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QUANTIFYING THE EFFECTS OF BREXIT VIA THE APPLICATION OF EVENT STUDY METHODOLOGY

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Abstract

The effects of the EU-UK Withdrawal Agreement, reached on 17 October 2019, on the stocks listed on the London Stock Exchange are the subject of the paper. The classic event study methodology was used to quantify impact. This research is based on a sample of 138 stocks, divided into five sample sections according to the company's business sector. In contrast to the research conducted after the referendum, which showed a clear negative impact on almost all of the observed sectors, the research conducted in this paper does not provide a unique conclusion. Three sectors recorded obvious positive effects, namely the financial sector, the food industry, and the medical sector, while no sector suffered obvious negative effects. The remaining two sectors did not provide data to aid in reaching a clear conclusion, as there were positive, negative and statistically insignificant results across different tests.

Key words: event study, abnormal return, Brexit, parametric tests, non-parametric tests.

КВАНТИФИКОВАЊЕ УТИЦАЈА БРЕГЗИТА НА ПРИНОСЕ АКЦИЈА МЕТОДОЛОГИЈОМ СТУДИЈЕ ДОГАЂАЈА

Апстракт

Предмет истраживања рада су ефекти договора о иступању Уједињеног Краљевства из Европске уније (ЕУ), постигнутог 17. октобра 2019. године, на акције листиране на Лондонској берзи. За квантификовање утицаја коришћена је класична методологија студије догађаја. Истраживање је изведено на примеру 138 акција, подељених у пет узорака према пословном сектору компаније. За разлику од истраживања спроведеног након референдума, које је показало јасан негативан утицај иступања из ЕУ на скоро све посматране секторе, истраживање спроведено у овом раду не даје јединствен закључак. Идентификована су три сектора која јасно бележе позитивне ефекте, а то су финансијски сектор, прехрамбена индустрија и медицински сектор, док није било сектора у којима су јасно забележени негативни ефекти

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иступања из ЕУ. Код преостала два сектора је било позитивних, негативних и статистички безначајних резултата на различитим тестовима, те није могуће формирати дефинитиван закључак.

Кључне речи: студија догађаја, екстра принос, Брегзит, параметарски тестови, непараметарски тестови.

INTRODUCTION

Trading on financial markets is characterised by the pronounced price volatility of financial instruments. In relation to stock trading, day-to-day events have some effect on whether prices rise or drop. Price changes often occur due to isolated events that affect only one particular company. Such events are stock splits, announcements of financial results, or internal turmoil. However, price changes can be driven by external factors that the company cannot influence. Such events can have a broad impact, affecting the entire market or specific business sectors. When analysing price changes, a very important parameter is change intensity. In other words, the question arises as to whether prices fluctuate within an established trend or exceed the expected limits under the influence of events. The event study methodology is used to determine the statistical significance of positive or negative stock returns.

The subject of this study are the effects of the EU-UK Withdrawal Agreement, reached on 17 October 2019, on the stocks listed on the London Stock Exchange. Reaching the agreement was marked by a number of activities following the June 2016 exit referendum. This paper analyses the effects of the UK's definitive withdrawal from the EU, neglecting any previous activities within the Brexit process. The research focuses on the sample of a total of 138 stocks listed on the London Stock Exchange, divided into five sample sections by business sector. This paper has one main objective and two specific objectives. The main objective is to determine the existence of a statistically significant abnormal return with reference to the observed samples. Achieving the main objective makes it possible to meet the first specific objective, i.e. to identify the differences in reactions among the observed sectors. The second specific objective is to compare the reactions of the observed business sectors to the Withdrawal Agreement with those produced by the referendum three years earlier.

