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Conservative accounting and the Brexit

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Abstract

The Brexit referendum was held on June 23, 2016. The Brexit could have a large impact on both UK-based companies and the UK economy. There are two feasible scenarios, the first scenario is that the leaders of the UK will come to an agreement with the leaders of the other EU members (soft Brexit). The second scenario is that the UK will leave the EU with no agreement and will lose all the privileges of being a member of the EU (hard Brexit), for example import/export tariffs. The (hard) Brexit could negatively affect companies. This thesis is about the relation between the effects of the Brexit and the application of conservative accounting. I focus in this Thesis on companies that already performed less well after the Brexit vote. A negative return on asset change after the Brexit vote is used as indicator for which companies will be negatively affected by the effects of the Brexit. Based on prior literature, we know that investors and lenders prefer the application of conservative accounting during financially difficult times[CITATION Placeholder1 \l 1033]. The subject of this study is to examine the relation between the Brexit and the application of conservative accounting. I expect that the negative effects of the Brexit are most for companies which already experienced a decline in performance (Measured with the return on asset change over one year). The sample contains 771 listed UK-based companies and the sample period is between 2014 and 2018. The Research question of this study is: Do companies in the UK which are negatively affected by the Brexit use more conservative accounting? In this study, I find that companies that have already experienced a decline in performance due to the Brexit use more conservative accounting. Considering this thought, it can be concluded that accounting is used to prepare for the possible effects of the Brexit as this research shows that companies with a decline in performance apply more conservative accounting after the Brexit vote.

Contents

1. Introduction.....	2
2. Literature review.....	4
2.1 The Brexit.....	4
2.2 Accounting conservatism.....	6
2.3 The Brexit and accounting conservatism.....	7
3. Hypothesis development.....	8
3.1 The potential effects of the Brexit.....	8
3.1.1 Exports.....	8
3.1.2 The financial service sector.....	8
3.1.3 All the industries.....	9
3.1.4 Uncertainty.....	9
3.2 Accounting conservatism and a financial crisis.....	9
3.3 Accounting conservatism and the Brexit.....	10
4. Research design and data.....	11
4.1 An estimate of accounting conservatism.....	11
4.2 Accounting conservatism and the Brexit.....	13
4.3 Robustness test.....	15
4.4 Data.....	16
5. Results.....	18
5.1 Results C_score.....	18
5.2 Results G+C_score.....	20
5.3 The hypothesis.....	21
6. Conclusion.....	23
7. Appendix.....	24
7.1 Appendix A.....	24

7.2 Appendix B.....	25
7.3 Appendix C.....	26
7.4 Appendix D.....	27
8. Bibliography.....	28

1. Introduction

24th of July, Theresa May has ended her period as prime minister of the UK, 30th of July, the British Pound has reached the lowest exchange rate since 2017, both real effects of a Brexit that has not even occurred yet. How do companies prepare for the Brexit? The purpose of this thesis is to study the relation between the economic effects of the Brexit for companies in the United Kingdom (UK) and the application of conservative accounting. This relation between conservative accounting and the Brexit will be studied using the following research question.

RQ: Do companies in the UK which are negatively affected by the Brexit use more conservative accounting?

The Brexit could have an enormous impact on the economy of the United Kingdom, Rabobank is even convinced that there is going to be a recession period for at least two years after the Brexit [CITATION Erk17 \l 1033]. The worst scenario possible for the UK is a hard Brexit. The hard Brexit entails the UK leaving the EU without a deal or a mutual agreement. The consequences of a hard Brexit could have a negative impact on the economy of the United Kingdom with estimated costs between £15 and 60 billion [CITATION Bre18 \l 1033]. Since the financial crisis in 2008, multiple studies have been conducted on the effect of conservative accounting and the possibilities to lend money and attract more equity during economic recession [CITATION Placeholder1 \m Fra13 \l 1033]. The results of these studies disclose that conservative accounting results in easier money lending and attracting capital. The focus of this research is to present companies that will be negatively affected by the Brexit, this is indicated by the return on asset change. A negative return on asset change after the Brexit vote indicates that these companies performed less well due to the uncertainty that exists after the Brexit vote and that is why I assume that these companies will also be negatively affected by the effects of the Brexit. At the moment, companies are aware of the fact that conservative accounting results in more investing opportunities during economically unfavourable times. Therefore, the companies seem to already apply more conservative accounting prior to the Brexit. By providing an answer to this research question, I can prove that companies use accounting, specifically conservative accounting, to prepare for the economic shock of the Brexit. Conservatism in accounting is not straightforward to measure and there are several ways to do so. I will use proxies based on the paper by Khan and Watts (2009) to conduct this research. The research design of this study will be a difference-in-difference design. I will compare the results of the UK-based companies that already

performed less well due to the Brexit vote with those companies that did not performed less well. The research design will be explained in more detail in the research design section. The main result of this study is that companies with a negative return on asset change apply significant more conservative accounting. Based on this result can be concluded that conservative accounting is used in advance by companies that will be negatively affected by the effect of the Brexit.

2. Literature review

The Brexit refers to the withdrawal of the United Kingdom (UK) from the European Union (EU). The people in the UK voted in favour of this decision with a small majority in 2016. In June 2016, 51.9 percent of the British population voted against the EU membership [CITATION Mat17 \l 1033]. This literature review will first discuss the political background concerning the Brexit vote. Secondly, it will clarify the reasons for voting in favour or against the Brexit. Thirdly, it will explain the consequences of a hard Brexit and a soft Brexit. Lastly, this study will explain the concept of accounting conservatism and how this concept relates to the Brexit vote.

2.1 The Brexit

During the election period of 2015, the Conservative Party, led by David Cameron, held an EU referendum as part of their election program to maintain votes. The Conservative Party won the majority of the votes. Right after the elections took place, Cameron started negotiating a new EU deal with other EU leaders. The negotiations, considered also as Cameron's last attempt to convince the British people to stay within the EU, attracted strong, adverse criticism by the media. After this last failed attempt to come to a new deal, the Brexit referendum was actually held on June 23, 2016.

Hobolt [CITATION Hob16 \n \t \l 1033] and Matti and Yang [CITATION Mat17 \n \t \l 1033] investigated the reasons why the British people were in favour of the Brexit. Although being in the EU provides some benefits to the UK, some people also regard the EU as a burden. The contradictory point of views resulted in a divided conservative party. According to Hobolt [CITATION Hob16 \n \t \l 1033], the strongest argument in favour of the Brexit is the immigration policy of the EU because British people demand full control of their borders. Another reason for leaving the EU seems to be the costs attached to the EU-membership which are considered to be too high. The motivation for people to vote against the Brexit are that they are concerned about the consequences and financial risks associated with a withdrawal from the EU. According to the Bank of England [CITATION Ban15 \n \t \l 1033], the UK achieved a trade surplus of almost £19 billion with the other EU member states in 2014 and after a hard Brexit the UK will no longer have this trade surplus.

