

Bauer, Matthias; Zenker, Martin

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Minor Nuisance Around Foreign Exchange Markets - Lessons from the Stability and Growth Pact Debate

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No. 32

Minor Nuisance Around Foreign Exchange Markets: Lessons from the Stability and Growth Pact Debate

Matthias Bauer and Martin Zenker

**GLOBAL FINANCIAL
MARKETS**

University Jena
Carl-Zeiss-Str. 3
D-07743 Jena

University Halle
Universitätsplatz 5
D-06099 Halle

Tel.: +49 3641 942261
+49 345 5523180

E-Mail: info@gfinm.de
www.gfinm.de

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Abstract

The euro did not depreciate against major currencies up until the reform of the Stability and Growth Pact (SGP) in March 2005. Thus the question comes up of whether foreign exchange markets turned a blind eye on the political debate undermining the original Pact. This paper studies the impact of political events that systematically undermined the SGP on the euro's foreign exchange expectation bias for the period 2001 to 2005. 1) We conclude that already in the early years of the SGP regime the demise of the original Pact was anticipated by foreign exchange market participants. 2) Political events undermining the long-term solvency of member states affected foreign exchange market expectations, though not the euro's external value. Our results have implications for the recently reformed SGP and new the "European Fiscal Compact", both lacking stringent enforcement mechanisms.

JEL Classification: E62; F31; F33; C22; C58

Keywords: Fiscal Rules, Stability and Growth Pact, FX Markets, GARCH

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I. Introduction

The recent European sovereign debt crisis, sometimes perceived as a crisis of the euro, has - more or less suddenly and thus painfully - made national policymakers aware of the consequences of non-cooperation within the European Union (EU) fiscal framework. We focus on one root of the current European sovereign debt crisis: the political confrontation with the European legislative framework on the coordination of national fiscal policies that is dated back roughly 10 years from now. It is the period of the gradual demise of the Stability and Growth Pact (SGP, the Pact) - the EU and European Monetary Union (EMU) mechanism for fiscal restraint. Having in mind the bail-out prohibition of the EU treaty and the initial rationale of the SGP, the effective contempt of the Pact by EU governments should have caused capital markets to anticipate worsening fiscal positions potentially resulting in an existential threat to the euro zone.

As regards the euro's external value, however, foreign exchange markets apparently turned a blind eye on the political haggling over enforcement of the SGP. Actually the euro became even stronger against major currencies when the euro zone became weaker due to the gradual loss of its fiscal anchor. In the following, we

analyse whether foreign exchange markets have been affected by the political debate over the SGP and whether market participants have anticipated certain political events that were indicating fiscal leeway among EMU member countries. We employ GARCH (Generalized Autoregressive Conditional Heteroscedasticity) models to show the effects that political events exerted on the expectation bias in euro-denominated foreign exchange markets. The period under review is January 2001 to March 2005.

Dealing with the expectation bias allows us to study the systematic effects of political events on market expectations about future spot exchange rates. We will show that 1) political decisions as well as political statements exerted no significant impact on the size of the expectation bias. 2) Our results suggest that political events systematically affected the volatility of the expectation bias, indicating that markets followed the debate. 3) Volatility decreased after scheduled EcoFin¹ decisions. Interestingly, foreign exchange markets paid less attention to decisions taken by the European Commission. Obviously the EcoFin's veto power was considered more by market participants, and the euro priced accordingly. 4) Non-scheduled European Commission statements were considered by financial markets signalling future adjustments to the Pact. We argue, that market participants questioned the credibility of Europe's weak fiscal framework already in its early years.

We proceed as follows: in the following section we provide a review of the relevant literature and discuss some focal points of research that combine financial markets with information and political events. In section 3 we discuss the expectation bias and its relation to political events before we explain the underlying theoretical framework. The description of the our data and the empirical framework are presented in section 4. Section 5 provides policy implications for EU/EMU policymaking. Section 6 concludes.

II. Literature Review

The literature on the impact of news on foreign exchange markets follows three main avenues: macroeconomic news, central bank policy announcements, and political events.

Macroeconomic News

For the USA and Germany, Almeida et al. (1998) analyse the short-term effects of macroeconomic news by using high frequency data. Their empirical results suggest that the majority of news under review have a significant influence on exchange rate movements within a five-minute period. Galati and Ho (2003) analyse scheduled macroeconomic news for the first two years of EMU. Their results suggest that up to ten per cent of daily movements in the EUR/USD foreign exchange rate

¹As a European institution the EcoFin consists of member state's Economics and Finance Ministers.

can be explained by macroeconomic news. Moreover, they find that market participants differentiate certain types of news. From an asymmetric evaluation of their news data it turns out that good macroeconomic news are effectively negligible. Ehrmann and Fratzscher (2005) study the linkage between economic fundamentals and foreign exchange rates between 1993 and 2003. The authors stress that the impact of macroeconomic news depends on market uncertainty. The larger market uncertainty is the stronger is the foreign exchange rate reaction in response to negative shocks.

Central Bank Policy Announcements

Analysing the EUR/USD exchange rate over the period April 2000 to September 2000, Prast and Vor (2005) find that market reaction is linked to unexpected political statements from members of European and international institutions. Market participants take into account political news and central bank statements that are related to the euro area. Investors also discern good and bad news. For the euro area, news perceived as “bad” political statements affected the EUR/USD exchange rate stronger than news perceived as “good”.

Jansen and De Haan (2005a) find that unscheduled and surprising statements exert stronger influence on pricing than released statements linked to macroeconomic data. Jansen and De Haan (2005b) investigate the EUR/USD exchange rate and its dependency on statements expressed by various groups of European Central Bank (ECB) members. The results confirm that bad news typically affect market volatility stronger than good news. However, the effects of verbal intervention on the exchange rate are found to be small and non-durable. A related study by Beine et al. (2009) investigates the effect of non-verbal intervention on the YEN/USD exchange rate. They show that the central bank is able to influence the exchange rate by both visible (announced) and secret foreign exchange rate interventions.

Conceptually related to our study, Baillie and Osterberg (2000) investigate the effects of central bank intervention on the deviation from uncovered interest rate parity (UIP). They conclude that interventions significantly affect deviations from UIP, though this effect is not stable over the complete time period under review. Fatum and Hutchison (2002) analyse interventions and intervention specific news announced by the ECB. The authors divide news into four different groups: rumours of intervention, reports of actual intervention, supportive and non-supportive euro statements by officials. Their results suggest that rumours of an intervention by the ECB influence the foreign exchange rate positively. Non-supportive statements affect the exchange rate negatively. Negative statements are found to be predominantly considered by market participants.

Rosa (2011) investigates the influence of the Federal Reserve Bank’s (FED) monetary policy decisions and news shocks on the US dollar exchange rate. According to the author the exchange rate is significantly affected when decisions or statements are surprising and unanticipated. Unanticipated statements explain up to 80 per

cent of the variance of exchange rate returns and the exchange rate considerably depends on the expected path of politics.

Political News

The link between foreign exchange markets and political events has received little attention in economic research. Bernhard and Leblang (2002) argue that the foreign exchange market is particularly affected in times of political uncertainty. Their results suggest that between 1974 and 1995 foreign exchange markets claimed higher risk premia before, during and after democratic elections. In addition, by comparing stable and volatile political periods evidence was found that increased risk premia more often prevail during times of uncertain political processes.

Fahrholz and Schneider (2012) investigate the influence of meetings, statements and decisions of European institutions for the period 2001 to 2005. Their investigation is based on daily data of selected political news undermining the SGP. The authors show that decisions on the enforcement of the SGP systematically decrease the volatility of the time-varying risk premium, which is inherent in foreign exchange markets.