After years of controversy over the UK's status in the EU, June 2016 saw a referendum on a possible exit. Contrary to expectations, almost 52% of the votes were in favour of the UK's exit from the EU. This initiated the process of the so-called Brexit. In accordance with the results of the referendum, Article 50 of the Treaty on the Functioning of the European Union obliged the Government to initiate negotiations on leaving the EU. Negotiations were necessary as the UK, as part of the EU, took on a number of international rights and obligations. The question that arose was how to

treat these rights and obligations once the UK ceased to be a member of the EU. Despite the need to regulate outstanding issues as soon as possible, the UK Government delayed the start of the negotiation process. The day after the referendum, David Cameron, the Prime Minister, resigned. Shortly afterwards, Theresa May replaced him. Although her plan to open negotiations was adopted in December of the same year, more than a year and a half passed before the UK's preliminary separation proposal was made. The EU rejected the proposal, so negotiations continued. In the summer of 2019, Theresa May resigned as she repeatedly failed to receive Parliamentary support for her Brexit plans. Boris Johnson became the new Prime Minister. His initial plan was for the UK to leave the EU unilaterally by 31 October 2019 if no agreement could be reached. Following intense diplomatic activity, an agreement was reached on 17 October 2019, and 31 January 2020 was set as the date of the UK's formal exit from the EU.

The first part of the paper reviews the existing event study literature regarding political event analysis. Particular attention is given to previous research related to the Brexit process. The second part outlines the methodological bases of the paper, which include describing the event study procedure, defining the research timeframe, and determining the tests to be conducted. The third part of the paper presents the research results, after which key effects are discussed.

REVIEW OF LITERATURE

Brexit has been a ubiquitous topic in economic literature for the past four years. Predictions of its effects on the real sector have been made with the aim of quantifying the potential decline of the UK and European economies in certain industries. Following the assumptions made by Gordon (2018), Wyman and Chance (2018) predicted that the sectors to be hit the hardest would be the chemical, automotive and food industries, the aviation, energy and technology, and pharmaceutical and financial companies. However, while some studies predict effects on the real sector, a considerable number of papers deals with effects on financial markets. Vikash, Pham and Moosa (2016) used event study methodology to analyse the impact of the outcome of the referendum on LSE-listed stocks by sector. They concluded that the largest number of sectors, mostly banks, insurance companies and travel agencies, recorded a negative abnormal return. Using the event study methodology, Schaub (2016) analysed the impact of the referendum on the British stocks traded in the US, and found a significant negative abnormal return in the first two days after the referendum. Oehler, Horn and Wendt (2017) applied event study analysis to a number of LSE-listed companies and concluded that, contrary to expectations, domestic-oriented companies experienced more pronounced negative effects than export-oriented companies. Bohdalova and Gregus (2017) analysed the impact of Brexit on six European markets, finding significant effects only in Ireland,

while no effects were recorded in Poland. Using event study methodology to analyse LSE, Breinlich, Leromain, Novy, Sampson, and Usman (2018) concluded that all companies to report markedly negative results after the referendum came from the construction, finance or airline sectors. Caporale, Gil-Alana and Trani (2018) applied the ARMA model to analyse the effects of Brexit on FTSE 100 stocks and the pound, comparing the currency against the US dollar, the euro and the Japanese yen, and reported adverse effects in all cases but the pound to yen case. Tomić et al. (2019) used event study methodology to analyse the impact of the outcome of the referendum on five selected sectors, and found statistically significant negative abnormal returns in the financial, and food and energy sectors, while the medical sector recorded a partially positive effect. Shahzad, Rubbaniy, Lensvert, and Bhatti (2019) performed cross-sectoral analysis using a modified event study procedure. They found that the referendum itself did not produce a statistically significant negative effect, and that the events following the referendum even created a significant positive effect in certain sectors. Škrinjarić (2019) relied on event study methodology to analyse the impact of Brexit on Central and South-East European markets, and found negative cumulative abnormal return with no statistical significance.

One can see that all previous studies analyse the effects of the referendum. The number of studies that deal with post-referendum Brexit events is limited. Muller (2020) conducted research focused on insurance companies, where the UK's withdrawal from the EU in January 2020 itself was used as an event. It showed significant negative abnormal returns in the periods before the event, but also significant positive abnormal returns following the event. There is an obvious lack of studies concerned with the periods of reaching the Withdrawal Agreement and the Withdrawal itself, for which this research will try to compensate. The analysis will cover five sectors, with the objective being not only to determine the results of the Withdrawal Agreement on representative industries but also to compare these results to those related to the referendum.