The negotiations on how the Brexit will proceed are still in question. One of the major advantages of being a member of the European Union is a reduction in trade costs among

countries within the European Union due to the open borders. Dhingra et al. [CITATION Dhi16 \n \t \l 1033] studies the potential consequences of the Brexit on the UK international trade and the standards of living. There are two possible scenarios for this so-called Brexit. First, a Brexit with certain agreements within the European countries, this is called a Brexit 'deal'. Second, a Brexit with no agreements, this is called a hard Brexit. An important consequence of the no-deal Brexit scenario could be tariffs and trade costs on the export to the European Union (Dhingra, Ottaviano, Sampson, & Van Reenen, 2016). In 2014, the export from the UK to other members of the EU was 45% of the total export of the UK. This 45% of all export accounts for nearly 13% of the total Gross Domestic Product (GDP) of the United Kingdom. The Brexit creates a wide range of uncertainties and it is hard to determine what the future economic effect will be for the UK. According to Dhingra et al. (2016), a hard Brexit could result in a decrease of between 6.3% to 9.5 % of the GDP due to the decrease in export and productivity. This so-called hard Brexit could severely affect various industries. Possible tariffs on exports to the European Union could limit the export to the EU, negatively affecting the exporting companies. Due to this reduction in exports, the productivity of the UK will continue to decrease in the long run. This possibility of a decrease in the total exports to the EU and the reductions of productivity causes uncertainty, possibly resulting in a reduction of foreign direct investment (Chang, 2018). Another sector that will be unfavourably affected due to a hard Brexit is the financial service sector. London is a major supplier of financial services. Once the UK is not part of the European Union, companies will move out of the UK as financial companies can no longer help their EU clients from the UK. Therefore, they will relocate to other countries within the EU where their clients are based. The Brexit could have an enormous impact on the third sector, namely the agricultural sector in the UK. Currently farmers get 60% of their income from the EU Common Agriculture Policy (CAP). A hard Brexit could mean that the farmers will not get this 60% of their income anymore in the future, leading to their bankruptcy. Bankruptcy of the majority of farmers could consequently result in a collapse of land prices (Chang, 2018). The other scenario is an agreement between the leaders of the United Kingdom and the leaders of the European Union. This agreement affects the economy of the UK in two different ways. Firstly, due to potential tariff agreements the trade costs will be minimal and the import and export between the UK and the EU will be maintained. Secondly, this deal will enhance the level of trust and stability creating confidence to investors [CITATION Han18 \l 1033]. Hantzche et al. already concludes that the GDP of the UK has reduced by

2% compared to other countries, only as a result of the enlarged uncertainty. These days, there is still considerable uncertainty about the outcome of negotiations. The former prime minister of the UK, Theresa May, has been endeavouring to reach a deal with the EU. It is regrettable that the House of Commons rejected the deal for the third time on March 12th, 2019. The following day, this same House of Commons voted against a no-deal Brexit (hard Brexit), so the outcome of the Brexit negotiations is still uncertain. [CITATION Bar19 \l 1033]

2.2 Accounting conservatism

The traditional explanation of conservatism is to anticipate no profits but anticipate all losses. The more up-to-date explanation of applying conservatism is that good news requires a higher degree of verification than bad news [CITATION Bas97 \l 1033]. Using conservative accounting results in a manager incurring losses earlier than gains. This consequently results in an understatement of profits and assets. Francis, Hasan, and Wu [CITATION Fra13 \n \t \l 1033] study the benefits of conservative accounting to the shareholders. Applying conservative accounting possibly reduces opportunistic behaviour of managers. Another advantage of applying conservative accounting is that in economically unfavourable times, for instance a financial crisis, companies applying conservative accounting report smaller value losses. The main reason for applying conservative accounting for managers is the trust it creates for the stakeholders in the company (the shareholders are the largest stakeholders) (Francis, Hasan, & Wu, 2013). The study of Zhang [CITATION Zha08 \n \t \l 1033] underscores the benefits of conservative accounting for borrowers and lenders. Zhang concludes that more conservative borrowers have lower interest rates and after a negative price shock a lower probability of violating their debt covenants. Zhang concludes that based on these results, accounting conservatism is in fact more efficient for both the lender as well as the borrower. Opponents of conservative accounting argue that conservative accounting increases information asymmetry because some gains are not recognized. Furthermore, conservative accounting results in a firm value lower than its actual value. In addition, accounting conservatism causes an inefficient resource allocation [CITATION Fra13 \l 1033].

The study of Balakrishnan, Watts and Zuo [CITATION Placeholder1 \n \t \l 1033] argues about accounting conservatism during the financial crisis. The subject of their study is the relation between investments and conservative accounting during the crisis. Their study

proves that organizations applying conservative accounting experience a lower decline in investments and are less financially constrained than companies that do not apply conservative accounting during a crisis. Therefore, it was necessary for companies to apply conservative accounting during the crisis, because it reduces information asymmetry. This reduced information asymmetry provides more trust to lenders and investors, which will result in more available capital, thus fewer financial constraints. To draw a conclusion, we could state that it is imperative for companies being in an unfavourable financial situation to apply conservative accounting [CITATION Placeholder1 \l 1033].

There are two forms of conservatism, conditional conservatism and unconditional conservatism. In the application of unconditional accounting conservatism, the book value of assets is understated using predetermined aspects in the accounting process. By conditional conservatism book values are written down as a result of for example bad news, but are not re-valued as a reaction to good news [CITATION Bea05 \l 1033]. The Brexit could be a shock and this research will study if companies that experience a decline in performance due to the Brexit vote apply more conservative accounting. Therefore, this study looks at the conditional accounting conservatism. The study of Basu [CITATION Bas97 \n \t \l 1033], developed the Basu measurement and is used frequently, but it is not perfect. The Basu measurement is used to calculate the conservatism for an industry year, assuming that all companies in an industry are comparable. The second way the Basu measure can be used is using an individual firm's time series, assuming that the level of conservatism of that specific firm is constant over time. Based on this imperfect approximation of accounting conservatism, Khan and Watts [CITATION Kha09 \n \t \l 1033] find a new improved way to measure accounting conservatism. Khan and Watts use in their approximation of conditional accounting conservatism both the timeliness of good news, this is the C-score, as well as the incremental timeliness of bad news, this is the G-score. The C-score and G-score are both based on the firm's size, market-to-book ratio and the leverage of a firm [CITATION Kha09 \l 1033]. In this study, the Khan and Watts measurement is used to measure conditional accounting conservatism.

2.3 The Brexit and accounting conservatism

The Brexit is a potential shock which can result in economically unfavourable times for UK-based companies. The outcome of the negotiations are still uncertain. Some companies could already have incurred a loss due to the Brexit voting. Prior research proves that in economically unfavourable times, such as the financial crisis of 2008, conservative

accounting could be used to provide more trust to lenders and investors. Based on this prior research, it can be concluded that conservative accounting can be used to anticipate the Brexit outcome because lenders and investor like the application of conservative accounting.

