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The Impact of Political Events Related to European Fiscal Governance on the Volatility of a Time-Varying Risk Premium in Euro Foreign Exchange Markets: The Early Years of European Fiscal Governance

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Abstract

This article examines whether and to what extent non-scheduled and scheduled political events concerning the European fiscal governance have influenced the volatility of the euro risk premium. In particular, this study estimates how political behavior by the European Commission, the Economic and Financial Affairs Council, and the European Council has impacted the volatility of a time-varying risk premium of the euro vis-à-vis the US dollar and the Swiss franc. Analyzing daily data, the empirical results point to crucial shortcomings of the legal framework of European fiscal governance, which are detectable even in this legal framework's early years.

JEL Classifications: G15, F31, E62, C32

Keywords: uncovered interest rate parity, risk premium, political event data

1. Introduction

The recent financial crisis within the Eurozone (EZ) has reinforced the view that political concerns have shaped and sometimes endangered the EZ project. This article moves beyond the analysis of the current crisis within the EZ, and examines whether political events surrounding the formation of EZ members' public debt have systematically influenced the euro foreign exchange market during the early years of the EZ. In particular, it is argued that these markets have considered short-term developments with regard to the Stability and Growth Pact (SGP) to be a key indicator of long-term public solvency within the European Union (EU). The willingness of European actors to enforce these rules and to credibly commit to long-term public solvency in the context of European fiscal governance is a prerequisite for the viability of the euro. One might expect that related political events would bear on foreign exchange markets. This article examines whether and to what extent related scheduled and non-scheduled political events affect euro exchange rate relations vis-à-vis the US dollar and the Swiss franc. Regarding the political events, the analysis refers to decisions, statements, and gatherings of the European Commission, the Economic and Financial Affairs Council, and the European Council.

Employing General Autoregressive Conditional Heteroskedasticity (GARCH) models, the author examines whether or not political events related to European fiscal governance exert any influence on the volatility of the risk premium of the euro against the US dollar and the Swiss franc. The risk premium is related to the forward rate bias, which pertains to the empirical rejection of the null hypothesis that the forward exchange rate is a conditionally unbiased predictor of future spot exchange rates. From a theoretical perspective, the present study refers to a time-varying risk premium based on the Uncovered Interest Rate Parity (UIP) with rational expectations. At the empirical end, the sample of daily data covers the period from January 3, 2001, when Greece was admitted to the EZ, to March 22, 2005, the day when the SGP was crucially reformed.

The present article clarifies whether political action and rhetoric in favor of or against the SGP-related Maastricht criteria help to explain how the euro risk premium varies over time. The present study indicates that foreign exchange markets react systematically to political events in the European fiscal arena. While scheduled meetings on the European level do not exert significant influence on foreign exchange markets, irregularly spaced statements and, particularly, decisions by relevant European actors affect the volatility of the euro risk premium, and thus the uncertainty that financial investors have regarding the future formation of public debt within the EZ. The author shows to what extent financial investors cared about the credibility of political commitment to the fiscal rules within the EU, as well as the long-term viability of the euro during its early years.

2. Theoretical Background

This section seeks to establish why political events related to European fiscal governance may affect the risk premium of euro exchange rates vis-á-vis the US dollar and the Swiss franc foreign exchange markets. In doing so, the section also seeks to classify the subsequent analysis into the vast academic debates in international finance associated with this issue. In this section, the author clarifies how the present study is linked to both other theoretical work and empirical studies in this field.

Theoretically, one should expect that the returns from investing in a financial asset in one country would equal—in terms of maturity and risk properties—those of holding a similar asset in some other country and currency. The UIP condition employed in the present study therefore assumes risk-neutral financial investors with rational expectations, as well as perfect capital mobility and the absence of taxes on capital flows. The original UIP condition also requires perfect capital substitutability as a key assumption. However, in examining the related forward rate bias, one implicitly assumes imperfect substitutability of otherwise identical nominal financial assets that are denominated in different currencies. In doing so, one usually generalizes the UIP condition by drawing on the covered interest rate parity. This is to say, exchange rate adjusted returns on nominal financial assets issued in different currencies are equalized as financial investors hedge against their exposure to exchange rate risk by making forward contracts in foreign exchange markets. For example, Taylor (1987) provides empirical support for the validity of the covered interest rate parity and, hence, for the market efficiency hypothesis regarding various currencies within the Eurodollar money market of foreign currencies traded at the London exchange. With respect to the related no-arbitrage assumption in foreign exchange markets, the rational expectations UIP condition for the case of risk-neutral financial investors boils down to the prediction that the forward exchange rate and, thus, the interest rate differential, is an unbiased forecast of the future spot exchange rate. However, it is a widespread empirical finding that there is a conditional bias when using the forward exchange rate for forecasting future spot exchange rates. Apart from market inefficiencies, the literature identifies several other reasons why the forward exchange rate might be a biased forecast of future spot exchange rates (e.g., Lewis, 1995, for a survey). The list of explanations comprise, for instance, a risk premium (see, in particular, Engel, 1996, for a survey), peso problems (e.g., Mussa, 1979), learning processes (cf. Froot & Frankel, 1989), and data imperfections and mis-specifications in statistical modeling of UIP relations (see McCallum, 1994, for an interesting take on this issue; further, Bekaert & Hodrick, 1993, for a related overview).

The present study confines its analysis to research that attributes the forward rate bias to a risk premium. When inferring from such an empirical phenomenon that there exists a time-varying risk premium, it is especially challenging to know how to model such a risk premium. Some theoretical research refers to a risk premium primarily derived from monetary economic general equilibrium model considerations (Engel, 1992). In this respect, an augmented money demand function based on money-in-the-utility considerations and a cash-in-advance constraint helps to generate endogenous risk premiums (see Bekaert, 1994, and Lucas Jr., 1982, for seminal contributions to this line of research). However, such models are usually incapable of producing sufficiently large endogenous risk premiums that fit the size and volatility of empirically observable risk premiums (e.g., Kim, 2013, for a similar assessment). In contrast, theoretical research frequently invokes a time-varying risk premium that abstracts from specific money demand concerns based on microeconomic transaction costs. Fama (1984), for example, shows that variations in such conventional risk premiums, in terms of unexpected future spot exchange rate changes, contribute most to forward exchange rate changes. Imposing such a risk premium and thus assuming imperfect capital substitutability does not necessarily indicate capital market inefficiencies. Rather, such a modification of the original UIP is a prerequisite for explicitly addressing systematic differences between two countries' monies, and for making allowances for financial investor risk adjustment. In this regard, postulating a risk premium is advisable whenever there is exchange rate uncertainty across countries, rooted in any form of an undiversifiable risk. For instance, unequally distributed political capabilities for manipulating the relative price of countries' monies is one such source of risk. In such a case, the time-varying risk premium of an exchange rate is symmetrical across countries (i.e., one country's financial asset premium is a discount in the case of the other country's financial assets) and compensates risk-neutral investors for holding relatively riskier nominal financial assets.

When establishing a causal link between the political sphere and a time-varying risk premium, one may also incorporate political event variables into the analysis of the foreign exchange markets. With regard to instances in which political events have played explicit roles, the literature frequently investigates the impact of central bank interventions on a time-varying risk premium. For instance, Baillie and Osterberg (2000) analyze US and German central bank interventions and their bearing on deviations from UIP. In dealing with communication strategies of various central banks, Ehrmann and Fratzscher (2007), for example, show that the processing of news by financial investors also hinges on the design of the underlying institutional framework in monetary affairs. Gómez, Melvin and Nardari (2007) provide empirical support for assertion that the euro exchange rate against the US dollar, the British pound, and the Japanese yen is affected when investors learn about the monetary policy of the European Central Bank (ECB). However, studies on the effect of more general forms of political decision-making on exchange rate behavior are rare. Bachman (1992) has probably been the first to run econometric analyses on the impact of elections on the time-varying risk premium of selected exchange rates, including those among the US and the Canadian dollar, the British pound, and the (historical) French franc. Other empirical research on the impact of elections and political business cycles on exchange rates often emphasizes the partisanship of incumbent government: forecasts of short-term exchange rate behavior of the US dollar, the British pound, and the (historical) German mark by Blomberg and Hess (1997) rely on political variables which capture party-, election-, and candidate-specific characteristics. Lobo and Tufte (1998) investigate the impact of partisanship and political business cycles on the volatility of the US dollar exchange rate against the yen, the British pound, the (historical) German mark, and the Canadian dollar. Further, Freeman, Hays and Stix (2000) examine the effects of uncertainty regarding electoral outcomes and policy shifts on exchange rates.

To the author's knowledge, no other studies have assessed the possible impact that political events—particularly concerning EU fiscal governance—may have on foreign exchange markets. The present article tries to fill this niche, attempting to systematically investigate and evaluate the influence that such political events exert on the time-varying risk premium of the euro against the US dollar and the Swiss franc.

3. The Modeling Set-Up

On basis of a monetary exchange rate model, this section establishes a causal link between EZ-related political events and the time-varying risk premium of the euro against the US dollar and the Swiss franc, eventually arriving at testable hypotheses.

The analytical framework perceives the exchange rate as the price that equilibrates the relative demand for and supply of countries' monies. Financial investors' rational and profit-maximizing behavior links the formation of spot and forward exchange rates. If the foreign exchange market is efficient and if financial investors are risk-neutral, arbitrage transactions will force the forward exchange rate to equal the expected spot exchange rate for the next period (Fama, 1970). If there is some undiversifiable risk, then a risk premium comes into play. In line with the afore-mentioned covered interest parity considerations, the risk premium is equal to the gap between the expected spot exchange rate of the next period and the associated forward exchange rate. Changes in risk premiums of an exchange rate stem only from the arrival of new information. Apart from that, exchange rate forecast errors will be random, under the assumption of rational expectations.