It can be summarized that foreign exchange markets systematically react on various sources of news. The effects, however, are not distributed symmetrically. The majority of empirical research indicate that “bad” news have a stronger impact on foreign exchange markets than “good” news. In addition, unexpected events are generally found to have a stronger impact on foreign exchange markets.

III. Political Events and the Foreign Exchange Expectations Bias

III.1. The Political Dispute Over the Initial SGP

To comply with the Maastricht criteria ambitious consolidation efforts have been undertaken by EU members until 1999 when 11 countries have decided to join the EMU. Many member states reduced their budgetary deficits significantly to the level of three per cent of GDP or even lower to achieve the required criteria. However, according to EuroStat, just before the beginning of EMU general government debt levels of six member states were above 60 per cent, though with the tendency of a downward path (EU Commission, 1998). Already at this point in time, one might question EMU member states’ actual willingness to comply with the SGP.

After EMU countries had replaced their own currencies by the euro in 1999, budgetary adjustment was still necessary for many of them in order to comply with the “close to balance or in surplus” condition, and in a narrower sense with the three per cent criterion. In this regard De Haan et al. (2003) provide figures on stability and convergence programs and on budgetary positions for the subsequent

five years. These figures illustrate that some EMU members performed well, while others did not cope with a required reduction of deficits.²

Right at the beginning of the euro zone, SGP rules have been abrogated in a politicized environment. The Pact's credibility thereby was gradually undermined by a rather pragmatic handling of budgetary misbehaviour, instead of an unambiguous enforcement of the rules. In January 2002, the European Commission sent an early-warning to Germany. De facto, however, this warning was rejected by the Council since it was not put to vote in February 2002. At the same time European Commission recommendations on Portugal, which was another early budget sinner, have not found the EcoFin's favour. Eventually in November 2002, an European Commission recommendation on Portugal was endorsed by the Council, followed by Germany in January 2003 and France in May 2003. Overall 39 excessive deficit procedures have been launched until 2011.³ Sanctions, as foreseen by the Pact, have never been applied.

Repeated disrespect for the SGP emerged in a growing demand for a new Pact. German, French and Italian policymakers have been among the most pre-eminent voices calling for laxer rules and extended budgetary leeway at national level.⁴ View Figure 1 in appendix A.2 for an overview of the frequency of "destabilising" EcoFin statements. A detailed definition and methodological considerations are provided in section IV.1.

Beyond destabilising EcoFin statements, the SGP debate was equally influenced by French, German and Italian heads of government. The German government did not favour a too rigid reading of the Pact and repeatedly called for not punishing Germany for budgetary leeway. French politicians claimed for excluding defence spending and research expenditures from the statistically relevant government budget. Italian politicians repeatedly called for laxer interpretation of the rules and urged to strip out investment spending from the SGP relevant budget. Figure 2 in appendix A.2 illustrates the frequency of "destabilising" statements of the heads of government.

At the beginning of the political debates that have severely undermined the SGP's credibility, the European Commission still acted as the guardian of the Pact. However, in the course of time, the number of statements suggesting a laxer interpretation and final adjustment of the rules remarkably increased, with its frequency

²Having a deficit of 2.8 per cent, Germany almost infringed the pact already in 2001. In 2002 (3.6 per cent) and 2003 (3.4 per cent) it became abundantly clear that Germany breached the rules. Portugal, France and Italy followed with breaching the deficit rule in 2001, 2002, and 2004 respectively.

³According to the European Commission (<http://ec.europa.eu>, as of October 2011) 15 Excessive Deficit Procedures have been initiated in the period 1999 to May 2008 - 14 of which are already closed. For an overview see appendix A.1.

⁴At the same time the ECB continuously claimed for adherence and non-modification of the rules. Freedom of monetary policy, low interest rates, and stable inflation expectations have been among the most frequently stated arguments by the ECB in defending the Pact. Convergence in fiscal policies has been argued to be essential for a smooth working of the euro zone as a currency area.

peaking in 2004. Starting with a warm welcome of the German-Portugal-budget-deal in 2002, officials of the European Commission repeatedly called for applying the SGP more “intelligently”, eventually backing the Pact’s reform. Decisions concerning deficit warnings, however, have consistently been applied in compliance with the SGP framework.

Long before the beginning of the third stage of EMU it has been argued that fiscal solvency of member states is a crucial precondition for the smooth functioning of the currency union (see Delors Report, 1989; Heipertz and Verdun, 2004). In line with this argument financial markets should pay attention to short-term events related to the degree of commitment to the SGP. Since non-commitment is a potential threat to long-term fiscal solvency of member states, the euro’s external value should have reflected this risk to the currency area (Fahrholz and Schneider, 2012).

Drawing conclusions from absolute exchange rate data is hardly possible. In fact, the euro appreciated against all currencies studied in this paper (USD, GBP, CHF, see Appendix 3) in the period under consideration. On the contrary, the development of the euro’s nominal external value against the currencies under study suggests that actual fiscal figures matter: due to deteriorating actual fiscal positions in most EMU member countries the euro depreciated against these currencies. For that reason one particular question arises: do foreign exchange markets consider political events indicating a threat to long-term solvency?

In the following section we focus on the link between the political debate described above and the foreign exchange forward bias that is inherent in the euro exchange rate.

III.2. The Theoretical Model

Similarly to Frenkel and Mussa (1980), the approach we follow in this paper is based on an asset market theory. According to this view, the foreign exchange rate, similar to stock returns, does not only reflect fundamental data and microeconomic risks. Rather political statements and/or decisions can influence the exchange rate as soon as market participants anticipate that the future economic performance of a currency area might be affected. One can argue that spot market participants in foreign exchange markets behave like investors engaged in the stock market, ie they form rational expectations about the future. Thereby the exchange rate return follows a random walk. New information from the political arena can thus be responsible for an alteration of the exchange rate and its volatility. Since our analysis relies on daily data, we are able to study the impact of political events on a daily basis.

We now describe the theoretical framework that links the foreign exchange rate to the interest rate differential between two countries, the so-called uncovered interest parity (UIP). According to the UIP theory an investor has the choice to invest in

domestic assets or to invest abroad. Free mobility of capital is assumed.⁵ When a European investor decides to invest in the USA it is necessary to exchange the amount given (denoted as W) apriori at the spot exchange rate S_t . The exchange rate is denoted with the US-Dollar as numeraire currency.⁶ If the investor intends to hedge the foreign exchange risk, this decision depends on the expectation of the spot exchange rate S_{t+1}^e , ie the spot rate of the next period $t + 1$.

As a result the investor has to choose between two final allocations. On the one hand, the investor receives a safe payment $W \cdot (1 + i_t)$ if he invests domestically - where it denotes the domestic (here European) currency price of the interest rate on domestic deposits. On the other hand, the investor receives an expected payment $W \cdot (1 + i_t^*) \cdot S_t / S_{t+1}^e$ in the case of investing abroad. Thereby i_t^* is the interest rate on foreign deposits of equivalent risk and maturity in t . S_{t+1}^e denotes the expected spot exchange rate in period $t + 1$ already arising in period t . Given the additional assumptions of rational expectations, risk neutrality and the absence of taxes on capital transfer, the UIP hypothesis can be summarized as

$$(S_{t+1}^e - S_t) / S_t = (F_{t+1} - S_t) / S_t \approx i_t^* - i_t \quad (1)$$

where F_{t+1} is denoted as the forward exchange rate for period $t + 1$ in period t . In the foreign exchange market two types of contracts can be traded: spot contracts and forward contracts. The price of a forward contract is determined in t for delivery somewhere in the future $t + 1$. According to the efficient market hypothesis (EMH) stated by Fama (1970) and following Bernhard and Leblang (2002) the price of an asset “fully reflects” all relevant news concerning a certain market. Consequently, the foreign exchange forward rate in t should perfectly predict the spot rate in $t + 1$. Put it differently, given the assumption of rational expectations, the forward rate should be the best forecast of the future spot rate.