3. Hypothesis development

3.1 The potential effects of the Brexit

The Brexit vote was held on the 23th of June 2016. Since then, the government of the UK and the members of the European Union have been endeavouring to come to an agreement, also called the Brexit Deal. Unfortunately, there is still no deal. The outcome of the negotiations between the UK and the EU are still uncertain. Since the actual Brexit has not occurred yet, the economic consequences are difficult to measure.

3.1.1 Exports

One of the most significant costs of the Brexit could be the trade barriers that will arise from a hard Brexit. Nowadays, the largest trading partners of the UK are the members of the European Union. As mentioned before, 45% of the total exports of the UK go to the EU [CITATION Dhi16 \l 1033] and [CITATION Bre18 \l 1033]. Besides the probability of higher trade costs to export to EU countries, the future trade agreements between the EU and trade-partners are not available for the United Kingdom. For example, the proposed trade deals between the EU and Japan will not be available for the UK after a hard Brexit as they are no longer part of the EU [CITATION Dhi16 \l 1033]. A decrease in export is also expected to result in a lower productivity in the future. Due to this reduced productivity, the innovation in the UK can stagnate [CITATION Bre18 \l 1033]. Since the referendum of 2016, the pound has already lost 15% of its original value in comparison with the US dollar, whereas the euro has only lost 12%. This means that the UK is relatively cheaper for companies to import from compared to 2016. This could partly compensate the potential future higher trade costs [CITATION Bre18 \l 1033]. Another possibility is an agreement between the UK and the EU, which could mean that there will be no enlarged trade costs between the UK and the EU [CITATION Han18 \l 1033]. The EU already has made trade agreements with over 60 different countries, these agreements could be used as a basis for new agreements between those countries and the UK [CITATION Bre18 \l 1033].

3.1.2 The financial service sector

Another sector that could be strongly affected due to the Brexit is the financial service sector. Nowadays the UK is a major provider of financial services worldwide. As soon as the UK

leaves the EU, British people may not be allowed to travel easily through Europe any longer, as a consequence, companies will move their headquarters and offices out of the UK to another country within the EU. Thus, the financial service sector will be affected due to the Brexit [CITATION Spr16 \m Bre18 \l 1033].

3.1.3 All the industries

The average income per household is expected to reduce between 1.3% and 2.6% in the UK, instigating people to spend less. This will not only affect one particular industry, but it is a general loss that could negatively impact every industry within the United Kingdom [CITATION Dhi16 \l 1033].

3.1.4 Uncertainty

As mentioned before, the effect of the Brexit is uncertain. Furthermore, what type of companies will be affected due to the Brexit is yet unclear. However, it is clear that it causes a lot of uncertainty. Due to this uncertainty, companies in the UK are expected to receive less foreign investment. Less investment results in lower innovation and thus lower future productivity. The actual effect of the Brexit on the UK companies is not clear yet. However, due to the expected lower foreign investments and companies moving out of the UK to other European countries, it is assumed that the Brexit has already adversely affected numerous companies. These companies will be even further impacted in the future due to the potential effects of the Brexit.

3.2 Accounting conservatism and a financial crisis

The financial crisis that began in 2008 had just ended at the time of the Brexit referendum in 2016. A lot of research has been conducted on the stake of accounting to examine the causes of the financial crisis. The study of Laux and Leuz [CITATION Lau10 \n \t \l 1033] is about how fair value accounting has attributed to the financial crisis. The study of Balakrishnan, Watts and Zuo [CITATION Placeholder1 \n \t \l 1033] find a positive relation between the investment and accounting conservatism during the financial crisis of 2008. During this crisis, the application of accounting conservatism provides a certain way of trust to investors. When a manager uses accounting conservatism, the information asymmetry reduces between the investor and the manager, because if the manager uses a lower value of an asset, to prepare for future losses, earnings management will become less likely. During the crisis, it turned out to be necessary to apply accounting conservatism because it provides trust to the investors and lenders. One way a company can apply conditional accounting

conservatism is timely loss recognition [CITATION Bal04 \l 1033]. Ball and Shivakumar studied the effect of timely loss recognition before the financial crisis. They found that timely loss recognition could make the financial statements more useful for investor and lender. Due to the timely loss recognition a manager is discouraged to make investments with a negative net present value. It is also not likely that a manager will proceed with operating investments with a negative cash flow [CITATION Bal04 \l 1033]. This creates better information availability to lenders for debt covenants and pricing of the loans. It could be reasonable to assume that lenders like timely loss recognition during economically unfavourable times to create better and more appropriate prices and covenants. Furthermore, the use of timely loss recognition increases the efficiency between the managers and the owners/investors of the company because early loss recognition reduces the opportunities for earnings managements of the managers. Besides the decreased earnings management opportunities, the managers now have a real reason to minimize the economic losses in the future. So based on past experiences, it could occur that companies, and therefore the managers of these companies, know that investors and lenders are in favour of this way of accounting during stressful economic times because it provides a certain trust.

3.3 Accounting conservatism and the Brexit

Based on the argumentation above, it can be concluded that the different studies come to different results and that the effect of the Brexit is uncertain. Some companies could have already experienced a decline in performance and these companies in the United Kingdom know a further potential shock could take place, depending on the negotiations between the UK and the EU. This decline in performance after the Brexit vote in the UK is most likely caused by the uncertainty of the Brexit after the vote. Therefore this loss is most likely a result of the increased uncertainty due to the outcome of the Brexit vote and the negotiations. Prior research also proves that conservative accounting could have a positive effect on the company's investing and lending opportunities during financially difficult times. Based on this, a potential relation could be expected between the further potential shock of the Brexit and conservative accounting. It is expected that the companies that already performed less well after the Brexit vote, are the companies that will be negatively affected by the real consequences of the Brexit. That is why I assume these are the companies that will anticipate on the potential consequences of the Brexit the most. Based on this prior research, I come to the following hypothesis.

H1: Companies in the UK that already performed less well after the Brexit vote are companies that will apply more conservative accounting to anticipate the further potential shocks of the Brexit.

4. Research design and data

The Libby boxes [CITATION Lib81 \n \t \ 1033] for the hypothesis can be found in the appendix A and operationalize and visualize the conceptual model. The companies with a negative return on asset change after the Brexit vote compared to the year before, are companies that already experience a decline in performance after the Brexit vote and perform less well compared to the year before due to the effects of the Brexit. To study the effect of the Brexit I will use a difference-in-difference design. The companies with a negative return on asset change are the companies that will most be affected by the Brexit, that is why I will focus on the difference between the companies that already have a negative return on asset change and companies which did not have a negative return on asset change. After the Brexit vote, it is most likely that the negative return on asset change is due to the effects of the Brexit.