As an analytical point of departure for establishing the subsequently employed risk premium, the author considers the UIP relation in its logarithmic approximation. In the following equations, s_t denotes the logarithmic spot exchange rate as the domestic currency price of foreign currency at time t, and $f_{t,t+1}$ refers to the logarithmic forward exchange rate at time t. In addition, i_t denotes the interest rate on domestic deposits, while i_t^f is the interest rate on foreign deposits of equivalent risk and maturity. Given the assumptions of rational expectations, risk neutrality, free capital mobility, and the absence of taxes on capital transfers (see Section 2), the UIP condition states that

$$E_t(s_{t+1}) - s_t = f_{t,t+1} - s_t = i_t - i_t^f \tag{1}$$

where $E_t(s_{t+1})$ is the mathematical expectation conditional on the information set available at time t. This is to say that the expected spot exchange rate changes are equal to the forward premium $f_{t,t+1} - s_t$, which is identical with the interest rate differential (see Equation 1). By assuming rational expectations such that $s_{t+1} = E(s_{t+1}) + u_{t+1}$ the UIP relation implies that

$$\Delta s_{t+1} = \alpha + \beta(i_t - i_t^f) + u_{t+1}, \tag{2}$$

where u_{t+1} is the serially uncorrelated exchange rate forecast error. However, the present study refers to a generalized UIP relation enhanced by a risk premium, so that the risk premium π_t can eventually be reduced to

$$\pi_t = (s_{t+1} - \mathrm{s}_t) - (i_t - i_t^f) + \varepsilon_t, \tag{3}$$

where ε_{t+1} is white noise.

Imposing such a risk premium in the case of the euro against the US dollar and the Swiss franc is advisable, as there exists some undiversifiable risk, with a systematic risk differential between domestic and foreign nominal financial assets in the corresponding exchange rate relations. The differential in relative risks between the euro and other currencies stems from the sovereign right to note issue, which still exists for individual EZ member countries. Both the ability of sovereign EZ-members to revert to new national legal tenders and the right to determine a conversion rate may, for instance, serve as a means of detaching from wholly immoderate levels of public debt. For this reason, news on a softening of European fiscal governance, which may point to increasing levels of public indebtedness, may push such a risk differential.[1] With respect to the present study, rational financial investors should account for such systematic differences in risks of sovereign default on public payment obligations as a function of the practiced commitment to live up to the European fiscal governance framework. Therefore, political events that signal a deterioration of the SGP-related fiscal framework should be reflected in changes in the risk premium that financial investors outside the EZ demand for holding relatively riskier euro-denominated financial assets.

Faini (2006), for example, supports the claim of a positive relationship between fiscal profligacy and both expectations and interest rates charged on public debt within Europe. In this respect, the SGP represents the nucleus of the legal framework of European fiscal governance. The SGP-related Maastricht criteria curtail the size of budget deficits to 3%, and limit the accumulated public debt to 60% of national GDP. The European Commission monitors the obligation to meet these criteria under the Excessive Deficit Procedure (EDP) and the Early Warning Mechanism (EWM). The Economic and Financial Affairs Council, which assembles the relevant ministers of the national EU member countries, is the key decision-making arena responsible for the implementation of these rules. In the case of an existing or impending infringement of the SGP, the European Commission approaches this EU institution. This means that the national member countries, who have agreed to abide by these rules, decide themselves whether or not they can live up to these self-imposed obligations. The lack of outside monitoring increases the possibility that opportunistic governments will disregard the SGP rules. The soft-law nature and the contracting problem of the SGP rules increase uncertainty about their enforceability (e.g., De Haan, Berger & Jansen, 2004). This kind of uncertainty nurtures the undiversifiable risk component in euro exchange rate relations.

With regard to testable hypotheses, the analysis of the present study particularly considers the impact of both scheduled and non-scheduled events with regard to the political decision-making processes of relevant key European actors, such as the European Commission and the Economic and Financial Affairs Council. The possible impact of gatherings by the European Council on euro risk premiums is also taken into account. Although the European Council is not at the heart of European fiscal governance, the political deliberation process on this intergovernmental level may, on some occasions, signal future fiscal policy shifts in EZ-member countries. Political events indicating a lack of compliance with or enforcement of the SGP rules should directly shape the expectations financial investors have with regard to whether or not fiscal cooperation between the EU member countries will continue or will fail. Such policy developments therefore provide a suitable yardstick with which to assess the willingness of sovereign EU member countries to live up to the all-encompassing goal of preserving the EZ project in the long run.

Outcomes of European actors' decision-making processes signaling a possible change in fiscal governance may affect the euro risk premium. This applies, most notably, to the European Commission, which is the primary guardian of the SGP. Accordingly, any lack of commitment to SGP rules is expected to undermine the overall credibility of European fiscal governance. Further events that may affect these rules negatively are deviations from the European Commission's policy

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[1] This argument is in line with the afore-mentioned, *prima facie* conflicting findings by Taylor (1987), who refers in his empirical analysis to the Eurodollar money market; in such a case, risk considerations are not applicable.

stance by the secondary central authority, the Economic and Financial Affairs Council. Any softening by this rather intergovernmental EU institution may signal future laxness in enforcing SGP rules, thereby affecting the euro risk premium. Financial investors may generally find it difficult to anticipate the European fiscal governance process, especially because the complexities of the European decision-making process aggravate the difficulty in anticipating whether or not negotiations will end in agreement. Likewise, the occurrence of a European Council summit relating to fiscal policy-making can convey new information to financial investors. Admittedly, some scheduled political events may end in failure, leaving it unknown whether the resulting predicament will be a temporary affair or the beginning of a meltdown endangering the legal framework of European fiscal governance. However, the extent to which such political uncertainty is priced in the euro risk premium is expected to remain unchanged if regular meetings of the European heads of state represent the kind of lip service that many media outlets take them to be. The same should be true for the many other non-scheduled political statements through which policy makers try to shape the rules of the SGP according to the wishes of their constituents. Financial investors are expected to pay close attention to the behavior of the key politicians acting in this arena, as their moves point to possible future public debt formation, thereby affecting the risk differential in the euro foreign exchange market against other currencies such as the US dollar and the Swiss franc.

In line with the enhanced rational expectations UIP, it is hard to conceive of level effects in euro risk premiums stemming from the arrival of political events. The reason for this is that arbitrage transactions would instantaneously be undertaken to correct foreign exchange market disequilibrium, as well as to restore equality of returns on differently denominated nominal financial assets (see Section 2). However, political developments may affect the uncertainty perceived by financial investors. In particular, financial investors may consider political outcomes of the decision-making process within the context of European fiscal governance as reducing the uncertainty of future paths of public debt formation within the EZ. A decrease in volatility following political events is reasonable, as such news usually indicates finality, thereby ending uncertainty. Accordingly, the focus of the empirical analysis in the present article will be on the influence that political events on the European level may exert on the volatility of the euro risk premium. To answer this question, the subsequent empirical analysis will explore three particular hypotheses regarding the influence that both non-scheduled and scheduled political events may exert on the risk premium of the euro against the US dollar and the Swiss franc. First, non-scheduled political events—in particular, decisions taken by the European Commission or the Economic and Financial Affairs Council—that indicate a present or future lack of commitment to fiscal prudence within the EZ decrease the volatility of the euro risk premiums (Hypothesis 1). When assuming that the SGP rules represent a solid commitment to fiscal prudence in the long run, it is reasonable to expect that financial investors will pay little attention to occasional expressions of opinions. Therefore, second, non-scheduled political events, especially in the form of derogatory statements concerning the European fiscal governance framework, do not influence the volatility of euro risk premiums (Hypothesis 2). Likewise, one may also expect that regularly spaced gatherings by the Economic and Financial Affairs Council and by the European Council do not affect the perceived uncertainty among financial investors. Therefore, third, scheduled political events in the form of official meetings on the European level do not affect the volatility of euro risk premiums (Hypothesis 3).

4. Data

To empirically investigate whether and to what extent financial investors—and, by extension, risk premiums—respond to news from the political sphere, the dynamics were modeled on the daily data level. With respect to euro–dollar (henceforth, USDEUR) and euro–franc (henceforth, CHFEUR) exchange rate relations, the size and depth of related foreign exchange markets allow for the abstracting of liquidity aspects and transactions costs that might otherwise systematically affect the risk premium. In contrast to other frequently traded floating currencies such as the British pound or the Japanese yen, the US dollar and the Swiss franc are both completely outside the realm of European fiscal governance and are not subject to recurrent speculation on depreciation that may have a systematic impact on the risk premium series. In the following paragraphs the author describes further economic and, especially, political variables that were employed to test the hypotheses presented in detail above.

The exchange rate and other economic time-series data for the US were retrieved from the Federal Reserve Bank of St. Louis Economic Data (FRED) and EconStats; relevant time-series data for Europe were provided by the Euribor-European Banking Federation and the Österreichische Nationalbank. The US spot exchange rates are recorded as noon buying rates at New York City (UTC -5h; i.e., Coordinated Universal Time); while Swiss spot exchange rates are ECB reference rates published at 2:15PM UTC. The analysis employed overnight interest rates with one-day maturity to arrive at daily deviations from UIP to capture the risk-premium augmented UIP relation. The UIP relation represents an arbitrage condition, as the choice of interest rates should reflect the borrowing costs of financial investors engaged in such arbitrage transactions. Therefore, the author primarily draws on London Interbank Offered Rates (LIBOR), which are published at 11:45AM UTC to construct the originally specified USDEUR risk premium series. Because of the most recent LIBOR scandal the author also employs the Effective Federal Fund Rate (EFFR, actual/360) and its counterpart, the European OverNight Index Average (EONIA, actual/360) to gauge non-manipulated interbank-market borrowing. The EFFR is the weighted average interest rate at which monetary financial institutions (MFIs) lend funds to each other through the overnight inter-banking market. The EFFR is the target interest rate that the Federal Reserve sets, primarily for guiding its open market operations in US securities. The EONIA serves as a proxy for the risk-free EZ interest rate. Although this interest rate is also a weighted average of effective inter-banking contracts between MFIs, it is a fixed price for overnight borrowing from the ECB. However, some imprecision arises from differences in recording the time of day and time of publication, as well as from difficulties in integrating data from different time zones. The EFFR is recorded at the Federal Reserve Bank of New York as a closing rate at 6:30PM Eastern Standard Time (UTC -5h). Similarly, the EONIA is calculated by the ECB at 6:00PM and published at about 7:00PM Central European Time (UTC +1h). Ambiguities stemming from differences in the timing of data are first mitigated through a proper event window size (see below), such that there is at least a possibility for political events to contribute to fluctuations in the time-varying risk premium. Second, the spot exchange rates for calculating the alternatively specified USDEUR risk premium series on the basis of EFFR and EONIA are lagged by one period, meaning that the euro risk premium is expected to undo the influence of interest rates that otherwise occurs after the recording of spot exchange rates. Furthermore, the author also considers an alternative specification for the original CHFEUR risk premium series. Although both financial time series rely on LIBOR data with one-day maturity, the subsequent diagnostic tests (see Section 5.1) indicated that estimates based on the originally specified CHFEUR time series suffered considerably from a few relatively extreme negative returns. Therefore, the author specified an alternative CHFEUR risk premium series with restricted minimum and maximum values to 3.5-times the standard deviation to control for the influence of such features on the robustness of empirical estimates. This empirical research strategy eventually arrives at four financial time series for the euro risk premium based on USDEUR and CHFEUR exchange rate relations, for both of which both original and alternative specifications are given. In addition, the opening and the closing of a trading week are added to the list of economic control variables. The reason for this is that financial investors usually considerably adjust their portfolios at such days of a trading week. In this context, the author has identified six duplicates (i.e., trading days that are completely surrounded by non-trading days). In these instances, the assignment of opening and closing day has been reversed. Finally, with respect to the research design, one challenge is the possible elimination of European political events due to differences in trading days between Europe and the US. Here, the author has given precedence to interpolation based on EFFR dates. The corresponding adjustments affect about 5% of the observations within US financial time series. However, only about 1.5% of observations are interpolated in the case of the European financial time series. Hence, the CHFEUR risk premium series may also enable more reliable empirical estimates.

