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Marcin Liberadzki*
ORCID: 0000-0002-1099-7997
mliber@sgh.waw.pl

Arkadiusz Orzechowski**
ORCID: 0000-0003-2872-189X
aorzec@sgh.waw.pl

Structural Breaks and Market Integration: Analysing the Effects of France's 2024 Legislative Crisis and 2025 Sovereign Downgrade

Abstract

This article examines the relationship between yield spreads of covered bonds and government bonds in France and Germany. The primary objective of the study is to determine whether the dissolution of the French National Assembly in June 2024 and the sovereign credit rating downgrade of France in October 2025 can be classified as structural breaks and to identify how these events influenced the relationships between mid-yields to maturity in these markets. The analysis is conducted using a vector autoregression model. The empirical findings, supported by Wald tests, confirm that both events constituted structural breaks. While the study finds no evidence of long-term cointegration, it reveals that the Granger causality evolved over time. Specifically, an initially bidirectional relationship between French and German mid-YTM spreads of debt securities became unidirectional following the 2024 legislative crisis, with developments in the French market influencing those in Germany. Although this influence weakened following the rating downgrade, the results suggest that the French market's impact on Germany may persist in the long term. Ultimately, the study underscores the importance of political stability and sovereign credit quality as key determinants of pricing dynamics and market integration within the euro area.

Keywords: vector autoregression model, Granger causality, structural breaks, dissolution of the French National Assembly, sovereign credit rating downgrade of France

JEL Codes: C58, G12, G21

* Marcin Liberadzki – SGH Warsaw School of Economics.
** Arkadiusz Orzechowski – SGH Warsaw School of Economics.

Introduction

Covered bonds are defined as hybrid debt instruments that combine the characteristics of traditional unsecured corporate (bank) bonds and asset-backed securities (Correia and Pinto 2022). A key feature distinguishing covered bonds from other debt instruments is the dual recourse mechanism, under which investors have claims against both the issuing credit institution and a dedicated cover pool of high-quality assets (EBA 2025, p. 16).

The covered bond market is predominantly concentrated in Europe and has a history spanning more than 250 years. It continues to play a crucial role in the long-term financing of mortgage lending and the public sector (Correia and Pinto 2022, p. 3). In contrast to the United States, where securitisation is the main instrument used to refinance mortgages, European banking systems have traditionally relied on covered bonds as a stable and resilient source of funding, particularly during periods of heightened market uncertainty.

It should be noted that a significant body of literature focuses on analysing the relationships between covered bonds and securitisation instruments, including asset-backed securities (ABS) and mortgage-backed securities (MBS). Although both types of instruments rely on asset pools and facilitate capital market financing, they differ substantially in their pricing mechanisms and risk characteristics. These differences have prompted researchers to further analyse how covered bonds interact with other financial instruments, focusing particularly on their valuation and liquidity.

Against this background, the present study contributes to the existing literature by analysing the relationships between differences in mid-yields to maturity (mid-YTM) of covered bonds and government bonds in France and Germany. The paper begins with a review of the relevant literature on covered bonds, followed by a description of the dataset and the applied research methodology. The empirical analysis focuses on identifying dependencies between differences in the mid-YTM levels of the selected financial instruments. Within this framework, particular attention is paid to two events: the dissolution of the French National Assembly by the President of France on 11 June 2024 and the downgrade of France's sovereign credit rating by the rating agency Standard & Poor's on 17 October 2025. These events are examined to determine whether they can be regarded as structural breaks. In the final stage of the analysis, a set of statistical tests is employed to assess whether these events led to changes in the way differences in mid-YTM of covered bonds and government bonds in France and Germany interact.

1. Review of the literature

The relationships between covered bonds and other financial instruments are complex and multidimensional. Nevertheless, it is possible to identify certain patterns that help to explain the behaviour of covered bonds within the broader financial system.

Evidence provided by Correia and Pinto (2022) suggests that, while credit ratings remain the primary factor influencing the pricing of ABS and MBS instruments, investors in the covered bond market tend to place greater weight on contractual characteristics, macroeconomic factors, and the financial condition of the issuing institution. This difference reflects the absence of the "bankruptcy remoteness" feature typical of securitisation structures; as the issuer continues to bear liability for the debt, investors must therefore closely assess the bank's underlying financial stability (Wegener et al. 2019, p. 2).