THEORETICAL FRAMEWORK

Event Study Procedure

The event study methodology was first applied in the late 1960s in the study of Fama, a Nobel Prize winner (Fama, Fischer, Jensen & Roll, 1969). It is a statistically intensive methodology, driven by the emergence of statistics computational methods (Eckbo, 2007, p. 5). The current event study process was formulated in the 1980s by Brown and Warner (1980; 1985), Dodd and Warner (1983) and Corrado (1989). The essence of the event study is to determine the normal return on a single stock by comparing historical returns with projected returns based on a long-term trend over a period believed to feel the effects of the event. A positive difference in

historical return and estimated return gives a positive abnormal return, while a negative difference represents a negative abnormal return. For statistical analysis, the values of the abnormal return in the event window are essential. However, in order to determine the normal return, it is necessary to observe the return on all stocks subject to analysis and the market indicator over a long period of time. This time interval is called the estimation window. Normal returns are determined on the basis of historical returns in the estimation window immediately preceding the event window.

The estimation window is a longer time period wherein the return trend on each observed stock is determined according to the market indicator (usually the stock index). The estimation window is a time interval ranging between two and eight months preceding the event itself. According to Serra (2002), it compensates for numerous daily events that affect the stocks of individual companies or groups of companies (p. 2). Due to its high impact on the normal return, it is of great importance that no major crisis affects the stock group and the whole market during the estimation window. With a shorter estimation window, minor events are also likely to have a high impact on normal return, leading to bias. Longer estimation windows carry a higher risk of including specific crises, which can again lead to bias. Therefore, a large number of authors choose the estimation window of six months.

The event window is several times shorter than the estimation window, and represents the time interval when the effects of the event on stock return are to be expected. Most often it is set asymmetrically relative to the day of the event, with the direction of asymmetry depending on the anticipation of the event itself. As the UK's exit from the EU was an expected event, the event window will cover more days before the event itself, and less after the event, considering that the effects of the expected event begin to be felt even before the event itself takes place. For research purposes, we constructed an asymmetric event window which starts two days before the event (T_{-2}), and ends one day after the event (T_{+1}). The time horizon is shown in Figure 1. The day marked with 0 represents the first day of the estimation window, so stock returns were monitored as of day 0. Days marked with T_{-2} and T_{+1} represent the first and last days of the event window. The effects of events are analysed within this asymmetric period, which includes the aforementioned days. T_0 marks the day of the event itself. The period between 0 and the first day of the event window is denoted by L_1.

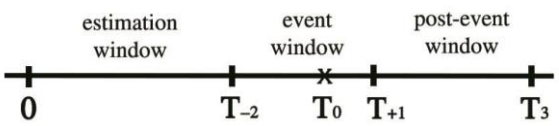

Figure 1. Event study time horizon

The essence of the event study is to determine the abnormal return on the observed stock sample. For an individual stock *i* on day *t* during the event window, the abnormal return is the difference between the historical return and the expected return on that stock on the observed day:

$$AR_{it} = R_{it} - E(R_{it}) \quad (1)$$

$$Var\ (AR_{it}) = \sigma_{\varepsilon_i}^2 \quad (2)$$

where AR_{it} is the abnormal return on *i*-th stock on day *t* within the event window (between T_1 and T_2 in Figure 1), R_{it} is the historical return on the observed stock on a particular day, and $E(R_{it})$ is the expected return on the same stock on that day, with the estimate based on the model selected to determine normal return; $\sigma_{\varepsilon_i}^2$ denotes the AR_{it} variance. Abnormal return always exists and its statistical significance should be proven through analysis.

Abnormal return aggregation for analysis purposes can be performed in several ways. The first way is to aggregate returns at the level of each day of the event window in order to determine the average abnormal return on day *t*, ($\overline{AR_t}$). Another way is to aggregate at the level of individual stocks over multiple days of the event window (or throughout the entire event window), thereby obtaining the cumulative abnormal return on stock *i*, CAR_i.

$$\overline{AR}_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \quad (3)$$

$$Var\ (\overline{AR}_t) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_{\varepsilon_i}^2 \quad (4)$$

$$CAR_{i(t_1,t_2)} = \sum_{t=t_1}^{t_2} AR_{it}, \quad T_1 < t_1 \leq t_2 \leq T_2 \quad (5)$$

$$Var\left(CAR_{i(t_1,t_2)}\right) = \sigma_{i(t_1,t_2)}^2 = (t_2 - t_1 + 1)\sigma_{\varepsilon_i}^2 \quad (6)$$

