FISCAL POLICY EVENTS AND INTEREST RATE SWAP SPREADS: EVIDENCE FROM THE EU
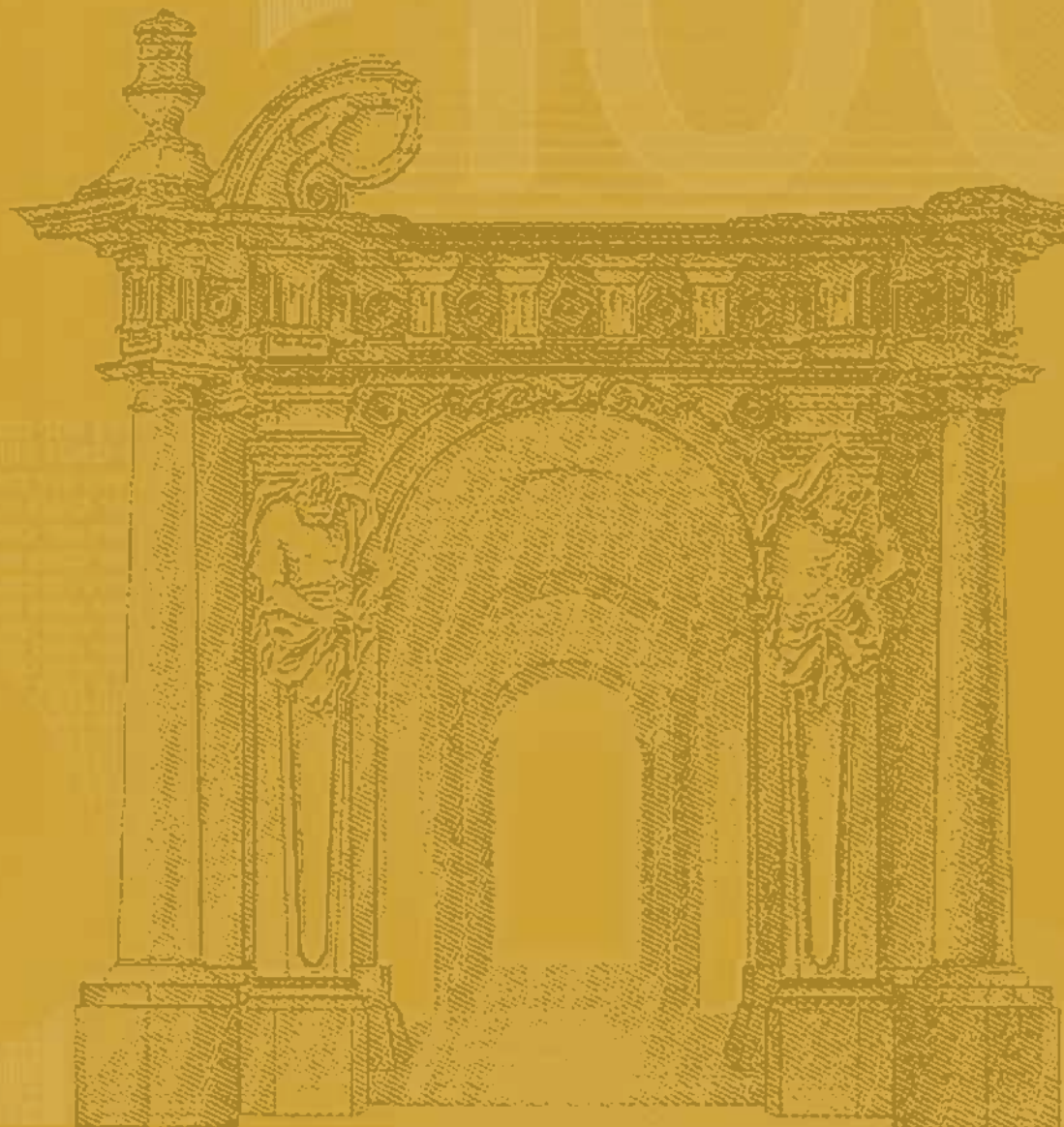
by António Afonso
and Rolf Strauch

WORKING PAPER SERIES

NO. 303 / FEBRUARY 2004

FISCAL POLICY EVENTS AND INTEREST RATE SWAP SPREADS: EVIDENCE FROM THE EU[1]

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In 2004 all ECB
publications
will feature
a motif taken
from the
€100 banknote.

CONTENTS

Abstract

In this paper we assess the importance given in capital markets to the credibility of the European fiscal framework. We evaluate to which extent relevant fiscal policy events taking place in the course of 2002 produced a reaction in the long-term bond segment of the capital markets. Firstly, we identify the fiscal policy events and qualitatively assess the views of capital market participants. Secondly, we estimate the impact of these fiscal events on the interest rate swap spreads, which is our measure for the risk premium. According to our results the reaction of swap spreads, where it turned out to be significant, has been mostly around five basis points or less.

Non-technical summary

During 2002 the Stability and Growth Pact (SGP) was put to a test due to the implementation of the surveillance process and the discussion about the framework itself in the context of the economic slowdown endured by euro area economies. The fiscal policy events that occurred in 2002 challenged the credibility of the European fiscal framework. Therefore, they present a first opportunity to assess how capital markets react when the SGP is put under stress and that is the purpose of this paper.

We assess some stylised facts on long-term interest rates, using weekly and daily data. Then we explore how these events were interpreted in capital markets by reviewing weekly notes and newsletters of four major investment banks for 2002, and we provide a chronology of major fiscal policy events throughout the year. The fiscal policy events are classified either as country specific actions and decisions related to the implementation of the surveillance procedures ("type 1" fiscal events), or as announcements of policy targets and discussions on the European institutional framework ("type 2" fiscal events). The relation of some of these selected fiscal events with long-term government yields, the implied break-even inflation rate, and interest rate swap spreads is then discussed.

In the second part of the paper we estimate reaction of interest rate swap spreads for the European Union countries to fiscal policy events using a SUR approach. Interest rate swap spreads are defined as the difference between the interest rate of the fixed leg of the 10-year interest rate swap and the 10-year government bond yield. The estimations are carried out using daily data.

Our results indicate only a significant reaction of interest rate swap spreads to *some* policy events. Among others, the rumours of the early warning for Portugal and Germany on 17 January led to a decrease of the swap spread for Portugal, pointing to increasing concerns about fiscal developments. In contrast, when the Council declared that Portugal has an excessive deficit on 5 November, swap spreads increased both for Portugal and Germany indicating a possible positive confidence effect. Furthermore, the change in swap spreads, when significant, has been mostly five basis points or less, and not exceeding ten basis points according to our estimates. Using moving window regressions around policy events, we cannot detect any persistence of the market reaction in terms of a continuous upward or downward shift of the swap spread after a fiscal policy event, but our estimates suggest an anticipation effect in two instances.

The main message of our paper is therefore the lack of a strong reaction of the default risk premium in long-term government interest rates to the identified fiscal policy events in 2002, even if some specific events had a temporary and limited impact on swap spreads.

1. Introduction

The process of European integration that culminated in the European Monetary Union was based on the belief that fiscal discipline is necessary for a functioning monetary union. Since the monetary union would allow members to free-ride on the common monetary policy by running excessive deficits and increasing debt ratios, a European fiscal policy framework was adopted setting deficit and debt limits for EU member states and installing an elaborated surveillance procedure.

The main thrust of the European fiscal framework, coupled with no bailout and no monetary financing clauses, is to ensure the sustainability of public finances since high or rapidly increasing debt levels in one Member State could have several externalities on others. Due to the monetary union, government securities would be more perfect substitutes and large supply of government securities could raise the costs of borrowing for other governments. Moreover, unsustainable public finances could raise pressure on the central bank to monetize these liabilities. Finally, high debt levels in the extreme could lead to default – partially or fully, either on interest payments or on the principal – with repercussions in the banking sector. The ECB could be forced to step in and similarly monetize government debt if this would spark a financial crisis.

The different implications of high government debt and unsustainable public finances should be reflected in prices for government securities. The existence and implementation of the European fiscal framework should therefore have a twofold effect. First, the credibility of the European fiscal framework and its ability to deter "excessive" deficits and debt in the perception of market participants generally affect future risks associated with liabilities of all member states. Second, the surveillance process could reveal information to market participants when valuing individual government liabilities. Either due to the perception of the credibility of the framework or the information content of the surveillance procedure, these budgetary institutions should affect the risk component included in government bond yields.

In 2002, the Stability and Growth Pact (SGP) was put to a test due to the implementation of the surveillance process and the discussion about the framework

itself in the context of the economic slowdown. The fiscal events that occurred in 2002 challenged the credibility of the European fiscal framework. They present therefore a first opportunity to assess how capital markets react when the SGP is put under stress. We address this issue by analysing whether the long-term bond segment reacts to the worsening of fiscal positions in some countries and/or to the criticisms made to the SGP fiscal rules.

As a starting point, we look at publications from investment banks and at the development of interest rate swap spreads around key fiscal policy events. The euro interest rate swap spread seems to be a good indicator of the relative risk of private versus government long-term bonds versus the private inter-bank market. The main result of our review of investment bank newsletters and notes is that market participants closely observe and contribute to the debate on the SGP and its implementation. But they do not share a unanimous view on specific aspects of institutional credibility and the optimal implementation. Correspondingly, we only find a significant reaction in the interest rate swap spread to a few policy events. In those cases, the reaction was sizeable and interestingly pointed into different directions. The results suggest that the overall debate on the Pact in Autumn has actually created some uncertainty about its future, and that any action against member states was eventually assessed as "a credibility yielding event", rather than information revealing higher country risks. We do not find any persistent impact of policy events on the level of spreads.

The remainder of the paper is organised as follows. Section 2 selects and discusses the relevant fiscal policy events of 2002. Section 3 addresses the measurement of default risk and examines the stylised facts of some of the proposed fiscal events. Section 4 presents the parametric analysis and discusses the several results. Section 5 concludes the paper.

2. Fiscal policy events in 2002

In 2002 the SGP was put to a test. Due to the economic slowdown and lack of fiscal consolidation in previous years, some countries still had not achieved a medium-term position close to balance or in surplus. Later on, several of those countries came very

close to or even breached the 3% deficit to GDP limit for excessive deficits set in the Maastricht Treaty. Thus two developments, closely intertwined, prevailed during the year 2002. First, the procedures specified in the SGP and in the Maastricht Treaty became relevant and had to be implemented for the first time for Portugal and for Germany. Secondly, as governments felt the restraint from the SGP and as the implementation process proceeded, a debate emerged on the implementation of the Pact and the criteria defined therein. The public debate and the implementation of the surveillance procedures are marked by certain key events, which should have figured into the public perception of the credibility of the Pact or revealed some information on the state of public finances in member states.

2.1. A chronology of the year

The developments in 2002 started with the Commission's recommendation for an early warning when it became apparent that Germany and Portugal would deviate significantly from the envisaged consolidation paths and would be close to the 3% of GDP limit for the deficit. When the Commission launched its annual review of public finances in Member States, rumours spread out on 17 January that it was considering an early warning to Germany and Portugal. This early warning was then recommended officially by the European Commission on Wednesday 30 January, as expected since Commissioner Solbes had clearly indicated his intention to launch the procedure beforehand.

After the Commission launched the initiative, a debate emerged of whether the early warning should be issued. Eventually, European governments abstained from an early warning. Eventually the ECOFIN Council decided on 12 February to close formally the procedure without issuing any early warning since Germany and Portugal renewed their firm commitment to their consolidation plans and medium-term targets. This gave rise to a more general discussion on the credibility of the Pact.

Over the course of the summer, various setbacks took place concerning the attainment of a close to balance position in several countries. France and Italy revealed budget plans indicating that they planned to deviate from their previously announced consolidation plans. President Chirac had proposed drastic tax cuts in his electoral

campaign. This initiative became part of the official policy line when the centre-right interim government indeed won the general elections on 16 June.