The literature also identifies a "mispricing" phenomenon, whereby ABS and MBS typically exhibit higher credit spreads than covered bonds with comparable credit ratings. This pattern arises because credit ratings primarily reflect the probability of default or expected loss, while potentially failing to capture the higher level of systematic risk inherent in securitisation structures. Covered bonds, by contrast, are perceived as relatively safe due to the dynamic nature of the cover pool, under which issuers are required to replace non-performing assets and maintain adequate levels of overcollateralization, as well as the additional protection provided by independent monitoring mechanisms.

The interdependence between covered bonds and sovereign debt markets has also attracted considerable attention, particularly in the context of liquidity risk transmission during periods of financial stress. Schwarz (2019) proposes a model-free indicator of market liquidity based on yield differentials between German government bonds and KfW agency securities (the so-called K-spread). Given that both instruments are backed by the same state guarantee, this measure can be interpreted as a proxy for liquidity conditions. Empirical findings indicate that liquidity played a substantial role during the global financial crisis, accounting for a significant proportion of the widening in euro-area sovereign spreads. More generally, these results highlight the importance of liquidity factors in shaping price dynamics across fixed-income markets.

Further evidence on liquidity effects is provided by analyses of the German covered bond market. In particular, comparisons between traditional Pfandbriefe and their more liquid Jumbo variants show that, although both instruments are characterised by similar credit risk, persistent yield differentials may arise over time. These spreads tend to widen during periods of market stress and exhibit a high degree of persistence, which is consistent with a "flight-to-liquidity" phenomenon, whereby investors shift their portfolios towards more liquid assets.

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The role of covered bonds in the transmission of monetary policy has also been widely examined, especially in relation to the asset purchase programmes implemented by the European Central Bank (ECB). In particular, the Covered Bond Purchase Programmes (CBPP1, CBPP2, and CBPP3) have been shown to influence financial conditions through several channels. These include signalling effects, whereby large-scale asset purchases reinforce expectations of accommodative monetary policy, credit easing effects, which operate through lower funding costs for banks, and portfolio rebalancing effects, which encourage investors to shift towards higher-yielding assets. In addition, the presence of the ECB as a significant market participant may contribute to lower perceived risk and reduced risk premia, thereby supporting financial stability (Benigno et al. 2023).

Empirical studies confirm that these programmes had a measurable impact on market outcomes. In particular, covered bond prices responded positively to ECB interventions, with the strongest effects observed for longer maturities (Gibson et al. 2015). Moreover, evidence suggests that these measures generated spillover effects, contributing to a reduction in sovereign bond spreads in financially vulnerable euro-area economies. However, their effectiveness varied across different phases, with some programmes, such as CBPP2, achieving more limited results, partly due to weaker than expected market demand.

Finally, the interaction between covered bonds and other forms of bank funding is shaped to a considerable extent by the regulatory environment, including the Covered Bond Directive and the Capital Requirements Regulation. A defining feature of covered bonds is the encumbrance of high-quality assets, which are earmarked for bondholders. While this enhances investor protection, it also reduces the pool of assets available to unsecured creditors in the event of bank insolvency. As a result, higher levels of asset encumbrance may alter the distribution of risk across different types of bank liabilities.

From a supervisory perspective, this issue has attracted increasing attention. Although covered bonds are generally viewed as a reliable funding source, regulators emphasise the need to monitor asset encumbrance carefully in order to avoid an excessive concentration of risk among unsecured creditors (EBA 2025). In parallel, ongoing regulatory discussions have explored the potential introduction of European Secured Notes, which are designed as dual-recourse instruments backed by loans to small and medium-sized enterprises. These instruments aim to broaden access to funding while maintaining robust structural safeguards, thereby limiting potential spillovers to the well-established covered bond market.

2. Data and methodology

The empirical analysis conducted for the purpose of this article comprises two stages. The first stage examines whether two events – namely, the decision of the President of France, Emmanuel Macron, on 11 June 2024 to dissolve the National

Assembly (event 1), and the downgrade of France's sovereign credit rating by the rating agency Standard & Poor's on 17 October 2025 (event 2) – can be regarded as structural breaks.

