# The Differential Impact of Brexit on Banking: UK vs. Europe


## AUTHORS[1]

**Camilo J. Vázquez Ordás**

University of Oviedo

**Myriam García-Olalla**

University of Cantabria



### *Abstract*

The objective of this study is to analyse the differential impact that the main events in the implementation of Brexit have had on the European-banking sector, and attempt to identify whether said impact has been different for UK and European banks. To do this, we selected a sample of UK banks listed on the stock exchange and a control group composed of banks belonging to European countries of a similar size to the UK banks. We used event study methodology to determine the impact, which was measured by the market reaction.

The obtained results allow us to state that UK banks reacted differently from European banks in response to the same events that have defined the path of Brexit, and generally more negatively.



### *Keywords*

Brexit, event study, banking, market reaction, abnormal returns,


### *Policy Implications*

- By analysing the behaviour of stock prices, policy makers can get some insights about market expectations regarding the economic impact of Brexit, not only in the UK but also in European countries.
- Regulators should keep in mind the UK and European banking reaction to Brexit as a benchmark for countries trying to leave EU in the future.
- Financial authorities would need to take into account the unintended effect of Brexit on stock markets in order to enhance the European financial stability.
- Economic authorities should consider the undesired effect on the markets of the individual economic interests of the countries, in order to improve the global competitiveness of the European countries.


[1] We would like to thank the European Commission from financial support through the Jean Monnet Module in *EU Finance and Institutions: New Social and Environmental Challenges* (620132-EPP-1- 2020-1-ES-EPPJMO-MODULE).

## *1. Brexit, a maze with no way out?*

In this short introduction we will briefly review the main events of the Brexit maze of negotiations that, at the time of the drafting of this study, has now become a reality, although still not free from several uncertainties.

It all started over five years ago, when in January 2013 the then British Prime Minister, David Cameron, announced his intention, if his party, the Conservatives, won the elections in May 2015, to hold a referendum before 2018 on whether the United Kingdom would remain or leave the EU. This referendum took place on 23rd June 2016 after the Conservative party had won an absolute majority and consequently called the referendum.

Although from the beginning the official position of Cameron's cabinet to the referendum was to support remaining in 'a reformed Europe', 51.9% of voters voted in favour of leaving the EU. The first consequence of this was nothing less than Cameron's resignation and his replacement by Theresa May, also a Conservative, who took up the post in July 2016 with the difficult main task of delivering 'Brexit'.

Eight months later, on 29th March 2017, the British government triggered Article 50 of the Treaty of Lisbon, which meant the beginning of negotiations with Brussels to enable the process of the United Kingdom's withdrawal from the EU in an orderly manner. The first round of negotiations began in June of the same year in order to establish the calendar that, at that time, would have to be completed before March 2019, in compliance with the period initially provided in European treaties for the withdrawal of a member state, which was two years.

Following this plan, in November 2017 Theresa May set the time for the withdrawal of the United Kingdom at 11.00 pm GMT on 29th March 2019 and warned that there was no going back on this process. One month later an agreement was reached, the main aspects of which can be summarised by stating that the British government undertook to pay the Brexit 'bill' (45 billion euros), to guarantee the rights of European citizens that lived in the United Kingdom and that there would not be a hard border with Ireland.

In March 2018, the EU and the United Kingdom also reached an agreement on the transition period, which would be extended from 30th March 2019 to 31st December 2020. During this time, the United Kingdom would not be able to participate in decision making in the EU, because it would no longer be a member state, but it would retain access to the single market and the customs union.

After almost a year and a half of negotiations, the Brexit agreement was finally published on 14th November 2018, and was collectively supported by May's cabinet. This agreement included allowing the UK to remain in the customs union of the EU, meaning that Northern Ireland would remain in the same customs territory as the rest of the United Kingdom. In parallel, a few days later at an extraordinary summit, the EU approved the Withdrawal Agreement and the Political Declaration on future relationship between the two territories.

However, and despite overcoming the apparent difficulty in reaching a consensus, 2019 began with the agreement's first defeat in the British Parliament, by 432 against and 202 in favour. On 12th March, it suffered a second defeat, which forced May to request an extension until 30th June. The third parliamentary defeat of the agreement occurred on

29th March and, a few days later, Brussels and London agreed on a new extension, this time until 31st October.

Under pressure from her own party, Theresa May resigned on 27th May and an internal process began to elect her successor, which Boris Johnson won. In June 2019, as soon as he took over as Prime Minister, Boris Johnson, former London mayor, hardened his stance and said that UK would leave the EU on 31st October, with or without an agreement. He also promised to eliminate the controversial safeguard designed to avoid a physical border being established between the Republic of Ireland and Northern Ireland after Brexit.

After several controversial actions, such as attempting to suspend parliamentary activity and initially failing in his attempt to force an early general election, in October 2019 Johnson was forced by parliament to request a new extension from Europe, this time until 31st January 2020. The same month, the British government managed to get its withdrawal agreement passed by the House of Commons with a comfortable majority, but failed in its attempt to get its calendar for implementation approved, through which it had intended to complete the process by 31st October, which would have meant that the extension requested from the EU would not have entered into force.

In response to this situation, at the end of that month the Prime Minister managed to get the Parliament to approve the holding of a general election, with the aim of achieving a clear majority in favour of his proposal. Finally, on 12th December 2019, the British people elected its new government, giving a clear (absolute) majority to the Conservative Party led by Boris Johnson, which now meant a clear 'yes' to Brexit, especially to the Brexit agreement that Boris Johnson had reached a few months earlier, the implementation of which would finally take place on 31st January 2020. As planned, although Brexit after this date is now a reality, it is subject to a transition period during which hardly anything has changed except the certainty that Brexit has happened. This will continue until, in theory, 31st December 2020, so that the parties can negotiate and prepare for all the contingencies that such an unprecedented divorce in recorded history presents.

