Credit and Capital Markets, 57 (2024) 1 – 4: 31 – 47
https://doi.org/10.3790/ccm.2025.1457101
Scientific Papers

The Perception of Brexit Uncertainty and How it Affects Markets

Christopher Priberny*, Christian Kreuzer**, and Johannes Huther***

Abstract

We empirically study the perception of political uncertainty by UK's stock markets, covering the entire Brexit period from January 2013 to March 2020. We find that indices dominated by the largest capitalized companies anticipate negatively perceived events already prior to the actual event, whereas positive events only effect them on the event day or following. In contrast, the FTSE 250, composed of medium-sized companies, tends to move prior to positively perceived events. Furthermore, we investigate the daily perception of Brexit measured by a metric based on Google Trends. Our results show that perception significantly affects all major UK indices.

Keywords: Brexit, event study, perception, Google Trends, GJR-GARCH, United Kingdom

JEL Classification: G14, G11, G39, H87

I. Introduction

The Brexit vote and the resulting decision of the United Kingdom to withdraw from the European Union is unique in terms of various issues. The possible future effects in terms of trade barriers and tariffs, free trade agreements, freedom

* Prof. Dr. Christopher Priberny: Corresponding author, Deutsche Bundesbank University of Applied Sciences, 57627 Hachenburg, Germany and Department of Finance, University of Regensburg, 93040 Regensburg, Germany.
E-Mail: christopher.priberny@ur.de.

** Dr. Christian Kreuzer: Department of Finance, University of Regensburg, 93040 Regensburg, Germany.
E-Mail: christian.kreuzer@ur.de.

*** Johannes Huther: Deutsche Bundesbank, 60006 Frankfurt am Main, Germany.
E-Mail: johannes.huther@bundesbank.de.

The contributions to this study represent the authors' personal opinions and do not necessarily reflect the views of Deutsche Bundesbank.

Acknowledgement:
We are grateful to an anonymous referee and the participants of the World Finance Conference 2022 for helpful comments and valuable suggestions.

Duncker & Humblot · Berlin

of movement, and economic decoupling could hardly be assessed in the stormy political period after the referendum on June 23rd, 2016. Uncertainties resulting from the surprising outcome of the Brexit referendum were also reflected in the global financial markets. As a first reaction, many international stock markets suffered significant losses on the following day. *Brühl* (2018) highlights the role of London in clearing euro-denominated OTC derivatives and implications after Brexit. However, there are indeed many more events related to this period of political distress that are closely related to Brexit and have caused significant reactions on the stock market.

In this study, we examine the impact of major political events in the context of Brexit on financial markets. For a holistic financial view, we cover the entire Brexit period from January 2013 to March 2020 and analyze positively or negatively perceived events separately. Furthermore, we show how the daily perception of political uncertainty, proxied by a metric based on Google Trends affects UK stock indices.

We contribute to a literature strand that deals with stock market reactions of various Brexit events (*Breinlich* et al., 2018; *Hudson* et al. 2020; *Ramiah* et al. 2017; *Shahzad* et al. 2019). As a matter of fact, early studies (*Breinlich* et al. 2018; *Ramiah* et al. 2017; *Shahzad* et al. 2019) comprise only the outcome of the Brexit referendum and some close events and only show a limited picture of the whole Brexit process.

To our best knowledge, we are the first to investigate Brexit-related events in the entire time frame between January 2013 and March 2020. Furthermore, we extend previous studies by considering the timing of market reactions, avoiding overlapping event windows and heeding whether an event is perceived as positive or negative by the market. In particular, we analyze certain Brexit events by using a GJR-GARCH Model. We find differences in the impact of various Brexit events depending on both whether they are perceived as positive or negative on the financial market as well as on the companies' size. In the case of positively perceived events, we find — in particular for indices dominated by larger sized companies — significant influences from the event day and the following ones. In contrast, significant influences can already be identified in the preceding days of negatively perceived events. Additionally, we consider the whole process of Brexit as a phase of uncertainty. Therefore, we measure the public sentiment of political uncertainty by an innovative measure based on Google Trends data. We find, the daily sentiment has a significant effect on stock returns.

The rest of the article is organized as follows: In Section II we present relevant literature and develop hypotheses. In Section III we address data sources as well as methodological approaches. The results are presented in Section IV. Section V concludes this work.

II. Literature & Hypotheses

Concerning the existing academic literature, one field deals with general economic consequences of Brexit (*Born* et al. 2019; *Hosoe* 2018; *Jackson/Shepotylo* 2018; *Steinberg* 2019). Furthermore, there are studies focusing on the economic performance measured by the gross domestic product (GDP) (*Born* et al. 2019; *Hosoe* 2018) as well as there is a literature strand addressing implications on welfare (*Jackson/Shepotylo* 2018; *Steinberg* 2019).