The French position was partly accommodated in the ECOFIN meeting on 20 June, by making the attainment of a close-to-balance position for France contingent on highly optimistic growth rates, i.e. it implicitly allowed the deadline for the achievement of the medium-term position to be missed. Italy took this outcome as a common understanding in the Council that allowed for a focus on growth and more flexibility in the fiscal framework. The government started then openly to discuss tax reductions, which would delay the attainment of the close to balance or in surplus position. These proposals were eventually included in the *Documento di Programmazione Economica e Finanziaria*, which was released on 8 July.[3]

Moreover in the summer, after the change in government following general elections in Portugal, it became clear that the actual Portuguese budgetary balance for 2001 drastically surpassed the value declared previously. The Portuguese Prime Minister revealed, first in a speech in Parliament on 26 June, that a report from the ECB indicates a deficit of 3.9% of GDP for 2001. The Portuguese government then submitted the official figure of 4.1% of GDP to the European Commission on 26 July, although it was already known in the press a few days before. As a consequence, the Commission declared its intention to write a report in order to launch the excessive deficit procedure (EDP) on 26 July. On 16 October the Commission then formally adopted an EDP against Portugal, and the country was indeed declared to be in excessive deficit by the ECOFIN Council on 5 November.

As the expected economic recovery did not materialise in the second half of the year, and economic prospects deteriorated, the attainment of a close to balance or in surplus position by 2004 became unrealistic for countries with large remaining imbalances. Therefore, on 24 September the Commission announced a new strategy for budgetary consolidation, which would give countries time to balance their budgets by 2006. France seized on this more flexible approach and declared that it would not achieve a balanced budget by 2004. Later on (on 30 September) Budget Minister Alain Lambert

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[3] The press had already indicated that intention on 3 July.

revealed that the budget would be brought into balance by 2007 rather than 2006. In an Eurogroup meeting on 8 October all euro area ministers of finance backed the Commission approach, with the exception of France which did not commit to start consolidation immediately.

The relative peace following the common position among government officials and representatives of EU institutions was suddenly put into question on 17 October. At that date the President of the European Commission Romano Prodi declared that excessively strict rules are not sensible and the rigid implementation of the Pact is "stupid," as all rigid decisions. Shortly thereafter on 24 October, the ECB Council reacting to the debate sparked by Prodi's remark issued a statement expressing its firm support for the existing European fiscal framework since it felt that the debate could be damaging the credibility of the Pact in the public.

By the time, when the EU Commission updated its autumn forecasts and the "new" strategy was discussed, it became also apparent that several member states would incur in deficits close to or even above the 3% of GDP limit in 2002 and in 2003. Therefore the Commission openly started to consider whether to issue an early warning against France and an excessive deficit procedure against Germany. The issue of an early warning to France was discussed first on 9 October immediately after the Eurogroup meeting.

On 13 November the Commission released its autumn forecasts, significantly revising downward the budgetary prospects for several member states. According to these forecasts Germany would clearly breach the 3% of GDP limit for the deficit and the Commission announced that it would launch an excessive deficit procedure and would write a report on Germany. Both, the early warning to France and the excessive deficit procedure for Germany were discussed in the Economic and Financial Committee in January 2003 and were adopted by the ECOFIN Council in the same month.

On 27 November the Commission released a public communication taking stock of the developments under the SGP, and in 2002 in particular, expressing its

Table 1. Chronology of fiscal policy events in 2002

Emphasis on country specific surveillance	17 Jan	Rumours of early warning for Portugal and Germany
	30 Jan	Recommendation of early warning by the EC to Portugal and Germany
	12 Feb	ECOFIN does not launch the procedure against Portugal and Germany
	20 Jun	ECOFIN accommodates France deviation from consolidations plans by making achievement of target conditional on growth rates
	26 Jun	Portuguese Prime Minister reveals deficit for 2001 was above 3% limit
	8 Jul	Italy proposes tax reductions that will delay close to balance position
	26 Jul	Portuguese government officially reports to the EC a deficit of 4.1% in 2001
Discussion on the SGP	24 Sep	EC announces new strategy on balanced budgets
	30 Sep	France announces balanced position only for 2007
	8 Oct	Eurogroup: all countries commit to start consolidation immediately, except France
	9 Oct	Eurogroup: early warning for France is discussed
	16 Oct	EC adopts an EDP against Portugal
	17 Oct	President of the EC declares that a rigid implementation of the SGP is "stupid"
Strengthening of the credibility of the SGP	24 Oct	ECB press statement in favour of the SGP
	5 Nov	Council declares that Portugal has an excessive deficit
	13 Nov	EC adopts an EDP against Germany
	27 Nov	Commission issues a Communication addressing some of the criticisms and implementation problems of the SGP

disappointment about the current situation and trying to accommodate some of the criticism expressed by government officials against the Pact. The declared objective was to re-invigorate the Pact by making its implementation somewhat more flexible under well-defined circumstances while strengthening the surveillance process.

A summary overview of the events described above is also given in Table 1 and this additionally helps to identify three different periods in 2002. In the first half of the year, the surveillance procedure concentrated on Portugal and Germany, but there was relatively little discussion on the SGP as such. Later on in the summer, the challenge to the overall structure of the SGP gained momentum, which sort of culminated with

the comments of the President of the EC on 17 October. In the autumn and winter, following the ECB's press statement on 24 October and the EC declaration in November, there was a certain strengthening of the SGP.

2.2. Capital market's view of the Stability and Growth Pact

Before moving on to the summary analysis of the stylised facts, it is useful to look at the discussion on the European fiscal framework and the events taking place in 2002 through the lenses of capital markets. This is done in this sub-section in order to identify some working hypotheses on the reaction of capital markets to the discussion on the Stability and Growth Pact. Therefore we screened the weekly notes and newsletters of four major investment banks for 2002.[4]

First, all policy events mentioned above were reported and discussed in some of the regular newsletters. The more important events, such as the early warning and the developments taking place in autumn 2002, were actually discussed in all newsletters and notes. Secondly, when looking at the material, it becomes apparent that there seems to be consensus on the need for a Pact as an institutional framework. None of the investment banks advocated abolishing the Pact altogether and leaving public finances in member states without any overall guidance or control. However, beyond that point, support for the specific regulations of the Pact and the decisions taken by the Council varies considerably.

The main reason for diverging assessments of the virtues of the Stability and Growth Pact is the position investment banks take with respect to the trade-off between credibility and short-term growth, that became particularly important in the second half of 2002. All investment banks saw that the need to keep the budgetary deficit below the 3% of GDP limit could force governments to take pro-cyclical policy measures. Even those acknowledging the need for fiscal restraint to reinforce the credibility of the European fiscal framework, always pointed to the concomitant reduction of short-term growth prospects during the current downturn.

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[4] We only reviewed the newsletters of the following four investment banks: Deutsche Bank, Goldman Sachs, Morgan Stanley and Credit Suisse First Boston, even though there are more ECB watchers.

Eventually investment banks developed a clear policy line in their newsletters, and some proposed changes to the Pact along these lines. For example, Morgan Stanley's (07/11/02) views were in line with the ECB, arguing that the Pact is not fundamentally flawed, but a valuable compromise, which should be kept as a framework for fiscal policies in EMU. Countries not complying with the Pact should not try to change the rules since it is their responsibility that they have not done enough to consolidate their public finances in good times. Similarly, Credit Suisse First Boston argued that changing the Pact would seriously damage its credibility.[5] By comparison, Goldman Sachs took a much more critical position. It argued that neither the Commission had indicated sufficient willingness to reform the alleged restrictive bias in the Stability and Growth Pact, nor had the ECB signalled its support for such an initiative. According to Goldman Sachs' own view, the Treaty and the Pact needed to be implemented more flexibly by giving more weight to the medium-term position required by each country to stabilise the debt level, and by understanding the 3% to GDP limit in cyclically adjusted terms.[6]

Given these diverse viewpoints, understandably, the assessment of individual events was also different among investment banks. One bank considered the struggle about the early warning to Germany and Portugal in February, and the Council's decision not to issue such a warning was considered a lost opportunity to enforce the Stability and Growth Pact as the existing procedure of fiscal co-ordination among European countries.[7] Conversely another bank argued "no warning, no problem," since the two countries confirmed their commitment to their fiscal target.[8] The embarrassment of the "sinners" resulting from the public debate of the issue had been an effective mechanism to enforce commitment to the European fiscal framework in this instance. This position is fully in line with the Commission and the ECB statements on the event at the time.

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[5] Credit Suisse First Boston, 22/09/02.
[6] See above all Europe's Stability Pact: "In Need for New Clothes," Global Economics Paper 81, 30/08/02.
[7] Credit Suisse First Boston, 15/02/02.
[8] Morgan Stanley, 15/02/02.

Similarly, when the Commission gave its revised recommendation for an appropriate fiscal strategy in autumn 2002, deviating from the original dates for achieving a safe budgetary position was conceived by CSFB as bending the Pact, although not breaking it.[9] In contrast, Goldman and Sachs welcomed the change of the proposed Commission strategy as a more realistic target, but it was refuted as still being too restrictive.[10]

Towards the end of the year, investment banks mostly saw the rules of the Stability and Growth Pact as being invigorated. The first reason for this was the declaration of an excessive deficit for Portugal, and more importantly, the initiation of such a procedure against Germany, which seemed to be also willing to accept a Council decision to declare an excessive deficit for Germany.[11] Second, the Commission Communication was considered as an attempt to re-interpret the Pact rather than changing the rules.[12] One bank saw this as recovering the ground that was lost in the preceding debate and it was expected that the Council would follow the Commission proposal, eventually strengthening the Stability and Growth Pact.[13]

3. Measurement of default risk and stylised facts about yields and swap spreads
3.1. Measuring default risk

The main concern of this paper, which according to the review of investment bank documents is shared by some market participants, is the credibility of the SGP. The credibility of the Pact ultimately refers to its ability to prevent unsustainable fiscal policies that could eventually lead to the risk of default, financial crisis and possible central bank bailout.

It is important to distinguish two types of events in our sample: actions or decisions related to the implementation of the surveillance procedures, "type 1" fiscal events; and other announcements of policy targets and discussions on the European institutional framework, "type 2" fiscal events.

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[9] Credit Suisse First Boston, 22/09/02.
[10] Goldman Sachs, 14/10/02.
[11] See for example Deutsche Bank 08/11/02, Credit Suisse First Boston, 25/10/02.
[12] Credit Suisse First Boston, 28/11/02.
[13] Deutsche Bank, 13/12/02.

The first type of event is similar to a credit rating action, i.e. it relates to an individual country. The informed public or other market participants are often able to anticipate the decision or action taken. Thus, at the date of the decision or action hardly any new information regarding the country itself may be revealed. After it has been taken, however, it is assumed to have a more lasting impact on the pricing of bonds issued by the agent. In contrast, the second type of events, such as the communication by the Commission, may not have been known in advance since it is not part of a regular procedure. The "surprise element" should therefore be larger for this type of events compared to the first one. A second difference is that these political statements often have the entire euro area or all EU member states as a reference point. This distinction is somewhat blurred in 2002. Since several procedural steps were implemented for the first time, and the implementation was accompanied by a strong discussion on the usefulness of the rules in general. Therefore even the more regular and country specific procedural events ("type 1") where seen as test cases for the credibility of the European fiscal framework in general.

The different views presented in the previous section suggest different aspects of how the SGP could affect capital market expectations about future developments, and hence prices for fixed government securities. If a strict interpretation of the SGP reduces budgetary flexibility and short-term growth prospects, it might lead to lower short or medium term interest rates. Conversely, if the central bank considers any breach or lax implementation of the Pact as an indication of an unduly expansionary fiscal policy leading to higher inflation, it could foreclose a monetary easing. Institutional strictness could then be conducive to lower short or medium-term rates. Finally, if the default risk premium prevails, this would lead to an overall increase of the marketable yield for a government security. This risk would mainly affect the long-term rates since such default is relatively unlikely in the short or medium-term under current circumstances, as sovereign bond ratings indicate.