## *2. Bibliographical review and hypothesis*

Until now not many academic works have been published on Brexit and, as far as we are aware, none of them have the focus or objective that we propose in this research study. However, below is a review of the works carried out and their main contributions.

Indeed, Brexit is a relatively recent subject for economic and financial history. As we know, there are few major research studies that analyse Brexit. We have summarised the most important ones here.

Ramiah, Pham and Moosa (2016) investigated the impact of the referendum result on various sectors in the British economy over the June-July 2016 period. The method used was again an event study, and what they found was that Brexit had a mixed effect depending on the particular sector. The affected sectors showed on average significant negative results, meaning that the news was bad for the UK economy in general. The study results also showed that the banking sector was one of the most severely affected by Brexit with negative abnormal returns, proving that the predictions by the Bank of England about changes in short-term systematic risk were right.

The Bonchev and Pencheva Master essay (Bonchev and Pencheva, 2017) analysed the impact of Brexit vote on stock returns in the banking sector in Europe. Working with a sample of 63 banks from the STOXX TMI Banks index it divided the sample into two groups (the UK group, consisting of 8 banks and the EX UK group, including the rest of the 63 banks) it showed that the event had, on average, a negative significant impact on bank stock prices. Additionally, it found that the potential factors that have an effect on returns were the size of banks and their domestic accounts, i.e. their orientation towards international markets.

Oehler, Horn and Wendt's (2017) article carried out event study analysis to determine short-term abnormal stock returns following the Brexit referendum. They examined whether firm-level internationalisation can help explain abnormal returns. They found that the stocks of firms with higher proportions of domestic sales realized more negative abnormal returns than stocks of firms with more sales abroad, i.e., a higher degree of international diversification. While firm-level internationalisation largely explained abnormal returns on the trading day after the referendum, it had no relevant pricing effect in the following days. The quick adjustment of stock prices to reflect firm-level internationalisation indicated, in their opinion, a high degree of market efficiency.

Burdekin, Hughson and Gu (2018) focused their article on the impact of Brexit on global equity markets. The authors used 64 stock exchanges in the period from 6th January 2016 to 30th June 2016. Their sample did not emphasize on any particular industry, region or country. On the contrary, they focused on the equity markets as a whole and used data from around 41 countries from Europe, Asia, North and South America. According to their raw results, negative abnormal returns are noted on 24th, 27th and 28th of June. They also showed that although Brexit was considered as 'bad news' for the world, not every country had experienced negative abnormal performance. The authors found it quite normal that the largest negative abnormal returns were found within the EU. For example, the study showed that those most negatively affected by the news were the PIIGS countries with an average of -6.64%. On the contrary, BRICS countries, Brazil and Russia, showed positive abnormal returns of 5.5% and 5.3% respectively. As far as the UK was concerned, the average AR was -4.2%.

Finally, Breinlich et al. (2018) studied stock market reactions to the Brexit referendum of 23rd June 2016. Their results suggested that initial stock price movements were driven by fears of a cyclical downturn and by the sterling depreciation following the referendum. They also found tentative evidence that market reactions to two subsequent speeches by Theresa May (her Conservative Party conference and Lancaster House speeches) were more closely correlated with potential changes to tariffs and non-tariff barriers on UK–EU trade, indicating that investors may have updated their expectations in light of the possibility of a 'hard Brexit'. In addition, they did not find a correlation between the share of EU migrants in different industries and stock market returns.

Having reviewed the literature and given that (as far as we are aware) there are no studies that attempt to identify the differential impact that Brexit has had on the European banking industry, by specifically attempting to observe if said impact is differential depending on whether the banks in question are UK or European, and despite its necessary experimental nature, we can define our main hypotheses as follows:

*H1: The stock market reacts negatively to Brexit-related announcements*

This hypothesis is based on the expectation of a negative impact on the whole European banking industry, because the process will generate greater uncertainty among investors by causing a situation that is contrary to the trend represented by the European project, goes against the basic dictums that could be inferred from recent increasing economic globalisation and, thirdly, in view of the uncertainties that could be inferred concerning the complexity of the implementation of said process.

*H2: The negative reaction will be stronger for UK banks than for European banks*

We believe that said effect will necessarily be greater on UK banks given that the content of hypothesis 1 will be felt more strongly by the investors of said banks, because in theory, the risk will be greater for the UK once Brexit is completed.

## *3. Sample*

To carry out this study we selected a final sample of 20 banks, 10 from the UK and 10 European banks. Because of the nature and purpose of the study, it was necessary that the sample fulfilled a set of requirements:

1.- Given that it measures the reaction of the market, the analysed institutions had to be listed on financial markets (London for the UK and other European markets for the Europeans).

2.- Brexit has had various important events since the idea was proposed until now. We believe that it is important to observe what the reaction of the banking industry was to each of them. Although it has been a long process, we consider that the most relevant events are as follows (Table 1):

a) 23rd June 2016: the United Kingdom votes in a referendum to leave the EU. 51.9% of voters voted in favour of leaving.
b) 29th March 2017: the United Kingdom triggers article 50 of the Treaty of Lisbon, which means the start of negotiations for its withdrawal from the EU.
c) 14th November 2018: the British government approves the agreement for withdrawal from the EU.
d) 25th November 2018: the 27 EU member states approve the agreement for the withdrawal of the United Kingdom from the EU.
e) 15th January 2019: the British Parliament rejects the withdrawal agreement previously approved by the government.
f) 11th April 2019: the European Parliament grants the United Kingdom an extension until 31st October to implement Brexit.
g) 28th October 2019: the European Parliament grants the United Kingdom a second extension until 31st January 2020 to implement Brexit.
h) 12th December 2019: general elections are held in the United Kingdom. The Conservative Party led by Boris Johnson wins an absolute majority.
i) 31st January 2020: Brexit enters into force.