Another strand of literature investigates the impacts on the volatility of stock and exchange markets (*Adesina* 2017; *Belke* et al. 2018; *Qiao* et al. 2021). In this regard, *Belke* et al. (2018) assess interactions of the UK's political uncertainty on the economy and the volatility on financial markets, while *Adesina* (2017) investigates the effect of the Brexit vote on the persistence of volatility. Moreover, *Belke* et al. (2018) show that political uncertainty will on the one hand continue to cause instability in key financial markets and on the other hand has the potential to damage the economy not only in the UK but also in European countries. *Adesina* (2017) indicates a significant increase in volatility persistence for stock markets, but a decrease of volatility persistence in foreign exchange markets. *Qiao* et al. (2021) investigate the impact on the US stock market and show increased volatility of S&P 500 returns even before Brexit.

Besides, some authors analyze the impact of economic policy uncertainty (*Armelius* et al. 2017; *Ko/Lee* 2015; *Nilavongse* et al. 2020; *Phan* et al. 2019; *Yung/Root* 2019) on the economy and stock markets. In particular, *Nilavongse* et al. (2020) evaluate implications of economic policy uncertainty shocks on the UK economy and find that Brexit uncertainty caused a massive depreciation of the British pound. Moreover, *Braun/Zenker* (2022) discuss the relations between the trust in EU and UK government and perceived uncertainty and identify strong country differences for soft and hard Brexit scenarios.

Few authors examine the relational dynamics and cross-correlation between the UK and European markets before and after the Brexit referendum (*Bashir* et al. 2019; *Guedes* et al. 2019). In detail, *Bashir* et al. (2019) conclude that after the Brexit referendum most EU financial markets tend to show a negative correlation with the UK market in the long term, whereas *Guedes* et al. (2019) show a decrease in cross-correlation. Besides, *Ayadi* (2021) investigates the transmission of shocks caused by the Brexit across international equity markets to detect contagion effects.

Another literature strand deals with stock market reactions of various Brexit events. Most of these studies focus on the UK market (*Breinlich* et al. 2018; *Hudson* et al. 2020; *Ramiah* et al. 2017; *Shahzad* et al. 2019). In particular, *Ramiah* et al. (2017) examine how the outcome of the Brexit referendum affects UK industry sectors and find a negative impact on the banking, travel, and leisure in-

dustry. However, as an early study it is limited to the Brexit vote itself and therefore to a rather small time window from June to July 2016. Furthermore, *Breinlich* et al. (2018) analyze reactions of stocks to three events around the referendum on EU membership. They show that initial stock movements are driven by fear of economic recession and sterling depreciation following the referendum as well as of potential changes to the UK-EU trade relations. *Shahzad* et al. (2019) investigate a chain of pre- and post-Brexit referendum events. They find not only an initially negative market reaction attributed to the Brexit referendum, but also positive reactions to post-Brexit referendum events up to March 2017 as future economic relations of the United Kingdom with EU began to take a shape.

Hudson et al. (2020) analyze the impact of Brexit events on 34 British financial (sub-)indices in the mid of the whole Brexit phase until April 2017, applying a GJR-GARCH framework. They conclude that, depending on the business sector, new information regarding Brexit is quickly incorporated into market prices and could be widely explained by rational asset pricing models. However, they do not distinguish between positively and negatively perceived events, which might have resulted in many of their event coefficients being erroneously insignificant. Moreover, they use event windows of five days before and after each event, which results in overlapping time windows with regard to their event dataset and may cause some bias.

While academic literature investigating political uncertainty is well studied (*Julio/Yook* 2012; *Kelly* et al. 2016; *Li* et al. 2022; *Obenpong Kwabi* et al. 2024; *Pástor/Veronesi* 2013), literature focusing on political uncertainty resulting from the Brexit Referendum is quite evolving. *Manasse* et al. (2024) investigate potential linkage of political risk on British pound exchange rates and find that the probability of Brexit predicts a depreciation of the pound and also that political risk is linked to exchange rates. *Cucinelli* et al. (2020) perform an event study solely on three Brexit events and find, that investors only price the days before the referendum as an event of political uncertainty. *Hill* et al. (2019) analyze the cross-sectional determinants of UK firms' exposure to the Brexit event and find that internationalization moderates potential Brexit exposure.

When eyeing on the history of the whole phase of Brexit, you can identify events, that have caused a higher level of political uncertainty, as well as events showing a relief of political tensions. In line with early studies (*Breinlich* et al. 2018; *Ramiah* et al. 2017), we expect events, that caused increased political uncertainty to have a negative effect on stock markets. The effect is economically sound, as many companies in the UK show close relations with the EU and uncertainty about the future legal framework of those bonds have severe effects on their business models.

Hypothesis 1: Political uncertainty has a negative influence on stock market returns.