Generally, the UIP condition is expressed in its logarithmic notation. In this case, the spot exchange rate and the forward exchange rate are denoted by the lower-case symbols s_t and f_{t+1} , respectively. Using logarithmic values for spot and forward rates the UIP takes the form

$$E_t(s_{t+1} - s_t) = f_{t+1} - s_t = i_t^* - i_t, \quad (2)$$

where $E_t(\cdot)$ is the mathematical expectation conditioned on all information relevant in period t . The UIP relation is fulfilled when the interest rate differential between the foreign and the domestic market is equivalent to the expected rate of appreciation (depreciation) period t . If the hypothesis of efficient markets is valid, the forward rate is a biased predictor for the future spot rate (Bernhard and Leblang, 2002; Deutsche Bundesbank, 2005). Given the assumption of rational expectations,

⁵In this paper we consider a number of different currency pairs. However, for our theoretical explanation we exemplarily focus on USD/EUR only.

⁶In other words, it is the inverted quotation from a European perspective.

the validity of the UIP can be checked with the following regression:

$$\Delta s_{t+1} = \alpha + \beta(i_t^* - i_t) + u_{t+1}, \quad (3)$$

where u_{t+1} is assumed to be white noise. For the above regression to hold, the parameter α (β) is not allowed to be significantly different from zero (one). According to Froot et al. (1990) as well as Deutsche Bundesbank (2005) the null hypothesis can be rejected.

Following Baillie and Osterberg (2000) one can argue to expand the UIP relation by the variable y_{t+1} . This ex post deviation from UIP is extensively discussed in the literature, though read in different ways. Unlike Fahrholz and Schneider (2012), Kaminsky and Peruga (1990) and contrary to Hodrick (1989) we do not consider y_{t+1} to be related to a time-varying risk premium. Rather y_{t+1} is interpreted as an expectation bias in foreign exchange forward markets.⁷ This ex post expectation bias can be summarized as

$$y_{t+1} = \Delta s_{t+1} - (f_{t+1} - s_t) = \Delta s_{t+1} - (i_t^* - i_t), \quad (4)$$

where y_{t+1} is equal to u_{t+1} in Equation (3). Moreover, we assume that $\alpha = 0$ and $\beta = 1$.

Generally, two important issues arise when studying foreign exchange markets: liquidity aspects and transaction costs. For a relatively illiquid currency pair, it is essential to integrate liquidity as well as transaction costs. Since the degree of financial integration across the currencies studied in this paper is high (see eg Bank for International Settlements, 2007) we abstract from transaction costs and liquidity considerations.

Foreign exchange market participants frequently update their beliefs after the arrival of new information that was not anticipated in advance. Foreign exchange market expectations are reflected in the forward rate. Deviations between the forward rate set in t and the spot rate in $t + 1$ can be utilised to uncover the effect of unanticipated information within the foreign exchange market.

One can argue that efficient markets anticipate political decisions. Given this argument holds, any statistically significant correlation with political decisions indicates inefficient processing of information. However, the outcome of political events cannot be predicted perfectly in most cases. This is particularly true for decision making processes at EU level. On the one hand, the agenda discussed at summits of EU institutions is generally not known beforehand. On the other hand, the number of member states pursuing individual interests increase the likelihood of political horse-trading (see Bechtel and Schneider, 2010 for related arguments). As a consequence, foreign exchange market participants cannot perfectly predict

⁷A certain part of the ex post deviation might be considered to be a time-varying risk premium. However, so far there is no consensus in the literature on how to interpret y_{t+1} .

political outcomes.

We assume that the ex post expectation bias depends on unanticipated information arriving from EU politics. Given that unanticipated political information systematically affect the foreign exchange expectation bias, we can test whether market participants anticipated the gradual undermining of the Pact, indicating a loss of credibility. For that reason we investigate the impact of decisions and statements of European political institutions on the level and the volatility of y_{t+1} .

If euro exchange markets had not anticipated the softening of the SGP, the ex post expectation bias should have increased systematically in level in response to destabilising political events. Similarly, if euro exchange markets had not anticipated the softening of the Pact, market uncertainty should have increased in response to destabilising political events. For that reason we check whether volatility has increased in response to destabilising statements and decisions. Accordingly, we test the following two hypotheses:

Hypothesis 1 (level effects): Due to the loss of credibility, political events signalling a softening of the SGP increase the level of the foreign exchange rate expectation bias.

Hypothesis 2 (volatility effects): Owing to the loss of credibility, political events signalling a softening of the SGP increase the volatility of the foreign exchange rate expectation bias.

IV. Empirical Analysis

IV.1. Data

We calculate the foreign exchange expectation bias on a daily basis. Thus, we are able to assign relevant fiscal policy events to these data. We chose closing spot as well as closing overnight forward exchange rates as a starting point for this analysis. Although it is well-known that news are rapidly incorporated by market participants (see eg Cheung and Chinn, 2001), we focus on daily data. This is due to the fact that we study whether there is a systematic impact of political news on the difference between the forward rate set t and the spot rate in $t + 1$.⁸

We study markets that are characterised by high liquidity: daily USD/EUR, GBP/EUR, and CHF/EUR exchange rates. Moreover, we consider GBP/USD to test for robustness. Daily exchange rates are obtained from Datastream, more specifically from WM Company in conjunction with Reuters. Closing spot and closing

⁸Empirical exercises frequently study daily movements of exchange rate variables (see eg Jansen and De Haan, 2005a; Galati and Ho, 2003; Fatum and Hutchison, 2002).

overnight forward exchange rates are calculated at around 4pm Greenwich Mean Time (GMT). According to Datastream, GMT was selected as the middle of the “global day” and the time of highest liquidity in global foreign exchange markets. Datastream updates the exchange rates of WM/Reuters by 4.45pm GMT. Table 1 reports descriptive statistics of the calculated expectation bias time series.⁹

Table 1: Descriptive Statistics

	USD/EUR	GBP/EUR	CHF/EUR	GBP/USD
Mean	0.027	0.015	-0.005	-0.013
Standard Deviation	0.634	0.435	0.231	0.515
Minimum	-2.265	-1.797	-2.143	-1.720
Maximum	2.504	2.666	1.332	2.022
Skewness	-0.057	0.266	-0.576	0.158
Kurtosis	3.484	4.766	11.822	3.483
Jarque Bera	10.768***	148.33***	3453.67***	14.532***
Observations	1047	1047	1047	1047

The dependent variable “expectation bias” is first-differenced and then multiplied by 100, ie basis points of (discrete) returns.

In order to identify the relevant political events we systematically analyse news from the FACTIVE database for the whole period from 2nd January 2001 to 24th March 2005. The analysis covers the period between Greece’s entry to EMU (so the number of EMU members does not change over the period under study) and the first reform of the SGP in March 2005. The news data are encoded in order to facilitate statistical computation, ie the evaluation of each entry according to its context (destabilising = 1). Destabilising events refer to statements and decisions that are related to all “technical” violations of the SGP’s given benchmark figures. In addition, we consider the content of news signalling a flexible interpretation of the original SGP. We define flexible interpretation as follows: 1) political behaviour in which an infringement of the SGP is not appropriately punished, 2) calls for flexible interpretations, and 3) calls for changing the rules of the SGP framework.