4.1 An estimate of accounting conservatism

The research design is based on the study of Dai and Ngo [CITATION Dai13 \n \t \ 1033]. Dai and Ngo performed an event study with the presidential election as main event (external shock). This study is similar to an event study with the Brexit vote as an exogenous shock. This study will compare the companies in the UK that have already experienced a decline in performance with the companies in the UK that have not experienced a decline in performance before and after the vote using a difference-in-difference design. The Khan and Watts measurement [CITATION Kha09 \n \t \ 1033] will be applied as a proxy for the accounting conservatism. Khan and Watts based their model of conservatism on the Basu cross-sectional regression (Eq1) [CITATION Bas97 \n \t \ 1033].

$$X_i = \beta_1 + \beta_2 D_i + \beta_3 R_i + \beta_4 D_1 R_i + e_i \quad (Eq 1)$$

In this regression (Eq 1) i stands for the specific firm. The X is earnings before extraordinary items divided by the total market value of the company (M). The variable of market value is not directly available in compustat and should be calculated. To calculate the market value (M) of a company, I use the *total outstanding shares* on the last day of the quarter and multiply that with the closing price, the average of the bid/ask.

Return (R) is the stock return of the company over 1 year. This is calculated by taking the stock price of year t minus the stock price of year $t-1$ and add the total dividend of year t . The last step is to divide this number by the stock price $t-1$. D is a dummy variable which takes value 1 if the firm has negative returns ($R < 0$) and 0 otherwise. e_i is the error term. In this regression the β_3 is the measure for the timeliness of good news and $\beta_3 + \beta_4$ the total timeliness of bad news, so β_4 is the additional timeliness of bad news on top of the timeliness of good news. The G_score is defined as timeliness of good news (β_3) and the C_score is defined as the timeliness of bad news (β_4).

$$G_score = \beta_3 = \mu_1 + \mu_2 \ln i + \mu_3 M/B_i + \mu_4 Leverage_i e_i \quad (Eq 2)$$

$$C_score = \beta_4 = \lambda_1 + \lambda_2 \ln i + \lambda_3 M/B_i + \lambda_4 Leverage_i e_i \quad (Eq 3)$$

In equation 2 and 3 $Size_i$ stands for the natural log of the market value from the company. The M/B (*Market to book*) Ratio is calculated by dividing the *market value* (M) by the book value (B) of the company. *Stockholders' Equity* (E) is the total book value of stockholders of ordinary shares.

Leverage_i is the leverage of the company. The variable *Leverage* (Lev) is also called the debt/equity ratio. The leverage is calculated by dividing the total debt by the total equity. The variable total debt is not directly available so it will have to be calculated. The value of total debt is calculated by taking the *total asset value* (T) of a company and deduct the *total stockholders' equity* (E).

The $\mu_1 - \mu_4$ and the $\lambda_1 - \lambda_4$ vary over time and Dai and Ngo (2009) estimated these variables for each separate year. This study uses quarterly data and the $\mu_1 - \mu_4$ and the $\lambda_1 - \lambda_4$ will be estimated for each separate year. The $\mu_1 - \mu_4$ and the $\lambda_1 - \lambda_4$ are constant across firms. The next step is to implement the G_score and the C_score into the first regression (Eq 1).

$$X_i = \beta_1 + \beta_2 D_i + \epsilon_i \quad (\text{Eq 4})$$

The β_4 is the additional timeliness of bad news over the timeliness of good news, and that is why the C_score combined with the results of equation 4 is used as a measure for the application of conservative accounting. A higher C-Score does imply that the firm applies more conservative accounting.

To study the effect of the Brexit on conservative accounting, the C_score from equation 3 combined with the annual results of equations 4 will be used as a measure for the application of conservative accounting. The total results of the fourth equation (G and C score) can be found in the Appendix B. Table 1 only shows the coefficients for the C_score. These results of the $\lambda_1 - \lambda_4$ in equation 4, will be used for the calculation of the C_score. The C_score is the timeliness of bad news over the timeliness of good news. I will also calculate the total timeliness of bad news, the G+C_score. The coefficients ($\mu_1 - \mu_4$) for the calculation of the G_score can be found in table 2.

Table 1
Coefficients for calculating C_score (Eq4)

coefficients			2014	2015	2016	2017	2018
	λ_1	DxRET	0.007	-0.004	0.017	0.010	0.002
Size	λ_2	D_SIZExRET	0.000	0.001	-0.002	-0.001	0.000
MB	λ_3	D_MBxRET	-0.001	0.001	-0.004	0.000	-0.005
LEV	λ_4	D_LEVxRET	-0.003	0.001	0.004	-0.001	0.003

Table 2
Coefficients for calculating G_score (Eq4)

coefficients			2014	2015	2016	2017	2018
	μ_1	RET	0.003	0.000	0.001	-0.002	-0.002
log_size	μ_2	SIZExRET	-0.001	0.000	0.000	0.000	0.001
MB	μ_3	MBxRET	0.000	0.000	0.000	0.000	0.000
LEV	μ_4	LEVxRET	0.001	0.000	0.000	0.001	-0.000

Table 3
C_score by year

year	Mean	Standard deviation	Observations
2014	0.009	0.006	1,924
2015	0.001	0.005	2,090
2016	0.007	0.004	2,058
2017	0.005	0.002	2,131
2018	0,002	0.002	2,055

Total	0.004	0.005	10,258
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Table 3 shows the yearly means of the results of the calculation of the C_score using the outcomes of equation 4 (Table 1). The total number of observations is 10.258. The means of the C_score is between 0.001 and 0.009.

4.2 Accounting conservatism and the Brexit

I will execute a difference-in-difference test, based on the study of André, Fili, and Paugman [CITATION And15 \n \t \l 1033]. In this study the difference between the companies that experienced a decline in performance after the Brexit vote is compared with those which did not. I use the Return on assets change as a proxy for companies that perform less well after the Brexit vote or not. A negative ROA change is expected to be an effect of the Brexit, so the companies that have a negative ROA change are the companies that will be negatively affected by the Brexit. I will execute 2 regressions, first a regression with the C_score as dependent variable (EQ5) and second the regression with the G+C_score as dependent variable (EQ6).

$$C_score = \alpha_1 + k_1 Brexit + k_2 ROA_{Change_i} + k_3 ROA_{Change_{i,t}} * Brexit + controls + \varepsilon \quad (Eq\ 5)$$

$$G+C_score = \alpha_1 + l_1 Brexit + l_2 ROA_{Change_i} + l_3 ROA_{Change_{i,t}} * Brexit + controls + \varepsilon \quad (Eq\ 6)$$

In these regressions *Brexit* is a dummy variable which takes value 1 when the date is after 23 June 2016 and takes value 0 if it is a date before 23 June 2016. Since this study relies on quarterly information and 23 June is close to the end of the second quarter, the second quarter of 2016 is seen as a quarter before the voting date. $ROA_{Change_{i,t}}$ Is a dummy that takes 1 if the ROA_Change, compared with the quarter before, is negative and 0 otherwise.

$$(ROA_{Change_{i,t}} = ROA_{i,t} - ROA_{i,t-1}).$$

$ROA_{Change_{i,t}} * Brexit$ is the interaction effect between after the voting date and the companies that already have a decline in performance due to the Brexit. The variable of interest from this study is the k_3 . A positive k_3 suggests that the interaction effect has a positive effect on the

C_score and thus on conservative accounting. This would suggest that companies that are affected by the Brexit vote apply more conservative accounting. The distribution of the C_score after the Brexit vote and the companies with a negative return on asset change can be found in Figure 1. The mean of companies with a positive ROA change after the Brexit vote is 0.0039 (3.728 observations) and with a negative ROA_change (1.477 observations) is 0.0042.