Following that implication, we also expect differences regarding the size of the companies. Largely capitalized companies are usually internationally oriented and often operate in a network of branches located in different countries. One can assume, that those players might have developed alternative plans on how to react when the final political decision about a specific form of Brexit is made. This might not hold for smaller and medium sized firms, as the setup cost for assuring excess to the European market even in the case of a hard Brexit are rather high. Therefore, we expect stock returns of medium sized companies to act more anxiously on news, that increase political uncertainty.

Hypothesis 2: Medium sized firms are affected earlier by political uncertainty in the context of Brexit then other companies.

However, the period following the Brexit referendum might also be seen as a whole phase of political uncertainty by the market, rather than being driven by specific events. Therefore we expect the daily public sentiment regarding political uncertainty[1], whether it is positive or negative, to affect stock returns.

Hypothesis 3: The market sentiment regarding political uncertainty has an impact on stock returns.

III. Data & Methodology

1. Data

For our analyses we use a unique dataset retrieved from three different data sources.

a) Events

Similarly to *Hudson* et al. (2020), the starting point for our thorough selection of events is about one year before Prime Minister David Cameron promised the EU referendum in case of his reelection. However, we use a larger time frame covering all relevant Brexit events from January 2013 (David Cameron advocates for a referendum) until the United Kingdom finally left the European Union on 31 January 2020. Furthermore, we neglect some events compared to *Hudson* et al. (2020) in order to avoid overlapping event windows.

[1] Proxied by a Google trends metric.

We identify appropriate events in accordance with five principles:

(1) Widespread mass media coverage of the respective event is necessary. As a suitable proxy we use peaks in Google Trends regarding the keywords[2] 'Exit' and 'Brexit'.

(2) The coverage needs to have a sufficient impact on the emotions of a large part of the population.

(3) It is sufficient that the emotional impacts on the population do not have different directions and thus offset each other but correlate across the majority of the population and are likely to affect market sentiment as well as asset prices.

(4) If news of an event are published on a non-trading day or after time of closing, the following trading day is considered as the event day.

(5) We select the main event and drop the secondary event whenever two events are closely together, in order to avoid overlapping event windows.

As a result, we identify 33 Brexit-related events from January 2013 to March 2020, presented in Table 5 in the Appendix.

b) Market returns

Our second dataset consists of daily log returns (r_t), covering the indices FTSE 350, FTSE 100, as well as FTSE 250 and FTSE All-Share. All log returns were derived from daily performance indices retrieved from LSEG Datastream (www.lseg.com, formerly Refinitiv), covering the period between January 2012[3] and February 2020.

c) Google Trends

The last source are Google Trends data (www.google.com). However, obtaining and using Google Trends data is not straightforward. Google limits the frequency of Trends data available for individual download according to the period of interest. This means short periods like a month provide daily measures whereas longer periods only provide data on a monthly basis. Note that Google Trends data is indexed separately in each time period for which the data is downloaded. E.g. if January 2020 is selected, we receive 31 daily scores ranging from 100 to 0, whereas the day with the most Google searches regarding the re-

[2] The term 'Brexit' became a common phrase in Feb 2016. Therefore, we apply 'Exit' as keyword until Jan 2017 and 'Brexit' since Feb 2016. In the overlapping window we use the mean of both Google trend series.

[3] The additional log returns covering the year 2012 are necessary for calibrating the model.

spective keyword is allocated the value 100. In order to derive a comparable daily metric for the whole period under consideration, we collect Google Trends data in the United Kingdom first on a monthly basis for the entire period under consideration and then daily data using a rolling time window for each month of the period under consideration. Next, we calculate a comparable daily metric GT_t in the following way:

$$GT_t = \frac{GT_t^{daily}}{GT_t^{mon}} \cdot \frac{1}{10{,}000}$$

where GT_t^{daily} notes the daily Google Trends value on a monthly basis and GT_t^{mon} the referring monthly value over the entire period. For better readability, we divide the resulting measure by 10,000. The descriptive statistics of market returns and Google Trends are shown in Table 1. A comparison of Google Trends data and Brexit events is presented in Figure 1 (see Appendix). It shows that all selected events are in line with spikes in the Google Trends data.

Table 1

Descriptive statistics

	N	Mean	SD	Min	Median	Max
FTSE 350	2,094	0.0003	0.0081	–0.0464	0.0005	0.0346
FTSE 100	2,094	0.0003	0.0083	–0.0478	0.0005	0.0352
FTSE 250	2,094	0.0005	0.0081	–0.0746	0.0007	0.0410
FTSE All-Share	2,094	0.0003	0.0079	–0.0463	0.0005	0.0341
Google Trends	2,094	0.1039	0.0873	0.0010	0.0885	1.0000

Notes: This table presents the mean, standard deviation, minimum, and maximum values of our dataset. Our sample ranges from January 2012 to February 2020.