To identify relevant political events, the author conducted a systematic content analysis of the relevant statements by three EU institutions: the European Commission (COM), the Economic and Financial Affairs Council (ECOFIN), and the European Council (SUMMIT).[2] The coded events distinguish between non-scheduled statements (*Statements*) and non-scheduled decisions (*Decisions*), both of which indicate some form of non-compliance or infringement of European fiscal governance rules. Further, the empirical analysis considered regularly spaced ECOFIN and SUMMIT gatherings, represented by the category *Meetings*.

As the COM is the primary, supra-nationalist arbiter of the SGP rules, it is reasonable to expect political action and rhetoric to influence the expectations of financial investors. This applies, for example, to *Statements* by Commissioners or other leading staff of the European Commission indicating a potential lack of compliance with the norms of European fiscal governance. Whenever the COM officially reports a violation of the SGP or recommends the opening of either an EDP or an EWP, such developments are coded as *Decisions*. Since this agency continuously monitors the fiscal formation of EU member countries, constructing a category *Meetings* comprising scheduled meetings of this institution is not feasible. The second actor considered here, the Economic and Financial Affairs Council, decides upon recommendations made by the European Commission. However, the ECOFIN does not necessarily comply with decisions by the European Commission. Accordingly, the category *Decisions* summarizes all events indicating that the ECOFIN is *not* following such recommendations by adjusting or reinterpreting the legal framework of the SGP. Likewise, the category *Statements* comprises opinions expressed by national ministers of finance or economics, as representative members of the ECOFIN, pointing at a possible infringement of the SGP or a softening of these rules. In addition, the category *Meetings* refers to regularly spaced ECOFIN sessions, sometimes in the form of preparing European Council gatherings, and sometimes shortly after such SUMMIT sessions. Finally, the analysis considered *Statements* and *Meetings* of the SUMMIT; here, the category *Decisions* is not applicable, as European Council gatherings do not belong to the regular European fiscal governance process. In this regard, the category *Statements* refers to cases for which the heads of the national governments have spoken of the SGP in a derogatory manner. Such rhetoric signals a willingness to possibly violate the rules of the European fiscal governance framework in the future. Scheduled meetings by the SUMMIT were coded as *Meetings,* as they might also impact the volatility of the USDEUR and the CHFEUR risk premium series.

To code developments within the realm of the EZ, the author referred to EU documentation regarding any official decisions or meetings, as well as to statements reported by the Financial Times (European edition).[3] With respect to the political events under consideration, one challenge is that such events often take place on non-trading days, especially on weekends or during holidays. There are two general approaches to overcoming the resulting problem: interpolation, or the shifting of the event to the next trading day. As the first solution would most probably heavily bias the

2 Political event data for decisions and statements made by the European Court of Justice, as well as by the ECB, were also compiled. However, such events were dropped because they did not occur with sufficient frequency.

3 The empirical investigation also drew on the German newspaper *Frankfurter Allgemeine Zeitung* for cross-checking. The resulting binary variables were coded as *Statements* only when both newspapers simultaneously reported on such events (see the Appendix 1 for more information on the narrative of such events).

variance of the time series, a European political event that took place on a weekend or holiday is treated as if it had occurred on the next trading day. At the same time, the empirical analysis retains only the final days of sessions by ECOFIN and SUMMIT, as the results of bargaining are typically presented at news conferences or in official press releases. This procedure affected 14 gatherings of the European Council (SUMMIT) and only three meetings by the Economic and Financial Affairs Council (ECOFIN).

The window size of the political event data was adjusted, as there was some vagueness as to whether published news on European political events had arrived in due time (see above). Similarly, the analysis took the possible anticipation of certain developments into account by using an enlarged event window (e.g., MacKinlay, 1997, for a similar approach). The two-day window *Decisions (ante)* contains, therefore, the actual event date and the trading day immediately preceding it, while *Decisions (post)* comprises the actual event date and the next trading day. The same procedure was applied to create *Meetings (ante)* and *Meetings (post)*, respectively. As statements are often made without notice, the event window *Statements* encloses only the day during which the event occurred, plus the next trading day. Moreover, a final decision had to be made with regard to the overlapping of the temporal frame of both the Economic and Financial Affairs Council and the European Council meetings. Here, the author gave as much precedence as was reasonable to the SUMMIT, as the alternative sessions of the ECOFIN are often closely intertwined with these higher-level gatherings, and therefore often have only a preparatory or wrap-up character.[4] This research strategy allows the author to precisely estimate the reactions of the USDEUR and the CHFEUR risk premium series—particularly in terms of the perceived political uncertainty—after political news has arrived, as well as before political actions take place.

The sample was confined to January 3, 2001–March 22, 2005 to assure as much structural homogeneity within the sample as possible: The sample starts directly after the entry of Greece into the EZ and ends the day before the European Council summit arrived at the agreement to substantially reform the European fiscal governance framework. The final data set comprises up to 1080 daily observations per risk premium series.

5. Empirical Analysis

This section presents the empirical research strategy that was used to examine the impact of European political events on the USDEUR and the CHFEUR risk premium series. In particular, the econometric analysis relies on general autoregressive conditional heteroskedasticity (GARCH) models to study the influence that European political events exert on the volatility of the time-varying risk premium in these particular euro foreign exchange markets.

5.1. Diagnostic Statistics

The present study gave particular precedence to the analysis of serial correlations in residuals. The sample autocorrelation and partial autocorrelation functions for all relevant financial time series were calculated. For all USDEUR financial time series, both functions (autocorrelation and partial autocorrelation) confirmed the stationarity of the corresponding series; the absolute values are very small and do not suffer from serial correlation. However, some form of cyclicity sets in at the fourth lag, as indicated by a change of sign. The subsequent empirical analysis took this regularity into account through the inclusion of a lagged dependent variable as a regressor. Moreover, the

4 This procedure affected nine meetings of the Economic and Financial Affairs Council. The number of days included in some disaggregated series will, therefore, slightly deviate from the number of observations from the aggregated political event data.

originally specified USDEUR and CHFEUR risk premium series have very different characteristics (see Figure 1).

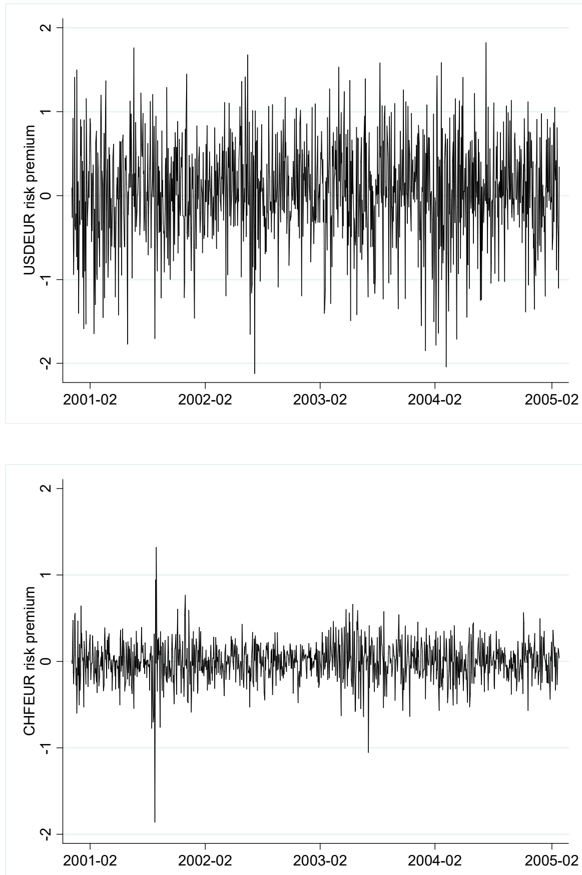

Figure 1. Selected risk premium series:
Daily data covering the period January 3, 2001–March 22, 2005

The diagnostic tests reported in Table 1 indicate that all financial time series were characterized by negative skewness, excess kurtosis, and non-normal distribution. In the case of USDEUR exchange rate relations, variation is low overall, as minimum and maximum values are within the range of a quadrupled standard deviation at a quasi zero mean; in contrast, the minimum value of the CHFEUR risk premium series is more than eight times higher than its standard deviation. When having curtailed minimum and maximum values in the case of the alternatively specified CHFEUR risk premium series (see Section 4), negative skewness, excess kurtosis, and non-normal distribution were reduced to levels similar to the case of the USDEUR risk premium series. The significant Portmanteau test statistics supported the finding of serial correlation in standardized residuals in the case of the alternatively specified CHFEUR risk premium series. All financial time series included in the study demonstrate serial correlation in squared standardized residuals. A series of conventional Ljung-Box test statistics for the squared residuals (Ljung-Box^2), for up to five lags, indicated that heteroskedasticity problems set in at the fifth lag, while the same test for the first four lags supported the null hypothesis of no autoregressive conditional heteroskedasticity (ARCH) effects within the USDEUR risk premium series. This rather puzzling feature may indicate pronounced volatility effects. In the case of the CHFEUR risk premium series, the null of no heteroskedasticity is rejected at any conventional level of significance (see Table 1).