Looking at government bond yields as such does not allow identifying the existence of a default risk premium since bond yields also reflect expectations about different monetary policy reactions. There are various ways to control for this and capture default risk. Looking at credit default swap rates, spreads between euro denominated

bonds issued by governments and international organisations, and interest rate swap spreads, [14] are among the most common that can be found in the literature. [15] The first two measures carry among others the difficulty that the financial market instruments do not exist for all countries or that they are comparatively illiquid. Changes in spreads could then capture trading activity and market liquidity rather than a genuine default risk. For these reasons, we will look primarily at interest rate swap spreads, defined as the difference between the 10-year interest rate swap and the 10-year benchmark government bond yield. [16]

The market for the 10-year benchmark bonds (or the closest available maturity) is the most liquid segment for sovereign debt. The euro interest rate swap market, moreover, is one of the largest and most liquid financial markets in the world. [17] It was among the first financial markets to become integrated following European monetary union, and quickly gained benchmark status. An important characteristic of this market is the robustness of liquidity, although liquidity might indeed evaporate in times of high volatility. [18]

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[14] An interest rate swap is an agreement to exchange a flow of fixed interest payments in return for a variable rate of interest. Additionally, the swap spread is defined as the difference between the interest rate of the fixed leg of the 10-year interest rate swap and the 10-year government bond yield.

[15] See section 4 for references.

[16] Nevertheless, we try to get some aditional evidence from credit default swaps in section 4.4.

[17] According to data from the BIS (2003), in terms of notional principal outstanding, over-the-counter markets for euro and US dollar denominated interest rate derivatives are the largest financial markets in the world. The euro interest rate swap market has actually roughly the same size as the dollar one: the notional stock of euro denominated interest rate swaps and forwards totalled € 26.3 trillion at end-June 2002; the stock of US dollar-denominated contracts was slightly smaller, at € 26.2 trillion. For the euro denominated interest rate swaps, the market seems to be particularly liquid in the short-term segment (see ECB (2001)).

[18] See, for instance, Remolona and Wooldridge (2003). The development and growth of the euro interest rate swap market, including its rise to benchmark status, seems to be partly attributed to continuing fragmentation in the government securities and repo markets in Europe. Other relevant features of this market are the continued importance of counterparty risk and the growing concentration of dealers.

3.2. Developments in 2002

In this section we look at data concerning 10-year government bond yields. Although our main interest is the default risk, this presents only one channel through which fiscal policies can affect long-term yields. There are other channels operating through monetary-fiscal interaction, which should be reflected in the evolution of yields. Therefore we start our descriptive analysis in this section by looking at yields, forward rates and inflation expectations at a weekly frequency. Then we move to an analysis of interest rate swap spreads, at a weekly and daily frequency.

For the EU countries represented in Figure 1, the yields dropped from an interval of 4.9%-5.2% in the beginning of 2002 to around 4.2%-4.4% at the end of the year, roughly a decrease between 72 and 82 basis points (bp). Comparing the development of yields in the EU with the one recorded for the US, it is obvious that the decline in the long-term interest rates was more significant in the US, around 132 bp. This means that the positive yield differential between the US and the EU benchmark (we take Germany here) of 18 bp at the beginning of the year shifted to a differential of – 36 bp at the end of the year.[19]

This development is also evident in the basic descriptive statistics reported in Appendix 1 for the government bond yields in the EU15 countries and the US. We also present the statistics for 10-year interest rate swaps and the corresponding swap spreads vis-à-vis the government bond yields. It seems worthwhile to notice that the respective yields for the countries more directly affected by fiscal policy events reported in the previous section show only marginally different correlation levels against the German benchmark than others. For France and Italy, the correlation coefficient is 0.997 and 0.996 respectively, while the coefficient is around 0.991 for Portugal.

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[19] It might be useful to bear in mind that the Federal Reserve cut its key interest rate by 50 basis points in November 2002, to 1.75 per cent (there was a cumulative cut of 475 basis points in 2001). In December 2002 the ECB also reduced its minimum bid rate on the main refinancing operations by 50 basis points point to 2.75 percent (in 2001 there was a cumulative 125 basis points cut).

Figure 1. Yields on 10-year government bonds for France, Germany, Portugal and the US, 2002 (weekly data)
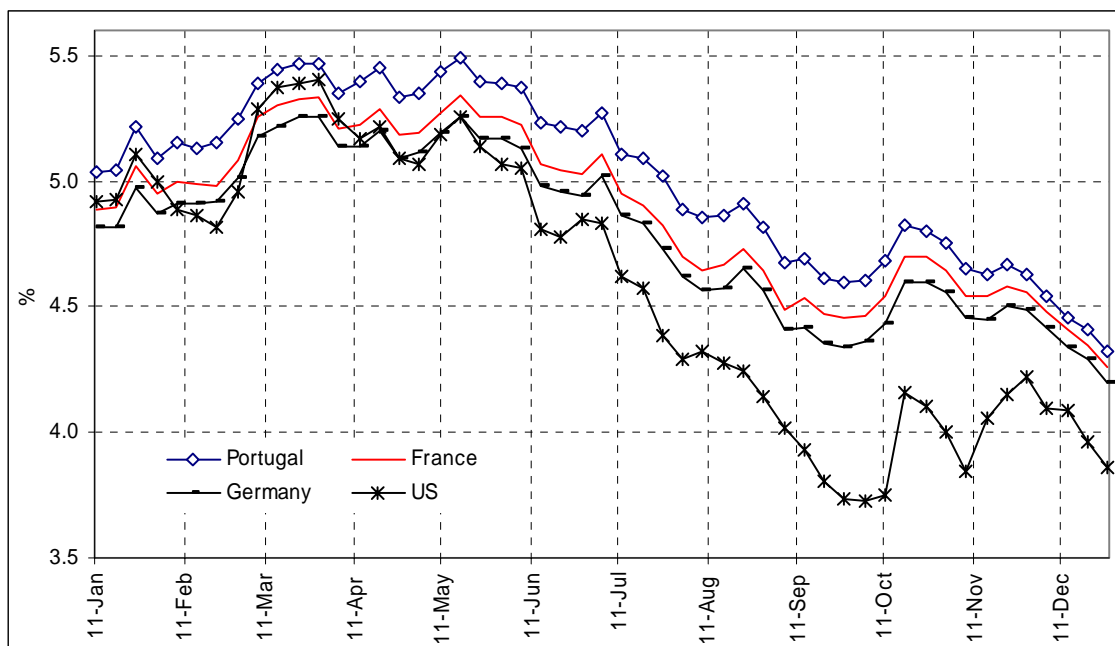
Source: Reuters.

Figure 2. Forward Rate and Yield Curve slope, 2002 (weekly data)
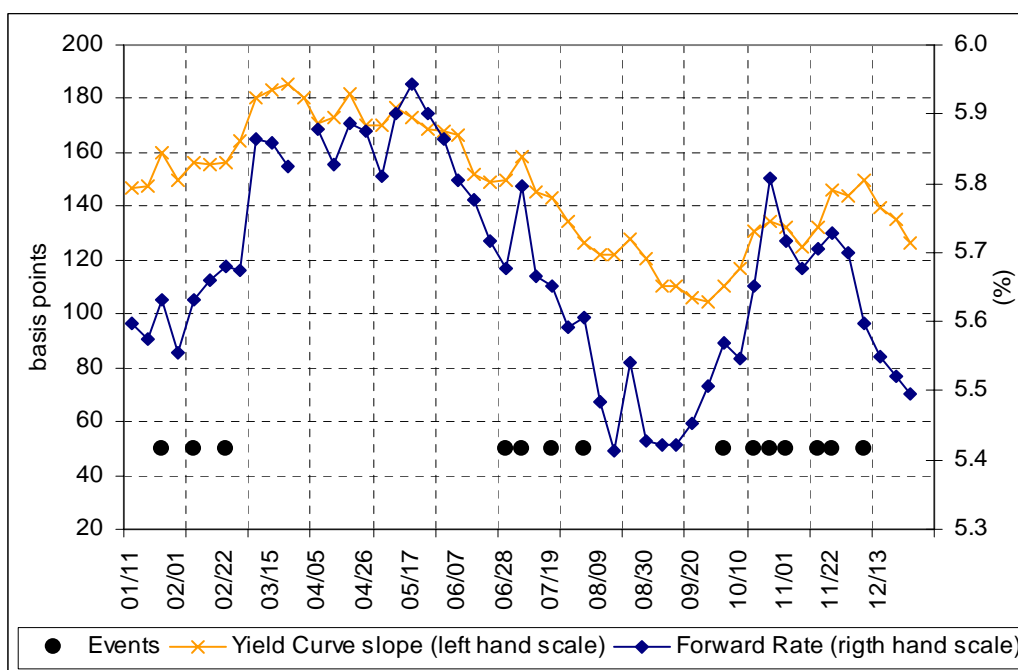
Notes: The yield curve is the 10-year German government benchmark yield minus the 3-month Euribor. The forward rate is the one year interest rate 9 years ahead (see Perez-Quiros and Sicilia (2002)).
Source: Reuters.

To which extent this decrease in bond yields is associated with changes in short-term or long-term rates becomes more evident when looking at the yield curve defined as the 10-year government bond yield minus the three months Euribor shown in Figure 2. Over the entire year, the slope of the yield curve fell by roughly 20 bp to somewhat less than 130 bp. The same trend is also illustrated by the implied one-year forward rate in nine years, as extracted from the German zero-coupon curve.[20] The rate falls by 10 bp in the course of year, although there are sizeable developments over time. It strongly increases in spring, shortly after the Council decision not to launch an early warning, and then it remains fairly stable above 5.8%. Subsequently, it falls by roughly 40 bp until September. After a renewed spike in mid-November, it decreases to the end-year level. As the series of points in Figure 2 reveal, this development can hardly be explained by the three phases of fiscal policy events.

A further issue is whether fiscal policy problems have lead to higher long-term inflation expectations. The bold line in Figure 3, depicting long-term inflationary expectations, as extracted from long-term index linked bond prices, indicates that this was not the case. After an initial increase until May, break-even inflation decreased to its initial level in October, and remained stable thereafter. This development is again not clearly linked to fiscal policy events, although the initial implementation problems may have contributed to the initial rise, and the renewed strengthening of the Pact in November to the stability of inflation expectations. But the comparison with the implied break-even inflation rate in the US and the UK reveals, the overall shape of the curve is clearly related to expectations on long-term growth in the Europe and the US.

Overall, changes in yields and implicit break-even inflation rates give little indication that the worsening of the fiscal situation in the course of 2002 and the implementation of the Pact have changed long-term expectations on inflation and monetary policy. In Figure 4 we therefore look at the evolution of the long-term interest rate swap spreads, as our preferred measure of default risk. The chart only depicts spreads for

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[20] See Perez-Quiros and Sicila (2002) for an explanation.

Figure 3: Implied Break-even inflation for the Euro Area, France, UK and US in 2002
(weekly data)
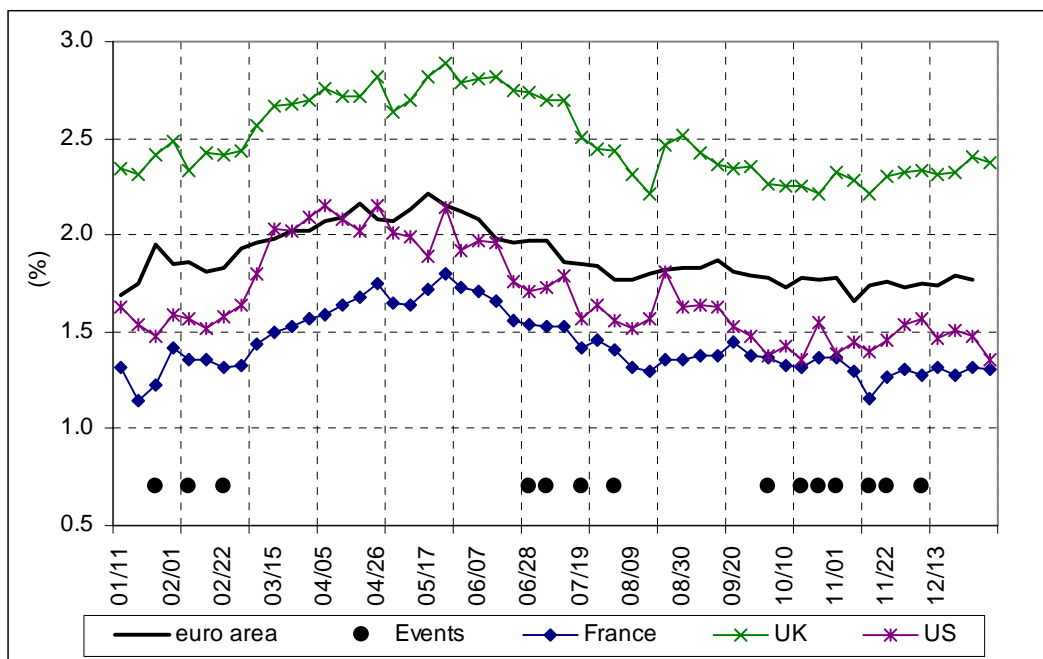
Note: Expectations from break-even inflation rate = 10-year nominal bond yields minus 10-year real
bond yields. The real bond yields are derived from the market prices of inflation-indexed bonds.
Source: French Treasury, ISMA and Reuters.