We then assign these events to different sources. First, we differentiate between two main categories: decisions and statements. Second, each main category consists

⁹For an illustration of the expectation bias time series see appendix A.3.

of sub-categories. On the one hand, decisions concerning the SGP can only be attributed to the European Commission and the EcoFin. Moreover, decisions can be considered as scheduled. On the other hand, we record (unscheduled) statements of the European Commission, European Council and the EcoFin.¹⁰

Due to the fact that FACTIVEA is a database with a high news frequency, occasionally a high number of statements arrive on one day. For this reason we have applied the following rule to obtain a proper database consisting of one statement each day: according to its power to monitor and enforce the rules of the SGP we consider statements from the European Commission to be of higher relevance to financial markets than statements from EcoFin members. In addition, we consider statements of representatives of the European Council statements to be least relevant. We apply this rule owing to the fact that the European Commission is found to be the key protagonist in the SGP regime with respect to public disclosure and media coverage (Meyer, 2004).¹¹

In this paper we focus on weekly trading days only. Statements, however, are frequently released on non-trading days, also on weekends. In order to cope with this problem, we assign affected events to the next trading day. Dealing with event studies also requires to set up an event window. This is crucial due to the fact that a number of market participants anticipate future developments. In addition, markets occasionally react time-delayed (MacKinlay, 1997). Unscheduled statements are rather surprising for market participants. For this reason, the event window of statements comprises 1) the trading day that coincides with the very statement and 2) the next trading day. In contrast to the event window of unscheduled statements we consider decisions as scheduled and so we extend the event window. For decisions we apply a three-day event window, ie the day prior and the one succeeding the actual event.

The political variables we chose for this analysis are based on decisions and statements of the European Council (which is comprised by member state's heads of state), the EcoFin (which is an institution that consists of member state's representatives at ministerial level), and the European Commission (assumed to be independent from member states' governments and by EU legislation the guardian of the SGP).

As shown in the previous section the SGP regime aimed for coordinating fiscal

¹⁰In October 2002, for example, the former President of the Commission, Romano Prodi, stated the SGP was stupid. This unscheduled European Commission statement can be interpreted as destabilising with respect to the credibility of the SGP.

¹¹We are aware of the issue that the procedure applied (in order to overcome the problem of multiple events) results in a pre-judgement of the relative importance of the institutions. Our approach, however, is based on the reasonable assumption that the SGP is a credible framework of multilateral fiscal policy coordination. Therefore the European Commission should have been considered to be the keeper of the rules. Similarly, the EcoFin should have been considered as either the enforcer of Commission recommendations or as a veto player, while the European Council had legislative power to change the rules.

policies within the EMU in order to avoid excessive deficits and excessive debt accumulation after individual EMU member states introduced the euro in 1999. Though the Pact's rules were simple (and also transparent) the Pact itself lacked self-enforcing rules and, moreover, no external agent continuously enforced the regulation (Buiter, 2003; Schuknecht, 2004).¹² Following repeated non-commitment to the SGP's rules and the political debates within and among EMU member states, it turned out that the SGP regime was evidentially not a credible one.

Based on these insights it follows that information-sensible foreign exchange markets should have reacted on the political haggling for relaxing the excessive deficit procedure and the final horse-trading for softer rules. News from various sources are incorporated into the expectations of market participants, including information on fiscal policy considerations by national governments. With respect to the SGP debate it follows that foreign exchange markets should have taken into consideration the statements and decisions undermining the Pact. Increasing net government debt levels and a strong disturbances within the EMU should have contributed to financial market's sensibility to the political news that were undermining the SGP.

As shown above, the difference between the forward rate and the realised spot rate can be interpreted as expectation bias resulting from unanticipated information in period t prior to the realisation of the spot rate in $t+1$. Studying returns only would not reflect a priori expectations. If foreign exchange markets had formed wrong expectations about the outcome of the SGP debate, an expectation bias would arise. If foreign exchange markets had formed correct expectations, an expectation bias would not arise. We concentrate on the question whether political news of the types mentioned above affect the level of the expectation bias and its volatility, ie the uncertainty induced by these political events.

IV.2. The Model to be Estimated

We calculate the daily expectation bias of three currency pairs: USD/EUR, GBP/EUR, and CHF/EUR. To study the effects political events exert on the level and the volatility of the euro's expectation bias we apply Generalized Autoregressive Conditional Heteroscedasticity (GARCH) models to the currency pairs at hand. We select GARCH models owing to the pre-diagnostic tests we made. The expectation bias time series we study are characterised by periods of conditional volatility, ie all dependent variable time series exhibit systematic volatility clustering. To test for serial correlation we regress our dependent variables on a constant before conducting Lagrange-Multiplier-tests (LM-tests) up to $n = 10$. Numbers are reported in Table 2. Except for USD/EUR the LM-tests indicate that all time series are

¹²See Kopits and Symansky (1998) for general remarks on fiscal policy rules and Debrun and Kumar (2008) for the effectiveness of numerical fiscal rules in the EU.

characterised by serial correlation in squared residuals. Although the null hypothesis of no autoregressive conditional heteroscedasticity cannot be rejected for the USD/EUR expectation bias, the Breusch-Pagan-Godfrey test statistic indicates that heteroscedasticity is a feature of this time series. Augmented Dickey-Fuller (ADF-test) and Phillips-Perron (PP-test) unit root tests for non-stationarity are further applied. Both the ADF- and the PP-tests reject the null of non-stationarity of the dependent variable time series at any conventional level of statistical significance.

The GARCH model, established by Bollerslev (1986), is an extension of the ARCH(p) model introduced by Engle (1982). The most common model is the generic GARCH (1,1) model. The first term in parentheses describes the order of the autoregressive GARCH term, whilst the latter term refers to the order of the moving average ARCH term. In general a GARCH(1,1) model can be summarized as

$$y_t = \theta x_t + \epsilon_t \quad (5)$$

$$\sigma_t^2 = \omega + \alpha \epsilon_{t-1}^2 + \beta \sigma_{t-1}^2 \quad (6)$$

The first equation (5) describes the mean equation as a function with exogenous variables as well as an error term. The second equation (6) describes the conditional variance which is a forecast variance that includes all past information. The conditional variance equation consists of three additional terms: 1) a long term average value (ω), 2) the ARCH term (ϵ_{t-1}^2), and 3) the GARCH term (σ_{t-1}^2). The main difference between ARCH and GARCH models is that the volatility depends not only on previous shocks (ARCH term) but also on its own past (GARCH term). Additionally, the parameters of the conditional variance equation have to accomplish a number of constraints in order to fulfil positivity and stationarity of σ_t^2 . The following constraints must apply: $\omega > 0$, $\alpha \geq 0$, $\beta \geq 0$ and $\alpha + \beta < 1$. Generally all GARCH(1,1) models that are applied to the different currency pairs at hand are specified as follows:

$$y_t = c + \gamma_0(l_{t-3}) + \delta_0(l_{t-m}) + \lambda_1 \Delta s_{t-n} + \sum_{j=1; (k=0)}^2 \theta_{j(k)}(D_{j(k)t}) + \epsilon_t, \quad (7)$$

$$\text{with } \epsilon_t \sim N(0, \sigma_t^2)$$

and

$$\sigma_t^2 = \omega + \alpha_1 \epsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2 + \tau_1 \Delta s_{t-n} + \sum_{j=1; (k=0)}^2 \phi_{j(k)}(D_{j(k)t}). \quad (8)$$

The dependent variable expectation bias is calculated as $y_t = \Delta s_t - (f_t - s_{t-1})$ (see equation (4)). The right hand side of the mean equation includes a set of independent variables. We start with the specification of the basic model, that does not contain any of the political event variables described above. The coefficient c

refers to a constant term - where applicable. Incidentally we include a third lagged autoregressive term (γ_0) and/or a moving average term (δ_0), with a lag period of $m \in \{1, 3\}$. We incorporate an AR term in order to deal with cyclicity in individual time series. In addition, we consider an MA term, capturing an atypical systematic trend in the time series under review. We also include the log change in the spot exchange rate (Δs_{t-n} , with $n \in \{0, 1\}$), that in some cases had an influence on the level of the expectation bias. Log-differenced exchange rate returns are taken into account since past capital flows are assumed to affect the expectation bias. Finally, a set of dummies $D_{j(k)t}$ (with $j \in \{1, 2\}$ and $k \in \{0, 2\}$), which cover various political events, are included in the model. The index j is defined as *Decisions* ($j = 1$) and *Statements* ($j = 2$), whilst the index k describes the key actors in each category, ie the European Commission ($k = 0$), the EcoFin ($k = 1$), and the European Council ($k = 2$). ϵ_t is an error term which has a time-varying variance.