The consideration that the sample had to be composed of banks that had maintained their identities as such at the time when the events have occurred (that is, they had not disappeared or been subject to restructuring processes such as mergers and/or acquisitions) and that they had to be listed on financial markets meant that, in each event

that was analysed, all banks that had disappeared or had participated in restructuring processes or that were not listed were excluded from the analysis. In the case of the UK banks, the final sample (in reality the population) was reduced to 10 banks by October 2018 (events a and b), 9 by December 2018 (events a, b, c and d), 8 by October 2019 (events a to f) and 7 for the entire period of analysis.

2.- Given that we wished to observe the differential reaction of UK banks compared to European banks, once the UK bank population was identified we selected a European partner for each of them. In order for these partners to be used as a control group, they had to fulfil three requirements:

a) be listed on a stock market in the Europe
b) be as similar in size (measured by their balance sheet and/or employees) as possible to their UK partner
c) not have undergone any restructuring process or have disappeared during the time window in which the events occurred

Finally, the sample was composed of a maximum of 20 and a minimum of 14 banks (it should be remembered that whenever a UK bank was eliminated its European partner was also eliminated so that the sample remained balanced) depending on the event being analysed, as shown in Table 1. The information was obtained from the Thomson Reuters EIKON/DataStream database.

(table 1)

### *4. Methodology*

We used event study methodology in order to identify the market's response to new information such as the withdrawal of the United Kingdom from the European Union. This method avoids the need to analyse accounting-based measures of profits, which may be subject to manipulation by insiders, by focusing the analysis on stock prices (McWilliams and Siegel, 1997). The underlying idea is that changes in the market value of companies around an event date can be interpreted as the net present value of future costs and benefits associated with that event.

We analysed the change in stock prices by estimating abnormal returns, which are the difference between actual stock returns and the returns expected according to a market model. We calculated abnormal returns by following the market model proposed by Fama et al. (1969). This model estimates each bank's returns relating to the return from the market portfolio, represented by a global, regional or local equity index used as a benchmark.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad (1)$$

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} \qquad (2)$$

Where $R_{it}$ is the return of the bank i stock on day t, $R_{mt}$ is the return of the market portfolio, represented by a world equity index, the MSCI World Index[1]. The model

parameters are α and β and εit is the error term, with $E(\varepsilon_{it})=0$. $E(R_{it})$ is the expected return estimated by the model.

We then calculated the abnormal returns (ARs) as established above, that are assumed to reflect the stock market's reaction to the arrival of new information. Positive AR values imply that stock prices rose 'abnormally' following the event, and negative values indicate that the stock prices decreased. Next, we calculated the average abnormal return (AAR) across all banks from our sample.

$$AR_{it} = R_{it}^{*} - E(R_{it}) \quad (3)$$

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} ARit \quad (4)$$

Where $R_{it}^{*}$ is the real return of the bank i on day t and N is the number of banks.

The model is estimated from the daily returns calculated based on the closing prices of each security listed on the Thomson Reuters EIKON/DataStream database over a period of 240 trading days ending 20 days before the date of the announcement, to avoid the influence of confounding events.

We estimated the cumulative abnormal returns (CAR) over different event windows around the event date (t=0). Following other studies on the subject (McWilliams and Siegel, 1997; Carboni et al., 2017; Abad et al, 2020), we analysed event windows of different lengths, short enough to avoid the problems of overlapping events and long enough to capture the effect of the analysed event. The shorter one was 1 day after the event (0,+1) while the longest one covered 10 days around the event date (-5,+5) in order to include a period both before and after the event to calculate the complete market reaction.

We then calculated the cumulative average abnormal returns (CAAR) as the mean of our estimates for each of the windows. The statistical significance of the CAARs was verified by means of a parametric test such as the T-test or the Patell Z-test (Patell, 1976), and a nonparametric test such as the Wilcoxon Signed-Rank Test.

In order to capture all the relevant market reactions, we identified nine events associated with Brexit, as listed in Table 2. The first one refers to the referendum held on 23rd June 2016, while the last one relates to the actual withdrawal of the UK from the EU on 31st January 2020.

(table 2)

### *5. Results*

Tables 3 to 5 show the CAARs around the relevant dates leading up to Brexit in the whole sample (Table 3) and the subsamples of banks from the UK (Table 4) and the European (Table 5), respectively. We will highlight the most significant results that occurred during these events. In order to facilitate their presentation, and also their comparison during the various events, we analysed the reaction of investors within two event windows; a shorter one of 3 days after the event (0,+3), and another longer one of 10 days around the event (-5,+5) in order to consider the possibility that investors took a little longer to assess the information and its possible impact on bank performance, also taking into account the

possibility that the market had reacted before the event in response to possible information or rumours.

a) 23rd June 2016: the United Kingdom votes in a referendum to leave the EU. 51.9% of voters voted in favour of leaving.

   Although the referendum represented a blow (extraordinary negative return) for the sample as a whole of approximately 9.39%, this blow was much more severe for UK banking, of approximately 4.5% more, amounting to 13.9% in the 3 days after the event date. In that same window, the European subsample registered a smaller impact because of the referendum result, specifically 4.88%. If we consider the days around the event, the analysis is similar, although less than above (a loss of 8.2% for the whole sample, 11.69% for the UK subsample and 4.7% for the European subsample).

   These results are consistent with those obtained in previous studies and with both proposed hypotheses.

b) 29th March 2017: the United Kingdom triggers article 50 of the Treaty of Lisbon, which means the start of negotiations for its withdrawal from the EU.

   The triggering of article 50 of the Treaty of Lisbon was received positively by investors from the European banking industry as a whole (+1.2%) with extraordinary stock returns being observed in the 3 days after the event that was slightly higher (1.58%) for UK banks, while the effect was slightly weaker for European banks (0.81%). For the (-5,+5) window the result could not be considered statistically significant.