Table 1. Diagnostic statistics

	USDEUR risk premium (orig.)	USDEUR risk premium (alt.)	USDEUR exchange rates	CHFEUR risk premium (orig.)	CHFEUR risk premium (alt.)	CHFEUR exchange rates
Observations	1080	1079	1080	1080	1080	1080
Mean	0.038	0.036	0.000	-0.0030	-0.003	0.000
Median	0.034	0.033	0.000	0.001	0.001	0.000
Maximum	1.823	1.824	0.018	1.323	0.696	0.013
Minimum	-2.119	-2.119	-0.021	-1.858	-0.696	-0.019
Std. dev.	0.609	0.609	0.006	0.232	0.221	0.002
Skewness	-0.269	-0.268	-0.270	-0.434	-0.127	-0.438
Kurtosis	3.373	3.372	3.374	8.218	3.655	8.235
Portmanteau (1)	0.447	0.410	0.435	2.023	3.592*	2.070
Ljung-Box^2 (1)	0.440	2.963	0.468	50.366***	25.686***	50.780***
Ljung-Box^2 (5)	15.453***	15.336***	15.455***	202.870***	108.030***	204.320***
Jarque-Bera	1.934***	1.914***	1.942***	1.259***	2.220***	1.268***

Variables are first differences of log rates multiplied by 100, i.e., basis points of continuous returns in financial time series with original (orig.) and alternative (alt.) specifications; *, ** and *** represent *p*-values of 0.1, 0.05, and 0.01, respectively.

The risk premium series are either based on a constant (USDEUR time series) or autoregressive (AR) and moving average (MA) terms of the dependent variable (CHFEUR time series). Eventually, the empirical research strategy arrived at well-specified mean and variance equations for Component-GARCH (CGARCH) specifications, in the case of the USDEUR exchange rate relations, and conventional GARCH models, in the case of the CHFEUR risk premium series (see Tables A–D in the Appendix 2).

5.2. The Empirical Model

The analysis stressed the volatility of the euro risk premium, particularly in referring to a specific class of GARCH models known as CGARCH, which break down volatility into two components. Namely, the CGARCH specification considers there to be both a permanent and a transitory component, the latter capturing deviations from the trend of conditional variance (see, in particular, Engle & Lee, 1999; further, e.g., Byrne & Davis, 2005; Christoffersen, Jacobs, Ornthanalai & Wang, 2008). The following set of equations describes the CGARCH model:

$$\pi_t = \gamma_1[Constant] + \gamma_2[AR\text{-}term] + \gamma_3[MA\text{-}term] + \sum \gamma_{j,k}(D_{j,k,t}) + \zeta_t , \tag{4}$$

$$\sigma_t^2 = q_t + \alpha(\zeta_{t-1}^2 - q_{t-1}) + \beta(\sigma_{t-1}^2 - q_{t-1}) + \delta_1 \Delta s_t + \delta_2[Opening] + \delta_3[Closing] + \sum \lambda_{j,k}(D_{j,k,t}) , \tag{5}$$

$$q_t = \omega + \rho(q_{t-1} - \omega) + \varphi(\zeta_{t-1}^2 - \sigma_{t-1}^2) + \eta_1 \Delta s_t + \eta_2[Opening] + \eta_3[Closing] + \sum \tau_{j,k}(D_{j,k,t}) , \tag{6}$$

where $\zeta_t = z_t \sigma_t$ with z_t i.i.N(0,1). The dependent variable π_t for the four financial time series representing original and alternative specifications of the USDEUR and CHFEUR risk premium series is calculated using Equation 3—i.e., $\pi_t = (s_{t+1} - s_t) - (i_t - i_t^f) + \varepsilon_t$—and is identical with the left-hand side of the mean equation in Equation 4. The formation of level effects is due only to the afore-mentioned independent variables—i.e., a constant or an autoregressive term—on the right-hand side.

The conditional variance in Equations 5 and 6 is of particular relevance to the present study. Basically, the transitory component in Equation 5 models the conditional variance σ_t^2 as a linear function of q_t, as well as the ARCH-term with the coefficient α and the GARCH-term with the coefficient β, while both of these terms are adjusted by a lagged q_{t-1}. The permanent component q_t in Equation 6 reflects a trend component around which short-term volatility fluctuates. The key coefficients of this variance process are ω (*Permanent*), representing the time-invariant unconditional level of volatility; the coefficient ρ, for the first-lagged variance (*AR(1)-variance*); and coefficient φ, correcting for the *Forecast error* within the conditional variance process. The forecast error is the difference between the ARCH-term and the first lag of the forecasted variance of the time series.

A number of restrictions were put into place to ensure that the CGARCH model generated consistent estimates for the variance process. The restrictions within the CGARCH specification concern $0 < \alpha + \beta < 1$—a pre-condition for volatility converging to its long-run trend—and $0 < \rho < 1$, also a pre-condition for convergence towards the time-invariant unconditional level of variance. Restrictions also require that $0 < \alpha + \beta < \rho < 1$. This implies that the transitory component of the conditional variance converges faster than the permanent component representing the time-varying long-term volatility. The sum $\alpha + \beta$ (i.e., the half-life of shocks) is a measure of volatility persistence. In the present study, the set of equations describing the CGARCH modelling set-up particularly refers to the USDEUR risk premium series, while the case of $\rho = \varphi = 0$—i.e., when the CGARCH model finally reduces to a standard GARCH model with ϖ as the constant of the variance equation—applies to the CHFEUR risk premium series. Employing a CGARCH model for the latter series, however, results in negative coefficient for the half-life of shocks (see, in particular, Tables C and D in the Appendix 2).

The conditional variance in Equations 5 and 6 is altered by a set of independent variables. When modeling a best-fit baseline economic model, the analysis suggests that exchange rate changes Δs_t —which were lagged one period in the case of the originally specified USDEUR risk premium series, in line with the afore-mentioned ambiguities (see Section 4)—affect both the component that captures the long-run movements and the component that accounts for the noisier short-run movements in volatility (see, in particular, Tables A and B in the Appendix 2). Furthermore, dummies representing the *Opening* and *Closing* of a trading week were added to the set of independent variables. Particularly in the case of the CHFEUR risk premium series, *Closing* has turned out to significantly affect short-term volatility, while *Opening* was ultimately proved to be insignificant for all GARCH model specifications (see Tables A–D in the Appendix 2). Most notably, a set of political event dummies $D_{j,t}$ with $j \in \{1,...,5\}$ accounts for the influence of *Decisions (ante)* $(j = 1)$, *Decisions (post)* $(j = 2)$, *Statements* $(j = 3)$, *Meetings (ante)* $(j = 4)$, and *Meetings (post)* $(j = 5)$, which are differentiated—when applicable—between key actors COM $(k = 1)$, ECOFIN $(k = 2)$, and SUMMIT $(k = 3)$, on the volatility of each univariate risk premium series, while there are no significant level effects (see Tables A–D in the Appendix 2).

5.3. Estimation Results

Table 2 shows the estimates of the key parameters of the empirical analysis on the influence that political events related to the European fiscal governance exert on the volatility of all four specifications of the daily euro risk premium series. Maximum likelihood estimates of all GARCH models principally draw on the Berndt-Hall-Hall-Hausmann algorithm. However, the Marquardt algorithm has been employed for five instances of *Decisions* and *Statements*—only in the case of the originally specified USDEUR risk premium series—to achieve convergence of estimates.

Bollerslev-Wooldridge robust standard errors for the coefficients are employed in all subsequent specifications due to the non-normally distributed residuals.

The discussion begins with a consideration of the relevant features of the post-diagnostic statistics (see Table 2a–e).

Table 2a. DECISIONS (ante)

	USDEUR risk premium		CHFEUR risk premium		USDEUR risk premium		CHFEUR risk premium	
	orig.	alt.	orig.	alt.	orig.	alt.	orig.	alt.
Const. in mean equation, γ_1	0.045***	0.072***	-	-	0.045***	0.072***	-	-
AR(1)-term, γ_2	-	-	-	-	-	-	-	-
AR(2)-term, γ_2	-	-	-0.065**	-0.061**	-	-	-0.080**	-0.058*
MA(1)-term, γ_3	-	-	-	-	-	-	-	-
Const. in variance equation, ϖ	n.a.	n.a.	0.005***	0.005***	n.a.	n.a.	0.002***	0.004***
ARCH(1), α	-0.083***	-0.087***	0.077**	0.057***	-0.087***	-0.086***	0.090***	0.054***
GARCH(1), β	0.594***	0.666***	0.879***	0.905***	0.312*	0.675***	0.870***	0.914***
Permanent, ω	0.491***	0.441***	n.a.	n.a.	0.393***	0.449***	n.a.	n.a.
AR(1)-variance, ρ	0.987***	0.970***	n.a.	n.a.	0.977***	0.973***	n.a.	n.a.
Forecast error, φ	0.028***	0.033**	n.a.	n.a.	0.024**	0.031**	n.a.	n.a.
Exchange rate changes, δ_1	1.391*	-	-	-	0.578	-	-	-
Opening, δ_2	-	-	-	-	-	-	-	-
Closing, δ_3	-	-	-0.013***	-0.015***	-	-	-0.010*	-0.013***
Exchange rate changes, η_1	-7.538***	-5.895**	n.a.	n.a.	-6.980***	-5.667**	n.a.	n.a.
Opening, η_2	-	-	n.a.	n.a.	-	-	n.a.	n.a.
Closing, η_3	-	-	n.a.	n.a.	-	-	n.a.	n.a.
Decisions (ante) [39], λ_1	-0.068***	-0.070***	-0.009***	-0.008***	-	-	n.a.	n.a.
COM [30], $\lambda_{1,1}$	-	-	-	-	-0.040***	-0.064***	-0.008**	-0.006*
ECOFIN [9], $\lambda_{1,2}$	-	-	-	-	-0.106***	-0.093**	-0.013***	-0.010***
Decisions (ante) [39], τ_1	0.097	0.128**	n.a.	n.a.	-	-	n.a.	n.a.
COM [30], $\tau_{1,1}$	-	-	n.a.	n.a.	-0.047	0.064	n.a.	n.a.
ECOFIN [9], $\tau_{1,2}$	-	-	n.a.	n.a.	0.330*	0.266*	n.a.	n.a.
Log Likelihood	-965.589	-970.327	124.279	149.815	-965.295	-969.090	123.602	150.480
Portmanteau (5)	3.511	3.790	5.357	5.112	3.262	3.733	5.558	4.963
Ljung-Box^2 (5)	2.962	4.662	4.761	2.647	3.539	4.771	3.717	2.636
ARCH-LM (5)	0.596	0.952	0.995	0.554	0.710	0.978	0.756	0.554
Jarque-Bera	6.205**	0.913	66.876***	8.256**	8.988**	0.685	60.238***	8.228**