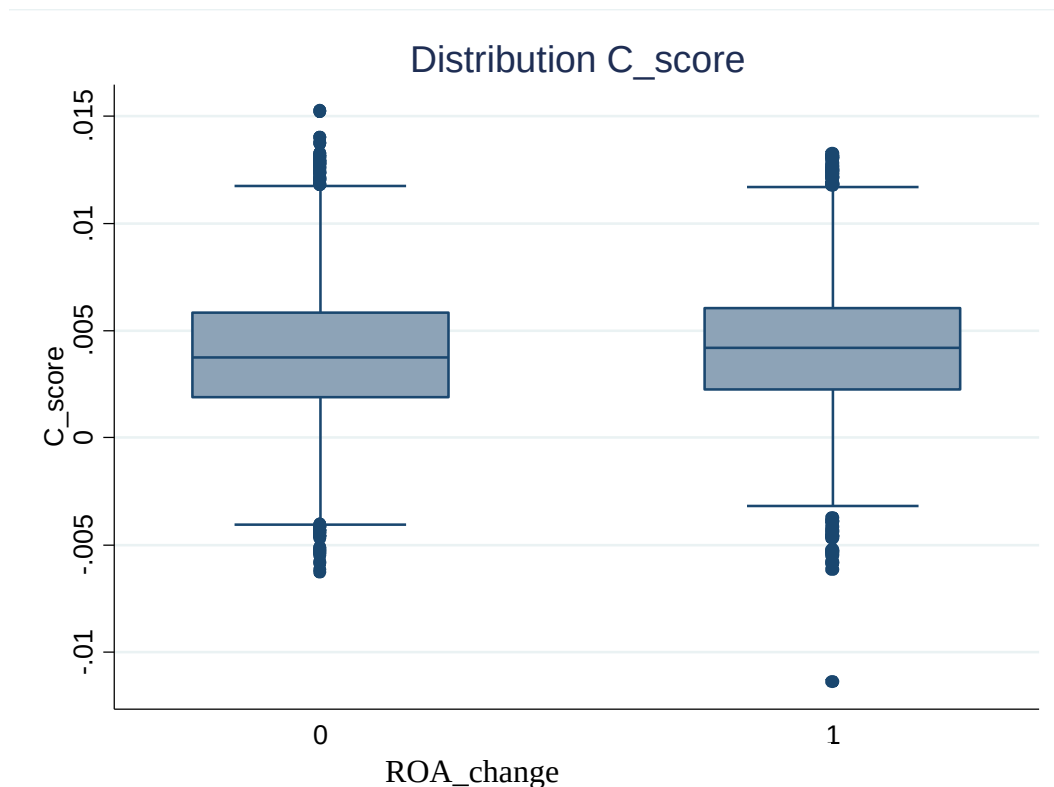


Figure 1: distribution C_score after the Brexit vote between companies with a positive (0) ROA_change and a negative (1) ROA_change.

I use the following control variable: *Tobin's q* (*Tobin's q* is calculated by using the *Market value (M)* and divide this by the *Total asset value (T)* of a company), *Size*, *M/B ratio*, *leverage*, *return*, *earnings*, *industry fixed effects* (SIC dummies) and *year fixed effects*. This is based on Balakrishnan, Watts and Zuo (2016) and on the study Dai & Ngo [CITATION Dai13 \n \t \l 1033].

4.3 Robustness test

Another widely used mechanism to measure the application of accounting conservatism is market to book value. The market to book value captures the understatement of the book

value compared with the market value [CITATION Zha08 \l 1033]. Therefore I will perform a robustness test with the market to book value as dependent variable. The market to book value is a completely other kind of measure than the C_score and that is why only the sign will be used to test for robustness. The results of the robustness test can be found in the appendix D.

4.4 Data

For this study data is extracted from the Compustat Global database. This is a limited database because only information of listed companies is available. The data contains financial information of 771 companies. I will use quarterly data between 2014 and 2018. I have deleted observations with a share price of less than 1 dollar and the observations in the top and bottom 1% of the Market to book ratio, earnings, log_size, return and leverage [CITATION Kha09 \l 1033]. I started with 15.072 observations and after the data management I keep 10.258 observations. Table 3 shows the process of the data management.

Table 3
Data management

Total observations	15.072
Share price <1\$	-3.426
MB upper 1% and 99%	-298
Earnings 1% and 99%	-305
log_size 1% and 99%	-260
Return 1% and 99%	-256
Leverage 1% and 99%	-269
Total observations used	10.258

Variables summary

X (Earnings)	$\frac{\text{Earnings before extraordinary items}}{\text{Market value } (M)}$
R (Return)	$\frac{(\text{Stockprice}_{i,t} - \text{Stockprice}_{i,t-1}) + \dot{i}_t}{\text{Stockprice}_{i,t-1}}$
M (market value)	outstanding shares * closing price (average bid ^ ask)
Size_i	$\log(M)$
M/B Ratio	$\frac{\text{market value } (M)}{\text{Stockholders' Equity } (E)}$
Leverage	$\frac{\text{Total debt } (D)}{\text{Total equity } (E)}$
Total debt (D)	Total asset value – Total stockholders' equity (E)
ROA (Return on assets)	$\frac{\text{Net income}}{\text{Total assets}}$
$\text{ROA}_{\text{Change}_{i,t}}$	$\text{ROA}_{i,t} - \text{ROA}_{i,t-1}$
Tobins Q	$\frac{\text{Market value } (M)}{\text{Total asset value}}$
D	1 if $R < 0$ & 0 if $R > 0$
Brexit	1 if date > 23 June 2016 0 if date < 23 June 2016

5. Results

The results section is divided into three parts, this research first will highlight the results of the C_score and the $G+C_score$. Secondly, it will answer the hypothesis based on regressions with the C_score . Finally, it will compare the results with the results of the robustness tests.

5.1 Results C_score

In appendix B the results of equation 4 can be found. These results are used as coefficients for the calculation of the C_score and the G+C_score. The results of appendix B are filled into the original equation 3. Table 4 shows the descriptive statistics of this study.