   However, this apparently contradictory result can be explained simply in terms of decision theory: investors welcomed what, at the time, they saw as a reduction in uncertainty and, although in theory Brexit could be considered a bad decision because of the reasons we have already outlined, perhaps this 'bad decision' was better than dealing with the inherent uncertainty of the 'Leave' or 'Remain' decision.

c) 14th November 2018: the British government approves the agreement for withdrawal from the EU.

   This approval caused losses of 1.78% for the sample as a whole, amounting to -3.21% for UK banks and disappeared (-0.34%, not significant) for European banks. If we focus on the window of 3 days after the event, the extraordinary results are larger: -3.69% for the banking industry as a whole and more negative for UK banking (-4.74%) and less so for European banking (-2.64%).

   Like the referendum result, these results are consistent with those obtained in previous studies and with both proposed hypotheses.

d) 25th November 2018: the 27 EU member states approve the agreement for the withdrawal of the United Kingdom from the EU[2].

   The approval by the 27 EU member states of the withdrawal agreement does not seem to have significantly affected the banking industry as a whole, because its

shares did not experience any significant extraordinary returns (-5,+5 window). The reaction was significantly negative for UK banking (-11.79%), while European banking did not register any significant extraordinary effect either. It is precisely this latter reaction that explains why the sample as a whole did not experience significant effects despite the strong negative impact on UK banking. If we focus on the effect after the announcement (0,+3), the result is similar: not significant for the sample as a whole or for the European subsample, but negative and significant (-13.91%) for UK banks.

This result supports hypothesis 2 quite significantly, in the sense that it was precisely UK banks, or UK investors at least, that perceived greater problems in development in the post-Brexit period.

e) 15th January 2019: the British Parliament rejects the withdrawal agreement previously approved by the government.

We could say, in general terms, that the rejection by the British Parliament of the withdrawal agreement was perceived positively by investors in the banking industry; if we focus on the stock returns on the days around the event (-5,+5), we can observe significant and positive returns for the UK subsample only (3.67%), while if we analyse only the days after the event the extraordinary return is significantly positive in all cases: 1.84% for the whole sample, 2.9% for the UK subsample and 0.77% for the European subsample.

In essence, the possibility that Brexit could finally become a bad dream that could be forgotten, in contrast to its arrival on the scene, was very well received (we should remember that Brexit was seen by analysts as a bad decision), especially by the sample that could be the most affected (UK banks) if said nightmare finally becomes a reality.

f) 11th April 2019: the European Parliament grants the United Kingdom an extension until 31st October to implement Brexit.

Again we can observe extraordinary positive returns for investors, of close to 4% (higher in the case of European banks) for the sample as a whole, slightly lower for the UK subsample and higher for the European subsample. The result is similar if we focus on the (-5,+5) event window and if we just analyse the days after.

In general, these results can be explained in the same way as those obtained when the British Parliament rejected the Brexit bill. The European extension encouraged the hope that Brexit might end up not happening or, in any case, that it might happen in a situation of greater understanding. In any case, it was all received positively by investors.

g) 28th October 2019: the European Parliament grants the United Kingdom a second extension until 31st January 2020 to implement Brexit.

The second EU extension was not perceived by investors in the same way as the first. We can only observe significant negative stock returns if we focus on the days after the event: -2.04% for the sample as a whole, -2.34% for UK banks and -1.75% for European banks.

One possible explanation for these results might be found in the dissatisfaction that political leaders generated in investors, especially in the case of UK, by showing what at that time seemed an absolute inability to deal with a process (of great importance) like Brexit with the necessary competence, and conveying contempt for the interests of the people.

h) 12th December 2019: general elections are held in the United Kingdom. The Conservative Party led by Boris Johnson wins an absolute majority.

The markets reacted favourably to this victory, generating very positive returns for banking investors; 4.97% in the (-5,+5) window and 3.02% in the (0,+3) window, being more significant in the case of the UK (6.5% and 4.83%), and more moderate for European banks, of 3.44% and 1.21% respectively.

In general, these results could indicate two things:

1. - The Conservative victory put an end to the impasse constructed by British political leaders for all those involved, especially their own citizens and companies (including banking, one of the principal national industries) regarding Brexit because of their seemingly insurmountable inability to find a way out of it. Finding a way out, in this case through Brexit, was seen as much better than continuing in the dark and, as such, was welcomed by financial agents.
2. - The improved returns that UK banks obtained in response to this result could be consistent with the idea of the reaffirmation of banks themselves, which wanted/needed to believe in themselves in view of the harsh approaching reality of an imminent Brexit.

i) 31st January 2020: Brexit enters into force.

The entry into force of Brexit was perceived differently by UK banks compared to European banks. Although in the (-5,+5) window European banks experienced positive extraordinary returns of 4.17%, which means a significant result for the sample as a whole of 3.04% despite the fact that the UK subsample did not experience significant results, for the (0,+3) window only the UK branch subsample experienced significant results, of -1.2%.

This new scenario, once the furore about the conservative victory had died down in the UK, explains once again, and consistent with hypothesis 2, that although Brexit has opened up a scenario full of uncertainties, possibly this scenario will be more difficult for UK banks to deal with than European banks.

(table 3)

(table 4)

(table 5)

## *6. Conclusions and discussion*

Due to the importance of trade relations between the UK and Europe, as well as the strategic nature of the financial sector for the British economy, this study may be helpful both in terms of the future development of Brexit, and the way in which future agreements between both spaces, which are necessary to shape this new scenario, are to be approached.