2. Methodology

a) Brexit events

The application of classical event study methodology in the spirit of *Fama* et al. (1969), which focuses on the calculation of cumulative abnormal returns, is not appropriate for our setting. The reason is that while we focus on market returns there is no suitable benchmark that is not influenced by the Brexit events themselves. Hence we utilize the approach introduced by *Sun/Tong* (2010) and *Glosten* et al. (1993) to apply a GJR-GARCH model (see also *Hudson* et al. 2020; *Priberny* 2023). The GJR-GARCH model is suitable for our setting, as it allows error terms to deviate in an asymmetric way around events and therefore con-

trols for heteroscedasticity inherent in periods of stress and relief on the markets.

In particular, we apply the following framework:

$$r_t = \alpha_0 + \sum_{k=1}^{5} \alpha_{1,k} r_{t-k} + \sum_{k=-3}^{3} (\alpha_{2,k} E_{t+k}) + \vec{\alpha} \cdot C_t + \varepsilon_t$$

$$h_t = \beta_0 + \beta_1 h_{t-1} + \beta_2 \varepsilon_{t-1}^2 + \sum_{k=-3}^{3} \beta_{3,k} E_{t+k} + \beta_4 \varepsilon_{t-1}^2 I_{t-1}.$$

In this model, the logarithmic return for the market index on day t is represented by r_t while r_{t-k} comprises the k'th previous daily market return, which controls for auto-correlation. By analyzing ACF plots and tests we identify 5 lags as suitable for our setting. C_t represents a vector of controls (see Table 2 for details). E_{t+k} denotes dummy variables addressing a window ± 3 days around event days. Therefore, on event day $E_t = 1$, and consequently 0 otherwise. Furthermore, ε_t describes the residual for asset i at time t. In the second equation, h_t represents the conditional variance of ε_t as a proxy for market risk. I_{t-1} denotes another dummy variable and equals 1, if $\varepsilon_{t-1} < 0$, and 0 otherwise. However, if there exists an event day return effect, the regression coefficient $\alpha_{2,0}$ will be statistically significant.

b) Daily Sentiment

As addressed by Hypothesis 3, the whole period following the Brexit referendum might be seen as a phase of uncertainty by the market. Thus, we present additional analyses that are not limited to specific events. Therefore, we examine how the markets react to the public interest in Brexit, measured by Google Trends. In doing so, we are the first to examine the effect of Google Trends values on Brexit events, using a comparable daily metric.

For this purpose, we adjusted the GJR-GARCH model in the following way:

$$r_t = \alpha_0 + \sum_{k=1}^{5} \alpha_{1,k} r_{t-k} + \alpha_2 \hat{\delta}_t T_t + \vec{\alpha} \cdot C_t + \varepsilon_t$$

$$h_t = \beta_0 + \beta_1 h_{t-1} + \beta_2 \varepsilon_{t-1}^2 + \beta_4 \varepsilon_{t-1}^2 I_{t-1}$$

where T_t is the Google Trends value variable and $\hat{\delta}_t$ is a sign function which returns the sign of the market return on day t. Note that the integration of this factor is necessary to differentiate between days with mostly positive or negative information. However, we are thus restricted to analyzing the magnitude of the perception, as we can no longer investigate its direction.

Table 2

Description of control variables

Variable	Description
Turn-of-Year (Dummy)	Dummy variable. Takes value 1 for the first two weeks in January, 0 otherwise.
Monday (Dummy)	Dummy variable. Takes value 1 on Mondays, 0 otherwise.
Turn-of-Month (Dummy)	Dummy variable. Takes value 1 for the last trading day of the month and the first three trading days of the following month, 0 otherwise.

IV. Results

1. Positively and negatively perceived events

The results of the GJR-GARCH(1,1) model are presented in Table 3. For more accuracy, we distinguish between positively and negatively perceived events. Therefore, we identify an event as negative if the rolling sum of market returns r_t regarding the respective event window (three days prior and after[4]) around event E_t is negative, and as positive otherwise. Moreover, the resulting subsamples are suitable for the examination of Hypothesis 1.

When considering the event day, we find significant coefficients with the expected results for nearly all perceptions and indices. Obviously, the results also show that the asset return dynamics of positively and negatively perceived events often show opposing signs. In particular, the broad index FTSE All-Share shows an abnormal negative return on event day of 36 bp equaling 90.7 %[5] on an annual basis. The effect is even more apparent for the cumulative abnormal return of the event and the day before, which is −92 bp. In contrast, the abnormal return for positive perceived events equals 45 bp or 113.4 % annually. Thus, the results are in favor of Hypothesis 1. Furthermore, our results indicate that positive perceived events have on the contrary a positive influence on stock market returns, which is an even stronger support for Hypothesis 1.

