behavior simultaneously, however. Instead, studies of fiscal behavior focus either on cyclicity in policy reactions or debt dynamics.

This section carries the analysis further by trying to isolate the effects of the risk premium on the changes on the debt/GDP ratio over the relevant period.

The expression used here for the quarterly average risk-premium on 10-year government bond rate in country relative to Germany is the following:

$$\begin{aligned} \text{Risk-premium}_{i,t} = (r10_j - r10_{de}) = a_0 + a_1(\text{Debt/GDP})_{i,t-1} \\ + a_2\text{CA/GDP}_{i,t} + a_3\text{CPI}_{i,t} + a_4\text{GDPgrowth}_{i,t} + a_5\text{Unemp}_{i,t} + e_i \end{aligned} \quad (3)$$

where $(\text{Debt/GDP})_{i,t-1}$ represents the beginning of quarter General Government Debt relative to annualized GDP, CA/GDP represents Current Account relative to GDP, CPI represents consumer price index (average for the quarter), GDPgrowth represents growth rate in quarterly GDP relative to previous quarter, Unemp represents unemployment rate in quarter in percent, and a_0 through a_5 represent constant coefficients.

The estimate of fiscal policy variable is the percentage change in government debt:

$$\begin{aligned} (\text{Debt/GDP})_{i,t} - (\text{Debt/GDP})_{i,t-1} = b_0 + b_1(\text{Debt/GDP})_{i,t-1} + b_3(r10 - r3m)_{i,t} \\ + b_4\text{CA/GDP}_{i,t} + b_5\text{CPI}_{i,t} + b_6\text{GDPgrowth}_{i,t} + b_7\text{Unemp}_{i,t} + v_i \end{aligned} \quad (4)$$

Interestingly, as for the effect of the risk premium variable on the percent change in the debt level for the most troubled countries in the EMU, the estimation using the above equation yielded conflicting results. In the case of Greece, though, this regression analysis for equation (4) showed the change in debt level to be positively related to the risk premium, the greater the percentage change in the level the higher the risk premium. This is to be expected, however, as Greece needed to borrow at any rate to finance the debt and the interest payments in order to avoid default and avert its consequences.

Figure 3 shows the relationship between risk premia versus (a) the debt/GDP ratio and (b) the change in debt/GDP ratio for the GIIPS countries. None represented random events. Noting the upward relationship, albeit not necessarily linear, for all these countries. The lesson here is that the relationships are unstable but the direction is clear. This further confirms the earlier analysis on the variance factor.

Concluding Remarks

The euro zone started with the best of intentions and perhaps the weakest of structures. At almost every turn, politics dominated economic rationality. Everyone knew that the Greeks, for example, were in violation of the conversion criteria, and that their book keeping was less than accurate and transparent. Everyone ignored the optimum currency area arguments when they decided to add new members to the EMU. No one has

explained convincingly what and how Greece and Slovakia, to mention a few countries, add to the strength of the euro and further the interests of the EMU.

Figure 3. Long-term interest rates (i.e., yields on 10-years treasuries) in all the GIIPS countries show increase with Debt/GDP ratio (open circles) as also with the change in Debt/GDP ratio (closed circles).

Further complicating matters are the harmonization requirements which are based on the wrong argument that the union will be better off if all look the same and act the same. One can achieve fiscal responsibility through various means. Likewise, differences across the countries can actually strengthen, and not necessarily weaken, the monetary union so long as all the member countries adhere to fiscal discipline. Balancing the budget is not an austerity measure, after all, it is rational economics.

The preceding analyses and discussions lead to two inescapable inferences. One is that the EMU has effectively created an “Impossible Trinity” that would continue to undermine it for a long time to come. As sketched in Figure 4, this trinity comprises monetary harmonization, fiscal independence, and an implicit debt guarantee.

Figure 4. An “Impossible Trinity”.

Unconstrained by a convergence requirement with teeth, debt guarantees (implicit or explicit)—typically end up in a bailout and only in partial adjustments. Also, the monetary and regulatory harmonization that puts every country in a straight jacket while eliminating adjustments through exchange rates can be prescriptions for trouble. Rescue packages can come and go. Ultimately, they undermine the very credibility of the system as bailouts substitute for responsible conduct.

The results presented here show conclusively that debt matters. If adding to them incredible pain and suffering of the average Greek, for example, the cost of maintaining a union without discipline, internal, or imposed from outside, could indeed be catastrophic especially when their negative effects on the world financial markets are included. The EMU can survive without Greece. If the European Union wants to support Greece, they may do so with increased foreign aid and a huge influx of tourists into the Greek economy.

This leads to the second inescapable inference here, that the euro’s main weakness lies more in the inability of the EMU member countries to strictly adhere to the narrow confines of the “snake in the tunnel”, and in the lack of any mechanism for enforcing such an adherence, than in any other structural weakness. The irony is that “Brexit” won presumably because of the concerns about immigration, never mind that the UK was an “opt-out” from the provisions of the Schengen Agreement that is integral to the Maastricht Treaty and encourages free mobility of labor, and might now affect the euro adversely, even though UK is an “opt-out” from the economic and monetary restrictions of the EU.

Figure 5. Daily fluctuations in the USD-EUR and GBP-EUR exchange rates through the past one year (data-source: <http://www.investing.com/currencies/>).

Perhaps, it is because of this, as shown in Figure 5, “Brexit” hardly arrested the downward slide in the British Pound’s value relative to the euro for the past one year, and may instead have actually accelerated that slide. It is not that the euro was a particularly strong currency during this period and has, for the past one year, just fluctuated about the US dollar without any discernible trend.

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