Figure 4. Long-term interest rate swap spreads, Portugal and Germany, 2002
(weekly data)
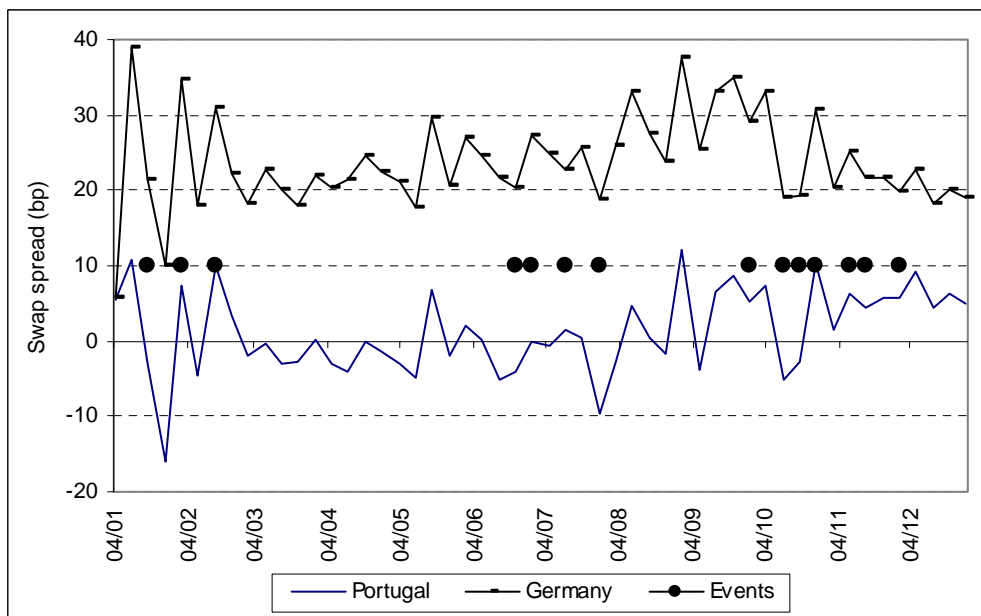
Note: Interest rate swap spreads are defined as 10-year swap rates minus government bond years of the
closest maturity.
 Source: Reuters.

Portugal and Germany, the countries mainly addressed in fiscal policy events. The development is quite erratic and does not reveal any clear trend. If anything, swap spreads tended to rise towards the end of the year for Portugal, while they started falling for Germany.

3.3. Stylised facts for selected fiscal policy events

In the previous sub-section we have described the evolution of yields and interest rate spreads in 2002 using weekly data. If the information revealed by policy events is processed efficiently in capital markets, it may nevertheless be necessary to look at higher frequencies to detect any impact of fiscal policy events.

In this section we therefore focus more carefully on specific events using daily data. As an illustration, we select two periods for a closer look. Event 1 is the episode leading to the ECOFIN decision to not issue an early warning against Portugal and Germany on 12 February, and event 2 is the remark made by President Prodi on the SGP followed by the press statement of the ECB in late October. While event 1 is more related to the regular surveillance procedure, and therefore to individual countries, event 2 was not part of any standard procedure and might be considered as having a potential effect for the entire EU.

Event 1 – 12 February 2002 (early warning episode for Portugal and Germany)

Visual inspection reveals that around the time of the EC recommendation of the early warning to Portugal and Germany (rumours on 17 January, recommendation on 30 January), there was an increase in Portuguese 10-year government bond yields. The cumulative increase in the Portuguese 10-year government bond yields reached 23 bp to decline thereafter to 10 bp in the beginning of February. This movement of the long-term yields implied a decline of the swap spread became negative in some days of the period between 17 January and 30 January (see Figure 5). A similar development can be tracked after the announcement of 30 January. The cumulative change in the yield reached a peak again on 13 February, while the swap spread turned negative again.

Figure 5. 10-year interest rates and swap spreads for Portugal
(2002: 16 Jan – 18 Feb)
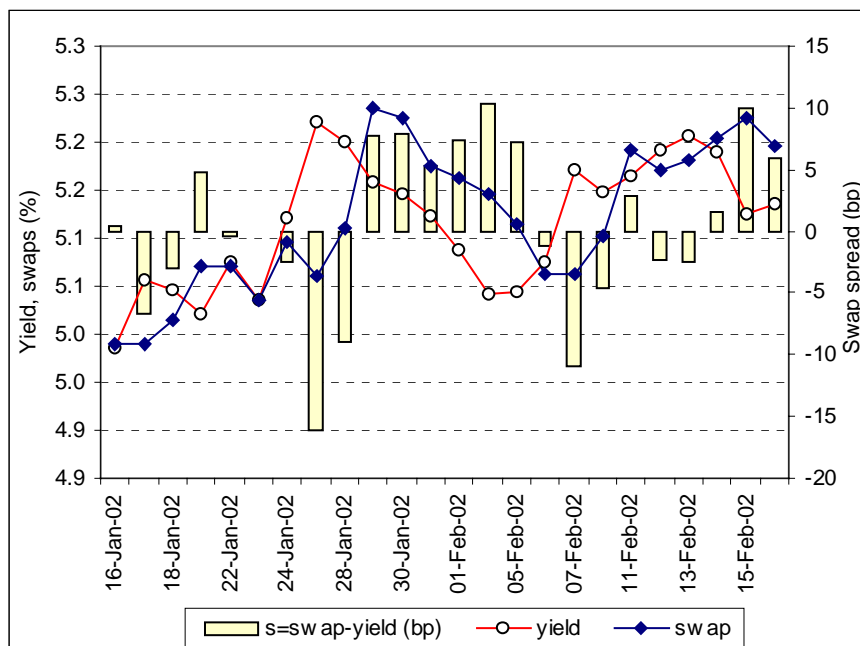
These daily movements in the Portuguese long-term interest rates could reflect a risk premium. The EC recommendation clearly signalled to markets that Portuguese public finances were facing difficulties. Therefore, markets might have attributed additional risk to the government debt, demanding a higher interest rate to hold the long-term bonds. At the same time, the risk of private bonds might have decreased relatively to government bonds, since this EC recommendation was not seen as directly damaging this segment of the market. All in all, these movements pushed down, even if temporarily, the swap spreads.

This development of the Portuguese long-term bond segment went in parallel with the evolution of the yields in the benchmark segment, the German 10-year bond market, and the corresponding swap spreads (see Figure 6). Indeed, swap spreads for Germany also decreased after the rumours of the early warning for this country.
The changes in the interest rate swap for the German 10-year bonds attained a cumulative peak around 24/5 January, with the swap spread staying at a low of 10 bp on 25 January.

Figure 6. 10-year interest rates and swap spreads for Germany
(2002: 16 Jan – 18 Feb)
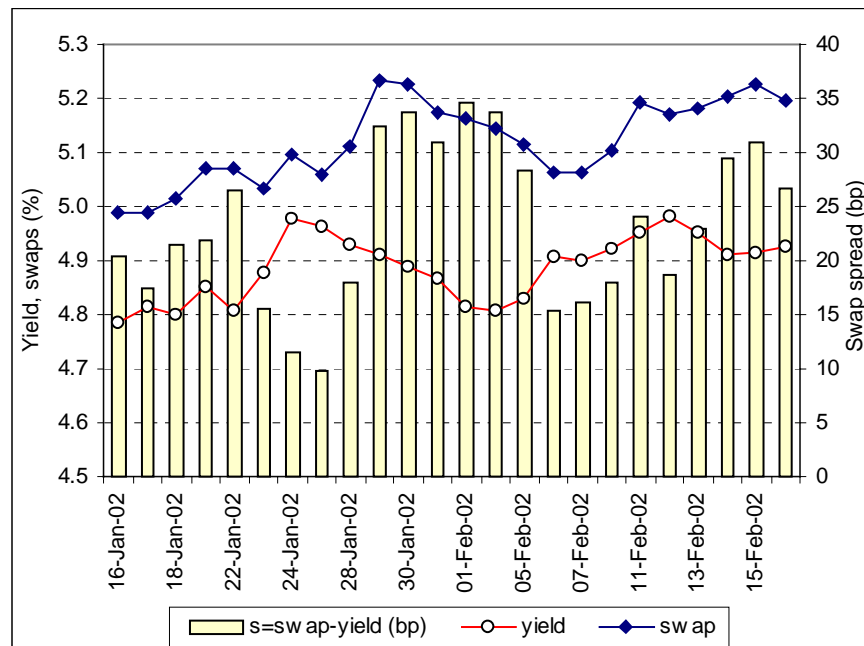
Furthermore, the changes in the yields and in the swap spreads for both Portugal and Germany, were not directly related to the change in the yield and in the swap spread in the leading international long-term interest rates market, the US. Between 17 January and 28 January, 10-year interest rates declined in the US and swap spreads increased around 40 bp (see Figure 7). This is worthwhile noticing since the US and the German government 10-year benchmark interest rates were strongly correlated during 2002.

All in all, the event of 17 January, informally announcing to markets that an early warning and an excessive deficit procedure was in the pipeline for Portugal and Germany, seems to have been relevant information to the long-term interest rate segment of the market.

Event 2 –17 October 2002 (President of the EC calls the strict implementation of the SGP "stupid") and 24 October 2002 (press statement of the ECB supporting the SGP)

After the declarations of the President of the EC, labelling the strict implementation of the SGP as "stupid", there was almost no increase in the 10-year German yield (see