Table 4
Descriptive statistics

Variable	Observations	Mean	Standard deviation	Min	Max
C_score	10,258	0.004	0.005	-0.023	0.044
G+C_score	10,258	0.000	0.009	-0.091	0.058
ROA_DUMMY	10,258	0.279	0.449	0.000	1.000
Brexit	10,258	0.508	0.500	0.000	1.000
ROADxBREXIT	10,258	0.144	0.351	0.000	1.000
Return	10,258	0.231	0.668	-0.805	4.760
log_size	10,258	6.249	1.660	2.160	11.869
Earnings	10,258	0.017	0.024	-0.101	0.112
Leverage	10,258	1.492	2.681	0.001	25.188
tobinsQ	10,258	1.350	1.320	0.022	15.274
MB	10,258	2.757	1.820	0.091	20.507
Y2014	10,258	0.188	0.390	0.000	1.000
Y2015	10,258	0.204	0.403	0.000	1.000
Y2016	10,258	0.201	0.400	0.000	1.000
Y2017	10,258	0.208	0.406	0.000	1.000
Y2018	10,258	0.200	0.400	0.000	1.000

The hypothesis was: *Companies in the UK that already performed less well after the Brexit vote are companies that will apply more conservative accounting to anticipate the further potential shocks of the Brexit.*

This hypothesis is tested by equation 5 and 6. The results of equation 5 can be found in table 5 and the results of equation 6 can be found in the appendix C. The first regression, shown as model 1 in table 5 and appendix C, only shows the effect of the Brexit on the C-score not corrected by other variables which could cause a bias. The second regression, model 2, includes control variables and is therefore controlled for the stock return, the natural logarithm of the size of the firm, the relative earnings, the market to book ratio, the leverage and for the Tobin's Q. The third regression, model 3, is the same as model 2, but extended by year fixed effects and the last regression, model 4, shows the most complete model and also controls for industry specific effects (SIC dummies).

In this first regression the Brexit shows a negative significant effect on the C_score, which means that there is a reduction of the application of conservative accounting after the Brexit referendum. The return on asset change dummy is not significant, so nothing can be concluded from this. The coefficient of the interaction effect between the ROA dummy and the Brexit is 0.001 and significant by a significance level of 5%. This shows that companies with a negative return on asset dummy after the Brexit apply more conservative accounting. The adjusted R² is in this first regression 0.006, consequently very low.

The second regression shows that the Brexit has a negative significant effect on the C_score. This negative coefficient indicates that the application of conservative accounting reduces after the Brexit vote of 2016. The return on asset change dummy has no significant effect on the C_score. This suggests that a decline in the return on assets ratio does not affect the use of conservative accounting. The interaction effect between the Brexit and the return on asset change dummy is 0.001 and significant, this shows a relation between the companies that will experience negative effects of the Brexit and conservative accounting. The stock return does not have a significant effect on the C_score indicating that the stock return will not influence the application of conservative accounting. Earnings have a positive significant effect on the C_score of 0.017. The market to book ratio has no significant effect on the C_score. Leverage is in this regression not significant. Tobin's Q has also no significant effect on the C_score. The adjusted R² of this regression is 0.018, which means that this model explains a little more the variation in the C_score than regression 1.

The third regression also includes the year fixed effects. In this regression, the variable Brexit has a positive significant effect on the C_score, this suggests that after the Brexit vote took place, companies use slightly more conservative accounting. The return on asset change dummy has no significant effect on the C_score. In regression three, there is a significant coefficient of 0.001 of the interaction effect between the Brexit and the return on asset change dummy suggesting that companies with a negative ROA change after the Brexit apply more conservative accounting. There is no significant effect of stock return. The effect of earnings is not significant. The dummies for 2014, 2016, 2017 and 2018 are all significant and positive. The dummy for 2015 is not significant. 2014 has a positive effect of 0.008 with a p-value of 0.01, 2016 has a positive effect of 0.006, the coefficient of 2017 is 0.006 and 2018 is 0.003. The R² of this regression is 0.39 which is a lot more than regression one and two.

In the last and fourth regression, the SIC dummies (Standard Industrial Classification codes) are added, which means that it is controlled for the industry specific characteristics. In this most complete model *Brexit* has a positive significant effect on the *C_score* of 0.0021, this indicates that companies use conservative accounting more after the Brexit vote. The return on assets change dummy does not have a significant effect on the *C_score*, nothing can be concluded from this. The interaction effect between the Brexit and the *C_score* is positive 0.001 and is significant by a P-value of 1%. A positive coefficient suggests in this case that companies which experienced a decline in return on assets, after the Brexit vote do use more conservative accounting. There is no significant effect of the stock return. The coefficient of the natural logarithm of the size is 0.000 and this suggest that the natural log of the size has no significant effect on the *C_score*. The earnings are in the fourth regression not significant and so nothing can be concluded about this. The market to book ratio has a no significant coefficient of 0.000, so also from the MB coefficient nothing can be concluded. The coefficient of leverage is not significant. The coefficient of 2014 has no significant effect on the *C_score*. The dummy 2015 has a significant effect on the *C_score* of -0.008, suggesting that in general companies in the UK apply less conservative accounting in 2015 The coefficient of 2016 is -0.003 and significant with a P-value of less than 1%. The coefficient of 2017 is -0.005 and significant. Also 2018 has a negative significant effect on the C-score of -0.008. The R^2 of this last and most complete regression is 0.30, this is slightly lower than the third model. The constant will not be interpreted.

5.2 Results G+C_score

The G+C_score is the measure of the total timeliness of good and bad news and the results of equation 6 can be found in the appendix C. The results of the first regression show the Brexit has no significant effect on the G+C_score. Besides, the ROA dummy and the interaction effect do not significantly affect the G+C_score. This could be interpreted as that the Brexit, ROA dummy and the interaction effect between the ROA dummy and the Brexit dummy do not influence the total timeliness of good and bad news. The second regression is also controlled for return, log_size, earnings, MB and for Tobin's Q. In this regression the Brexit still has no significant effect on the G+C_score. The coefficient of the ROA dummy is positive and is 0.001 that indicates that after the Brexit vote the total timeliness of good and bad news becomes a bit more. The interaction effect between the ROA dummy and the Brexit dummy has no significant effect on the G+C_score. The R^2 is 0.135 and is higher than for the first regression, suggesting that the explanatory power is higher for this model. The third

and fourth regression are also controlled for year fixed effects, the Brexit vote dummy does not have a significant effect on the G+C_score. The ROA_DUMMY has for both a positive significant effect of 0.001 suggesting that the total timeliness of good and bad news become more and the interaction effect of the ROA change dummy and the Brexit vote is negative suggesting the total timeliness of companies with a negative return on asset change reduces after the Brexit. The R² of the third and fourth regression is respectively 0.227 and 0.222. Because the third and the fourth regression have the most explanatory power of the four regressions I can conclude that the total timeliness of good and bad news becomes more when a company has a negative return on asset change dummy, but the total timeliness of good and bad news reduces when the return on asset change is caused by the uncertainty of the Brexit by -0.001.