Coefficients use Bollerslev-Wooldridge robust standard errors in estimates of euro risk premium series with original (orig.) and alternative (alt.) specifications; post-diagnostics give test statistic values; *, **, and *** represent *p*-values of 0.1, 0.05, and 0.01, respectively; 1080 (1079) observations with number of observations for disaggregated Decisions, Statements, and Meetings in square brackets of the first column; *n.a.* means not applicable.

Table 2b. DECISIONS (post)

	USDEUR risk premium		CHFEUR risk premium		USDEUR risk premium		CHFEUR risk premium	
	orig.	alt.	orig.	alt.	orig.	alt.	orig.	alt.
Const. in mean equation, γ_1	0.045**	0.071***	-	-	0.044***	0.072***	-	-
AR(1)-term, γ_2	-	-	-0.467*	-	-	-	-	-
AR(2)-term, γ_2	-	-	-	-0.061**	-	-	-0.062*	-0.057*
MA(1)-term, γ_3	-	-	0.537**	-	-	-	-	-
Const. in variance equation, ϖ	n.a.	n.a.	0.005***	0.004***	n.a.	n.a.	0.005***	0.005***
ARCH(1), α	-0.095***	-0.091***	0.076**	0.056***	-0.088***	-0.089***	0.074**	0.053***
GARCH(1), β	0.526***	0.644***	0.880***	0.906***	0.460**	0.656***	0.884***	0.913***
Permanent, ω	0.461***	0.444***	n.a.	n.a.	0.470***	0.451***	n.a.	n.a.
AR(1)-variance, ρ	0.976***	0.968***	n.a.	n.a.	0.978***	0.972***	n.a.	n.a.
Forecast error, φ	0.031***	0.034**	n.a.	n.a.	0.027**	0.031***	n.a.	n.a.
Exchange rate changes, δ_1	-	-	-	-	-	-	-	-
Opening, δ_2	-	-	-	-	-	-	-	-
Closing, δ_3	-	-	-0.013**	-0.014***	-	-	-0.013**	-0.014***
Exchange rate changes, η_1	-7.336***	-6.084**	n.a.	n.a.	-7.248***	-5.837**	n.a.	n.a.
Opening, η_2	-	-	n.a.	n.a.	-	-	n.a.	n.a.
Closing, η_3	-	-	n.a.	n.a.	-	-	n.a.	n.a.
Decisions (post) [38], λ_2	-0.069***	-0.073***	-0.008**	-0.007**	-	-	-	-
COM [30], $\lambda_{2,1}$	-	-	-	-	-0.062***	-0.064***	-0.007*	-0.006*
ECOFIN [8], $\lambda_{2,2}$	-	-	-	-	-0.110***	-0.097**	-0.014***	-0.014***
Decisions (post) [38], τ_2	0.077	0.113*	n.a.	n.a.	-	-	n.a.	n.a.
COM [30], $\tau_{2,1}$	-	-	n.a.	n.a.	0.057	0.034	n.a.	n.a.
ECOFIN [8], $\tau_{2,2}$	-	-	n.a.	n.a.	0.112**	0.265*	n.a.	n.a.
Log Likelihood	-969.590	-970.161	124.647	149.570	-964.042	-968.552	125.054	150.996
Portmanteau (5)	3.428	3.766	3.154	4.937	3.590	3.569	5.000	4.808
Ljung-Box^2 (5)	2.230	4.162	4.717	2.547	2.667	4.463	5.193	2.502
ARCH-LM (5)	0.448	0.845	1.025	0.538	0.532	0.911	1.079	0.522
Jarque-Bera	10.032***	0.833	62.275***	8.508**	8.233**	0.630	68.898***	8.549**

Coefficients use Bollerslev-Wooldridge robust standard errors in estimates of euro risk premium series with original (orig.) and alternative (alt.) specifications; post-diagnostics give test statistic values; *, **, and *** represent *p*-values of 0.1, 0.05, and 0.01, respectively; 1080 (1079) observations with number of observations for disaggregated Decisions, Statements, and Meetings in square brackets of the first column; *n.a.* means not applicable.

Table 2c. STATEMENTS

	USDEUR risk premium		CHFEUR risk premium		USDEUR risk premium		CHFEUR risk premium	
	orig.	alt.	orig.	alt.	orig.	alt.	orig.	alt.
Const. in mean equation, γ_1	0.047***	0.075***	-	-	0.048***	0.073***	-	-
AR(1)-term, γ_2	-	-	-0.487*	-	-	-	-0.473*	-
AR(2)-term, γ_2	-	-	-	-0.062**	-	-	-	-0.062**
MA-term, γ_3	-	-	0.555**	-	-	-	0.542**	-
Const. in variance equation, ϖ	n.a.	n.a.	0.005**	0.005***	n.a.	n.a.	0.005**	0.005***
ARCH(1), α	-0.080***	-0.082**	0.081**	0.060***	-0.089***	-0.100***	0.081**	0.060***
GARCH(1), β	0.554***	0.704***	0.874***	0.900***	0.448***	0.691***	0.870***	0.899***
Permanent, ω	0.374***	0.391***	n.a.	n.a.	0.400***	0.391***	n.a.	n.a.
AR(1)-variance, ρ	0.985***	0.953***	n.a.	n.a.	0.982***	0.942***	n.a.	n.a.
Forecast error, φ	0.034***	0.045*	n.a.	n.a.	0.032***	0.054*	n.a.	n.a.
Exchange rate changes, δ_1	1.585*	-	-	-	1.533*	-	-	-
Opening, δ_2	-	-	-	-	-	-	-	-
Closing, δ_3	-	-	-0.012*	-0.013**	-	-	-0.013**	-0.013**
Exchange rate changes, η_1	-8.148***	-5.617**	n.a.	n.a.	-9.523***	-6.317**	n.a.	n.a.
Opening, η_2	-	-	n.a.	n.a.	-	-	n.a.	n.a.
Closing, η_3	-	-	n.a.	n.a.	-	-	n.a.	n.a.
Statements [85], λ_3	-0.011	-0.018	0.001	0.000	-	-	-	-
COM [29], $\lambda_{3,1}$	-	-	-	-	-0.010	-0.012	-0.000	-0.001
ECOFIN [50], $\lambda_{3,2}$	-	-	-	-	-0.023***	-0.036	-0.001	-0.001
SUMMIT [18], $\lambda_{3,3}$	-	-	-	-	0.006	0.012	0.010	0.004
Statements [85], τ_3	0.049	0.052	n.a.	n.a.	-	-	n.a.	n.a.
COM [29], $\tau_{3,1}$	-	-	n.a.	n.a.	0.075	-0.027	n.a.	n.a.
ECOFIN [50], $\tau_{3,2}$	-	-	n.a.	n.a.	-0.014	0.110**	n.a.	n.a.
SUMMIT [18], $\tau_{3,3}$	-	-	n.a.	n.a.	0.198	0.090	n.a.	n.a.
Log Likelihood	-974.914	-975.994	121.329	146.433	-969.822	-974.128	122.313	146.873
Portmanteau (5)	2.664	2.679	2.968	4.573	2.636	3.198	3.124	4.700
Ljung-Box^2 (5)	3.702	5.935	4.306	2.348	4.638	4.452	4.684	2.426
ARCH-LM (5)	0.743	1.202	0.943	0.503	0.903	0.902	1.024	0.518
Jarque-Bera	8.966**	1.411	63.673***	8.524**	7.356**	1.173	58.174***	8.959**

Coefficients use Bollerslev-Wooldridge robust standard errors in estimates of euro risk premium series with original (orig.) and alternative (alt.) specifications; post-diagnostics give test statistic values; *, **, and *** represent *p*-values of 0.1, 0.05, and 0.01, respectively; 1080 (1079) observations with number of observations for disaggregated Decisions, Statements, and Meetings in square brackets of the first column; *n.a.* means not applicable.