[4] As a robustness consideration, we have also used other time windows. The findings are essentially in line with these results. However, it should be noted that many events happen in quick succession and therefore larger time windows lead to overlapping event windows, which must be taken into account when interpreting the results.

[5] $0.907 = 0.0036 \cdot 252$.

Table 3

Result of Brexit events

	FTSE 350		FTSE 100		FTSE 250		FTSE All-Share	
Variables	pos. event	neg. event	pos. event	neg. event	pos. event	neg. event	pos. event	neg. event
event −3d	0.0004	−0.0012	0.0007	−0.0001	0.0007	−0.0031 **	0.0005	−0.0012
event −2d	0.0014	0.0022 ***	0.0013	0.0025	0.0028 ***	−0.0017	0.0015	0.0021 ***
event −1d	0.0007	−0.0058 ***	0.0009	−0.0064 **	−0.0008 *	−0.0041	0.0007	−0.0056 **
event day	0.0045 **	−0.0037 ***	0.0034 *	−0.0023	0.0059 **	−0.0053	0.0045 ***	−0.0036 ***
event +1d	0.0033	−0.0015	0.0033	−0.0015	0.0026	−0.0015	0.0033	−0.0015
event +2d	0.0024 **	−0.0037 ***	0.0041 **	−0.0054 ***	−0.0000	−0.0017	0.0024	−0.0036 ***
event +3d	0.0021 **	−0.0028 *	0.0026 *	−0.0030	0.0019	−0.0006	0.0021 **	−0.0028 ***
Controls								
Monday (Dummy)	−0.0005	−0.0005	−0.0004	−0.0004	−0.0009 ***	−0.0009 **	−0.0005	−0.0005
Turn-of-Month (Dummy)	0.0007	0.0005	0.0007	0.0004	0.0012 **	0.0009 *	0.0008	0.0005
Turn-of-Year (Dummy)	0.0008	0.0006	0.0008	0.0006	0.0007	0.0008	0.0008 *	0.0006
GJR-GARCH-parameters								
r_{t-1}	0.0047	0.0032	−0.0072	−0.0061	0.0560 **	0.0461 *	0.0081	0.0068
r_{t-2}	−0.0210	−0.0222	−0.0152	−0.0119	−0.0344	−0.0395	−0.0195	−0.0205
r_{t-3}	0.0143	0.0178	0.0141	0.0189	0.0122	0.0125	0.0145	0.0182
r_{t-4}	−0.0415 *	−0.0422	−0.0372 *	−0.0366 *	−0.0566 **	−0.0623 **	−0.0405	−0.0409
r_{t-5}	−0.0344	−0.0365	−0.0324	−0.0353	−0.0408 *	−0.0447 *	−0.0345	−0.0363 *
intercept (α_0)	0.0001	0.0004 ***	0.0001	0.0004	0.0003 **	0.0006 ***	0.0001	0.0004 **
variance intercept (β_0)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***

Note: Results of the GJR-GARCH(1,1) model. Pos. event denotes the sample of positively perceived Brexit events, whereas neg. event denotes the sample of negatively perceived Brexit events. All variables as in Table 2. ***, **, * indicate a significance level of 1%, 5%, and 10% respectively.

Note, that not distinguishing between both subsamples has distorting effects and might explain why *Hudson* et al. (2020) can hardly find any significant results regarding the event days. Regarding the size of the companies, we find interesting differences. There are no significant effects observable on the event day for negative events in the FTSE 100 and for positive events in the 250 medium-sized companies of the FTSE. This is the first indication of major differences between indices dominated by the 100 larger companies (FTSE 100, FTSE 350, and FTSE All-Share) and the medium capitalized companies of the FTSE 250 index.

Our results reveal that the companies of the FTSE 250 anticipate the impact of positive events earlier, as indicated by the significant event –2d dummy followed by a significant correction on the following day. However, the cumulative return of the three days (event and the two previous days) equals 79 bp. This is also true with regard to the negatively perceived events for which the dummy event –3d shows the only significant coefficient. One reason for this observation might be obvious: Since the risk and the volatility of smaller and medium-sized companies are higher than that of companies with high market capitalization, investors seem to react already before the event days. The increased risk might be driven e. g. by setup costs in EU countries or uncertainty about future trade barriers. Thus, we can support Hypothesis 2.

In contrast, FTSE 100, FTSE 350, and FTSE All-Share show additional movements two or three days after positive events (all show significantly positive returns). A possible explanation may be that larger companies are more dependent on the relationship between the UK and the EU than medium-sized companies and therefore stronger reactions on the stock market can be observed after the event day as soon as further impacts are discernible and future economic UK-EU relations begin to take shape, as discussed by *Shahzad* et al. (2019). Furthermore, these companies tend also to anticipate the outcome of negative events, as indicated by the significant coefficients prior to the event.