If we focus on the trade relations between mainland Europe and the United Kingdom, it can be observed that:

- In 2019, UK exports to Europe totalled 206.167 billion euros (49.2% of exports), of which 192.338 billion euros (45.9% of total exports) were to EU countries. In terms of GDP, this accounts for 8.17% of UK GDP (7.62% if we only consider the EU), but it only represents 1.23% of total European imports, and 2.05% if we only include EU countries (excluding the UK in both cases).
- In turn, British imports from Europe totalled 343.163 billion euros (55.7%), 304.349 billion euros (49.4% of the total) in the case of EU countries. Again, in terms of UK GDP, this represents 13.60% (Europe) and 12.06% (EU). But, British imports only account for 2.05% of exports from mainland Europe and 3.24% of EU exports (excluding the UK in both cases).

Considering the above data, several things are evident:

1. The importance of the trade relations between the UK and the EU (and, by extension, the European continent).

2. The UK's greater trade dependence on the EU (and, by extension, mainland Europe).

3. The existence of the UK's significant external deficit with Europe, which it has maintained now for several years and which is mainly due to the external goods balance, given that the export of services (including financial services) far exceeds their import, resulting in a positive services trade balance.

4. The significance of this reality for the banking sector (the subject of this paper), which must provide the financial means necessary to ensure the aforementioned flows (besides the relations of the rest of the world with both economic areas).

In addition to the above, it must also be taken into account that the services sector employs over 80% of the active population and accounted for 70.9% of UK GDP in 2019, being the main engine of the British economy, underpinned primarily by two pillars: the banking sector (the City) and the tourism sector.

Before Brexit emerged, it could be considered that the City was (and continues to be) the key piece in the British economy and, beyond a doubt, the headquarters of the European banking industry (it is estimated that there are currently over 255 foreign banks in the UK). In 2016, the business generated by the City accounted for approximately 11.8% of UK GDP and represented 7.4% of the country's total employment, around 2.2 million jobs across the United Kingdom (including both direct and indirect employment). It was also the gateway to Europe for US investment giants.

Not only does the above demonstrate the City's importance and the job opportunities that it generates, but it also provides insight, in a very general sense, into how economic agents perceive the different milestones that have gradually taken place in relation to Brexit, until becoming the reality that it is today.

Answers to questions such as the following: What might happen if, as a result of Brexit, several companies (mainly, but not exclusively, financial) decide to move to other places with better access to the European market, such as Dublin or Frankfurt? How can the UK handle the expected reduction in services exports (mainly, but not exclusively, financial) and, by extension, how can it fund its already structural trade deficit? Such aspects must surely form the basis of the agreements that will make the future development of Brexit possible.

***Notes***

1. We carried out the event study using an international portfolio, as represented by the MSCI World Index (https://www.msci.com/developed-markets) as a reference for the market portfolio to avoid any possible bias of the national index. The MSCI World Index is a broad global equity index that represents large and mid-cap equity performance across all 23 developed market countries.

2. Given that 25th November 2018 was a Sunday and therefore with no trading on stock markets, the following day, 26th November 2018 was taken as a reference for the determination of the analytical event windows.

***References***


- Abad P.; García-Olalla M. and Robles MD. (2020). Does the Single Supervisory Mechanism Reduce Overall Risk in the European Stock Markets? *Global Policy Journal*, 11 (1), 39-51.

- Bonchev, L., Pencheva, M. (2017): The impact of BREXIT vote on stock returns. An event study on European bank industry, Unpublished Master Essay, Department of Economics, Lund University School of Economics and Management.
- Burdekin, R., Hughson, E., Gu, J. (2018): A First Look at Brexit and Global Equity Markets, *Applied Economics Letters*, February, 25(2), pp. 136-140, https://doi.org/10.1080/13504851.2017.1302057.

- Breinlich, H., Leromain, E., Novy, D., Sampson, T., Usman, A. (2018): The Economic Effects of Brexit - Evidence from the Stock Market, *Fiscal Studies*, December, 39(4), pp. 581-623, https://doi.org/10.1111/1475-5890.12175.

- Carboni M., Fiordelisi, F. and Ricci O. (2017): Surprised or Not Surprised? The investors' reaction to the Comprehensive Assessment preceding the launch of the Banking Union. *Journal of Banking and Finance* 74, pp. 122-132,

https://doi.org/10.1016/j.jbankfin.2016.11.004

- Fama E. and MacBeth J. (1973): Risk, Return and Equilibrium: Empirical Test. *Journal of Political Economy* 81, pp. 607-636, http://dx.doi.org/10.1086/260061
- McWilliams A., Siegel D. (1997): Event Studies in Management Research: Theoretical and Empirical Issues. *Academy of Management Journal* 40(3), pp. 626-657, https://doi.org/10.5465/257056
- Oehler, A., Horn, M., Wendt, S. (2017): Brexit: Short-term stock price effects and the impact of firm-level internationalisation, *Finance Research Letters,* January, 22, pp. 175–181, https://doi.org/10.1016/j.frl.2016.12.024.
- Patell J.M. (1976): Corporate Forecasts of Earnings Per Share and Stock Price Behavior: Empirical Test. *Journal of Accounting Research*, pp. 246-276, http://dx.doi.org/10.2307/2490543
- Ramiah, V., Pham H. N. A., Moosa I. (2016): The sectoral effects of Brexit on the British economy: early evidence from the reaction of the stock market, *Applied Economics*, October, pp. 2508-2514, https://doi.org/10.1080/00036846.2016.1240352