Table 2d. MEETINGS (ante)

	USDEUR risk premium		CHFEUR risk premium		USDEUR risk premium		CHFEUR risk premium	
	orig.	alt.	orig.	alt.	orig.	alt.	orig.	alt.
Const. in mean equation, γ_1	0.042***	0.069***	-	-	0.050***	0.070***	-	-
AR(1)-term, γ_2	-	-	-0.493*	-**	-	-	-0.509*	-**
AR(2)-term, γ_2	-	-	-	-0.063**	-	-	-	-0.062**
MA(1)-term, γ_3	-	-	0.561**	-**	-	-	0.575**	-**
Const. in variance equation, ϖ	n.a.	n.a.	0.005**	0.005***	n.a.	n.a.	0.005**	0.005***
ARCH(1), α	-0.085***	-0.064*	0.080**	0.060***	-0.079***	-0.066**	0.077**	0.057***
GARCH(1), β	0.442*	0.750***	0.876***	0.900***	0.401*	0.757***	0.881***	0.906***
Permanent, ω	0.314***	0.225***	n.a.	n.a.	0.263*	0.227***	n.a.	n.a.
AR(1)-variance, ρ	0.974***	0.971***	n.a.	n.a.	0.986***	0.971***	n.a.	n.a.
Forecast error, φ	0.034**	0.038*	n.a.	n.a.	0.031***	0.038**	n.a.	n.a.
Exchange rate changes, δ_1	-	-	-	-	1.418*	-	-	-
Opening, δ_2	-	-	-	-	-	-	-	-
Closing, δ_3	-	-	-0.012*	-0.014***	-	-	-0.012**	-0.014***
Exchange rate changes, η_1	-6.289***	-4.490	n.a.	n.a.	-7.316***	-4.605*	n.a.	n.a.
Opening, η_2	-	-	n.a.	n.a.	-	-	n.a.	n.a.
Closing, η_3	-	0.104**	n.a.	n.a.	-	0.104**	n.a.	n.a.
Meetings (ante) [116], λ_4	0.015	0.018	-0.000	-0.000	-	0.018	-	-
ECOFIN [80], $\lambda_{4,1}$	-	-	-	-	0.013	-	-0.001	-0.001
SUMMIT [36], $\lambda_{4,2}$	-	-	-	-	-0.003	-	0.002	0.002
Meetings (ante) [116], τ_4	-0.038	0.017	n.a.	n.a.	-	-	n.a.	n.a.
ECOFIN [80], $\tau_{4,1}$	-	-	n.a.	n.a.	-0.085***	0.008	n.a.	n.a.
SUMMIT [36], $\tau_{4,2}$	-	-	n.a.	n.a.	-0.015	0.037	n.a.	n.a.
Log Likelihood	-976.567	-973.093	121.295	146.441	-973.614	-972.947	121.579	146.715
Portmanteau (5)	2.641	2.529	2.925	4.558	2.644	2.526	2.413	4.316
Ljung-Box^2 (5)	4.348	7.114	4.328	2.319	4.340	7.220	4.413	2.233
ARCH-LM (5)	0.886	0.405	0.947	0.497	0.879	1.500	0.961	0.478
Jarque-Bera	10.777***	1.947	63.548***	8.357**	8.621**	1.881	63.443***	8.809**

Coefficients use Bollerslev-Wooldridge robust standard errors in estimates of euro risk premium series with original (orig.) and alternative (alt.) specifications; post-diagnostics give test statistic values; *, **, and *** represent *p*-values of 0.1, 0.05, and 0.01, respectively; 1080 (1079) observations with number of observations for disaggregated Decisions, Statements, and Meetings in square brackets of the first column; *n.a.* means not applicable.

Table 2e. MEETINGS (post)

	USDEUR risk premium		CHFEUR risk premium		USDEUR risk premium		CHFEUR risk premium	
	orig.	alt.	orig.	alt.	orig.	alt.	orig.	alt.
Const. in mean equation, γ_1	0.042**	0.069***	-	-	0.043**	0.070***	-	-
AR(1)-term, γ_2	-	-	-0.495*	-	-	-	-0.506*	-
AR(2)-term, γ_2	-	-	-	-0.062**	-	-	-	-0.062**
MA(1)-term, γ_3	-	-	0.564**	-	-	-	0.573**	-
Const. in variance equation, ϖ	n.a.	n.a.	0.005**	0.005***	n.a.	n.a.	0.005**	0.004***
ARCH(1), α	-0.086***	-0.072**	0.081**	0.060***	-0.086***	-0.074**	0.078**	0.057***
GARCH(1), β	0.486**	0.683***	0.875***	0.900***	0.426*	0.669***	0.879***	0.905***
Permanent, ω	0.294***	0.249***	n.a.	n.a.	0.281***	0.236***	n.a.	n.a.
AR(1)-variance, ρ	0.976***	0.966***	n.a.	n.a.	0.977***	0.969***	n.a.	n.a.
Forecast error, φ	0.033**	0.038*	n.a.	n.a.	0.033***	0.036**	n.a.	n.a.
Exchange rate changes, δ_1	-	-	-	-	-	-	-	-
Opening, δ_2	-	-	-	-	-	-	-	-
Closing, δ_3	-	-	-0.012**	-0.013***	-	-	-0.012*	-0.013**
Exchange rate changes, η_1	-6.402***	-4.993*	n.a.	n.a.	-6.534***	-5.087*	n.a.	n.a.
Opening, η_2	-	-	n.a.	n.a.	-	-	n.a.	n.a.
Closing, η_3	-	0.111**	n.a.	n.a.	-	0.112**	n.a.	n.a.
Meetings (post) [127], λ_5	0.016	0.021	-0.001	-0.000	-	-	-	-
ECOFIN [98], $\lambda_{5,1}$	-	-	-	-	0.027	0.031	-0.001	-0.001
SUMMIT [35], $\lambda_{5,2}$	-	-	-	-	-0.009	-0.002	0.003	0.003
Meetings (post) [127], τ_5	-0.006	-0.030	n.a.	n.a.	-	-	n.a.	n.a.
ECOFIN [98], $\tau_{5,1}$	-	-	n.a.	n.a.	-0.023	-0.054	n.a.	n.a.
SUMMIT [35], $\tau_{5,2}$	-	-	n.a.	n.a.	-0.011	0.020	n.a.	n.a.
Log Likelihood	-976.526	-973.194	121.324	146.438	-975.768	-972.455	121.549	146.757
Portmanteau (5)	2.732	2.700	2.972	4.563	2.820	2.723	2.831	4.243
Ljung-Box^2 (5)	4.368	5.874	4.296	2.324	4.759	5.872	4.363	2.268
ARCH-LM (5)	0.894	1.217	0.942	0.498	0.962	1.222	0.953	0.485
Jarque-Bera	10.423***	1.997	62.593***	8.374**	10.220***	1.678	63.393***	8.998**

Coefficients use Bollerslev-Wooldridge robust standard errors in estimates of euro risk premium series with original (orig.) and alternative (alt.) specifications; post-diagnostics give test statistic values; *, **, and *** represent *p*-values of 0.1, 0.05, and 0.01, respectively; 1080 (1079) observations with number of observations for disaggregated Decisions, Statements, and Meetings in square brackets of the first column; *n.a.* means not applicable.

With regards to the variance process, all model specifications point to persistent shocks in the series of euro risk premiums. The highly significant—although both negative and small, in the case of the CGARCH models for the USDEUR risk premium series—ARCH-error coefficient α implies that volatility reactions do not fluctuate much: on the contrary, the relatively large GARCH-lag coefficient β for all euro risk premium series indicates that it takes a relatively long time for shocks to die down. Technically, this means that the volatility is generally very persistent. The relatively low sum of the ARCH- and GARCH-term coefficients in the USDEUR risk premium series arises from the decomposition of the variance process within the CGARCH modeling framework. The time-invariant, permanent level of volatility ω is significantly positive for all CGARCH model specifications. The coefficient ρ for the variable *AR(1)-variance* is large, highly significant, and exceeds the sum of the coefficients $\alpha + \beta$ in the transitory component in all instances of the CGARCH models. The significantly positive but small coefficient φ of the *Forecast error* confirms the finding that it takes a long time for shocks to die down.

Regarding further post-diagnostic tests, a series of Portmanteau tests for the standardized residuals (for up to five lags) indicated a correct specification of the mean equation for all instances. Similarly, the ARCH-LM test statistics at the fifth lag, which tested for any remaining ARCH-effects, indicated that the variance process was modeled properly for all model specifications. The Jarque-Bera (JB) test statistics generally failed to reject the null hypothesis that the data was normally distributed. In the cases of the originally specified USDEUR risk premium series and of the alternatively specified CHFEUR risk premium series, the null was rejected at the .05 significance level. While the same test for the originally specified CHFEUR risk premium series failed to reject the null at any conventional level of significance, there was statistical evidence for normal distribution in the case of the alternatively specified USDEUR risk premium series. These post-diagnostic tests indicated that the statistical results for all independent variables regressed on the euro risk premiums can therefore be interpreted and employed to arrive at a robust estimate across euro risk premium series (see also the discussion surrounding Figure 1 in Section 5.1).

Regarding the economic control variables that account for the impact of exchange rate changes, as well as the opening and closing of trading weeks, estimates within the restricted models did not substantially differ from the best-fit baseline economic models (see also Tables A–D in the Appendix 2). Exchange rate changes were found to exert a highly significant influence on the volatility of the euro risk premium: a one-unit positive change in the euro exchange rate (i.e., an exchange rate appreciation of the euro against some other currency in basis points) decreased the volatility of the euro risk premium by roughly seven units. Hence, one may infer that a considerable portion of the volatility of the euro risk premium series stemmed from short-term financial capital flows. However, this result only pertains to the two USDEUR risk premium series. In the case of the two CHFEUR risk premium series, only the closing day of a trading week significantly reduced short-term volatility of the euro risk premium, as was the case with the unrestricted baseline economic models.

Table 2 displays the impact of political events on the volatility of the euro risk premium. The political events are divided into the general categories of *Decisions (ante)*, *Decisions (post)*, *Statements*, *Meetings (ante)*, and *Meetings (post)*. These categories are further divided by different European key actors: the European Commission (COM), the Economic and Financial Affairs Council (ECOFIN), and the European Council (SUMMIT), all of whom function as initiators of political news. The values of the coefficients $\lambda_{j,k}$ and $\tau_{j,k}$ with $j \in \{1,...,5\}$ and $k \in \{1,2,3\}$, respectively, were so small that the author restricted himself to an interpretation of the signs.