Finally, the average cumulative abnormal return, $\overline{CAR}$, can be determined as the average of cumulative abnormal returns on each individual stock over the same time interval. For the purposes of analysis, we also need a standardised cumulative abnormal return on each individual stock, $SCAR_i$, obtained by dividing CAR_i and the standard deviation of the particular stock:

$$\overline{CAR}_{(t_1,t_2)} = \frac{1}{N} \sum_{i=1}^{N} CAR_{i(t_1,t_2)} \quad (7)$$

$$Var\left(\overline{CAR}_{(t_1,t_2)}\right) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_{i(t_1,t_2)}^2 \quad (8)$$

$$SCAR_{i(t_1,t_2)} = \frac{CAR_{i(t_1,t_2)}}{\sigma_i} \quad (9)$$

The condition for equations (2), (4), (6) and (8) is the high value of L_1, where variance formulas are reduced to a given form (MacKinlay, 1997, p. 21).

Statistical Tests

Within the event study, two types of tests are applied – parametric and non-parametric. The study uses the parametric t-test, J_1 and J_2 tests, and the non-parametric J_3 (Sign test) and J_4 (Corrado test) tests.

The essence of the t-test is to test the difference between the realised and the hypothetical statistical value. The zero hypothesis in the case of the t-test is the absence of a statistically significant abnormal return, and the alternative hypothesis rejects the null hypothesis.

$$H_0 : \overline{AR} = 0\,, \quad H_1 : \overline{AR} \neq 0 \tag{10}$$

$$t = \frac{\overline{AR}_t - AR_o}{S/\sqrt{N}} \tag{11}$$

The t-test statistic is presented in equation (11). It is calculated for each day of the event window. Since $AR_0 = 0$, the t-statistic is calculated by dividing the average abnormal return on the observed day by the quotient of the standard deviation of the whole sample and the root of the number of observations (according to Samitas & Kenourgios, 2004, p. 172). The critical value for rejecting the null hypothesis is ± 1.96, with a confidence level of 95%.

The remaining two parametric tests, J_1 and J_2, give unique results for the entire event window. J_1 tests the $\overline{CAR}$ value, while J_2 tests the $\overline{SCAR}$ value. The zero hypothesis is that $\overline{CAR}$ and $\overline{SCAR}$ values are not statistically significantly different from 0, so the alternative hypothesis rejects the null hypothesis. The critical values for these tests are also ± 1.96, with a confidence level of 95%, since these are two-tailed tests.

$$H_0 : \overline{CAR} = 0\,, \; H_1 : \overline{CAR} \neq 0\,,$$
$$\text{and } H_0 : \overline{SCAR} = 0\,, \; H_1 : \overline{SCAR} \neq 0 \tag{12}$$

$$J_1 = \frac{\overline{CAR}_{(t_1,t_2)}}{\sqrt{\overline{\sigma}^2_{i(t_1,t_2)}}} \tag{13}$$

$$J_2 = \sqrt{\left(\frac{N\,(L_1-4)}{L_1-2}\right)}\,\overline{SCAR}_{(t_1,t_2)} \tag{14}$$

Of the non-parametric tests, the Sign test and the Corrado test, referred to in literature as J_3 and J_4 tests, are used in the paper. The Sign test tests the distribution of observed statistics around median value (Luoma, 2011). Since the existence of abnormal returns is determined in this case, the median value is 0. The null hypothesis states that there is an equal distribution of the positive and negative values of the observed statistics around the median value, and the alternative hypothesis rejects the null hypothesis. Sign test statistics are given in equation (16).

$$H_0 : Me = 0.5\,, \quad H_1 : Me \neq 0.5 \tag{15}$$

$$J_3 = \left(\frac{N^{+(-)}}{N} - \; 0.5\right)\frac{\sqrt{N}}{0.5} \tag{16}$$

N is the number of total observed stocks, and $N^{+(-)}$ is the number of positive or negative statistics. The statistic of interest is CAR*i*. Authors usually focus on the number of positive ones, except in the case of one-tailed tests, when examining whether the observed event leads to a negative abnormal return. The critical value of the test is ± 1.64 in the case of the two-tailed test.