***Tables***

***Table 1: Composition of the sample***

| *Name* | *Total assets* (mil euro)* | *Employees** | *Country* |
|---|---|---|---|
| Rasmala Plc (delist 19-12-18) | 158.733 | 74 | UK |
| Secure Trust Bank Plc | 1.692.847 | 706 | UK |
| Metro Bank PLC | 8.343.481 | 1.821 | UK |
| Virgin Money Holdings (Uk) PLC (delisted 15-10-18) | 41.023.776 | 3.058 | UK |
| Cybg Plc (re-branded as Virgin Money UK PLC in 31-10-19) | 52.526.556** | 6.816** | UK |
| Standard Chartered Plc | 589.372.457 | 84.076 | UK |
| Lloyds Banking Group Plc | 1.094.756.285 | 85.703 | UK |
| Royal Bank of Scotland Group Plc (The) | 1.106.590.197 | 93.659 | UK |
| Barclays Plc | 1.519.968.285 | 129.400 | UK |
| HSBC Holdings Plc | 2.217.281.713 | 264.000 | UK |
| Teximbank-PEB Texim AD | 125.021 | 263 | Bulgaria |
| Volksbank Vorarlberg e.Gen. | 2.439.596 | n.a.*** | Austria |
| Vontobel Holding AG-Vontobel Group | 16.188.322 | 1.494 | Switzerland |
| Bank Polska Kasa Opieki SA-Bank Pekao SA | 39.613.973 | 18.327 | Poland |
| Luzerner Kantonalbank AG | 30.594.501 | 943 | Switzerland |
| Nordea Bank AB (publ) | 646.868.000 | 29.815 | Sweden |
| ING Groep NV | 841.769.000 | 54.000 | Netherlands |
| Intesa Sanpaolo | 676.568.000 | 86.939 | Italy |
| Société Générale SA | 1.334.391.000 | 145.703 | France |
| BNP Paribas | 1.994.193.000 | 189.077 | France |

** At 31-12-15*

*** At 30-09-15*

**** 473 at 31-12-14 and 438 at 31-12-16*

***Table 2. Overview of event dates***

| | Event Date | Description |
|---|---|---|
| **1** | ***23rd June 2016*** | *Brexit referendum* |
| **2** | ***29th March 2017*** | *United Kingdom triggers Article 50 of the Treaty of Lisbon* |
| **3** | ***14th November 2018*** | *The British government approves the agreement for the withdrawal of the UK from the EU* |
| **4** | ***25th November 2018*** | *The 27 EU MS approve the agreement for the withdrawal of the United Kingdom from the EU* |
| **5** | ***15th January 2019*** | *British Parliament rejects agreement for the withdrawal of the UK from the EU* |
| **6** | ***11th April 2019*** | *The European Parliament grants an extension to the UK until 31st October 2019 to implement Brexit* |
| **7** | ***28th October 2019*** | *The European Parliament grants a second extension to the UK until 31st January 2020 to implement Brexit* |
| **8** | ***12th December 2019*** | *Boris Johnson wins an absolute majority in the British general elections* |
| **9** | ***31st January 2020*** | *Brexit enters into force* |

***Table 3. All banks stock market reaction on the relevant dates for Brexit***

| **Event window** | **CAAR %** | **T-test** | **Patell-Z** | **Sign-Test** |
|---|---|---|---|---|
| ***23rd June 2016*** | | | | |
| *(-5,+5)* | **-8.20** | -59.992*** | -60.178*** | -20.596** |
| *(-1,+1)* | **-4.27** | -59.836*** | -56.971*** | -20.596** |
| *(-3, 0)* | 0.99 | 12.025 | 11.843 | 10.764 |
| *( 0,+1)* | **-4.88** | -83.749*** | -80.891*** | -20.596** |
| *( 0,+3)* | **-9.39** | -114.011*** | -111.107*** | -25.077** |
| ***29th March 2017*** | | | | |
| *(-5,+5)* | 0.28 | 0.1790 | 0.1842 | 10.011 |
| *(-1,+1)* | 0.65 | 0.7960 | 0.9712 | 14.517 |
| *(-3, 0)* | -0.34 | -0.3647 | -0.3976 | -0.3507 |
| *( 0,+1)* | **0.65** | 0.9792 | 11.123 | 28.034*** |
| *( 0,+3)* | **1.20** | 12.736 | 14.259 | 23.528** |
| ***14th November 2018*** | | | | |
| *(-5,+5)* | **-1.87** | -17.263* | -19.485* | -10.713 |
| *(-1,+1)* | -0.57 | -10.130 | -13.580 | 0.3436 |
| *(-3, 0)* | 0.97 | 14.916 | 16.250 | 12.868 |
| *( 0,+1)* | **-1.82** | -39.376*** | -48.662*** | -24.861** |
| *( 0,+3)* | **-3.77** | -57.771*** | -72.279*** | -24.861** |
| ***26th November 2018*** | | | | |
| *(-5,+5)* | -1.19 | -10.651 | -12.245 | -0.5889 |
| *(-1,+1)* | **1.18** | 20.328** | 21.732** | 31.837*** |
| *(-3, 0)* | **3.06** | 45.562*** | 54.475*** | 31.837*** |
| *( 0,+1)* | **1.41** | 29.737*** | 33.205*** | 27.121*** |
| *( 0,+3)* | 0.58 | 0.8554 | 0.7045 | 0.3542 |
| ***15th January 2019*** | | | | |
| *(-5,+5)* | **2.48** | 20.194** | 18.364* | 17.545* |
| *(-1,+1)* | **2.36** | 36.791*** | 41.980*** | 22.555** |
| *(-3, 0)* | 0.59 | 0.7992 | 11.731 | 0.7526 |
| *( 0,+1)* | **1.73** | 33.008*** | 38.317*** | 22.555** |
| *( 0,+3)* | **2.35** | 31.746*** | 30.829*** | 22.555** |
| ***11th April 2019*** | | | | |
| *(-5,+5)* | **4.24** | 24.780** | 38.139*** | 29.080*** |
| *(-1,+1)* | **2.19** | 24.494** | 38.788*** | 29.080*** |
| *(-3, 0)* | **0.28** | 0.2755 | 0.9887 | 19.078* |
| *( 0,+1)* | **2.33** | 32.006*** | 52.113*** | 29.080*** |
| *( 0,+3)* | **3.57** | 34.626*** | 53.255*** | 34.082*** |
| ***28th October 2019*** | | | | |
| *(-5,+5)* | 0.20 | 0.0894 | -0.8204 | -12.200 |
| *(-1,+1)* | **-1.08** | -0.9334 | -16.815* | -17.549* |
| *(-3, 0)* | -0.19 | -0.1434 | -0.9292 | -0.6850 |
| *( 0,+1)* | **-1.21** | -12.819 | -24.551** | -17.549* |
| *( 0,+3)* | **-2.49** | -18.624* | -35.777*** | -28.248*** |
| ***12th December 2019*** | | | | |
| *(-5,+5)* | **5.48** | 23.576** | 34.735*** | 31.352*** |

