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Uncertainty Across the Pond: An Evaluation of Equity Market Returns and Currency Fluctuations in Reaction to Key Brexit Events

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by

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Abstract

The citizens of the United Kingdom shocked the world on June 23rd, 2016 when they voted in favor of leaving the European Union. The 3-year aftermath of the Referendum has created a large amount of uncertainty regarding the future of the United Kingdom economy and its post-Brexit relationship with the European Union. The purpose of this research is to explore how the financial markets react to Brexit news headlines, compare the returns of European and non-European exchange-traded funds (ETFs) and currencies, identify common themes, and ultimately shed light on how investors weigh-in on the interconnectedness of the UK, the EU, and the broader global markets. After researching the major milestones in the development of Brexit, twenty-three different events were selected for this study. To look at the financial market's reaction, UK, EU, Germany, United States, and South African ETFs and currency returns in response to Brexit news were recorded. The results show that positive Brexit news headlines are a universal benefit but generate higher returns for the European Union and Germany as opposed to the United Kingdom itself, and that shared negative returns affect the United Kingdom to a greater extent. Investors are pricing in the uncertain and negative implications of Brexit to the point where the United Kingdom has limited upside and plenty of downside within the realms of the financial markets.

I. Introduction

On June 23rd, 2016, the people of the United Kingdom made a country-altering decision by voting to leave the European Union. The surprising result from the Referendum caused turmoil in the financial markets as the pound fell -8% and global investors no longer had a clear vision of the future economy of the United Kingdom and Europe. Three years have passed since the Referendum, and the relationship between the United Kingdom and Europe has only become more confusing, complicated, and unpredictable. As news headlines regarding Brexit appear in the paper each morning, investors must perform the difficult task of pricing in Brexit as they place in their trades and provide sound financial advice for their clients, and international businesses must successfully develop a strategy that prepares them for a potentially disruptive exit from the bloc.

The purpose of this research is to explore and analyze the relationship between financial market returns and Brexit news headlines. The analysis will be from a European and non-European perspective so all global stakeholders, who may potentially be impacted by Brexit, are accounted for. By observing the financial markets reactions to Brexit developments, connections and trends within the stock and currency markets will be identified and will ultimately shed light on how investors price in the negative and positive implications of the UK exiting the EU. To bring a degree of context to Brexit, the thesis will first lay-out the historical relationship between the United Kingdom and the European Union and will finish the background with an explanation as to why the UK citizens voted in favor of Brexit. Starting from the day of the Referendum in June of 2016 and finishing in March of 2019, twenty-three Brexit events were selected and various exchange-traded funds (ETF) and currency returns surrounding the events were recorded and analyzed. By doing so, this research will identify how investors price in the uncertainty regarding Brexit, investigate the interconnectedness of the global markets, and determine which countries have the most upside or downside with Brexit.

From a stock market standpoint, the results show that the United Kingdom ETF benchmark was the only one with an overall negative return, and that on an actual positive return basis the United Kingdom had the lowest average compared to all other benchmarks. Further, approximately 70% of the same-direction ETF movements amongst the UK, Germany and EU were associated with positive news developments, as well as 82.35% of the time with the United States. In terms of the currencies in this study, the pound had the lowest average return and the lowest average negative-only return. Global currency connection was showcased as the pound and the dollar had a negative correlation of -85.60% which indicates that because of the uncertainty surrounding the UK economy, investors safe-guarded their assets in the consistent United States economy whenever unfavorable Brexit events occurred. These results summarize the conclusion that positive Brexit news headlines are a universal benefit but generate higher returns for the European Union and Germany as opposed to the United Kingdom itself, and that shared negative returns affect the United Kingdom to a greater extent. Investors are pricing in the uncertain and negative implications of Brexit to the point where the United Kingdom has limited upside and plenty of downside within the realms of the financial markets.

The remainder of this paper will be devoted to explaining the history behind the European Union and the United Kingdom as well as explaining the results and conclusions of the stock market and currency return research. Specifically, Section II is the Literature Review which explains the history behind the United Kingdom and the European Union Pre-Brexit, discusses the details surrounding Brexit, and outlines the key Brexit events that are used in the study. Section III contains the Research Questions regarding the ETF and currency returns and predictions. Section IV outlines the methodology behind the data collection and analysis for the study. Section V contains the results for the stock returns, currency returns, and prediction returns accuracy. Section VI is the conclusion of the paper which will contain limitations, further research, and final thoughts regarding the results of the thesis.

II. Literature Review

A. The Relationship Between the United Kingdom and the European Union: Pre-Brexit

The complicated relationship between the United Kingdom and the European Union originates back to the middle of the 20th century. After the end of World War II, Western Europe was greatly divided and needed to re-develop a connection between the neighboring countries. One solution to this problem was signed into law on March 25th, 1957, the Treaty of Rome established the European Economic Community (EEC) which eventually become the European Union (Pruitt, 2017). The EEC brought together France, West Germany, Belgium, Italy, Luxemburg, and the Netherlands through a law binding relationship based on the free movement of goods, people, services, and capital (Eur-Lex, 2017). Essentially, the underlying goal of the EEC was to unite the six countries by gradually aligning their economic policies, abolishing trade quotas and customs duties in the EEC, creating a shared tariff on imports from outside the EEC, and creating a provision where the EEC could implement further joint policies. Specifically, the EEC created a European Social Fund to improve job conditions and create opportunities for workers, and a European Investment Bank (EIB) to help further economic expansion (Eur-Lex, 2017).