The Corrado test, or the J_4 test, examines the return ranks for each observed stock (Corrado & Zivney 1992). The observation period is represented by the estimation window and event window in aggregate. Since only the return ranking is relevant to the analysis, extreme values do not affect the value of the test statistic. What differentiates this test from the J_3 test is the fact that it observes the stock return rank during the event window versus the combined estimation window and event window. It tests each day of the event window individually, with some days showing statistical significance and some not (similar to the t-test). The null hypothesis states that there is an equal distribution of the observed statistics around the median value, and the alternative hypothesis rejects the null hypothesis with the conclusion that the distribution is not even. The formula for the J_4 test is found in Cowan (1992) and Kolari & Pynnonen (2008):

$$J_4 = \frac{1}{N} \sum_{i=1}^{N} \left(K_{i0} - \frac{L_2+1}{2} \right) / S\,(L_2) \tag{17}$$

$$S(L_2) = \sqrt{\frac{1}{L_2} \sum_{t=T_0+1}^{T_2} \left(\frac{1}{N} \sum_{i=1}^{N} \left(K_{it} - \frac{L_2+1}{2} \right) \right)^2} \tag{18}$$

The median rank is denoted as $(L_2 + 1)/2$, K_{io} is the return rank on the event day, $S\,(L_2)$ is the standard deviation of the return rank, K_{it} is the return rank of the *i*-th stock on the *t*-th observed day, $t \in L_2$. The critical value of the test is ± 1.64 in the case of the two-tailed test, which is applied in this paper. It should be borne in mind that non-parametric tests are subject to constant adjustments to the test procedure and methodology.

RESULTS

An asymmetric $T_{-2} – T_{+1}$ event window was used in the analysis, with T_0 denoting the event day of 17 October 2019. A six-month estimation window, beginning with 15 April 2019, was used to estimate market trends. The authors used the FTSE 100 index as a benchmark for market trends. A total of 138 stocks of companies listed on the London Stock Exchange were analysed. Historical data was downloaded from *Yahoo! Finance*, and all statistical calculations were performed using the IBM SPSS 20 software package.

The stocks were divided into five groups according to which business sector they belong to. In order to examine the effects of the UK's exit from the EU, both parametric and non-parametric tests were conducted

– the parametric t-tests, and J_1 and J_2 tests, and the non-parametric J_3 and J_4 tests. Table 1 shows the values of the obtained statistics. The values of statistics which have statistical significance are underlined.

Table 1. Values of test statistics by sector

Sectors	Observations	Period	t-test	J_1	J_2	J_3	J_4
Food sector	23	T_{-2}	2,03579	5,60837	5,70665	2,29366	1,29378
		T_{-1}	2,24394				1,70796
		T_0	2,06732				0,98782
		T_{+1}	0,27609				0,65126
Financial sector	39	T_{-2}	6,58808	8,38604	9,32759	4,0032	2,70526
		T_{-1}	-0,59897				-0,00708
		T_0	0,84505				0,81441
		T_{+1}	1,23105				0,53822
Energy sector	19	T_{-2}	0,970866	4,36232	0,19154	-0,68825	0,01204
		T_{-1}	1,394393				0,93878
		T_0	0,578823				0,25275
		T_{+1}	0,783356				0,20059
Medical sector	23	T_{-2}	1,69803	2,76267	2,5465	2,71069	0,05554
		T_{-1}	0,72816				-0,06016
		T_0	0,58302				0,24991
		T_{+1}	0,70394				-0,1157
Technology sector	34	T_{-2}	-0,03091	1,89351	-3,33535	3,67424	0,94361
		T_{-1}	-0,28276				-0,4486
		T_0	1,01923				-0,19723
		T_{+1}	1,29805				1,3342