The second stage of the analysis investigates the relationships between differences in mid-YTM of covered bonds and government bonds in France and Germany across four sub-periods:

- the pre-event 1 sub-period, covering the period from 29 August 2023 to 11 July 2024 (sub-period 1);
- the post-event 1 sub-period, covering the period from 12 July 2024 to 21 March 2025 (sub-period 2);
- the pre-event 2 sub-period, covering the period from 8 January 2025 to 17 October 2025 (sub-period 3); and
- the post-event 2 sub-period, covering the period from 20 October 2025 to 12 February 2026 (sub-period 4).

While analyses of this type typically rely on event study methodology (Khan et al. 2023; Madane and Benjana 2025), this article adopts an alternative approach. Specifically, it examines changes in Granger causality between differences in mid-YTM of selected covered bonds and government bonds in France and Germany across the four sub-periods defined above.

The departure from the event study framework is motivated by the fact that event study methodology is based on the aggregation of abnormal returns, which are conventionally calculated for equities (Bacon and Cagigas 2022; Majid et al. 2024). For fixed-income instruments, such as covered bonds and government bonds, the YTM represents the primary return metric; however, its cumulative aggregation offers limited analytical value.

Changes in Granger causality are analysed using a vector autoregression model with p lags (Sims 1980; Granger 1980), denoted as $VAR(p)$, specified as follows:

$$\boldsymbol{Y}_t = \boldsymbol{c}_0 + \boldsymbol{\Pi}_1 \boldsymbol{Y}_{t-1} + \boldsymbol{\Pi}_2 \boldsymbol{Y}_{t-2} + \ldots + \boldsymbol{\Pi}_p \boldsymbol{Y}_{t-p} + \boldsymbol{\varepsilon}_t$$

where:

$\boldsymbol{Y}_t = (Y_{1,t}, \ldots, Y_{n,t})'$ denotes the vector of endogenous variables,

$\boldsymbol{c}_0$ is an $(n \times 1)$ vector of parameters,

$\boldsymbol{\Pi}_1$ to $\boldsymbol{\Pi}_p$ are $(n \times n)$ matrices of coefficients corresponding to vectors of $\boldsymbol{Y}_{t-1}$ through $\boldsymbol{Y}_{t-p}$,

$\boldsymbol{Y}_{t-p}$ is an $(n \times 1)$ vector of regressors with p lags,

$\boldsymbol{\varepsilon}_t$ represents an $(n \times 1)$ unobservable zero mean white noise vector of disturbances with a time-invariant covariance matrix $\sum$. This implies that: $E(\boldsymbol{\varepsilon}_t) = \boldsymbol{0}$, $E(\boldsymbol{\varepsilon}_t, \boldsymbol{\varepsilon}_t') = \sum$, $E(\boldsymbol{\varepsilon}_t, \boldsymbol{\varepsilon}_t') = \boldsymbol{0}\ \forall t \neq p$. Furthermore, it is assumed that $\boldsymbol{\varepsilon}_t \sim iid$.

The $VAR(p)$ model is estimated using input data in the form of the differences between mid-YTM of the following financial instruments:

- two issues of French covered bonds (ISIN: FR0013088432, FR0013102845) and a French government bond (ISIN: FR0013131877), maturing on 25 May 2026;
- two issues of German covered bonds (ISIN: DE000DFK0GN6, DE000DFK0GP1) and a German government bond (ISIN: DE0001102390), maturing on 15 February 2026.

Time series data for all financial instruments included in the study were obtained from the Bloomberg database. Prior to the empirical analysis, two main periods are defined: the first comprising sub-periods 1 and 2, and the second comprising sub-periods 3 and 4. Each sub-period includes 200 daily observations, except for sub-period 4, which has 81 observations due to the maturity of the German sovereign bond included in the analysis. All calculations were performed in STATA 19.

The first stage of the empirical analysis begins by testing whether events 1 and 2 constitute structural breaks. To this end, a Wald test for the presence of a structural break is conducted under the assumption that the structural break (i.e. the moment of change in the regression coefficients) is known and corresponds to the dates of events 1 and 2, respectively. The test is performed after first differencing of the time series in order to ensure their stationarity (the stationarity of the time series will be formally examined at a later stage of the analysis). The results are reported in Table 1.