5.3 The hypothesis

Because the C_score is defined as a measure for the timeliness of bad news over the timeliness of good news the C_score is used as a measure of accounting conservatism. The fourth model with the C_score as dependent variable, is the most complete model of the thesis, this model will be used to answer hypothesis one. To determine which companies will be hurt by the effects of the Brexit is the Return on asset change dummy used in combination with the Brexit vote dummy, a negative return on asset indicates which companies will be hurt by the effects of the real Brexit. The variable Brexit is a dummy to determine whether the quarter is after the voting date. So the interaction effect between the return on asset change dummy and the Brexit is the variable of interest. Based on the Results fourth regression, is this coefficient (ROADxBREXIT) 0.001 and significant with a P_value of less than 1%. This means that companies which already performed less well after the Brexit vote happened have a higher C_score, which suggests that those companies apply more conservative accounting. Based on these results hypothesis one is not rejected.

Comparing the significant coefficients on the C_score and on the robustness test (MB), I find that the interaction effect between the return on assets dummy, the Tobin's Q (*TobinsQ*), year dummy 2017 and year dummy 2018 have the same significant sign for the coefficient and therefore the results are robust.

Table 5
Results equation 5

	(1) (N=10.253)	(2) (N=10.253)	(3) (N=10.253)	(4) (N=10.243)
Brexit	-0.001*** (-7.71)	-0.001*** (-7.67)	0.001*** (5.43)	0.001*** (5.35)
ROA_DUMMY	0.000 (-1.34)	0.000 (0.03)	0.000 (-1.04)	0.000 (-1.07)
ROADxBREXIT	0.001** (2.27)	0.001** (2.12)	0.001*** (3.55)	0.001*** (3.6)
Return		0.000** (-2.31)	0.000 (-1.19)	0.000 (-1.39)
log_size		0.000*** (-7.93)	0.000*** (-9.54)	0.000*** (-7.79)
Earnings		0.017*** (7.94)	0.001 (0.85)	0.002 (0.96)
MB		0.000* (1.82)	0.000 (0.72)	0.000 (0.56)
Leverage		0.000 (-0.51)	0.000 (-0.60)	0.000 (-0.04)
tobinsQ		0.000 (-1.31)	0.000 (-1.64)	0.000* (-1.73)
Y2014			0.008*** (39.28)	0.000 (0.60)
Y2015			0.000 (0.46)	-0.008*** (-65.70)
Y2016			0.006*** (38.28)	-0.003*** (-16.88)
Y2017			0.003*** (28.52)	-0.005*** (-22.62)
Y2018			0.000 (0.6)	-0.008*** (-38.65)
constant	0.005*** (58.91)	0.006*** (28.64)	0.002*** (7.71)	0.010*** (21.96)
SIC_dummies	No	No	No	Yes
adj. R-sq	0.006	0.018	0.39	0.388

t statistics in parentheses

* p<0.1, ** p<0.05, *** p<0.01

6. Conclusion

In this thesis, I study the effect of the anticipation towards the Brexit on the application of conservative accounting. I assume, based on prior research that companies that have already experienced a decline in performance due to the increased uncertainty after the Brexit vote, will apply more conservative accounting. So the research question of this thesis is:

Do companies in the UK which are negatively affected by the Brexit use more conservative accounting?

The main result of this thesis is that the companies that experience a decline in performance after the Brexit vote, which is most likely caused by the increased uncertainty after the Brexit vote, use more conservative accounting. Based on this, the hypothesis is not rejected. Moreover the coefficient Brexit is positive, which means that companies in the UK in general apply more conservative accounting after the Brexit vote.

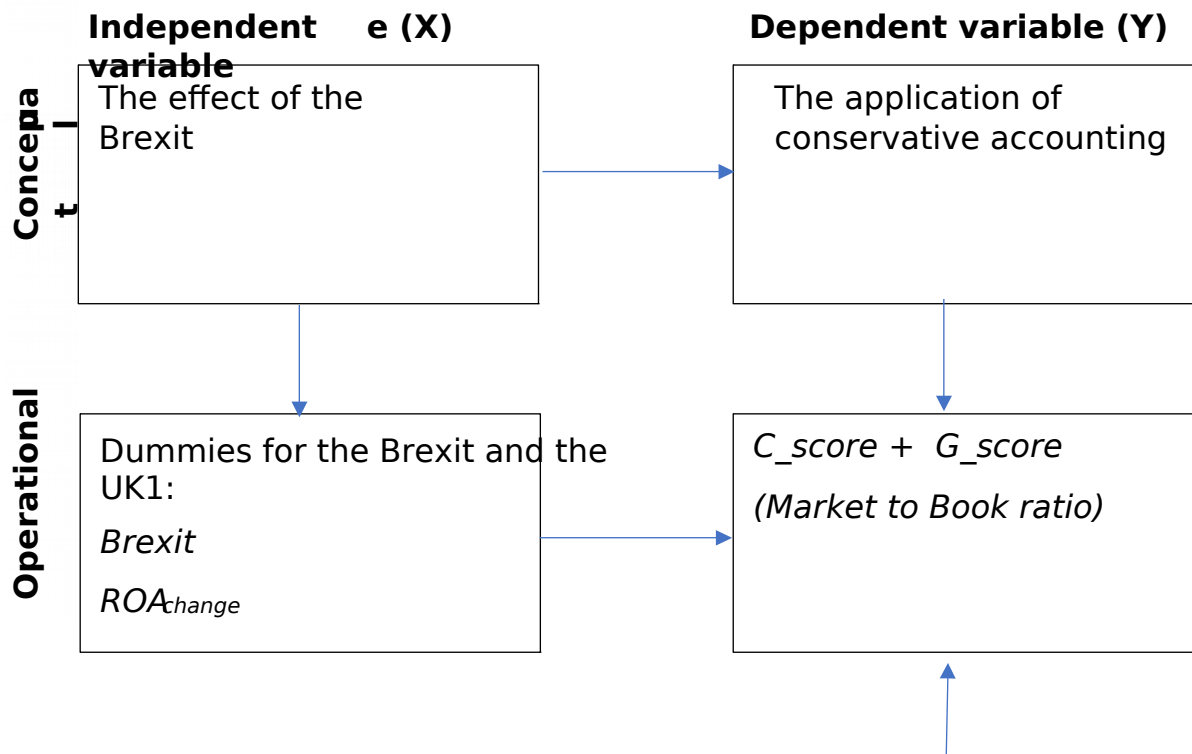
Based on these results, I can answer the research question. Companies that already experienced a decline in performance due to the Brexit vote use more conservative accounting. These findings are in accordance with my initial hypothesis. I can conclude that conservative accounting is used in preparation for the financial effects of the Brexit, just as it was used during the financial crisis of 2008[CITATION Fra13 \l 1033]. The contribution is that the financial statements should be comparable over the years and among different companies[CITATION deF11 \l 1033]. The choice to apply more or less conservative accounting in advance to a potential crisis make the financial statements less comparable over time. Stakeholders should take this into account when analysing the financial statements of companies in the UK that are negatively affected by the Brexit.