The conditional variance equation (8) contains the log-differenced exchange rate return and the political event dummies, a constant term, the ARCH term, and the GARCH term. The coefficient ϕ describes the reaction of volatility on various political events, whereas α_1 and β_1 provide information about the reaction of volatility to certain other shocks.

Table 2: Diagnostic statistics

	USD/EUR	GBP/EUR	CHF/EUR	GBP/USD
Heteroskedasticity Tests				
ARCH-LM(1)	0.071	3.806*	72.126***	0.060
ARCH-LM(4)	3.562	9.989**	93.915***	6.259*
Breusch-Pagan-Godfrey	7.031**	2.073	21.923***	4.772*
Ljung-Box(1)	1.154	1.096	0.092	0.340
Ljung-Box(4)	6.558	15.027***	5.123	5.087
Unit Root Tests				
Augmented DF	-33.39***	-31.30***	-32.03***	31.75***
Phillips-Perron	-33.41***	-31.30***	-32.05***	-31.75***

IV.3. Empirical Results

Owing to non-normally distributed dependent variables (see Table 1) we compute heteroscedasticity consistent standard errors for all model specifications. We refer to BIC and, in addition, to Ljung-Box diagnostics for serial dependence of squared residuals that have directed us to determine mean and variance specifications for

each currency pair. We do not include a constant into the mean equation of our specifications. Incorporating a constant would imply that foreign exchange markets would be systematically wrong in building expectations about the daily development of the very exchange rate. However, although theoretically inappropriate, we include a constant to the USD/EUR model due to improved BIC and residual tests. At the same time we consider AR terms where appropriate. AR terms address potential cyclicity in the respective series. The MA terms, however, capture a systematic trend value in a series. Although theoretically inappropriate, we incorporate an MA term in the GBP/EUR model due to improved model specification.

Table 3 presents the results of our estimated models for the sample period 2nd January 2001 to 24th March 2005. Log-Likelihood-Ratio-tests (LR-tests) relate to the baseline model. The baseline model does not contain any political dummy as regressor, neither in the mean, nor in the variance equation. Overall, the information criteria point to improved model specification due to the inclusion of political variables. In addition, LR-test statistics suggest that the inclusion of political variables improves the estimates.

First, we focus on ARCH and GARCH effects. The coefficient α provides information about the response of volatility after a shock has occurred - the smaller α is the less intensive is the volatility reaction. The coefficient β provides information on how long it takes for shocks to die out. Shocks are more persistent in USD/EUR and GBP/EUR markets relative to the CHF/EUR market.

Our results indicate that political decisions and statements that undermined the SGP did not affect the level of the expectation bias in USD/EUR, GBP/EUR and CHF/EUR currency markets. The coefficients of political variables are statistically insignificant for all currency pairs. In these currency markets the level of the expectation bias was not affected by the SGP dispute, neither by political decisions nor by political statements.¹³

This finding might result from the huge cloud of daily information in these currency markets. Since both the USD and the GBP are major world reserve currencies and frequently traded in high volumes¹⁴ they are exposed to vast amounts of daily information. Similarly, though traded in lesser volumes, the CHF is a liquid safe-haven for many global investors (see eg Lund, 2011). According to the Bank for International Settlements (2007) the most transacted foreign exchange has been USD/EUR, followed by highly traded USD/GBP, EUR/GBP and EUR/CHF. Further explanatory variables, mostly fundamental economic data and central bank

¹³We also study the NOK/EUR exchange rate. Scheduled EcoFin decisions and European Council statements that undermined the SGP systematically increased the expectation bias of the NOK/EUR exchange rate. Both coefficients are positive and statistically significant. However, due to the relatively low level of liquidity and the relatively high volatility of liquidity in the NOK/EUR market (see eg Lund, 2011) these results should be interpreted with caution.

¹⁴According to Bank for International Settlements (2007) the average daily turnover in spot market transactions has been USD 1,005 billion in April 2007.

intervention rather than the political events at hand, might thus drive market expectations and, consequently, the level of the expectation bias. However, since the SGP has already been the fundamental institutional pillar of the euro back then, one can argue that rational agents should have formed expectations concerning the economic and political outcome of the SGP dispute.

Similarly, decisions and statements taken by the European Commission did not affect the expectation bias, ie neither statements nor scheduled decisions taken by the guardian of the Pact affected the level of the expectation bias of the currency pairs at hand.

From studying the mean equation only, we conclude that the laissez-faire regime of loose fiscal policies and rising (excessive) government deficits did either not attract the attention of market participants, or market participants indeed formed correct expectations thereby anticipating the gradual demise of the SGP regime.

The coefficients of the volatility equation indicate that the latter is true. Though the coefficients are small by number (similar to the findings of Fahrholz and Schneider, 2012), scheduled EcoFin decisions systematically decreased the volatility of the expectation bias in the USD/EUR, GBP/EUR and CHF/EUR markets. These findings indicate that foreign exchange markets indeed anticipated the gradual demise of original the SGP framework rather than just ignoring the debate. The EcoFin's impact on foreign exchange markets can be explained by the veto power of the EcoFin. After foreign exchange markets had formed expectations about the potential outcome of EcoFin summits and corresponding decisions, eg after the European Commission has submitted a recommendation, expectations were met and more certainty returned to currency markets after a period of increased uncertainty. This outcome reflects that markets systematically incorporated into their expectations the EcoFin's possible role to act as veto player. If the SGP would have been a credible regime back then, ie if the rules had been applied as prescribed by the initial letters, uncertainty would not have increased (decreased) before (after) EcoFin decisions.

Apparently, European Commission statements also affected the volatility of the expectation bias. Although not statistically significant for the USD/EUR market, European Commission statements systematically decreased uncertainty in GBP/EUR and CHF/EUR markets. This outcome is somewhat surprising. Due to its role as keeper of the rules, statements of organs of the European Commission should have signalled that the SGP was still a viable legal institution. However, the European Commission occasionally signalled that the initial SGP regime was in parts inappropriate and too rigid. Markets formed expectations according to this line of thinking. Expectations might have been affirmed causing uncertainty to decrease in the wake of European Commission statements indicating need for flexible interpretation and reform of the Pact. This finding corresponds to the impact we found for EcoFin decisions.