Table 1. Wald test for structural change

	Event 1	Event 2
Number of observations	399	280
$Chi^2(2)$	5.7564	64.4924
Prob > chi2	0.0562*	0.0000***

* significant at $\alpha = 0.1$.
*** significant at $\alpha = 0.01$.

Source: Authors' own elaboration.

Based on the obtained results, the null hypothesis H_0, stating the absence of a structural break, can be rejected in both cases: at the significance level of $\alpha = 0.1$ for event 1 (with rejection in fact occurring at a lower level of approximately $\alpha = 0.06$) and at $\alpha = 0.01$ for event 2.

In the subsequent stage of the empirical analysis, statistical tests are conducted to examine the relationships between the risk premium on covered bonds relative to government bonds in France and Germany across four sub-periods. The procedure adopted is multi-stage and begins with testing the stationarity of the time series separately for each sub-period. For this purpose, the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests are employed. It is important to note that the stationarity of the time series plays a key role in the proposed methodology because, within the $VAR(p)$ framework, all variables should be integrated of order one, i.e. $I(1)$. When this condition is satisfied, the $VAR(p)$ model can yield meaningful results and forecasts (Dickey and Fuller 1979; Phillips and Perron 1988). The null hypothesis formulated at this stage of the research is that the variables contain unit roots, whereas the alternative hypothesis states that the time series are generated by stationary processes. The obtained results are presented in Table 2.

Table 2. Unit root tests of the variables

Sub-period		ADF test		PP test	
		At level	At 1st difference	At level	At 1st difference
1	YTM spread in France	-2.725	-14.775***	-2.407	-14.792***
	YTM spread in Germany	-2.407	-14.785***	-2.424	-14.789***
2	YTM spread in France	-1.405	-12.561***	-1.615	-12.611***
	YTM spread in Germany	-2.022	-13.198***	-2.325	-13.277***
3	YTM spread in France	-2.331	-12.193***	-2.704	-12.182***
	YTM spread in Germany	-1.629	-13.230***	-1.753	-13.238***
4	YTM spread in France	-1.892	-6.780***	-2.100	-6.837***
	YTM spread in Germany	-1.549	-9.841***	-1.418	-9.908***

*** significant at $\alpha = 0.01$.

Source: Authors' own elaboration.

On the basis of the results reported in Table 2, it can be concluded that the analysed time series are non-stationary at levels but become stationary after first differencing. Having established stationarity of the time series, the optimal lag length can be determined. For this purpose, two criteria are employed, namely the Final Prediction Error (FPE) and the Akaike Information Criterion (AIC). The results are presented in Table 3.

Table 3. Optimal lag length selection

Sub-period	Lag	FPE	AIC
1	7	5.6e-07	-8.7135
2	9	1.4e-06	-7.7924
3	1	9.5e-07	-8.1909
4	1	5.4e-07	-8.7482

Source: Authors' own elaboration.

According to the adopted procedure, the existence of long-term relationships between the variables is examined before testing for Granger causality. To this end, the Johansen test was applied. This test is based on the maximum likelihood method and provides two statistics: the trace statistic and the maximum eigenvalue statistic. The null hypothesis in the trace test states that there are no more than *r* cointegrating relationships. The alternative hypothesis states that the number of cointegrating relationships exceeds *r*. For the maximum eigenvalue test, the null hypothesis states that the number of cointegrating relationships is exactly *r*, whereas the alternative hypothesis states that it exceeds *r* by one. As cointegration analysis requires non-stationary variables, the input data are used in their original (untransformed) form rather than at first differences. The results are reported in Table 4.

Table 4. Johansen test for cointegration

	Sub-period 1	Sub-period 2	Sub-period 3	Sub-period 4	
Maximum Rank	Trace statistics	Trace statistics	Trace statistics	Trace statistics	Critical value (5%)
0	7.5444	8.2802	11.7585	7.9187	15.41
1	3.3076	0.2725	2.3180	2.5569	3.76
Maximum Rank	Maximum Statistics	Maximum Statistics	Maximum Statistics	Maximum Statistics	Critical value (5%)
0	4.2367	8.0077	9.4404	5.3618	14.07
1	3.3076	0.2725	2.3180	2.5569	3.76

Source: Authors' own elaboration.