Figure 7. 10-year interest rates and swap spreads for the US
(2002: 16 Jan – 18 Feb)
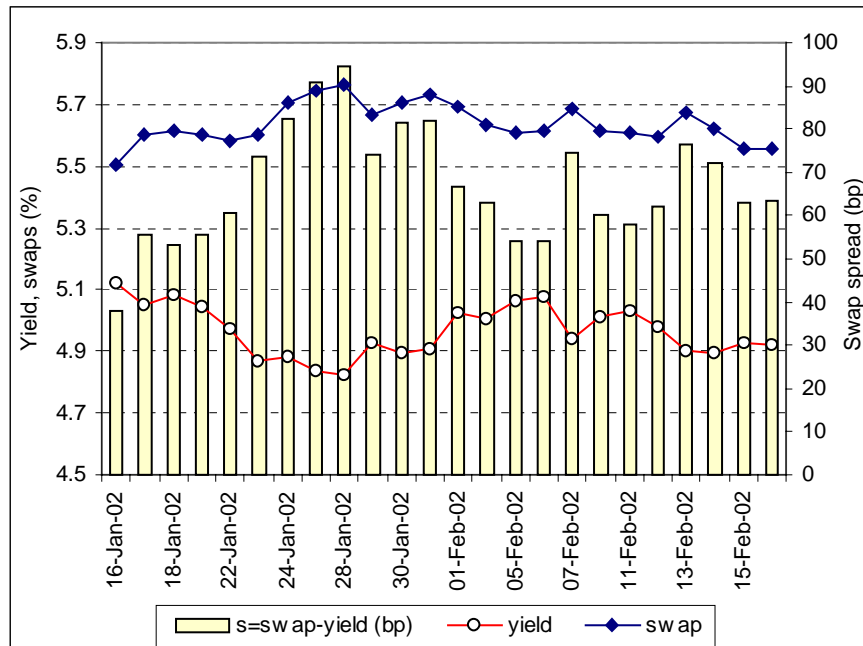
Figure 8. 10-year interest rates and swap spreads for Germany
(2002: 7 Oct – 7 Nov)
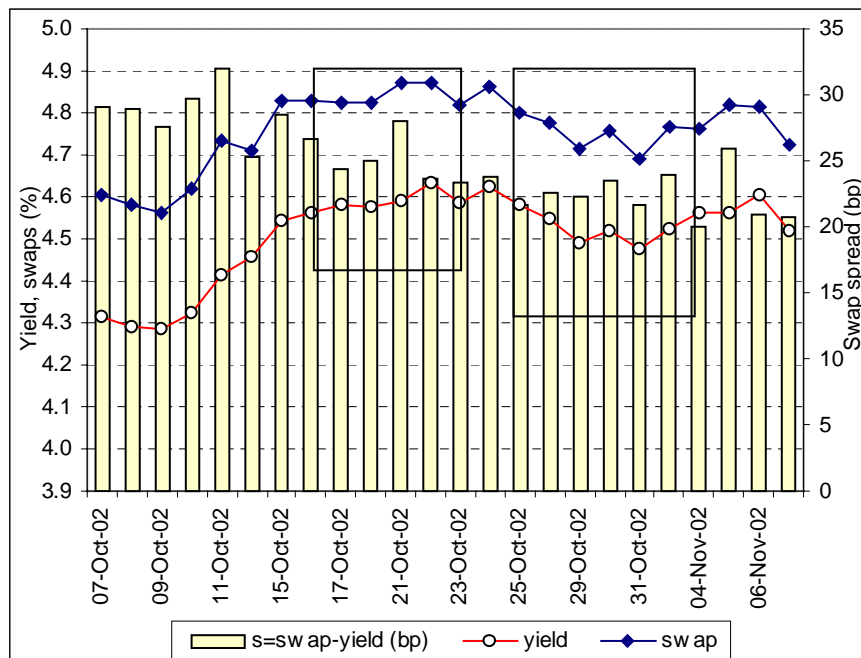
Figure 8). Additionally, the swap spreads were also quite stable around 24 bp between 17 October and 24 October. This last date is also relevant because it was the day when the ECB issued a press statement in favour of the SGP. After the press statement there was indeed some decline, around 10/15 bp, in the yields in the subsequent 4/5 days.

Again, these developments have to be gauged against the international market. Just after the declaration of the President of the EC, yields were quite stable for US bonds (see Figure 9). After the press statement from the ECB, the decline of German yields was accompanied by the falling of US long-term yields. Notice however that the swap spreads for Germany remained relatively stable, around 22-24 bp in the period 17 Oct/30 Oct, while in the US the swap spreads declined from 99 bp to around 36 bp. Overall, there is no clear evidence that the announcements affected the risk premium.

Figure 9. 10 year-interest rates and swap spreads for the US
(2002: 7 Oct – 7 Nov)
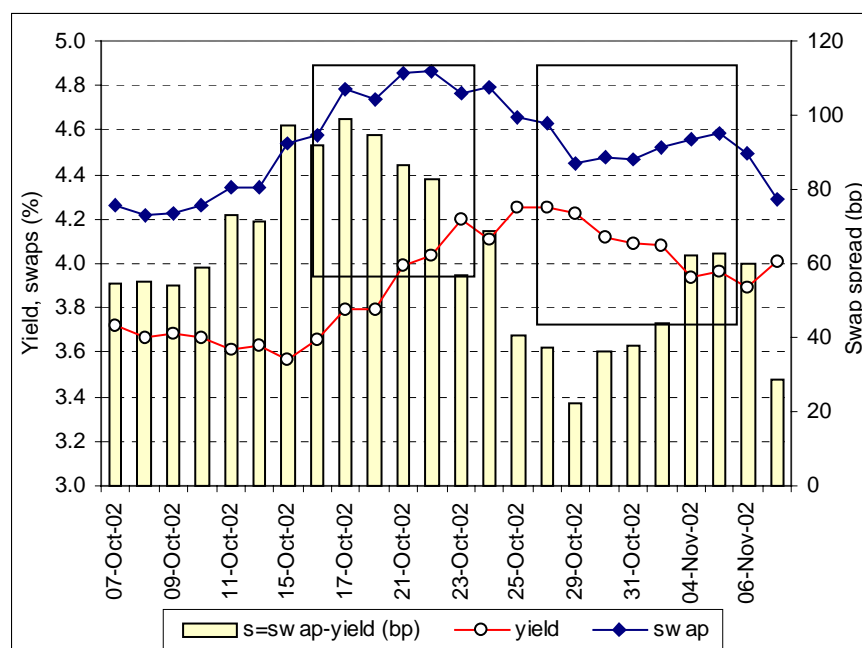
4. Analytical framework

There are several studies, which try to empirically assess the impact of the fiscal and political factors on government bond risk premia.[21] These studies mostly trace longer-

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[21] See, for example, Alesina et al (1992), Bernoth et al (2003), Goodhard and Lemmen (1999), Løning (2000).

term developments and use data at a monthly or even lower frequency for a cross-section of countries or bond issues. The purpose of our study is to analyse the impact of specific fiscal policy events, and how the information content inherent in these events is reflected in bond yields.

Extracting the information content of the aforementioned events can be achieved with different approaches. For a rating action study, one would look at the evolution of yields over a longer-time horizon before and after the action takes place and data at daily or lower frequency may suffice.[22] To extract the surprise element from an announcement or event, one should use data as close as possible to the incidence of the announcement to see the immediate market reaction to this particular information. Therefore, announcement studies often use higher, intra-day frequencies.[23]

Using high frequency data and looking at very short time windows however is not suitable for our fiscal policy events. Official data releases, for example, often follow a pre-specified calendar and markets participants are prepared to absorb that information. By comparison, when the Commission releases a communication, the precise timing of the event may be difficult to determine, since some information may have leaked before the official announcement. Moreover, the document is only made available on the Internet with a lag. In addition, the dissemination process may take longer since market participants are not always alert in advance, and the assessment of the event may be more complicated than, for example, more straightforward corporate news. Under these circumstances, using intra-day data seems not suitable.[24]

The closest to our analysis are the studies by Favero et al (1997) and Codogno et al (2002). They analyse, among others, developments of government bond yields vis-à-vis the German benchmark from 1992 onwards. The above description of events makes clear that this is not a suitable approach for our study since the German bond yield and the risk premium reflected therein is endogenous to the impact of policy

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[22] See, for example, Steiner and Heinke (2001).
[23] See for example Fleming and Remolna (1999).
[24] See Ehrmann and Fratzscher (2002) for a similar argument with respect to macroeconomic announcements and the use of daily data.

events. Therefore we cannot use a risk measure based on the relative performance of European sovereigns.

4.1. Model specification

Taking into account the stylised facts described in the previous section, we now formally assess the specific effect on interest rate swap spreads of the selected fiscal policy events. In our model specification we tried to explain the swap spread of the relevant country in a quite parsimonious way. We used as determinants of the interest rate swap spreads the interest rate swap spread in the US, a measure of bond market liquidity, a measure of the stock market risk/volatility, the slope of the yield curve in the US, and also the already discussed fiscal policy events. [25] As mentioned before, for a given country we define the swap spread, S, as

$$S_t = swap_t - yield_t, \tag{1}$$

where *swap* is the 10-year rate reported for the inter-bank swap market, and *yield* is the 10-year government yield. The swap spread is then modelled as

$$S_t = \alpha_1 + \alpha_2 S_{t-1} + \alpha_3 S_t^{US} + \alpha_4 S_{t-1}^{US} + \alpha_5 Y_t^{ba} + \alpha_6 STOX_{t-1} + \alpha_7 SLP_t +$$

$$+ \sum_{j=1}^{n} \delta_j dum\_ddmm_j. \tag{2}$$

S^{US} is the interest rate swap spread for the US, Y^{ab} the bid-ask spread for the 10-year government bonds, *STOX* the average of the volatility of put and call options on the Eurostoxx index, *SLP* the slope of the US yield curve, and *dum_ddmm* are dummies used as proxies for the fiscal policy events.

As a measure of the international factors that might have an impact on the determination of the long-term swap spread for the European swap spreads, we use the long-term interest rate swap spread for the US. This is done taking into account

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[25] The selection of variables has been inspired by Codogno et al (2003).

the leading role of the US economy and its capital markets in the world. Furthermore, we assume that the US interest rate swap spread does not react to changes in the European interest rate swap spread. One would expect the long-term US swap spread to increase as a sign of a fall of government bond yields relative risk vis-à-vis the swap market, if there is an increase in the demand for US government bonds. 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 consequent increase of European interest rate swap spreads. If instead of a spill-over effect, the increase in the demand for US government bonds implies demand substitution vis-à-vis European government bonds, i.e. less demand for sovereign European debt, then a decrease of European interest rate swap spreads might occur.

Liquidity is an important element in spread valuation. Our liquidity measure is the bid-ask spread relative to each 10-year benchmark government bond. An increase in the bid-ask spread implies a larger distance between offer and demand orders, therefore less liquidity for the benchmark bond market segment. This in turn might raise the short-term relative risk of government bonds vis-à-vis the swap rates and tighten the swap spread. Therefore, one should expect a negative relation between the bid-ask spread and the swap spread.[26]

Concerning the effects of stock market volatility on the interest rate swap spreads, we selected the average of the volatility of the put and call options on the Eurostoxx equity index. For instance, if there is an increase of the average volatility of puts and calls, implying that the equity segment might be temporarily experiencing a riskier period, then some demand for securities can shift towards less riskier segments, namely long-term government bonds. This movement will raise prices and decrease the yield-to-maturity of 10-year government bonds, increasing therefore the corresponding swap spread. Consequently, a positive relation between the measure of equity risk and the interest rate swap spread is expected.

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[26] Most standard measures of market liquidity (trade size, trade impact, spread between more and less liquid securities etc.) require detailed information on individual trades, something that is outside the scope of this study. Therefore, we draw on a simpler measure such as bid-ask spreads to assess liquidity.

The slope of the yield curve is computed as the difference between the 10-year government bond yields and the 3-month interest rates. Future growth expectations, related to a steeper slope of the yield curve, may indeed reduce the relative risk of private versus government bonds. Therefore, one might expect that the decrease in the relative risk of private bonds, vis-à-vis government bonds – depicted for example in the increase of the government yields and of the yield curve slope – reduces the swap spread.

For the fiscal policy events reported on Table 1, we created dummy variables that takes the value one for the date of the event and assumes the value zero for the rest of the year. Afterwards, an alternative approach is tested using a time window for these dummy variables, and this is explained in more detail in sub-section 4.3.

4.2. Estimation results and discussion

Our data sample covers the entire year 2002 including 253 daily observations. We estimate seemingly unrelated regressions for the specification given in (2), for 13 countries. Luxembourg is not included due to missing data. The UK is excluded since unit root tests showed that the swap spread is non-stationary (unit root tests for the variables are reported in Appendix 2). For the same reason, both the proxy for the stock market volatility (the *STOX* variable) and the yield curve inclination (the *SLP* variable) are used in first differences. The model specification to be estimated is

$$S_t = \alpha_1 + \alpha_2 S_{t-1} + \alpha_3 S_t^{US} + \alpha_4 S_{t-1}^{US} + \alpha_5 Y_t^{ba} + \alpha_6 \Delta STOX_{t-1} + \alpha_7 \Delta SLP_t +$$

$$+ \sum_{j=1}^{n} \delta_j dum\_ddmm_j . \tag{3}$$

Overall, the estimation results do not seem to differ substantially for the sample countries. In fact, most of the fiscal policy events turned out not to be statistically significant in explaining the swap spreads for the majority of countries. We report in Table 2 the estimation results of specification (3) for the countries more directly involved in the described 2002 fiscal events: Portugal, Germany and France.