| | | | | |
|---|---|---|---|---|
| *(-1,+1)* | **2.61** | 21.543** | 31.602*** | 26.005*** |
| *(-3, 0)* | **3.02** | 21.588** | 30.002*** | 31.352*** |
| *( 0,+1)* | **2.70** | 27.244*** | 39.650*** | 20.659** |
| *( 0,+3)* | **4.04** | 28.844*** | 41.787*** | 26.005*** |
| ***31st January 2020*** | | | | |
| *(-5,+5)* | **3.09** | 15.758 | 21.873* | 20.659* |
| *(-1,+1)* | 0.22 | 0.2141 | -0.2489 | 0.4620 |
| *(-3, 0)* | 0.73 | 0.6138 | -0.0740 | -0.0726 |
| *( 0,+1)* | -0.27 | -0.3176 | -0.8381 | -11.418 |
| *( 0,+3)* | -0.27 | -0.2272 | 0.0939 | -0.6072 |

****significant at 1%, **significant at 5%, *significant at 10%*

*Table 4. UK banks stock market reaction on the relevant dates for Brexit*

| Event window | CAAR % | T-test | Patell-Z | Sign-Test |
|---|---|---|---|---|
| ***23rd June 2016*** | | | | |
| *(-5,+5)* | **-11.69** | -61.461*** | -61.278*** | -25.956*** |
| *(-1,+1)* | **-5.49** | -55.256*** | -50.961*** | -25.956*** |
| *(-3, 0)* | **2.53** | 22.077** | 21.765** | 0.6343 |
| *( 0,+1)* | **-6.67** | -82.266*** | -77.006*** | -25.956*** |
| *( 0,+3)* | **-13.91** | -121.247*** | -115.135*** | -25.956*** |
| ***29th March 2017*** | | | | |
| *(-5,+5)* | 0.72 | 0.3333 | 0.2649 | 0.2324 |
| *(-1,+1)* | 0.97 | 0.8560 | 0.9234 | 0.8666 |
| *(-3, 0)* | -0.21 | -0.1587 | -0.0671 | -0.4017 |
| *( 0,+1)* | **0.89** | 0.9651 | 0.8860 | 21.349** |
| *( 0,+3)* | 1.58 | 12.152 | 10.025 | 15.008 |
| ***14th November 2018*** | | | | |
| *(-5,+5)* | **-3.53** | -26.384*** | -24.066** | -0.9444 |
| *(-1,+1)* | -0.78 | -11.147 | -0.9725 | 0.3892 |
| *(-3, 0)* | **1.43** | 17.720* | 17.744* | 10.560 |
| *( 0,+1)* | **-2.36** | -41.416*** | -42.358*** | -0.9444 |
| *( 0,+3)* | **-5.22** | -64.774*** | -68.102*** | -0.9444 |
| ***25th November 2018*** | | | | |
| *(-5,+5)* | **-3.30** | -23.222** | -19.798** | -0.2595 |
| *(-1,+1)* | 0.45 | 0.6079 | 0.3851 | 17.411 |
| *(-3, 0)* | **3.57** | 41.623*** | 44.957*** | 17.411* |
| *( 0,+1)* | **1.51** | 24.832** | 23.399** | 10.742 |
| *( 0,+3)* | 1.04 | 12.120 | 0.8890 | 0.4074 |
| ***15th January 2019*** | | | | |
| *(-5,+5)* | **4.76** | 26.758*** | 24.856** | 21.022** |
| *(-1,+1)* | **2.57** | 27.701*** | 25.997*** | 13.950 |
| *(-3, 0)* | 0.70 | 0.6534 | 0.9242 | -0.0192 |
| *( 0,+1)* | **1.47** | 19.310* | 17.094* | 0.6879 |
| *( 0,+3)* | **3.70** | 34.492*** | 32.057*** | 13.950 |
| ***11th April 2019*** | | | | |
| *(-5,+5)* | **4.16** | 15.646 | 23.926** | 28.093*** |
| *(-1,+1)* | **2.24** | 16.147 | 25.951*** | 21.022** |
| *(-3, 0)* | 1.02 | 0.6340 | 13.609 | 13.950 |
| *( 0,+1)* | **2.09** | 18.460* | 31.174*** | 21.022** |
| *( 0,+3)* | **2.90** | 18.060* | 26.638*** | 28.093*** |
| ***28th October 2019*** | | | | |
| *(-5,+5)* | 1.67 | 0.4595 | -0.8560 | -0.5311 |
| *(-1,+1)* | **-1.83** | -0.9643 | -21.052** | -12.882 |
| *(-3, 0)* | -0.33 | -0.1521 | -13.930 | 0.2261 |
| *( 0,+1)* | **-1.85** | -11.897 | -28.704*** | -20.454** |
| *( 0,+3)* | **-2.83** | -12.878 | -31.629*** | -12.882 |
| ***12th December 2019*** | | | | |
| *(-5,+5)* | **8.31** | 21.341** | 32.662*** | 25.566** |

| | | | | |
|---|---|---|---|---|
| *(-1,+1)* | **4.63** | 22.780** | 38.104*** | 25.566** |
| *(-3, 0)* | **3.85** | 16.412 | 22.677** | 18.002* |
| *( 0,+1)* | **4.92** | 29.618*** | 49.425*** | 18.002* |
| *( 0,+3)* | **6.75** | 28.747*** | 46.657*** | 25.566** |
| ***31st January 2020*** | | | | |
| *(-5,+5)* | 1.64 | 0.4977 | 0.2471 | 10.947 |
| *(-1,+1)* | 0.81 | 0.4677 | 0.0105 | 0.3387 |
| *(-3, 0)* | 2.32 | 11.654 | 0.3964 | 0.3387 |
| *( 0,+1)* | -0.16 | -0.1162 | -0.8045 | -11.734 |
| *( 0,+3)* | -1.61 | -0.8096 | -11.309 | -11.734 |