Source: Authors

This research did not yield consistent results. Unlike the results regarding the 2016 referendum, which were all negative across different studies, the majority of the results in this study showed positive effects. Namely, the financial sector, the food industry, and the medical sector experienced the Withdrawal Agreement's positive effects, which was confirmed by different tests. All sectors showed statistically significant positive results on the J_1, J_2 and J_3 tests. The financial sector showed significant positive results on the t-test and the J_4 test for T_{-2}, while the window statistics of these two tests were not significant for other days of the event. The t-test for the food industry showed consistent positive effects on T_{-2}, T_{-1} and T_0, while J_4 confirmed the significance on T_{-1}. There was no significance in the t-test and the J_4 test for the medical sector, which means that this sector failed to prove significance at the level of a single day, but showed a significant cumulative effect, measured by J_1, J_2 and J_3.

The energy sector did not provide enough data to aid in reaching a meaningful conclusion, as there was only one statistically significant result. While the majority of the statistics were positive, only the J_1 test statistic

was significant. All t-test statistics were positive with low value, leading to a significant cumulative result, measured by J_1. The technology sector yielded even more inconsistent results. There were two significant statistics: a negative J_2 test statistic, and a positive J_3 test statistic. The J_2 measure standardised CAR, which means that those stocks with a negative CAR also showed a lower volatility of returns. That is why the average standardised CAR was negative even though the majority of the stocks have a positive CAR.

CONCLUSION

The general conclusion is that the tests provided unexpected results, especially compared to the results obtained three years earlier, after the referendum. The most surprising results were obtained in the financial sector, where all tests showed significant positive effects. A number of studies mentioned in the literature review attest to the negative effect of the referendum on the financial sector. Thus, it was expected that the Withdrawal Agreement would have effects similar to those of the referendum. The food and healthcare sectors also showed significant positive abnormal returns, while the remaining two sectors showed high inconsistency between different tests. In the case of the technology sector, there were both positive and negative abnormal returns which were statistically significant, while the case of the energy sector revealed a single significant test statistic.

The achievement of political stability that the Withdrawal Agreement brought about can be the explanation for these unexpected results. The UK government had set a deadline for reaching a Withdrawal Agreement – 31 October 2019, and planned to unilaterally withdraw if no agreement was reached. It is certain that the absence of an agreement would have been a severe blow to all internationally oriented companies in the UK, and therefore the agreement came as a kind of desired and salutary legal framework to prevent a wider crisis.

This research can be improved on two grounds. Firstly, further research can focus on the analysis of several important successive dates during the Brexit process on the same sample of stocks, allowing for a comparison of the results obtained in both papers. In addition to the referendum and the Withdrawal Agreement, one can also consider the activation of the Agreement on 31 January 2020, and the dates related to the political crisis in the UK as important dates. Secondly, further research may compare the effects of Brexit on the London Stock Exchange with results that would be obtained by analysing the financial markets of key EU members such as Germany, France and Italy. It would be interesting to see if, and to what extent these results are correlated.

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КВАНТИФИКОВАЊЕ УТИЦАЈА БРЕГЗИТА НА ПРИНОСЕ АКЦИЈА МЕТОДОЛОГИЈОМ СТУДИЈЕ ДОГАЂАЈА

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Резиме

Рад анализира ефекте договора о иступању Уједињеног Краљевства из Европске уније (ЕУ), постигнутог 17. октобра 2019. године, на акције листиране на Лондонској берзи. Истраживање је изведено на примеру од укупно 138 акција листираних на Лондонској берзи, подељених у пет категорија према пословном сектору. Главни циљ рада је да се утврди постојање статистички значајног екстра приноса на примеру посматраних узорака. Постизањем главног циља могуће је испунити и први изведени циљ, а то је да се утврде разлике у реакцијама на догађај између пословних сектора. Други изведени циљ подразумева поређење реакција посматраних пословних сектора након постигнутог договора о иступању са ефектима које је изазвао референдум три и по године раније.