Overall, our results show, that there are differences in the way stock markets incorporate information from positively and negatively perceived events. While the effects of positively perceived events on the asset returns are mostly (with exception of FTSE 250) recognizable on and after the event day, the effects of negatively perceived events are already recognizable before the event day as well as after the event day. Furthermore, the results indicate an increase of significant coefficients in the event window of negatively perceived events. One possible explanation could be that negatively perceived events are also associated with additional uncertainty, which in turn unsettles not only companies but also investors in stock markets. Thus, cautious investors tend to react already before these events, which leads to increased return dynamics before the event day as well as after the event day, once investors might better assess the event's impact.

These findings are in line with *Breinlich* et al. (2018) who show that initial stock movements to Brexit are driven by fear and potential changes in UK-EU trade relations. The market risk coefficient around the event day ($ß_3$) shows a highly significant value in all observed indices, indicating a higher risk premium and providing further supporting evidence.

2. Market reactions on public sentiment measured by Google Trends

For analyzing Hypothesis 3 we perform additional GJR regressions including the variable Google Trends to proxy the daily sentiment regarding political uncertainty as described in Section III.2. The results of these regressions are summarized in Table 4. We find highly significant values regarding all observed markets. Therefore, the results indicate a strong relationship between our daily Google Trends metric and the respective asset returns. To put these findings in a nutshell: the higher the Google Trends value (positive or negative) and thus public attention, the stronger the asset return dynamics. All in all, we detect supporting evidence in favor of Hypothesis 3.

Table 4

Results of public interest proxied by Google Trends

	FTSE 350	**FTSE 100**	**FTSE 250**	**FTSE All-Share**
Google Trends	0.0417 ***	0.0430 ***	0.0426 ***	0.0410 ***
Controls				
Monday (Dummy)	–0.0003	–0.0002	–0.0008 ***	–0.0003
Turn-of-Month (Dummy)	0.0006	0.0006	0.0014 ***	0.0006
Turn-of-Year (Dummy)	0.0007	0.0006	0.0006	0.0007
GJR-GARCH-parameters				
r_{t-1}	–0.0035	–0.0153	0.0385	–0.0020
r_{t-2}	–0.0230	–0.0286	–0.0091	–0.0292
r_{t-3}	0.0228	0.0244	0.0272	0.0213
r_{t-4}	–0.0417 *	–0.0410 *	–0.0803 ***	–0.0329
r_{t-5}	–0.0117	–0.0274	–0.0329	–0.0121
Intercept (α_0)	–0.0002 *	–0.0002	0.0000	–0.0002
variance intercept (β_0)	0.0000 ***	0.0000 ***	0.0000 ***	0.0000 ***

Note: Results of the GJR-GARCH(1,1) model. All variables as in Table 2. ***, **, * indicate a significance level of 1 %, 5 %, and 10 % respectively.

V. Conclusion

In this paper, we are the first to examine the impact of various positively and negatively perceived Brexit events on the UK stock markets during the whole phase of Brexit. Our analyses based on a GJR-GARCH(1,1) model show significant asset return dynamics on event days as well as prior and after the event day.

In particular, stock markets incorporate information from positively and negatively perceived events differently, also depending on the market capitalization of companies. Concerning larger-sized companies, the effects of positive events are mostly measurable on and after the event day, while effects of negative events are by and large even recognizable in the days before and after the event day. Members of the FTSE 250 show significant returns prior to positive events. We primarily attribute these findings to an increase in uncertainty and fear regarding changes in UK-EU trade relations. For a thorough understanding, we analyze the daily magnitude of the perception during the whole period of uncertainty, proxied by Google Trends rather than by specific events. We observe that the perception of political uncertainty during the phase of Brexit has a significant influence on market returns for all major UK indices. Our findings highlight the significant and tremendous impact of Brexit and the subsequent period of political instability on various UK markets. However, the results also suggest that political actions signaling relief and the potential for future stability can positively influence markets. This underscores the critical role of political stability in fostering stock market growth and economic development. Moreover, these insights are crucial for firms planning financing or investment decisions during major political distress, which may raise capital costs. Furthermore, the findings provide valuable considerations for investors making portfolio decisions in politically uncertain times.

In summary, this paper contributes to a deeper perspective on the issue of how political uncertainty during the whole phase of Brexit affects the UK's financial markets. These insights might be helpful for both private companies and investors, as well as policy makers. The implemented approaches and ideas might extend existing event study methodologies, revealing promising potential for further research.

References

Adesina, T. (2017): Estimating volatility persistence under a brexit-vote structural break. Finance Research Letters 23, 65 – 68.

Armelius, H./*Hull*, I./*Köhler*, H. S. (2017): The timing of uncertainty shocks in a small open economy. Economics Letters 155, 31 – 34.