Table 2. Selected SUR estimates of equation (3) for Portugal, Germany and France
(01/04/2002 to 12/31/2002)

	Panel A			Panel B		
	Portugal	Germany	France	Portugal	Germany	France
Constant	0.0070	0.0519	0.0484	0.0071	0.0511	0.0476
	(0.77)	(5.62) ***	(5.65) ***	(0.77)	(5.48) ***	(5.52) ***
S_{t-1}	0.6057	0.7608	0.6771	0.6001	0.7611	0.6764
	(17.38) ***	(28.21) ***	(27.97) ***	(17.11) ***	(28.19) ***	(28.02) ***
S_t^{US}	-0.0676	-0.0663	-0.0475	-0.0777	-0.0727	-0.0524
	(-2.22) ***	(-2.47) ***	(-1.49)	(-2.55) ***	(-2.70) ***	(-1.66) *
S_{t-1}^{US}	0.0593	0.0731	0.0453	0.0687	0.0795	0.0511
	(1.84) **	(2.56) ***	(1.35)	(2.12) ***	(2.78) ***	(1.52)
Y_t^{ba}	-0.0053	-0.0003	-0.0132	-0.0110	-0.0003	-0.0121
	(-0.0665)	(-1.73) *	(-0.86)	(-0.13)	(-1.76) *	(-0.78)
$\Delta STOX_t$	0.0007	0.0008	0.0015	0.0007	0.0010	0.0018
	(0.70)	(0.99)	(1.47)	(0.67)	(1.11)	(1.73) *
ΔSLP_t	-0.0040	-0.0674	-0.0091	-0.0102	-0.0690	-0.0138
	(-0.10)	(-1.84) *	(-0.21)	(-0.25)	(-1.88) *	(-0.32)
Dum_1701	-0.0613	-0.0305	0.0103			
	(-1.88) *	(-1.04)	(0.30)			
Dum_1202	-0.0389	-0.0528	0.0136			
	(-1.20)	(-1.82) *	(0.40)			
Dum_2006				0.0075	0.0245	0.0200
				(0.23)	(0.84)	(0.59)
Dum_2607				-0.0078	0.0217	0.0454
				(-0.24)	(0.73)	(1.31)
Dum_0511				0.0635	0.0554	0.0411
				(1.95) *	(1.90) *	(1.21)
Dum_1311				0.0188	0.0062	0.0121
				(0.57)	(0.21)	(0.35)
SE of reg.	0.03	0.03	0.03	0.03	0.03	0.03
Adj. R^2	0.37	0.52	0.46	0.37	0.52	0.46
DW	1.94	1.97	1.96	1.93	1.96	1.93

Notes: total system (balanced) observations 3211.
1) t-statistics in brackets.
2) * - significant at the 10% level; ** - significant at the 5% level; *** - significant at the 1% level.
3) For the description and the date of the events, relating to the dummy variables, see Table 1. For instance, *dum_1701* relates to the rumours of early warnings for Portugal and for Germany on 17 January.

Swap spreads react to the US swap spread, and this holds for all countries. The bid-ask spread, the liquidity measure, seems to be only relevant for Germany, and is not statistically significant for Portugal or France. There is also evidence that equity market volatility is relevant in determining swap spreads in France, at least at the 10 per cent significance level, but no such evidence exists for Germany or Portugal.

Regarding the fiscal policy events, all belonging to the first type, estimates indicate little relevance in terms of their explanatory power for swap spreads. However, one may perhaps notice a few interesting points. The rumours of the early warning for Portugal and Germany on 17 January (see *dum_1701*) seem to have actually decreased the swap spread for Portugal in line with the rationale presented in section 3 (10 per cent significance, see Panel A of Table 2). There is no evidence of similar

effects for Germany, except maybe when ECOFIN did not launch the EDP procedure on 12 February (see *dum_1202*), there was also a decline of the German swap spread (at the 10 per cent level).

Concerning the event that occurred on 5 November, when the Council declares that Portugal has an excessive deficit, there is some statistical evidence of an increase in the swap spreads both for Portugal and Germany (see Panel B of Table 2). This particular episode is additionally illustrated for Portugal in Figure 10 that clearly depicts the increase of the swap spread on that date.

Figure 10. 10-year interest rates and swap spreads for Portugal
(2002: 7 Oct – 7 Nov)
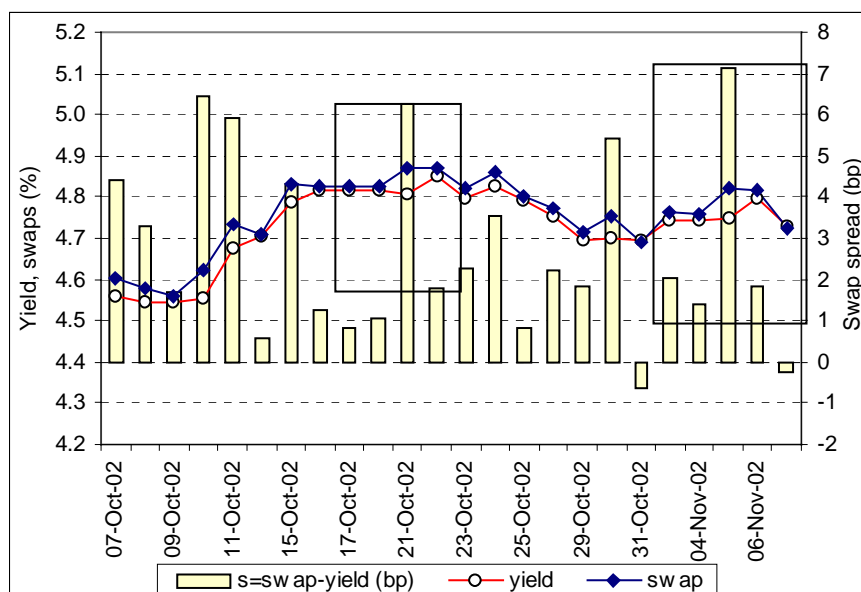
A possible interpretation of that finding is that capital markets viewed the actual decision to adopt an EDP against Portugal not as new information on a risky position of public finances in Portugal. Rather it might have been seen as an event signalling the credibility of the European fiscal framework as such, in the context of the general uncertainty created by the public debate, since rules were actually implemented. Alternatively it might also have reflected a reassurance that Portugal in the first case, but possibly Germany later on, would actually make more serious efforts to adjust their public finances. The coefficient for Portugal is slightly larger than for Germany. But the difference between the two coefficients is very small pointing, if anything,

more to a "common credibility effect" rather than to the assessment of adjustments in the each country.

In Table 3 we report estimation results for another set of events for the same three countries as above, as well as for Spain and for Greece.

Table 3. Selected SUR estimates of equation (3) for Portugal, Germany, France, Spain and Greece (10/04/2002 to 12/31/2002)

	Portugal	Germany	France	Spain	Greece
Constant	0.0075	0.0541	0.0494	0.0395	-0.0111
	(0.81)	(5.77) ***	(5.71) ***	(4.53) ***	(-0.99)
S_{t-1}	0.6037	0.7534	0.6734	0.6876	0.5693
	(17.30) ***	(27.84) ***	(27.85) ***	(31.82) ***	(18.46) ***
S_t^{US}	-0.0825	-0.0656	-0.0466	0.0008	0.0266
	(-2.66) ***	(-2.37) ***	(-1.43)	(0.03)	(0.70)
S_{t-1}^{US}	0.0729	0.0709	0.0438	-0.0281	-0.0547
	(2.24) ***	(2.44) ***	(1.29)	(-0.81)	(-1.37)
Y_t^{ba}	-0.0141	-0.0003	-0.0124	-0.0033	-0.1588
	(-0.17)	(-1.73) *	(-0.80)	(-0.08)	(-1.98) **
$\Delta STOX_t$	0.0005	0.0007	0.0015	0.0004	0.0014
	(0.51)	(0.83)	(1.44)	(0.38)	(1.14)
ΔSLP_t	-0.0163	-0.059	-0.0099	0.0510	0.0998
	(-0.39)	(-1.57)	(-0.22)	(1.13)	(1.91) *
Dum_2409	0.0030	0.0198	0.0100	0.0057	0.0304
	(0.09)	(0.67)	(0.29)	(0.16)	(0.75)
Dum_0810	0.0033	0.0089	0.0007	-0.0231	-0.0077
	(0.10)	(0.30)	(0.02)	(-0.66)	(-0.19)
Dum_1710	0.0087	-0.0061	-0.0085	0.0141	-0.0225
	(0.26)	(-0.20)	(-0.24)	(0.39)	(-0.5400)
Dum_2410	0.0274	0.0060	-0.0099	0.0254	0.0326
	(0.84)	(0.20)	(-0.29)	(0.73)	(0.80)
Dum_2711	0.0645	-0.0101	0.0061	0.0504	0.0836
	(1.97) **	(-0.34)	(0.17)	(1.44)	(2.06) **
SE of reg.	0.03	0.03	0.04	0.04	0.04
adj. R^2	0.37	0.51	0.45	0.51	0.44
DW	1.92	1.99	1.95	1.96	1.97

Notes: total system (balanced) observations 3211.
1) t-statistics in brackets.
2) * - significant at the 10% level; ** - significant at the 5% level; *** - significant at the 1% level.
3) For the description and the date of the events, relating to the dummy variables, see Table 1. For instance, *dum_2711* relates to the attempt by the EC to accommodate some of the criticism expressed by government officials against the Pact.

Concerning the event of 17 October (see *dum_1710*), when the President of the EC mentioned that a rigid application of the SGP would be a "stupid" avenue, there is no evidence of significant reactions from the markets. Indeed, the markets may have interpreted the announcement as not raising the risk of the European long-term government bond benchmarks vis-à-vis the 10-year interest rate swaps and, consequently, no relevant changes occurred in the swap spreads.

Regarding the event of 27 November, when the EC tried to accommodate some of the criticism expressed by the government officials against the Pact, there is some evidence of swap spread increases for Portugal and Greece. This can be interpreted as capital markets assigning a lower relative level of risk to those countries sovereign debt vis-à-vis the swap interest rates. Interestingly, these countries are precisely the ones with the lowest GDP per capita of the EU.[27] Therefore, the fact that markets might perceive some loosening in the EC attitude could have led to a decrease in the relative risk level vis-à-vis private debt of countries with a lower credit rating. Alternatively, the result could again be interpreted as reflecting a credibility effect related to the European fiscal framework, as our review of investment bank documents indicates. Market participants might have seen this as re-invigorating of the Stability and Growth Pact.

Given the different sensitivity of market participants regarding the credibility of the Pact and a strict implementation of rules, this lack of clear significant reaction may not come as a surprise. Our results however do not allow distinguishing between simple neglect, on the one hand, and opposite reactions cancelling out each other at the aggregate level, on the other hand. The only assessment that can be made is that the reaction to the events, if any, was not sufficiently unanimous to produce any sizeable result. In cases where the reaction of swap spreads turned out to be significant, the impact has been mostly 5 bp or less, but not exceeding 10 bp, according to our estimates. This is still sizeable provided that maximum spreads between government bond yields on average were around 30 bp for euro area countries in recent years (Blanco 2001).[28]

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[27] For instance, Afonso (2003) reports that sovereign rating is highly correlated with GDP per capita. Indeed, with the exception of Spain, rated triple A in 2002 by Moody's (but not by S&P), Portugal and Greece's government debt had lower ratings than the EU15 average. Aside from Portugal and Greece, Spain is the only country for which the estimated coefficient for this event attains statistical significance (14%) close to standard levels.

[28] Even if swap spreads are stationary, we also replicated the above estimates with changes in bond yields, in order to see if liquidity premium could be assumed constant over the time span. However, this exercise did not produce any conclusive results.

4.3. Testing anticipation and persistence

As discussed at the beginning of this section, 'type 1' events resemble some characteristics of credit rating action. They may have been anticipated and they could be expected to have a lasting impact on spreads. Therefore, we use now forward and backward moving windows of dummy variables, extending to several days before and after the event, in our regressions. This should allow us to assess if interest rate swaps react to fiscal policy events with leads and how they change thereafter.[29]

Specifically, we used an increasing backward window of 10 days before the date of the fiscal policy event and a forward increasing window of 10 days after the date of the event. Coding a dummy variable for these different intervals before and after the event with one (and zero otherwise)[30] captures the shifting mean swap spreads over this time period. This implies that one has to estimate 20 additional SUR systems for each relevant policy event.