The limitations of this study are that I focus on the effects of the Brexit while only the Brexit vote itself has taken place until now and the Brexit has not actually occurred yet. Hence, it is not possible to use the actual effects in this research. Another limitation is that I have used only data of listed UK companies because only that information was available. My suggestion for further research is that it could focus on the actual effects of the Brexit on the application of conservative accounting and compare this with the effects prior to the actual Brexit.

7. Appendix

7.1 Appendix A

Libby boxes



Control variables

Earnings
Stock Return
Tobin's Q
Year fixed effects
Industry fixed effects

1. The Brexit vote could already have resulted in a decline in performance by companies in the UK. In this study is assumed that the companies that experienced a decline after the vote, are the companies that will be hurt by the effects of the Brexit

7.2 Appendix B

Table 6
G+C results equation 4

Earnings	2014	2015	2016	2017	2018
D	-0.077*** (-15.01)	-0.058*** (-13.02)	-0.067*** (-11.24)	-0.052*** (-8.31)	-0.058*** (-12.92)
Return	0.003 (1.25)	0.000 (0.00)	0.001 (0.23)	-0.002 (-0.80)	-0.002 (-0.90)
SIZExRET	-0.001 (-2.32)	0.000 (0.5)	0.000 (-0.66)	0.000 (-0.25)	0.001 (1.35)
MBxRET	0.000 (1.02)	0.000 (0.13)	0.000 (1.93)	0.000 (0.90)	0.000 (-0.06)
LEVxRET	0.001** (2.63)	0.000 (-2.45)	0.000 (0.34)	0.001** (2.81)	-0.000 (-1.43)
DxRET	0.007 (0.75)	-0.004 (-0.95)	0.017 (1.69)	0.010 (1.13)	0.002 (0.27)
DxSIZExRET	0.000 (0.11)	0.001 (0.88)	-0.002 (-0.99)	-0.001 (-0.52)	0.000 (-0.08)
DxMBxRET	-0.001 (-0.23)	0.001 (0.85)	-0.004 (-2.05)	0.000 (-0.13)	-0.005 (-1.93)
DxLEVxRET	-0.003 (-0.62)	0.001 (1.03)	0.004 (1.68)	-0.001 (-1.11)	0.003* -2.33
SIZE	-0.000 (-1.59)	-0.001** (-2.61)	-0.006*** (-3.46)	-0.001*** (-3.75)	0.000 (0.55)
MB	-0.002*** (-12.99)	-0.002*** (-8.94)	-0.003*** (-14.14)	-0.002*** (-16.15)	-0.002*** (-10.16)
Leverage	-0.000 (-1.56)	0.000 (0.42)	-0.000* (-2.16)	-0.000 (-1.58)	0.000 (0.37)
DxSIZE	0.005*** (5.25)	0.001 (0.99)	0.002* (2.14)	0.001 (0.68)	0.000 (0.26)
DxMB	0.006*** (4.44)	0.004*** (6.12)	0.006*** (4.88)	0.004*** (5.43)	0.006*** (8.05)
DxLEV	-0.004** (-2.96)	-0.001* (-2.49)	-0.002* (-2.19)	-0.001 (-1.48)	0.001 (1.78)
Constant	0.032*** (18.32)	0.028*** (16.9)	0.038*** (19.74)	0.037*** (20.91)	0.0240*** (13.2)
N	1924	2090	2058	2131	2055

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

7.3 Appendix C

Table 7
G+C score

G+C_score	(1) (N=10.253)	(2) (N=10.253)	(3) (N=10.253)	(4) (N=10.243)
Brexit	0.000 (0.61)	0.000 (0.94)	0.000 (0.35)	0.000 (0.85)
ROA_DUMMY	0.000 (1.14)	0.001* (1.77)	0.001** (2.23)	0.001** (2.35)
ROADxBREXIT	0.000 (-0.14)	0.000 (-0.93)	-0.001* (-1.79)	-0.001* (-1.81)
return		0.000 (0.55)	0.000 (0.78)	0.000 (0.41)
log_size		0.000*** (-6.79)	0.000*** (-7.43)	0.000*** (-6.50)
earnings		0.008** (2.13)	0.015*** (4.33)	0.014*** (4.12)
MB		-0.001*** (-20.94)	-0.001*** (-21.40)	-0.001*** (-16.19)
leverage		0.000*** (2.79)	0.000*** (3.58)	0.000*** (3.05)
tobinsQ		0.000 (-0.82)	0.000 (-0.81)	0.000 (0.44)
Y2014			0.001 (1.3)	0.000 (1.4)
Y2015			-0.003*** (-7.09)	-0.003*** (-14.02)
Y2016			-0.007*** (-23.61)	-0.008*** (-25.39)
Y2017			-0.002*** (-9.73)	-0.003*** (-7.14)
Y2018			0.000 (1.5)	-0.001 (-1.45)
constant	-0.000** (-2.18)	0.005*** (13.15)	0.007*** (13.88)	0.007*** (7.61)
SIC_dummies	No	No	No	Yes
adj. R-sq	0.000	0.135	0.227	0.222

t statistics in parentheses

* p<0.10, ** p<0.05, *** p<0.01

7.4 Appendix D

Table 8
Robustness test market to book ratio [CITATION Zha08 \l 1033]

	(1) (N=10.253)	(2) (N=10.253)	(3) (N=10.243)
MB			
Brexit	0.004 (0.06)	-0.139*** (-3.77)	-0.023 (-0.44)
ROA_DUMMY	0.033** (0.37)	-0.011 (0.02)	0.053 (1.40)
ROADxBREXIT	0.222* (-1.79)	0.066 (-0.94)	0.032* (-0.61)
return		0.016 (0.70)	-0.014 (-0.74)
log_size		0.127*** (13.04)	0.084*** (8.66)
earnings		-3.698 (-5.45)	-0.275 (-0.52)
leverage		0.352*** (57.47)	0.455*** (59.48)
tobinsQ		1.699*** (139.14)	1.587*** (124.34)
Y2014			0.000 (-1.4)
Y2015			-0.003 (-0.08)
Y2016			-0.066 (-1.45)
Y2017			-0.123*** (-1.93)
Y2018			-0.266*** (-4.71)
Consant	2.788*** (970.25)	-0.719*** (-10.70)	-0.664*** (-4.71)
SIC_dummies	No	No	Yes
adj. R-sq	0	0.685	0.827

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

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