Ayadi, A. (2021) Brexit: equity market contagion and transmission channels. Applied Economics 54(34), 3933 – 3952.

Bashir, U./*Zebende*, G. F./*Yu*, Y./*Hussain*, M./*Ali*, A./*Abbas*, G. (2019): Differential market reactions to pre and post brexit referendum. Physica A: Statistical Mechanics and its Applications 515, 151 – 158.

Belke, A./*Dubova*, I./*Osowski*, T. (2018): Policy uncertainty and international financial markets: the case of brexit. Applied Economics 50, 3752 – 3770.

Born, B./*Müller*, G. J./*Schularick*, M./*Sedláček*, P. (2019): The costs of economic nationalism: Evidence from the brexit experiment. The Economic Journal 129, 2722 – 2744.

Braun, E./*Zenker*, S. (2022): In governments we trust: A two-country brexit field experiment on perceived uncertainty as mediator for consumer decisions. Journal of Business Research 138, 335 – 346.

Breinlich, H./*Leromain*, E./*Novy*, D./*Sampson*, T./*Usman*, A. (2018): The economic effects of brexit: Evidence from the stock market. Fiscal Studies 39, 581 – 623.

Brühl, V. (2018): The clearing of euro otc derivatives post brexit – why a uniform regulation and supervision of ccps is essential for european financial stability. Credit and Capital Markets 51, 345 – 365.

Cucinelli, D./*Farina*, V./*Schwizer*, P./*Soana*, M. G. (2020): Better the devil you know: The impact of brexit political uncertainty on european financial markets. International Journal of Business and Management 15, 62 – 83.

Fama, E. F./*Fisher*, L./*Jensen*, M./*Roll*, R. (1969): The adjustment of stock prices to new information. International Economic Review 10.

Glosten, L. R./*Jagannathan*, R./*Runkle*, D. E. (1993): On the relation between the expected value and the volatility of the nominal excess return on stocks. The Journal of Finance 48, 1779 – 1801.

Guedes, E. F./*Ferreira*, P./*Dionı´sio*, A./*Zebende*, G. F. (2019): An econophysics approach to study the effect of brexit referendum on european union stock markets. *Physica A:* Statistical Mechanics and its Applications 523, 1175 – 1182.

Hill, P./*Korczak*, A./*Korczak*, P. (2019): Political uncertainty exposure of individual companies: The case of the brexit referendum. Journal of Banking & Finance 100, 58 – 76.

Hosoe, N. (2018). Impact of border barriers, returning migrants, and trade diversion in brexit: Firm exit and loss of variety. Economic Modelling 69, 193 – 204.

Hudson, R./*Urquhart*, A./*Zhang*, H. (2020): Political uncertainty and sentiment: Evidence from the impact of brexit on financial markets. European Economic Review 129, 1 – 4.

Jackson, K./*Shepotylo*, O. (2018): Post-brexit trade survival: Looking beyond the european union. Economic Modelling 73, 317 – 328.

Julio, B./*Yook*, Y. (2012): Political uncertainty and corporate investment cycles. The Journal of Finance 67, 45 – 83.

Kelly, B./*Pástor*, L./*Veronesi*, P. (2016): The price of political uncertainty: Theory and evidence from the option market. The Journal of Finance 71, 2417 – 2480.

Ko, J. H./*Lee*, C. M. (2015): International economic policy uncertainty and stock prices: Wavelet approach. Economics Letters 134, 118 – 122.

Kwabi, F. O./*Adegbite*, E./*Ezeani*, E./*Wonu*, C./*Mumbi*, H. (2024). Political uncertainty and stock market liquidity, size, and transaction cost: The role of institutional quality. International Journal of Finance & Economics 29, 2030 – 2048.

Li, Q./*Maydew*, E. L./*Willis*, R. H./*Xu*, L. (2022): Corporate tax behavior and political uncertainty: Evidence from national elections around the world. Journal of Business Finance & Accounting 49, 1605 – 1641.

Manasse, P./*Moramarco*, G./*Trigilia*, G. (2024): Exchange rates and political uncertainty: The brexit case. Economica 91, 621 – 652.

Nilavongse, R./*Rubaszek*, M./*Uddin*, G. S. (2020): Economic policy uncertainty shocks, economic activity, and exchange rate adjustments. Economics Letters 186, 108765.

Pástor, L./*Veronesi*, P. (2013): Political uncertainty and risk premia. Journal of Financial Economics 110, 520 – 545.

Phan, H. V./*Nguyen*, N. H./*Nguyen*, H. T./*Hegde,* S. (2019): Policy uncertainty and firm cash holdings. Journal of Business Research 95, 71 – 82.

Priberny, C. (2023): The Impact of COVID-19 on Demand and Lending Behavior in Prosocial P2P Lending. Credit and Capital Markets 56, 5 – 26.