****significant at 1%, **significant at 5%, *significant at 10%*

*Table 5. European banks stock market reaction on the relevant dates for Brexit*

| Event window | CAAR % | T-test | Patell-Z | Sign-Test |
|---|---|---|---|---|
| ***23rd June 2016*** | | | | |
| *(-5,+5)* | **-4.70** | -23.972** | -23.827** | -0.3676 |
| *(-1,+1)* | **-3.05** | -29.771*** | -29.608*** | -0.3676 |
| *(-3, 0)* | -0.55 | -0.4654 | -0.5017 | 0.9018 |
| *( 0,+1)* | **-3.09** | -36.891*** | -37.391*** | -0.3676 |
| *( 0,+3)* | **-4.88** | -41.250*** | -41.994*** | -10.023 |
| ***29th March 2017*** | | | | |
| *(-5,+5)* | -0.16 | -0.0715 | -0.0044 | 11.909 |
| *(-1,+1)* | 0.33 | 0.2822 | 0.4501 | 11.909 |
| *(-3, 0)* | -0.48 | -0.3531 | -0.4952 | -0.0929 |
| *( 0,+1)* | **0.41** | 0.4315 | 0.6871 | 18.328* |
| *( 0,+3)* | **0.81** | 0.5995 | 10.140 | 18.328* |
| ***14th November 2018*** | | | | |
| *(-5,+5)* | -0.21 | -0.1217 | -0.3490 | -0.5719 |
| *(-1,+1)* | -0.37 | -0.4123 | -0.9480 | 0.0968 |
| *(-3, 0)* | 0.52 | 0.5043 | 0.5237 | 0.7656 |
| *( 0,+1)* | **-1.27** | -17.528* | -26.460*** | -25.782*** |
| *( 0,+3)* | **-2.31** | -22.564** | -34.116*** | -25.782*** |
| ***25th November 2018*** | | | | |
| *(-5,+5)* | 0.93 | 0.5414 | 0.2481 | -0.5750 |
| *(-1,+1)* | **1.92** | 21.365** | 26.883*** | 27.690*** |
| *(-3, 0)* | **2.55** | 24.679** | 32.082*** | 27.690*** |
| *( 0,+1)* | **1.32** | 18.042* | 23.561** | 27.690*** |
| *( 0,+3)* | 0.11 | 0.1064 | 0.1074 | 0.0938 |
| ***15th January 2019*** | | | | |
| *(-5,+5)* | 0.20 | 0.1205 | 0.1115 | 0.3770 |
| *(-1,+1)* | **2.15** | 24.263** | 33.372*** | 18.011* |
| *(-3, 0)* | 0.48 | 0.4729 | 0.7348 | 10.890 |
| *( 0,+1)* | **2.00** | 27.579*** | 37.094*** | 25.131** |
| *( 0,+3)* | 1.01 | 0.9834 | 11.541 | 18.011* |
| ***11th April 2019*** | | | | |
| *(-5,+5)* | **4.32** | 20.057** | 30.011*** | 13.033 |
| *(-1,+1)* | **2.13** | 18.983* | 28.903*** | 20.109** |
| *(-3, 0)* | -0.45 | -0.3453 | 0.0373 | 13.033 |
| *( 0,+1)* | **2.58** | 28.064*** | 42.525*** | 20.109** |
| *( 0,+3)* | **4.25** | 32.723*** | 48.677*** | 20.109** |
| ***28th October 2019*** | | | | |
| *(-5,+5)* | -1.28 | -0.5038 | -0.3041 | -11.941 |
| *(-1,+1)* | -0.33 | -0.2483 | -0.2728 | -11.941 |
| *(-3, 0)* | -0.05 | -0.0325 | 0.0790 | -11.941 |
| *( 0,+1)* | -0.58 | -0.5347 | -0.6017 | -0.4379 |
| *( 0,+3)* | **-2.15** | -14.099 | -18.967* | -27.063*** |
| ***12th December 2019*** | | | | |

| | | | | |
|---|---|---|---|---|
| *(-5,+5)* | **2.64** | 10.430 | 16.461* | 18.779* |
| *(-1,+1)* | 0.59 | 0.4488 | 0.6588 | 11.219 |
| *(-3, 0)* | **2.19** | 14.361 | 19.752** | 26.338*** |
| *( 0,+1)* | 0.48 | 0.4432 | 0.6649 | 11.219 |
| *( 0,+3)* | 1.33 | 0.8706 | 12.439 | 11.219 |
| ***31st January 2020*** | | | | |
| *(-5,+5)* | **4.54** | 21.410** | 28.462*** | 18.271* |
| *(-1,+1)* | -0.37 | -0.3320 | -0.3625 | 0.3148 |
| *(-3, 0)* | -0.87 | -0.6786 | -0.5011 | -0.4414 |
| *( 0,+1)* | -0.37 | -0.4068 | -0.3807 | -0.4414 |
| *( 0,+3)* | 1.07 | 0.8400 | 12.637 | 0.3148 |

****significant at 1%, **significant at 5%, *significant at 10%*