Table 3: Regression Results

Parameters		USD/EUR	GBP/EUR	CHF/EUR	GBP/USD
Mean Equation					
Constant	c	0.045** (0.023)			
Exchange Rate Return ^a	λ_t		-0.053* -0.030	0.034 (0.034)	0.010 (0.030)
Autoregressive Term ^b	γ_o		0.706*** (0.142)		
Moving Average Term ^c	δ_o		-0.751*** (0.132)		
European Commission Decisions (n=64)	$\Theta_{1,o}$	-0.039 (0.076)	0.044 (0.049)	0.015 (0.023)	0.060 (0.069)
EcoFin Decisions (n=27)	$\Theta_{1,t}$	0.017 (0.114)	-0.058 (0.066)	-0.025 (0.019)	-0.030 (0.121)
European Commission Statements (n=96)	$\Theta_{2,o}$	0.002 (0.066)	0.007 (0.036)	0.003 (0.019)	-0.051 (0.053)
EcoFin Statements (n=82)	$\Theta_{2,t}$	-0.037 (0.067)	-0.018 (0.042)	0.027 (0.022)	-0.035 (0.053)
European Council Statements (n=90)	$\Theta_{2,2}$	-0.019 (0.065)	-0.029 (-0.042)	-0.005 (0.025)	-0.030 (0.054)
Variance Equation					
Constant	ω	0.017** (0.008)	0.011*** (0.004)	0.005*** (0.001)	0.006 (0.004)
ARCH	α_t	0.018* (0.010)	0.016* (0.010)	0.088*** (0.033)	0.040*** (0.012)
GARCH	β_t	0.947*** (0.023)	0.935*** (0.020)	0.802*** (0.038)	0.937*** (0.022)
Exchange Rate Return ^a	τ_t		-0.018 (0.011)	-0.015 (0.013)	-0.009 (0.010)
European Commission Decisions (n=64)	$\Theta_{1,o}$	-0.005 (0.014)	0.001 (0.008)	-0.004 (0.003)	0.002 (0.013)
EcoFin Decisions (n=27)	$\Theta_{1,t}$	-0.038* (0.023)	-0.028*** (0.009)	-0.013*** (0.002)	0.002 (0.018)
European Commission Statements (n=96)	$\Theta_{2,o}$	0.001 (0.010)	-0.010* (0.006)	-0.003* (0.002)	0.016 (0.011)
EcoFin Statements (n=82)	$\Theta_{2,t}$	0.010 (0.017)	-0.006 (0.008)	0.003 (0.003)	-0.006 (0.013)
European Council Statements (n=90)	$\Theta_{2,2}$	-0.026* (0.014)	-0.001 (-0.007)	0.005 (0.004)	-0.018* (0.010)
Log likelihood	LL	-993.19	-577.22	125.62	-762.52
Akaike info criterion	AIC	1.924	1.141	-0.212	1.488
Schwarz criterion	SIC	1.990	1.221	-0.140	1.559
ARCH-LM(1)	$LM(1)$	3.275*	0.043	0.002	2.234
ARCH-LM(4)	$LM(4)$	6.871	1.466	0.661	5.180
Q(1)		0.436	1.879	0.051	0.158
Q(4)		4.364	3.971	6.094	2.852
Jarque-Bera	JB	3.037	54.459***	273.38***	8.694**
LR Test(10)	$LR(10)$	29.537***	24.998*	23.495***	2.828

^aThe exchange rate return of CHF/EUR refers to the return from t-1 to t, whereas the time period for the other currency pairs is one trading day earlier compared to CHF/EUR.

^bThe AR-Term is third lagged.

^cThe MA-Term is third lagged. Key parameters of conditional mean and variance equation depict coefficients with HCSE in brackets; *, **, and *** represent 0.1-, 0.05-, and 0.01-level of significance.

Yet, our results indicate that destabilising European Commission decisions were less relevant for market participants. European Commission decisions might have appeared as mere official rulings about offences against the Pact that were already made public before. The outcome of these rulings apparently was clear even before the decision was made public. Evidently, foreign exchange market participants anticipated the gradual demise of the SGP that was initiated by national politicians first, but then spilled over to the quasi-independent European Commission.

For the USD/EUR market only our results indicate that European Council statements systematically decreased the volatility of the expectation bias. Since the SGP dispute was to a large extent influenced by national heads of government (view Figure 2 in Appendix 2), participants in the USD/EUR market might have been attended to the highest level of EU policy making. As mentioned above the USD/EUR market is exposed to vast amounts of daily information. Thus participants in this high volume market might have paid attention to heads of governments only - likely owing to popularity and the European Council's path-breaking impact on EU/EMU policy making.

IV.4. Robustness Tests

Previous results have illustrated that the political events we studied in this analysis have systematically affected the volatility of the expectation bias of selected currencies against the euro. To check for the robustness of our findings we also analyse the GBP/USD exchange rate, ie we estimate a further model for GBP/USD.¹⁵ GBP/USD represents a highly traded currency pair. Column 5 of Table 3 reports the estimation results for GBP/USD. The results indicate that political events that undermine the SGP do not affect the expectation bias of this currency pair. Neither level nor volatility effects can statistically be attributed to the political events at hand. The LR-test points out that the political model does not improve the baseline model, ie a model that does not contain any political event variable.

V. Implications for EU/EMU Fiscal Governance

Our results indicate that political haggling over the enforcement of a multilateral fiscal rule attracts the attention by foreign exchange markets. The loss of credibility of the EU/EMU fiscal framework, however, was not reflected in the development of major euro denominated currencies over the period 2001 to 2005. Put differently, the impact of political resistance against the Pact on the development of the euro's nominal external value was low. We read these results as follows: 1) Political events undermining the long-term solvency of member states affected foreign exchange

¹⁵It turns out that the CHF/USD foreign exchange forward bias time series did not meet the characteristics of GARCH models.

market expectations, though not the euro's external value. 2) Although not investigated in this paper, other political and macroeconomic variables such as economic growth and central bank rates in the euro zone and outside apparently affected the euro's external value (see section II, as well as Apergis et al., 2012 and for a critical assessment of models explaining exchange rates Rogoff, 2009). 3) Concerning the anticipation of long-term solvency problems the results indicate that foreign exchange market participants are short-sighted. In other words, breaching the rules is not considered to be a problem as long as other macroeconomic variables including actual fiscal positions are assessed as sustainable by financial markets. Since foreign exchange markets react on actual fiscal developments, as can be observed for the years 2009 onwards, we argue that financial markets rather consider actual fiscal and economic data than a non-credible multilateral fiscal rule.

This is an essential insight European politicians need to consider in their efforts to set up enhanced rules for multilateral fiscal cooperation within the EMU, including the recently reformed SGP and the new "European Fiscal Compact". Both still lack substantial binding elements and is thus likely to fall short of the political processes in the European arena again (see eg Gros, 2012; Holler and Reiss, 2011; Kullas, 2011).¹⁶ Given that national politicians do not comply with the rules and financial markets consider hard economic data in the first place, there is strong reason to question the existence (and administration) of a politicised multilateral fiscal rule.

VI. Conclusion

In this paper we analyse whether the 2001 to 2005 political debate on softening the Stability and Growth Pact systematically affected the foreign exchange market. We focus on the expectation bias of different currency pairs, ie USD/EUR, GBP/EUR, and CHF/EUR. Our results indicate that the SGP indeed became a relevant anchor for financial market participants when building their expectations in euro foreign exchange markets.

The overall picture we derive from this analysis is that foreign exchange markets anticipated the gradual demise of the SGP. Our findings indicate that for major euro currency-pairs the level of the expectation bias was not affected by the political dispute over softening the Pact. At the same time volatility was systematically affected by political rhetoric and political action. This finding suggests that foreign exchange markets were indeed attentive to the political dispute over the enforcement and softening of the Pact's rules, rather than ignoring it. However, the euro's

¹⁶Formally "Treaty on Stability, Coordination and Governance in the Economic and Monetary Union" (TSCG). Signed at the European Council meeting on 1st-2nd March 2012 by 25 EU members aiming for stricter fiscal discipline within the euro area. Based on good intentions, national constitutional restrictions on the accumulation of public debt are not compulsory and the role of the European Court of Justice to enforce the TSCG's provisions is contested (see eg Chalmers, 2012).

nominal value did not depreciate against the currencies under study. We thus conclude that currency markets were only on watch but not concerned or even alarmed by the development of European fiscal affairs in the early years of the euro zone. These results confirm that the long-run success of the euro (zone) was not considered by financial markets to be at any harm in a time when fiscal prudence became an ever less accepted model for many national policymakers.