As an example of the results obtained from these additional estimations, we present in Figure 11 and Figure 12 the estimates for the coefficient of the dummy variable used to capture the effect of the early warning decision on 12 February on German and Portuguese swap spreads.

Concerning the fiscal policy event of 12 February 2002 the estimates indicate an anticipating behaviour in capital markets during the 4-5 days before the event (notice that t-2 and t-3 was a weekend). This behaviour was clearer for Germany than for Portugal and the estimated coefficients are always negative in line with the results reported in Table 3. Additionally, one should notice that the absolute value of the estimated coefficient for the case of Germany was around 0.022/0.023 in days t-4, t-5 and t-6 and it was a bit higher, 0.053, on the day of the event itself. A similar point can be made for Portugal, with a slightly higher absolute coefficient for the dummy on the day of the event, 0.0387, than in days t-4 and t-5 (0.021/0.025).

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[29] Steiner and Heinke (2001) compute excess returns with rolling forward and backward windows, although the analytical impementation is different from ours.

[30] See Appendix 3 for the assigment of values to the dummy variables.

Figure 11. Statistical significance of the dummy coefficient on the "failed" early warning (12 Feb 2002) on German interest rate swap spreads
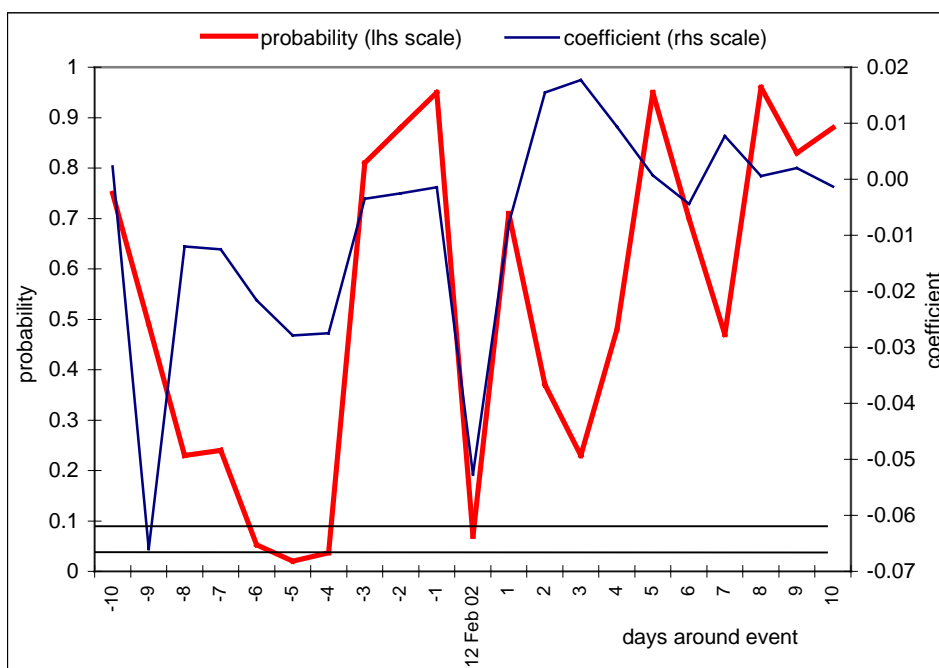
Note: the two horizontal bars denote the 10% and 5% significance levels respectively.

Figure 12. Statistical significance of the dummy coefficient on the "failed" early warning (12 Feb 2002) on Portuguese interest rate swap spreads
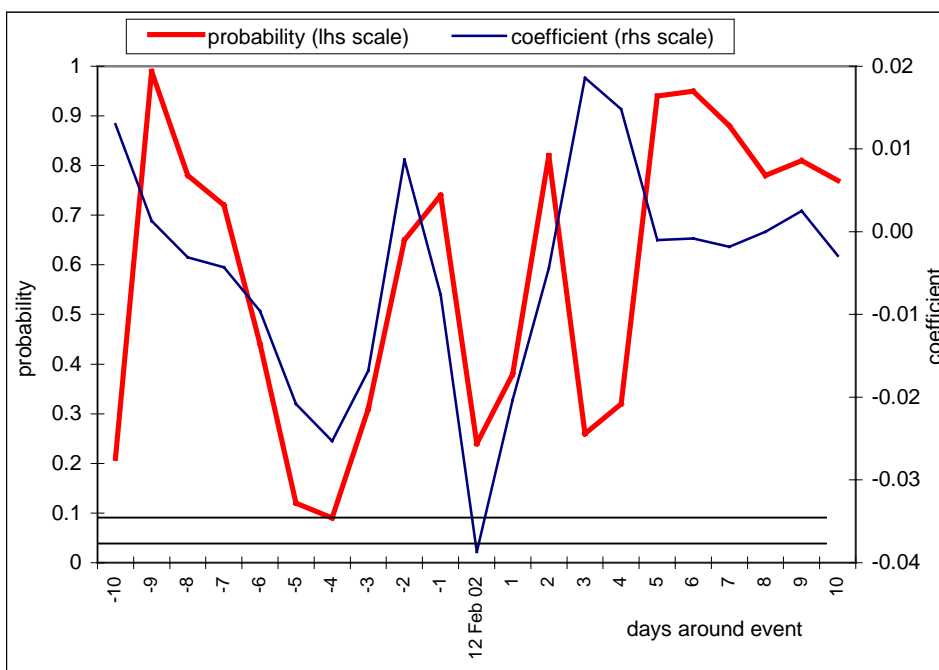
Note: the two horizontal bars denote the 10% and 5% significance levels respectively.

In Figure 13 we present the results of similar SUR estimations for the fiscal policy event that occurred when the Council declared that Portugal had an excessive deficit, on 5 November 2002. We only present the results for Portugal.

Figure 13. Statistical significance of the dummy coefficient on the declaration by the Council (5 Nov 2002) on Portuguese swap spreads
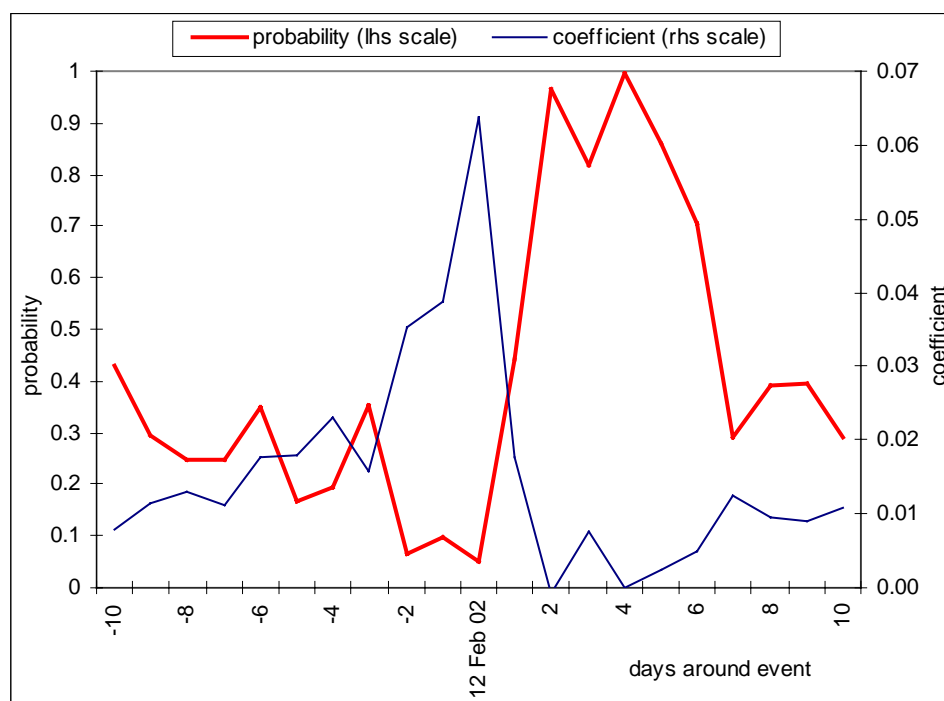
Note: the two horizontal bars denote the 10% and 5% significance levels.

Notice that the statistical significance of the estimated coefficient for the dummy variable is slightly increasing two days before the event. The absolute value of the estimated coefficient for the dummy variable again is higher at the date of the event, 0.064, than in days t-1 and t-2 before (0.035/0.038).

We also performed this estimation strategy of backward/forward windows for other fiscal policy events. The exercise did not produce any further informative results and estimates are therefore not reported. Based on this analysis, fiscal policy events seem to bring additional information for the pricing of long-term bonds in capital markets mainly at the date of the event, and there is little indication for anticipation effects.

4.4. Additional evidence from CDS

We also assess the responsiveness of credit default swaps (CDS) to the aforementioned fiscal policy events.[31] CDS rates have been used as measures of default risk in other studies. For instance, Hull, Predescu and White (2003) report that CDS spread changes tend to anticipate negative rating announcements (one might also think of "adverse" fiscal policy events) using a sample of 1,599 entities, including corporations, sovereigns and quasi-sovereigns.

In Figure 14 we present the evolution of the 10-year CDS in basis points, in the fourth quarter of 2002, for the relevant countries. We include Austria as a control country that in principle should have been less affected by country specific fiscal events. The data that we got for CDS basically show nearly no changes for the first three-quarters

Figure 14. 10-year CDS (2002: Sep 2-Dec 31)
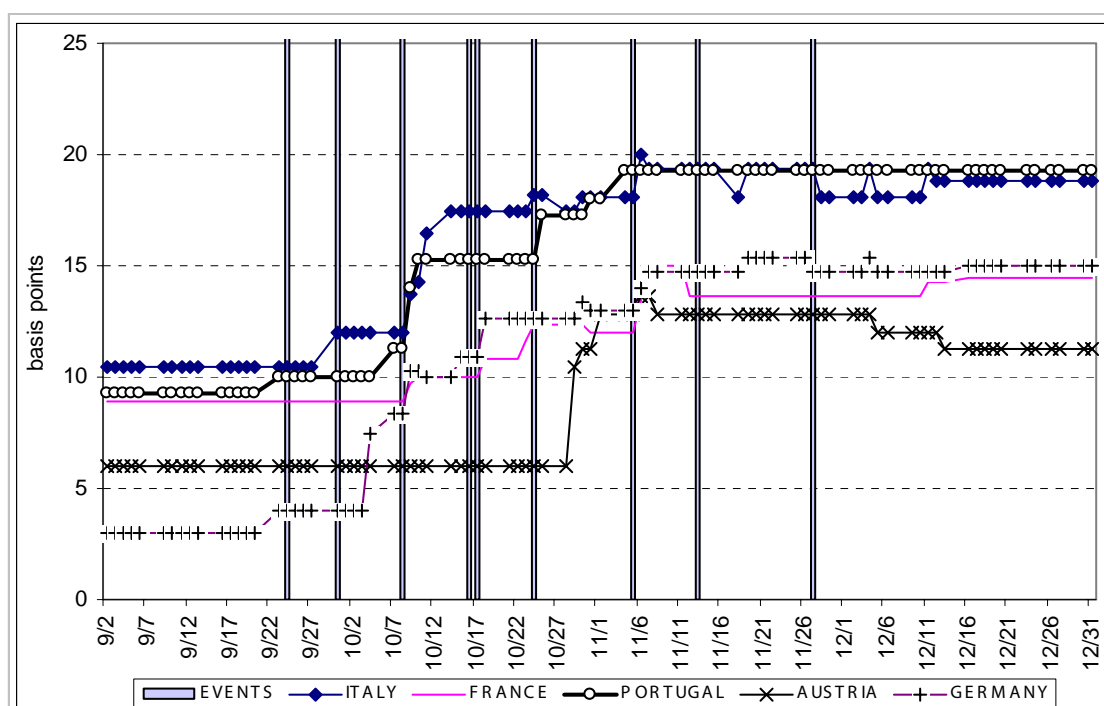
Source: JPMorgan.