Furthermore, the author primarily confines himself to an interpretation of robust estimates, i.e., significant evidence that occurs in at least two series of conditional variance processes. Most notably, there was statistical evidence at the .01 significance level in support of a negative impact of decisions on the short-run volatility of the euro risk premium. Accordingly, those European decision-making processes that indicate a lack of commitment to the European fiscal governance decreased the volatility of all euro risk premium series. This result specifically refers to *Decisions (ante)* and *Decisions (post)*, and applies to both the COM and the ECOFIN (see Tables 2a and 2b). There was also some evidence for a positive impact of the ECOFIN on the permanent component of the conditional variance in the case of both *Decisions (ante)* and *Decisions (post)*, while the COM did not significantly affect the long-run movements in volatility (see Tables 2a and 2b). In the case of ECOFIN, the category of *Statements* also negatively affected the transitory component of the conditional variance, while the same variable had a positive influence on the permanent component (see Table 2c)—however, the two CHFEUR risk premium series could not support this finding because of the conventional GARCH model employed. Finally, there were no robust estimates in the case of either *Meetings (ante)* or *Meetings (post)*, either for ECOFIN or SUMMIT (see Tables 2d and 2e). Overall, the improvements to the log likelihood statistics suggested that estimates have been improved by the inclusion of political event data. The subsequent discussion of results sheds more light on the influence that political action and rhetoric exert on the euro risk premium.

There is robust empirical evidence in support of Hypothesis 1, that decisions by the European Commission and the Economic and Financial Affairs Council decreased the volatility of the risk premium of the euro against the US dollar and the Swiss franc. The empirical analysis supports the assertion that the European Commission played a key role in European fiscal governance. The Economic and Financial Affairs Council also provided financial investors with relevant news. A particularly notable finding is that decisions by this EU institution—i.e., political action, in striking contrast to decisions by the European Commission—not only reduced the short-run volatility, but also increased the time-varying long-run volatility of the euro risk premium. The surge of the latter volatility hinted at a national political bias that impacts financial investor behavior. Hypothesis 2 states that non-scheduled statements indicating fiscal profligacy should not affect the volatility of the euro risk premium. Contrary to this conjecture, there was some evidence of volatility effects for such political rhetoric. While decisive statements were not expected from the Commission, they were, however, what the Economic and Financial Affairs Council has become known for. This particular finding supports the idea of a latent national political bias within the context of European fiscal governance, particularly concerning the role of the Economic and Financial Affairs Council. Moreover, the empirical analysis supports Hypothesis 3, that scheduled meetings on the European level did not affect the volatility of euro risk premium. This finding confirms the widespread complaint that political events on the European level of this nature were of no great importance, and that they largely confirm political decisions that had already been made.

The analysis suggests that different EU institutions influence volatility in varying ways; theories about the general interconnection between EU decision-making and financial markets should therefore consider these discrepancies. The empirical results show that, for the early history of the EZ, financial investors closely observed what the governments of the EZ member countries and other relevant actors did and said. The present study indicates that political events affected the perceived uncertainty among financial investors to a considerable extent: the overall impression is that the progressive weakening of the Maastricht criteria and the SGP-related rules of European fiscal governance have always had repercussions in foreign exchange markets.

6. Conclusion

Econometric studies on UIP-related issues to date have paid scant attention to the European integration process and its possible impact on a time-varying risk premium of the euro. The analysis contained in the present article focused on political events pertaining to European fiscal governance within the EZ. This study examined whether political events surrounding the formation of EZ members' public debt have systematically influenced the euro foreign exchange market. In particular, this article has explored the impact of decisions, statements, and meetings of key European institutions on the volatility of the risk premium of the euro against the US dollar and the Swiss franc. Relevant actors on the European level, with regard to the fiscal governance framework of the EZ, comprise the European Commission, the Economic and Financial Affairs Council, and—although it is not officially contained within that framework—the European Council. All these EU institutions may be providers of economically relevant political news. The present article showed to what extent financial investors were sensitive to the political actions and rhetoric that accompanied the early years of the legal framework of European fiscal governance. To be more precise, the empirical analysis demonstrated how scheduled and non-scheduled political events influenced the volatility of selected euro risk premium series, based on daily observations for the period of January 3, 2001–March 22, 2005.

Decisions made by the European Commission, which generally tries to detect member state infringements of the SGP, decreased the volatility that represents a crucial indicator of the uncertainty that financial investors associated with the euro relative to other currencies. This supports the original hope that the institutional framework of the EZ provided a credible deterrent against the national temptation to violate or weaken the SGP rules. The irrelevance of official meetings on the European level, established through the analysis, supports this optimistic assessment of European fiscal governance. However, the significant impact of decisions taken by the Economic and Financial Affairs Council on the long-run volatility of euro risk premiums spoils the illusion that all was well with the European fiscal governance in the early 2000s. Likewise, the evidence for volatility effects of statements made by the Economic and Financial Affairs Council also suggests that national politics played a strong role in the European arena during the early years of the European fiscal governance. If the SGP had represented a solid commitment towards fiscal prudence and, by extension, the long-term viability of the EZ project, then financial investors would not have paid any attention to statements that mostly pertained to the national sphere. The present study has provided robust empirical evidence for the plummeting volatility of euro risk premiums in the short run, as well as some evidence for increasing volatility in the long run. In particular, decisions made by the European Commission and the Economic and Financial Affairs Council indicating some form of non-compliance or infringement of European fiscal governance rules have reduced the uncertainty of future paths of public debt formation within the EZ. However, political action and rhetoric have also contributed to relatively greater uncertainty among financial investors regarding the enforcement of SGP rules and the long-term viability of the EZ project.

The legal framework of European fiscal governance was designed as a pillar for the viability of the euro, until this framework was picked apart by reform in March 2005. The severity of the recent EZ financial crisis unraveled the shortcomings of the institutional design of the EZ. A seemingly latent national political bias reflects the inability of the EU institutions to enforce the SGP rules. The Treaty of Lisbon in December 2009, along with the Sixpack in December 2013, further altered the institutional framework of the EU, adding momentum to collective EU decision-making. However, even the Fiscal Compact under international law, which entered into force in January

2013, does not provide any ways to enforce fiscal prudence. The apparent lack of outside monitoring or enforcement mechanisms increases the possibility that opportunistic governments will further disregard the legal framework of European fiscal governance. In line with the approach presented here, researchers are encouraged to study both what went wrong and what was effective in the attempts to safeguard the Euro.

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Appendix

Appendix 1

Table. STATEMENTS – Headlines of the Financial Times (European Edition)

4-Feb-02	Warning on deficits tests EU stability pact
5-Feb-02	Prodi denies Commission split on deficit warning to Germany
11-Feb-02	EU faces showdown on warning to Germany; Brown to resist additional Brussels pressure over UK public spending
12-Feb-02	Berlin attacked over stance on deficit
10-Jul-02	France to cut taxes and spend more
11-Jul-02	Portugal admits guilt over stability pact breach
24-Sep-02	EU states threaten credibility of deficit pact
25-Sep-02	French deficit 'likely to remain beyond 2006'
26-Sep-02	EU launches fierce attack on France over budget
16-Oct-02	Germany admits it will breach EU rules on deficit
17-Oct-02	Euro rules 'stupid', says Prodi
18-Oct-02	Germans feel Brussels' fiscal squeeze
21-Oct-02	Prodi defends line on EU's 'stupid' stability pact
4-Nov-02	Plea for more stress on jobs and inflation in EU policy
10-Feb-03	Big Three consider easing EU budget rules in event of war
11-Feb-03	Prospect of war hits EU hopes for eliminating budget deficits
25-Feb-03	Defiant France rules out austerity package
6-Mar-03	France heading for clash with partners on spending and tax
18-Mar-03	German budget limit exemption
2-Apr-03	France 'could breach deficit rules for three years'
7-Apr-03	If Rome breaches 3% limit, all three of the Eurozone's biggest economies will have broken the pact
4-Jun-03	German leaders disagree over euro rules
14-Jul-03	Soften stability pact, Chirac urges
15-Jul-03	Eurogroup torn apart as French deficit rouses anger
16-Jul-03	Commissioners in scathing attack on Prodi group report
27-Aug-03	Prodi vows tough line if eurozone rules are breached
28-Aug-03	More states ready to challenge stability pact, says Schroder
2-Sep-03	EU may isolate France over euro pact
4-Sep-03	French tax cut sets stage
5-Sep-03	Brussels warns France over stability pact
23-Oct-03	Berlin to breach deficit rules in 2004
29-Oct-03	Brussels warns on budget deficit breaches
4-Nov-03	German proposal could be end of stability pact
14-Nov-03	Eichel launches scathing attack on Brussels over stability pact
17-Nov-03	The stability pact is not a blunt instrument
18-Nov-03	Eichel rejects Brussels call for more budget cuts
24-Nov-03	France and Germany may escape EU fines
25-Nov-03	Sanctions deal leaves euro pact in tatters
26-Nov-03	Outrage as collapse of deficit pact splits EU
1-Dec-03	Eichel calls for inflation to be included in fiscal appraisals
2-Dec-03	Monti hits at 'selfish' Paris and Berlin
28-Jan-04	EU warns UK and Netherlands on debt
10-May-04	German deficit may breach EU fiscal rules again, admits Eichel
11-May-04	SPD chief willing to flout EU rules on budget
24-Jun-04	French finance minister hails growth rate for first quarter
10-Sep-04	Ministers agree on stability pact reform - but not on the extent
13-Sep-04	Linguistic differences reflect rift over euro
23-Sep-04	Greece's 'white hole' turns black for Europe
16-Nov-04	Ministers reject move to loosen budget deficit rules
22-Dec-04	Germany's finance minister sees a bright future for the economy
17-Jan-05	Schroder urges loosening of fiscal rules in EU states
18-Jan-05	Brussels seeks to reclaim key role over changes to fiscal rules
15-Feb-05	Plans to water down stability pact rules
16-Feb-05	European heads told not to undermine pact talks
7-Mar-05	Ministers fear Berlin demands will hit pact deal
8-Mar-05	EU attempts to reform stability pact break down
21-Mar-05	Germany's deficit divides EU finance ministers
22-Mar-05	Leaders back changes to services directive

Appendix 2. Model Selection

Table A. USDEUR risk premium (original specification)