More specifically, 1) destabilising decisions taken by the EcoFin significantly affected the volatility of the expectation bias, whereas our findings suggest that destabilising European Commission decisions were less relevant. We argue that this result emerged due to the “political” veto power of the EcoFin and that this veto power was perceived by market participants. On the contrary, European Commission decisions appeared as mere official rulings about offences against the Pact that were already made public before. 2) European Commission statements systematically affected volatility in euro currency markets. Though these statements were by nature unscheduled, European Commission officials frequently attracted the attention of foreign exchange market participants. This might be due to the European Commission’s role as a (future) standard setter in EU/EMU fiscal policy coordination. In addition, European Commission statements frequently addressed the fiscal problems of EMU members just before these countries were denounced officially. 3) Our results indicate that the European Council did not play a crucial role for foreign exchange markets. In the USD/EUR currency market only, market participants were sensitive statements arising from the EU heads of government.

Our findings have implications for the recently reformed SGP as well as the recently established “European Fiscal Compact”, both lacking stringent enforcement mechanisms again. Given that national politicians do not comply with the rules and financial markets consider hard economic data in the first place, there is strong reason to question the existence of politicised multilateral fiscal rules.

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A. Appendix

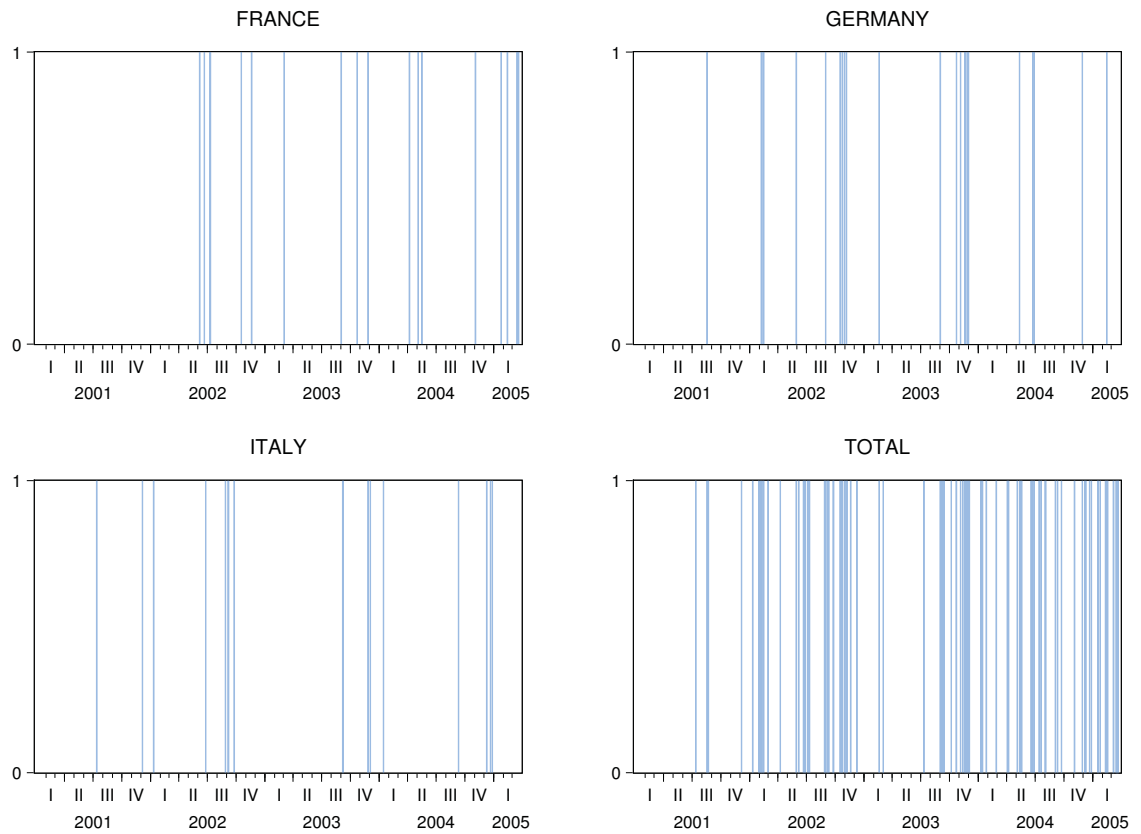
A.1. Excessive Deficit Procedures

	01/1999-05/2008		since 06/2008	
	Closed	Ongoing (current deadline for correction)	Closed	Ongoing (current deadline for correction)
Austria	-	-	-	2009 (2013)
Belgium	-	-	-	2009 (2012)
Bulgaria	-	-	2010-2012	-
Cyprus	2004-2006	-	-	2010 (2012)
Czech Republic	2004-2008	-	-	2009 (2013)
Denmark	-	-	-	2010 (2013)
Estonia	-	-	-	-
Finland	-	-	2010-2011	-
France	2003-2007	-	-	2009 (2013)
Germany	2002-2007	-	2009-2012	-
Greece	2004-2007	-	-	2009 (2014)
Hungary	-	2004 (2012)	-	-
Ireland	-	-	-	2009 (2015)
Italy	2005-2008	-	-	2009 (2012)
Latvia	-	-	-	2009 (2012)
Lithuania	-	-	-	2009 (2012)
Luxembourg	-	-	2010	-
Malta	2004-2007	-	-	2009 (2012)
Poland	2004-2008	-	-	2009 (2012)
Portugal	2002-2004	-	-	2009 (2014)
Romania	-	-	-	2009 (2012)
Slovakia	2004-2008	-	-	2009 (2013)
Slovenia	-	-	-	2009 (2013)
Spain	-	-	-	2009 (2014)
Sweden	-	-	-	-
The Netherlands	2004-2005	-	-	2009 (2013)
UK	2004	-	-	
	2005-2007			2008 (2014/15)
Total	14	1	2	22

Source: European Commission, <http://ec.europa.eu>, as of November 2012.

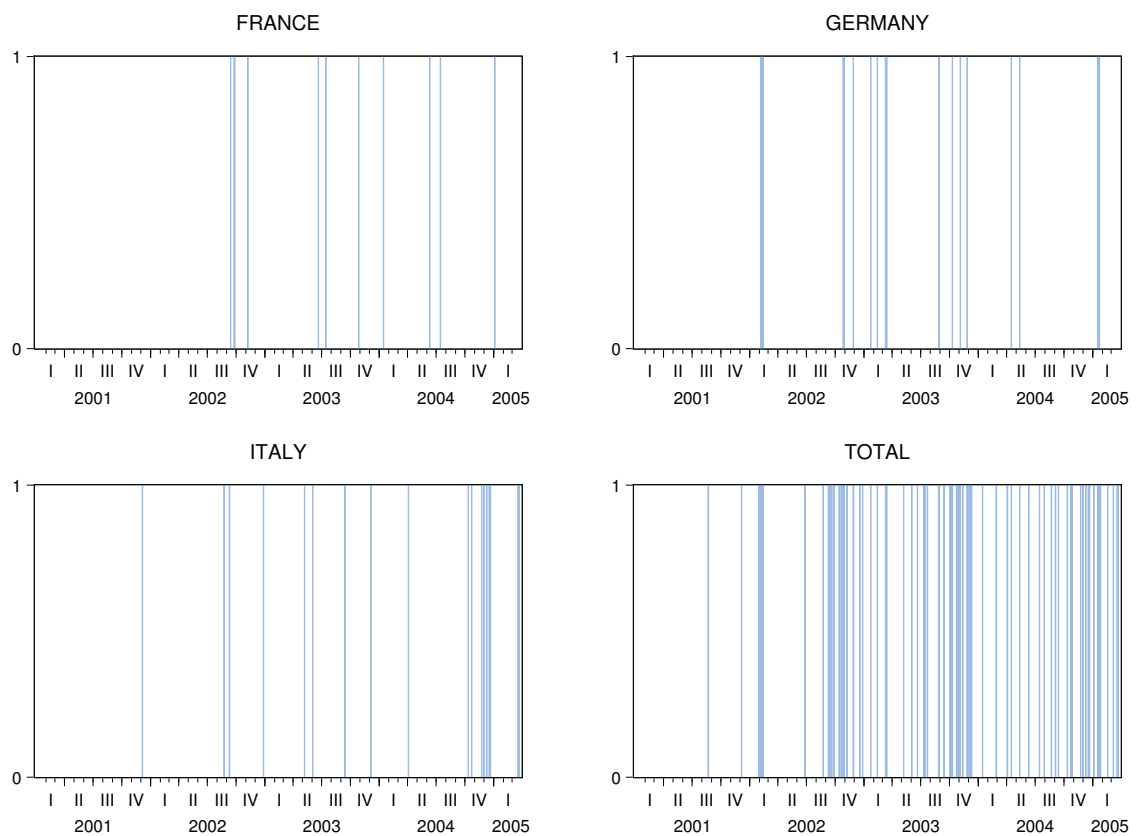
A.2. Frequency of Destabilising Statements