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[31] This contract provides insurance against default by a particular company or sovereign entity. The issuer is known as the reference entity and a default by the issuer is known as a credit event. The buyer of the insurance makes periodic payments to the seller and in return obtains the right to sell a bond issued by the reference entity for its face value if a credit event occurs. This seems to be particularly true when extreme declines in credit quality happen within a short period of time.

of 2002, but then started to increase in the fourth quarter. Even if one considers the low liquidity of the CDS market for sovereigns, some additional information can be obtained concerning the markets participants responsiveness to the policy events that occurred in 2002.

Some long and short-term developments depicted in Figure 14 are worth noticing. First, Germany looses its position as the country with the lowest rate and at the end of the sample period ranks third, with France and Austria having lower rates. At the same time, Portugal looses some ground relative to Italy, which has slightly lower rates at the end of the sample.

Second, CDS rates increased for Germany and France, right after the 17 October, when the President of the EC conveyed his comments on the SGP. In addition, there was an increase in the CDS rate of all the countries depicted in Figure 14 just before and after the declaration of the Council that Portugal had an excessive deficit (5 November). This contradicts the result we found in our SUR analysis since a rise in the CDS rates can be interpreted as implying a rise in the perceived risk, assigned by market participants, to those countries' sovereign debt. The evidence for the other fiscal policy events captured is less clear cut.

5. Conclusion

In 2002, the Stability and Growth Pact was put to a test due to the implementation of the surveillance process and the discussion about the framework itself in the context of the economic slowdown. This study evaluates to which extent policy events taking place in the course of 2002 produced a reaction in the long-term bond segment of the capital markets. First, we qualitatively study the views of market participants reviewing their publications. Then simple statistics and econometric estimates are used to assess the impact of these events on the swap spread, our measure for the default risk premium.

Publications of investment banks show that market participants are not only perceptive to the debate on and the implementation of the SGP, but in some cases they

even intend to contribute to the debate. Although there is unanimous agreement that some form of a European fiscal framework is useful, markets' views on specific credibility aspects and how the Pact ought to be implemented differ widely. In our parametric analysis, we concomitantly do not find a clear capital market reaction for various events. Since we do not have data on individual trades, our results do not allow discriminating whether the lack of reaction was due to neglect or opposing assessments.

Nevertheless, we find some effects of political events and discussions on the swap spread. Interestingly, they point in different directions in the first quarter of 2002 and in the last quarter. The credibility of the framework as such may have been negatively affected by the public debate. The rumours of the early warning for Portugal and Germany on 17 January did seem to actually have decreased the swap spread for Portugal pointing to increasing concerns about fiscal developments. By contrast, for the event of 5 November, when the Council declared that Portugal as an excessive deficit, there is some statistical evidence of an increase in the swap spreads both for Portugal and Germany, which indicates a possible confidence effect. Finally one has to restate once more that the reaction of swap spreads, when significant, has been sizeable – mostly 5 basis points or less, but not exceeding 10 basis points – according to our estimates.

The failure to find a significant impact in most cases has not been an anticipation effect, since procedural events are generally not associated with a fall of spreads beforehand. Moreover, we could not detect any persistence of the market reaction in terms of a continuous upward or downward shift of the swap spread after an event. One could have expected such a reaction if the credibility of the European institutional framework would have been seriously threatened and market participants would have predicted a serious misalignment of public finances in the future.[32]

Summarising, the main finding of our paper is the lack of a persistent and systematic reaction of the default risk premium to the identified fiscal policy events during 2002, even if some specific events had a significant, temporary impact on swap spreads.

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[32] This is also the view supported by a recent EC report (see EC (2003)).

Appendix 1 – Descriptive statistics

Table A1.1. Descriptive statistics for 10 years daily government bond yields (2002)

	Mean (%)	Median (%)	Maximum (%)	Minimum (%)	Standard Deviation	Skewness	Kurtosis
AT	4.941	5.008	5.445	4.244	0.345	-0.225	1.690
BE	4.980	5.051	5.480	4.304	0.341	-0.231	1.662
DE	4.775	4.825	5.256	4.175	0.319	-0.145	1.648
DK	5.053	5.073	5.502	4.443	0.283	-0.140	1.813
FI	4.957	5.010	5.475	4.276	0.330	-0.238	1.781
FR	4.862	4.902	5.339	4.237	0.318	-0.147	1.669
ES	4.928	4.994	5.433	4.252	0.342	-0.188	1.645
GB	4.855	4.891	5.334	4.360	0.293	-0.021	1.662
GR	5.103	5.203	5.602	4.429	0.342	-0.272	1.679
IE	4.994	5.003	5.505	4.280	0.332	-0.164	1.772
IT	5.018	5.072	5.511	4.407	0.328	-0.204	1.665
NL	4.886	4.935	5.389	4.204	0.345	-0.195	1.672
PT	5.002	5.059	5.489	4.315	0.333	-0.272	1.782
SE	5.300	5.286	5.770	4.685	0.282	0.008	1.869
US	4.603	4.799	5.426	3.567	0.534	-0.261	1.624

Source: Reuters.

Table A1.2. Correlation matrix for daily government bond yields (2002)

	AT	BE	DE	DK	FI	FR	ES	GB	GR	IE	IT	NL	PT	SE	US
AT	1														
BE	0.987	1													
DE	0.995	0.985	1												
DK	0.965	0.978	0.966	1											
FI	0.994	0.986	0.993	0.970	1										
FR	0.997	0.983	0.997	0.965	0.992	1									
ES	0.999	0.986	0.995	0.964	0.992	0.997	1								
GB	0.974	0.970	0.986	0.958	0.977	0.981	0.974	1							
GR	0.997	0.987	0.992	0.962	0.991	0.993	0.996	0.968	1						
IE	0.955	0.964	0.951	0.972	0.959	0.951	0.952	0.938	0.951	1					
IT	0.996	0.982	0.996	0.961	0.989	0.997	0.997	0.977	0.993	0.947	1				
NL	0.999	0.986	0.996	0.965	0.994	0.998	0.998	0.976	0.996	0.956	0.997	1			
PT	0.995	0.987	0.991	0.967	0.996	0.991	0.992	0.973	0.993	0.959	0.989	0.994	1		
SE	0.940	0.953	0.944	0.982	0.948	0.942	0.936	0.943	0.932	0.971	0.934	0.941	0.944	1	
US	0.924	0.937	0.927	0.923	0.909	0.919	0.925	0.919	0.930	0.913	0.926	0.921	0.914	0.899	1

Table A1.3. Descriptive statistics for 10 years daily interest rate swaps (2002)

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
DK	5.230	5.290	5.760	4.520	0.344	-0.155	1.766
EU	5.014	5.070	5.480	4.365	0.317	-0.218	1.704
GB	5.239	5.305	5.650	4.770	0.272	-0.165	1.564
SE	5.542	5.525	6.020	4.930	0.288	-0.027	1.865
US	5.150	5.263	6.080	4.210	0.583	-0.124	1.524

Table A1.4. Correlation matrix for 10-year daily interest rate swaps (2002)

	EU	DK	GB	US	SE
EU	1.000				
DK	0.994	1.000			
GB	0.984	0.978	1.000		
US	0.947	0.933	0.954	1.000	
SE	0.976	0.977	0.960	0.903	1.000

Appendix 2 – Unit root tests

Table A2.1. Unit root tests (ADF), interest rate swap spreads

Country	Trend	Drift	Lags	Test Statistic
Austria	Y	Y	5	-5.33 ***
Belgium	Y	Y	5	-5.41 ***
Denmark	Y	Y	5	-4.71 ***
Spain	Y	Y	5	-5.24 ***
Finland	N	Y	10	-3.17 **
France	Y	Y	5	-4.85 ***
United Kingdom	N	N	10	-1.10
Germany	Y	Y	5	-4.17 ***
Greece	Y	Y	5	-6.45 ***
Ireland	Y	Y	5	-4.89 ***
Italy	Y	Y	5	-4.21 ***
Netherlands	Y	Y	5	-4.87 ***
Portugal	Y	Y	5	-4.13 ***
Sweden	Y	Y	5	-4.80 ***
United States	Y	Y	5	-4.62***

*** - Significant at 1% or less.

** - Significant at 5% or less.

Table A2.2. Unit root tests (ADF), bid-ask spreads

Country	Trend	Drift	Lags	Test Statistic
Austria	Y	Y	5	-5.88***
Belgium	Y	Y	5	-6.59***
Denmark	N	Y	5	-3.15**
Spain	Y	Y	5	-4.93***
Finland	Y	Y	5	-4.72***
France	Y	Y	5	-5.75***
United Kingdom	Y	Y	5	-6.41***
Germany	Y	Y	5	-6.69***
Greece	Y	Y	5	-7.41***
Ireland	Y	Y	5	-4.94***
Italy	Y	Y	5	-7.04***
Netherlands	Y	Y	10	-5.22**
Portugal	Y	Y	5	-6.64***

*** - Significant at 1% or less.

** - Significant at 5% or less.

Table A2.3. Unit root tests (ADF), other variables

Variable	Trend	Drift	Lags	Test Statistic
Eurostoxx (implied volatility)	N	N	5	-0.44
US yield curve	N	N	5	-1.07
First differences				
Eurostoxx (implied volatility)	Y	Y	1	-7.18
US yield curve	Y	Y	1	-7.50 ***

*** - Significant at 1% or less.

Table A3.1. Example of value assignment to the dummy variables in the "window" estimates

SUR	...	t-11	t-10	t-9	t-8	t-7	t-6	t-5	t-4	t-3	t-2	t-1	t+0	t+1	t+2	t+3	t+4	t+5	t+6	t+7	t+8	t+9	t+10	t+11	...
1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
...																									
9	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0
...																									
20	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0

Note: t+0 is the date of the event.

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Annex - Data sources

The sources for the data used in the study are reported below, for each series.

10-year government bond yields (Reuters)	10-year interest rate swaps (Reuters)	10-year government bond, bid and ask prices (Reuters)	stock market put and call volatility (Bloomberg)
PT10YT=RR		RT.BM.AT.10Y.ASK	EUROSTOXX
BE10YT=RR		RT.BM.AT.10Y.bid	CALL IV
ES10YT=RR		RT.BM.be.10Y.ASK	PUT IV
FR10YT=RR		RT.BM.be.10Y.bid	
IE10YT=RR		RT.BM.de.10Y.ASK	
DE10YT=RR	EURAB6L10Y=	RT.BM.de.10Y.bid	
IT10YT=RR		RT.BM.dk.10Y.ASK	
NL10YT=RR		RT.BM.dk.10Y.bid	
AT10YT=RR		RT.BM.es.10Y.ASK	
FI10YT=RR		RT.BM.es.10Y.bid	
GR10YT=RR		RT.BM.fi.10Y.ASK	
US10YT=RR	USDAM3L10Y=	RT.BM.fi.10Y.bid	
GB10YT=RR	GBPSB6L10Y=	RT.BM.fr.10Y.bid	
SE10YT=RR	SEKAB3S10Y=	RT.BM.fr.10Y.ASK	
DK10YT=RR	DKKAB6C10Y=	RT.BM.gb.10Y.bid	
		RT.BM.gb.10Y.ASK	
		RT.BM.gr.10Y.bid	
		RT.BM.gr.10Y.ASK	
		RT.BM.ie.10Y.bid	
		RT.BM.ie.10Y.ASK	
		RT.BM.it.10Y.bid	
		RT.BM.it.10Y.ASK	
		RT.BM.nl.10Y.bid	
		RT.BM.nl.10Y.ASK	
		RT.BM.pt.10Y.bid	
		RT.BM.pt.10Y.ASK	
		RT.BM.se.10Y.bid	
		RT.BM.se.10Y.ASK	
		RT.BM.us.10Y.bid	
		RT.BM.us.10Y.ASK	

Credit Default Swaps	3 month interest rates (Reuters)	
Source:	USD3MZ=R	
JP Morgan	SEK3MZ=R	
	DKK3MZ=R	
	GBP3MZ=R	
	EUR3MZ=R	

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