Након вишегодишње полемике о статусу Уједињеног Краљевства у ЕУ, јуна 2016. године је организован референдум о могућем изласку из Уније. Супротно очекивањима, готово 52% бирача гласало је за излазак Уједињеног Краљевства из ЕУ. У складу са резултатима референдума, те у складу са чланом 50 Уговора о функционисању Европске уније, Влада Уједињеног Краљевства је била у обавези да покрене преговоре о изласку из ЕУ. Након интензивне дипломатске активности, договор је постигнут 17. октобра 2019. године, а 31. јануар наредне године је одређен као формални датум изласка Уједињеног Краљевства из ЕУ. Брегзит је у временском периоду између референдума и коначног изласка из ЕУ био свеприсутна тема у економској литератури. Вршена су предвиђања ефеката на реални сектор, са циљем квантификовања потенцијалног пада британске и европске привреде у одређеним индустријама.

За квантификовање утицаја у овом раду коришћена је класична методологија студије догађаја. Суштина студије догађаја се односи на утврђивање нормалног приноса једне акције поређењем историјски остварених приноса са предвиђеним

приносима на основу дугорочног тренда у периоду за који се сматра да постоји ефекат догађаја. Позитивна разлика историјског приноса и процењеног приноса представља позитивни екстра принос, док негативна разлика представља негативни екстра принос. За статистичку анализу су битне вредности екстра приноса у периоду догађаја. Међутим, да би се претходно утврдио нормални принос, потребно је посматрати кретање приноса свих акција које ће бити предмет анализе и тржишни показатељ у дужем временском периоду. Тај временски интервал се назива периодом процене. Нормални приноси се утврђују на основу историјских приноса у периоду процене, који непосредно претходи периоду догађаја. За период процене се узима временски интервал од два до осам месеци пре самог догађаја. Период догађаја је вишеструко краћи од периода процене и представља временски интервал током кога се очекује ефекат догађаја на приносе посматраних акција. Најчешће се поставља асиметрично у односу на дан догађаја, а смер асиметрије зависи од антиципације самог догађаја. Пошто је излазак Уједињеног Краљевства из ЕУ био очекивани догађај, период догађаја обухвата више дана пре самог догађај, а мање након остварења догађаја, јер ефекти очекиваног догађаја почињу да се осећају и пре његовог остварења. За процену тржишних кретања у овом раду је коришћен шестомесечни период процене који почиње 15. априла 2019. године.

Резултати овог истраживања су другачији од резултата постигнутих у већем броју студија усмерених на ефекте референдума. Супротно генералним очекивањима, негативни ефекат није недвосмислено забележен ни у једном сектору. Даље, у случају три сектора забележено је присуство позитивног екстра приноса, и то у финансијском сектору, прехрамбеној индустрији и медицинском сектору. Код последњег сектора, t-тест није показао статистичку значајност ни за један дан догађаја, али сви остали тестови имају статистички значајне вредности статистика. У односу на преостала два сектора није могуће доћи до недвосмисленог закључка јер су различити тестови забележили присуство и позитивног и негативног екстра приноса, док је највећи део вредности статистика био статистички без значаја. Посебну неконзистентност између различитих тестова показао је технолошки сектор, јер постоје и позитивни и негативни екстра приноси који имају статистичку значајност. Ипак, највеће изненађење представљају резултати тестова за финансијски сектор. Овакви резултати су неочекивани из два разлога. Прво, након референдума, компаније финансијског сектора су реаговале изразито негативно, па је стога очекивано да ће се реакција поновити. Друго, компаније финансијског сектора чешће су осетљиве на потресе који долазе из политичког окружења. Очекивано је да ће дезинтеграциони процес изазвати негативну реакцију на финансијском тржишту. Међутим, упркос набројаним аргументима, тестови су недвосмислено показали позитивну реакцију компанија на излазак Уједињеног Краљевства из ЕУ.

Узрок наведених резултата је дефинитивно висока варијабилност приноса у време периода догађаја. Пошто је догађај био очекиван, трговци на берзи су могли да се правовремено припреме. Ефекат изненађења, који је постојао након референдума, изостао је у овом случају. Даље, за разлику од референдума, који је био шокантан, процес преговора око изласка био је дуг и мучан како за ширу јавност тако и за учеснике. Стога, постизање договора пратио је осећај олакшања, који се очигледно пренео на финансијско тржиште. Може се закључити да су ефекти изласка Уједињеног Краљевства из ЕУ на акције листиране на Лондонској берзи били далеко умеренији и позитивнији у поређењу са ефектима референдума.