Figure 1: Frequency of Destabilising EcoFin Statements



Source: own illustration. Each line represents one event. The visualisation is based on our own database. For methodological issues view section 4.

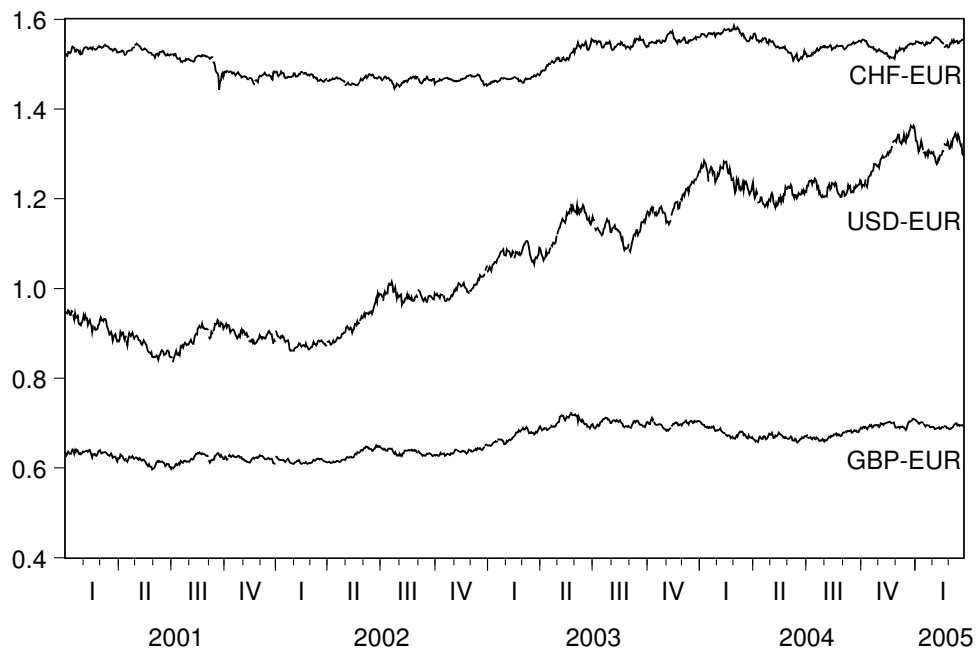
Figure 2: Frequency of Destabilising Statements of EU Heads of Government



Source: own illustration. Each line represents one event. The visualisation is based on our own database. For methodological issues view section 4.

A.3. EUR Exchange Rate Development

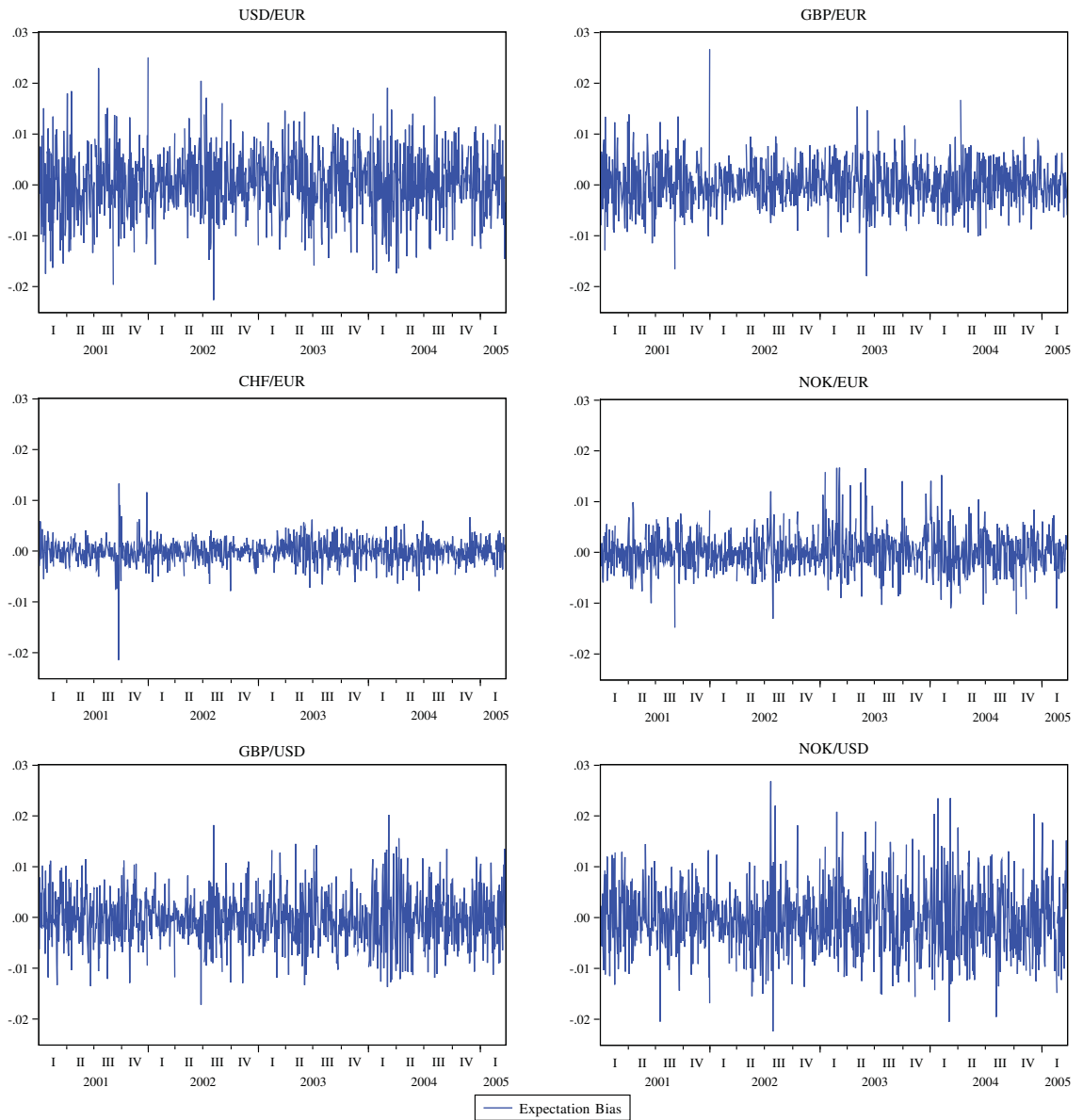
Figure 3: EUR Exchange Rate Development



Source: WM Company and Reuters.

A.4. Expectation Bias between 2001 and 2005

Figure 4: Expectation Bias between 2001 and 2005



Source: own illustration.