	OLS	GARCH	IGARCH	CGARCH	**CGARCH**
Constant in mean equation, γ_1	0.033	0.042^{**}	0.040^{**}	0.033	0.046^{**}
AR(1)-term, γ_2	-	-	-	-	-
MA(1)-term, γ_3	-	-	-	-	-
Decisions (ante) [39], γ_4	0.031	0.040	0.035	0.047	
Decisions (post) [38], γ_5	-0.100	-0.137	-0.137	-0.138	
Statements [85], γ_6	0.046	0.048	0.049	0.055	
Meetings [116], γ_7	0.083	0.083	0.080	0.087	
Meetings [127], γ_8	-0.058	-0.056	-0.055	-0.051	
Constant in variance equation, ϖ	n.a.	0.008	n.a.	n.a.	n.a.
ARCH(1), α	n.a.	0.027^{**}	0.027^{***}	-0.074^{**}	-0.085^{***}
GARCH(1), β	n.a.	0.951^{***}	0.973^{***}	0.554^{*}	0.512^{***}
Permanent, ω	n.a.	n.a.	n.a.	0.367^{***}	0.316^{***}
AR(1)-variance, ρ	n.a.	n.a.	n.a.	0.964^{***}	0.988^{***}
Forecast error, φ	n.a.	n.a.	n.a.	0.043^{**}	0.034^{***}
Exchange rate changes (lagged), δ_1	n.a.	-	-	-	1.569^{*}
Opening, δ_2	n.a.	-	-	-	-
Closing, δ_3	n.a.	-	-	-	-
Exchange rate changes (lagged), η_1	n.a.	n.a.	n.a.	-	-7.864^{***}
Opening, η_2	n.a.	n.a.	n.a.	-	-
Closing, η_3	n.a.	n.a.	n.a.	-	-
Log Likelihood	-994.238	-985.566	-990.287	-982.012	-975.884
Portmanteau (5)	2.850	2.314	2.300	2.209	2.679
Ljung-Box^2 (5)	15.842^{***}	11.439^{**}	10.247^{*}	5.955	4.175
ARCH-LM (5)	3.306^{***}	2.354^{**}	2.120^{*}	1.191	0.857
Jarque-Bera	18.633^{***}	12.052^{***}	12.164^{***}	13.075^{***}	9.874^{***}

Coefficients use Bollerslev-Wooldridge robust standard errors; post-diagnostics give test statistic values; *, **, and *** represent p-values of 0.1, 0.05, and 0.01, respectively; 1080 observations with number of observations for disaggregated Decisions, Statements, and Meetings in square brackets of the first column; *n.a.* means not applicable.

Table B. USDEUR risk premium (alternative specification)

	OLS	GARCH	IGARCH	CGARCH	**CGARCH**
Constant in mean equation, γ_1	0.028	0.034^{*}	0.032	0.029	0.073^{***}
AR(1)-term, γ_2	-	-	-	-	-
MA(1)-term, γ_3	-	-	-	-	-
Decisions (ante) [39], γ_4	0.016	0.119	0.121	0.118	-
Decisions (post) [38], γ_5	-0.065	-0.053	-0.059	-0.044	-
Statements [85], γ_6	-0.071	-0.071	-0.072	-0.080	-
Meetings [116], γ_7	0.042	0.082	0.085	0.073	-
Meetings [127], γ_8	0.046	0.036	0.031	0.041	-
Constant in variance equation, ϖ	n.a.	0.008	n.a.	n.a.	n.a.
ARCH(1), α	n.a.	0.027^{**}	0.026^{***}	-0.062^{*}	-0.080^{**}
GARCH(1), β	n.a.	0.952^{***}	0.974^{***}	0.558	0.700^{***}
Permanent, ω	n.a.	n.a.	n.a.	0.364^{***}	0.370^{***}
AR(1)-variance, ρ	n.a.	n.a.	n.a.	0.970^{***}	0.953^{***}
Forecast error, φ	n.a.	n.a.	n.a.	0.040^{**}	0.046^{*}
Exchange rate changes, δ_1	n.a.	-	-	-	-
Opening, δ_2	n.a.	-	-	-	-
Closing, δ_3	n.a.	-	-	-	-
Exchange rate changes, η_1	n.a.	n.a.	n.a.	-	-5.563^{**}
Opening, η_2	n.a.	n.a.	n.a.	-	-
Closing, η_3	n.a.	n.a.	n.a.	-	-
Log Likelihood	-993.019	-984.371	-989.065	-981.093	-977.032
Portmanteau (5)	2.938	2.472	2.480	2.482	2.670
Ljung-Box^2 (5)	16.422^{***}	11.940^{**}	10.445^{*}	7.463	6.149
ARCH-LM (5)	3.435^{***}	2.244^{**}	2.134^{*}	1.476	1.257
Jarque-Bera	19.877^{***}	14.051^{***}	14.744^{***}	14.514^{***}	1.765

Coefficients use Bollerslev-Wooldridge robust standard errors; post-diagnostics give test statistic values; *, **, and *** represent *p*-values of 0.1, 0.05, and 0.01, respectively; 1079 observations with number of observations for disaggregated Decisions, Statements, and Meetings in square brackets of the first column; *n.a.* means not applicable.

Table C. CHFEUR risk premium (original specification)

	OLS	GARCH	IGARCH	CGARCH	**GARCH**	**GARCH**
Constant in mean equation, γ_1	-	-	-	-	-	-
AR(1)-term, γ_2	-0.679**	-0.489*	-0.558**	-0.618**	-0.490*	-
AR(2)-term, γ_2	-	-	-	-	-	-0.069*
MA(1)-term, γ_3	0.731***	0.556**	0.625***	0.675***	0.559**	
Decisions (ante) [39], γ_4	0.019	0.023	0.020	0.023	-	-
Decisions (post) [38], γ_5	-0.022	-0.007	-0.008	-0.001	-	-
Statements [85], γ_6	0.001	-0.010	-0.006	-0.010	-	-
Meetings [116], γ_7	0.002	0.027	0.021	0.028	-	-
Meetings [127], γ_8	0.003	0.002	0.003	-0.011	-	-
Constant in variance equation, ϖ	n.a.	0.003**	n.a.	n.a.	0.005**	0.005**
ARCH(1), α	n.a.	0.086**	0.065***	0.016**	0.080**	0.083**
GARCH(1), β	n.a.	0.861***	0.935***	-0.997***	0.876***	0.873***
Permanent, ω	n.a.	n.a.	n.a.	0.050***	-	-
AR(1)-variance, ρ	n.a.	n.a.	n.a.	0.953***	-	-
Forecast error, φ	n.a.	n.a.	n.a.	0.084***	-	-
Exchange rate changes, δ_1	n.a.	-	-	-	-	-
Opening, δ_2	n.a.	-	-	-	-	-
Closing, δ_3	n.a.	-	-	-	-0.012*	-0.011*
Exchange rate changes, η_1	n.a.	-	-	-	-	-
Opening, η_2	n.a.	-	-	-	-	-
Closing, η_3	n.a.	-	-	-	-	-
Log Likelihood	48.573	119.555	105.892	124.382	121.295	120.671
Portmanteau (5)	7.189*	2.669	1.675	3.552	2.915	4.791
Ljung-Box^2 (5)	228.410***	4.032	9.966**	2.366	4.330	3.879
ARCH-LM (5)	40.463***	0.871	1.984*	0.501	0.948	0.815
Jarque-Bera	1161.809***	65.042***	81.795***	46.935***	63.638***	69.983***

Coefficients use Bollerslev-Wooldridge robust standard errors; post-diagnostics give test statistic values; *, **, and *** represent *p*-values of 0.1, 0.05, and 0.01, respectively; 1080 observations with number of observations for disaggregated Decisions, Statements, and Meetings in square brackets of the first column; *n.a.* means not applicable.

Table D. CHFEUR risk premium (alternative specification)

	OLS	GARCH	IGARCH	CGARCH	**GARCH**	**GARCH**
Constant in mean equation, γ_1	-	-	-	-	-	-
AR(1)-term, γ_2	-0.557**	-0.462	-0.516**	-0.567**	-0.457	-
AR(2)-term, γ_2	-	-	-	-	-	-0.058*
MA(1)-term, γ_3	0.630***	0.525*	0.584**	0.620**	0.523*	
Decisions (ante) [39], γ_4	0.017	0.021	0.020	0.018	-	-
Decisions (post) [38], γ_5	-0.023	-0.008	-0.010	-0.004	-	-
Statements [85], γ_6	-0.002	-0.009	-0.007	-0.010	-	-
Meetings [116], γ_7	0.010	0.023	0.017	0.028	-	-
Meetings [127], γ_8	0.007	0.005	0.008	-0.004	-	-
Constant in variance equation, ϖ	n.a.	0.002**	n.a.	n.a.	0.004***	0.004***
ARCH(1), α	n.a.	0.066***	0.051***	0.013**	0.058***	0.066***
GARCH(1), β	n.a.	0.894***	0.949***	-0.992***	0.906***	0.902***
Permanent, ω	n.a.	n.a.	n.a.	0.046***	-	-
AR(1)-variance, ρ	n.a.	n.a.	n.a.	0.963***	-	-
Forecast error, φ	n.a.	n.a.	n.a.	0.065***	-	-
Exchange rate changes, δ_1	n.a.	-	-	-	-	-
Opening, δ_2	n.a.	-	-	-	-	-
Closing, δ_3	n.a.	-	-	-	-0.013***	-0.012**
Exchange rate changes, η_1	n.a.	n.a.	n.a.	-	-	-
Opening, η_2	n.a.	n.a.	n.a.	-	-	-
Closing, η_3	n.a.	n.a.	n.a.	-	-	-
Log Likelihood	104.742	143.788	134.200	147.754	146.915	144.727
Portmanteau (5)	4.932	2.344	1.241	2.867	2.647	4.392
Ljung-Box^2 (5)	107.540***	3.396	6.279**	2.316	3.119	2.034
ARCH-LM (5)	14.906***	0.706	1.226	0.468	0.666	0.426
Jarque-Bera	18.889***	10.967***	18.153***	7.572**	6.907**	10.408***

Coefficients use Bollerslev-Wooldridge robust standard errors; post-diagnostics give test statistic values; *, **, and *** represent *p*-values of 0.1, 0.05, and 0.01, respectively; 1080 observations with number of observations for disaggregated Decisions, Statements, and Meetings in square brackets of the first column; *n.a.* means not applicable.

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