Qiao, K./*Liu*, Z./*Huang*, B./*Sun*, Y./*Wang*, S. (2021): Brexit and its impact on the US stock market. Journal of Systems Science and Complexity, 1 – 19.

Ramiah, V./*Pham*, H. N. A./*Moosa*, I. (2017): The sectoral effects of brexit on the british economy: early evidence from the reaction of the stock market. Applied Economics 49, 2508 – 2514.

Shahzad, K./*Rubbaniy*, G./*Lensvelt*, M./*Bhatti*, T. (2019): UK's stock market reaction to brexit process: A tale of two halves. Economic Modelling 80, 275 – 283.

Steinberg, J. B. (2019): Brexit and the macroeconomic impact of trade policy uncertainty. Journal of International Economics 117, 175 – 195.

Sun, Q./*Tong*, W. H. (2010): Risk and the january effect. Journal of Banking & Finance 34, 965 – 974.

Yung, K./*Root*, A. (2019): Policy uncertainty and earnings management: International evidence. Journal of Business Research 100, 255 – 267.

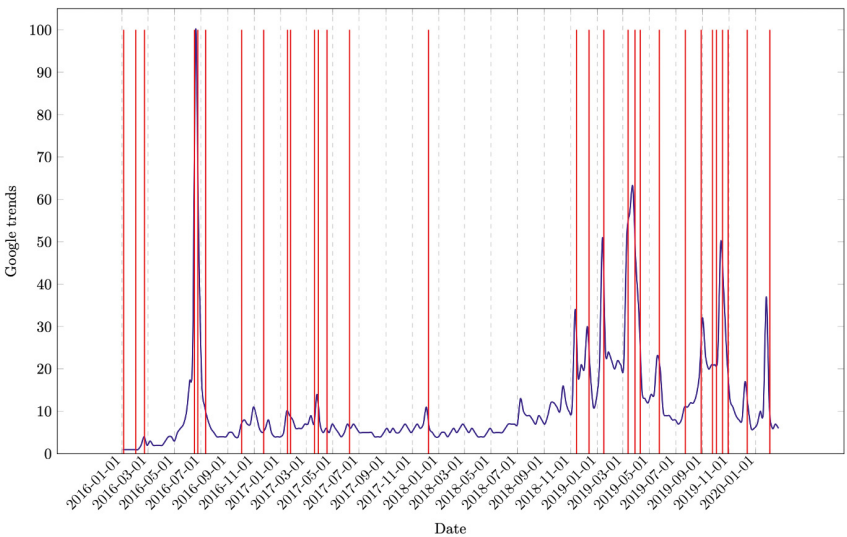
Appendix

Table 5

Description of Brexit events

Date	Description of event	Sentiment
01/23/13	David Cameron: Pro referendum	+
05/08/15	UK 2015 General Election	+
05/27/15	EU Referendum bill unveiled	–
01/05/16	(Conservative) Ministers are allowed to campaign for either side in the referendum.	–
02/02/16	European Council publishes a draft blueprint for the proposed changes to the UK's membership of the EU.	–
02/22/16	Announcement of referendum date	+
06/16/16	Labour Party MP Jo Cox, a supporter of remaining in the EU, was murdered.	+
06/24/16	Referendum	+
07/12/16	Theresa May will become Prime Minister on 13/07/2016.	+
10/03/16	Theresa May confirms that she will trigger Article 50 notice of Lisbon Treaty in March 2017.	+
11/23/16	The UK's Chancellor of the Exchequer, outlines his financial plans.	+
01/17/17	May sets out plan for Brexit at Lancaster House.	–
01/24/17	Supreme court: Parliament must be allowed to vote.	–
03/20/17	Triggering of Article 50 announced.	–
03/29/17	Triggering of Article 50: Two-year period for exit negotiations begins.	–
04/18/17	Prime Minister May calls snap general election.	–
06/09/17	2017 General Election	–
12/08/17	Joint report proposes solutions for Irish border.	+
11/14/18	May and EU publish withdrawal agreement.	–
12/13/18	May wins vote of confidence.	–
01/16/19	May loses meaningful vote.	+
03/13/19	May loses 2nd meaningful vote.	+
03/29/19	Brexit Day 1: Theresa May loses 3rd meaningful vote.	+
04/10/19	EU agrees to extension II.	+

Date	Description of event	Sentiment
05/24/19	May announces resignation.	–
07/23/19	Boris Johnson wins race.	+
08/29/19	Proroguing of Parliament	+
09/24/19	Prorogation unlawful	+
10/03/19	Johnson outlines proposal in parliament.	–
10/17/19	New agreement with EU	–
10/30/19	General election called.	+
12/13/19	2019 General election	+
02/03/20	Brexit Day 3	+



Note: This plot compares Google Trends data (graph) to key Brexit events (lines).

Figure 1: Google trends and Brexit events