The results in Table 4 indicate that, at rank 0, neither the trace nor the maximum eigenvalue statistic exceeds the corresponding critical values. Therefore, the null hypothesis of no cointegration cannot be rejected, suggesting the absence of cointegrating relationships between the spreads, i.e. differences in mid-YTM, of covered bonds and government bonds in France and Germany.

Finally, a Granger causality test was performed. It is worth noting that one variable is said to Granger-cause the second variable if past values of the second variable improves the prediction of the first one, i.e. reduces the forecast error variance. Thus, the Granger causality test allows to assess whether one variable contains useful information for forecasting another. The results of the Granger causality tests are presented in Table 5.

Table 5. The Granger causality tests

	Equation	Excluded	Chi sq.	df	p-value
Sub-period 1	d.YTM.spread.fr	d.YTM.spread.de	24.467	7	0.001
	d.YTM.spread.fr	All	24.467	7	0.001
	d.YTM.spread.de	d.YTM.spread.fr	20.311	7	0.005
	d.YTM.spread.de	All	20.311	7	0.005
Sub-period 2	d.YTM.spread.fr	d.YTM.spread.de	14.652	9	0.101
	d.YTM.spread.fr	All	14.652	9	0.101
	d.YTM.spread.de	d.YTM.spread.fr	26.134	9	0.002
	d.YTM.spread.de	All	26.134	9	0.002
Sub-period 3	d.YTM.spread.fr	d.YTM.spread.de	0.4604	1	0.497
	d.YTM.spread.fr	All	0.4604	1	0.497
	d.YTM.spread.de	d.YTM.spread.fr	0.7749	1	0.379
	d.YTM.spread.de	All	0.7749	1	0.379
Sub-period 4	d.YTM.spread.fr	d.YTM.spread.de	0.0476	1	0.827
	d.YTM.spread.fr	All	0.0476	1	0.827
	d.YTM.spread.de	d.YTM.spread.fr	2.0099	1	0.156
	d.YTM.spread.de	All	2.0099	1	0.156

Source: Authors' own elaboration.

Based on the data presented in Table 5, three conclusions can be drawn with respect to the analysed sub-periods. In the first sub-period, a bidirectional relationship is observed between the differences in mid-YTM of covered bonds and government bonds in France and Germany. This implies that differences in mid-YTM spreads of debt securities in France Granger-cause differences in mid-YTM spreads of corresponding financial instruments in Germany, and vice versa. It should be noted that the variables denoted as d.YTM.spread.fr and d.YTM.spread.de represent the mid-YTM spreads between the analysed financial instruments.

In the second sub-period, this relationship changes: differences in mid-YTM spreads of debt securities in France Granger-cause the corresponding spreads in Germany, whereas the reverse relationship is no longer observed.

By contrast, the third and fourth sub-periods do not provide robust evidence of Granger causality between the variables analysed. It should be noted, however, that the fourth sub-period is based on a much smaller number of observations. Despite this limitation, the pattern of causality identified appears more similar to that observed in the first sub-period. Moreover, at a significance level of around 16%, the null hypothesis of no Granger causality between the mid-YTM of covered bonds and government bonds in France and Germany may still be rejected.

Taken together, these findings suggest that events 1 and 2 – although the latter is associated with a lower level of statistical significance – played an important role in distinguishing periods characterised by different patterns of Granger causality between covered bond and government bond spreads in France and Germany.

Summary

The empirical analysis presented in this study yields several important conclusions regarding the integration of the French and German debt markets. First, the Wald test results indicate that both the dissolution of the National Assembly by the President of France, Emmanuel Macron and the downgrade of France's sovereign credit rating by Standard & Poor's constituted structural breaks, leading to changes in the underlying relationships between yield spreads.

The second stage of the analysis reveals evolving patterns of Granger causality. In the initial period, a bidirectional relationship is observed, indicating mutual influence between French and German mid-YTM spreads. However, following the dissolution of the French National Assembly, this relationship becomes unidirectional, with developments in the French market influencing those in Germany. In the subsequent periods after the rating downgrade of French government bonds, the evidence of causality weakens, although some results suggest that the influence of the French debt market on German debt market may still persist over the longer term.

In summary, the findings show that major political and fiscal events can substantially reshape the transmission mechanisms linking sovereign and covered bond markets in France and Germany. The findings also highlight the importance of political stability and sovereign credit quality as key determinants of liquidity and pricing dynamics in euro area financial markets.

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