The complications between the United Kingdom and the EEC begin to take form in 1963 when their first application to become a member of the EEC is vetoed by French president

Charles de Gaulle (Pruitt, 2017). In 1967, the United Kingdom executes an additional failed attempt to join the EEC as Charles de Gaulle vetoes their membership a second time. The second veto had the same rationale as the first; British membership would ultimately break up the EEC community (BBC On This Day, 1967). At a news conference at the Elysee Palace in Paris, President de Gaulle accused Britain of a "deep-seated hostility" towards European construction, and that numerous aspects of Britain's economy made them incompatible with Europe (BBC, 2018). Charles de Gaulle also held a staunch belief that if Britain joined, the English language could potentially replace French as the dominant language in the EEC (Pruitt, 2017).

France was the only country in the EEC that opposed Britain's membership, and with President Charles de Gaulle resignation in 1969, Britain's likelihood of becoming a member of the EEC increased exponentially. On January 1, 1973, Britain, alongside Ireland and Denmark, was admitted into the European Economic Community. By being granted membership, Britain was given the right to four votes within the EEC council, which proposed policies ranging from environmental issues to public health (BBC On This Day, 1973). According to Sir Crispin Tickell, who participated in the negotiations that led to the UK's accession to the EEC and later became the British ambassador to the UN, becoming a member of the EEC went far beyond the trade benefits associated with it. From the very beginning, the United Kingdom understood that the EEC would eventually evolve into a political union, as opposed to a simple free-trade agreement (Tickell, 2016). Therefore, Ted Heath, the prime minister of Britain at the time during the negotiations, wanted to make sure that they were part of the initial shaping of this political collective (Tickell, 2016).

However, the United Kingdom's full-on commitment to the EEC was relatively short-lived, as the first national referendum associated with staying in the EEC took place in 1975. At this point in the UK's history, there was a deep divide between the Labour party and the Conservative party. The Labour party, led by Tony Benn, were those that wanted to leave the EEC, while the conservative party, led by Margaret Thatcher, wanted to remain. The Labour party based their pro-leave ECC argument on poor economic conditions, reduction in jobs, and an increase in the trade deficit. For example, the Labour party reiterated the point that inflation was running at a rate of 24% since the common market forced Britain to buy food from other member states, while cheap imports such as butter from New Zealand, was banned. The Labour party went on to state that the price of butter would ultimately double by the year 1978 if they stayed in the EEC (Wheeler, 2016). Tony Benn went on to claim that Britain's membership in the EEC had eliminated 500,000 British jobs in two years due to the growing trade deficit between Britain and the EEC (Wheeler, 2016). However, the Conservative party made the argument that being a member of EEC created food security for the United Kingdom, as Britain benefited from being a part of a community which was self-sufficient in food (Wheeler, 2016). Regarding the unemployment figures, the Conservative party claimed that the Labour party fabricated the potential impact on the future unemployment rate and that the real cause behind the rising unemployment rate was due to a global slump, not solely because of EEC membership (Wheeler, 2016). Immigration was not yet an issue for those who wanted to leave the EEC as free movement amongst European countries was not yet occurring; Britain was experiencing terrible economic conditions, which made immigration far less desirable for those living in other nations (Wheeler, 2016). The Labour Party campaign efforts ultimately failed on June 5, 1975, as 67.2% of Britain voted to remain in Europe (Nelsson, 2015).

After the Referendum vote, tensions remained between the United Kingdom and Europe. The United Kingdom continued to be divided between two separate political parties: the

Conservative Party, and The Labour Party. However, there was also a split amongst the Conservative Party on whether Britain should maintain a free-trade relationship with Europe. This divide dates to the original 1961 application to join the EEC, but it began to take a stronger hold under the leadership of Margaret Thatcher (Jones, 2007). One example of the negative attitude towards Europe is Britain's refusal to join the European Monetary System in 1979. The European Monetary System was an arrangement where most nations in the EEC would link their currencies to prevent fluctuations, but the United Kingdom opted out and remained independent with the pound (Tendera-Wlazczuk, 2018). Thatcher also began to make the claim that Britain paid too much into the EEC budget and that the budget itself allocated too many resources towards agriculture. Thatcher's stance on Britain's economic contributions to the EEC remained stable throughout her time as prime minister. By the time she stepped down as Prime Minister of Britain (due to the strong conflict she created within her party over her increasingly Eurosceptic views), she left her Conservative Party relatively directionless on their stance with the current European relationship (Jones, 2007). During the Conservative Party's internal conflict, the Labour Party remained collectively strong in their opinion of European relations. At the time of the 1983 General Election, the Labour Party ran their campaign on the notion that the United Kingdom should withdraw from the EEC because of the negative impact it had on United Kingdom jobs. Although they suffered a major defeat in the general election, it still represents another time in the UK's history where large masses of people united under the common cause of splitting from Europe.

While Britain's divide on European relations steadily deepened, main-land Europe continued to progress their relationship from a free-trade agreement to a political union. In 1993, The Maastricht Treaty was signed into law by twelve countries, and it created the current

European Union. The signing of this treaty was a monumental moment in European history, as it laid the groundwork for using a single currency (the euro), created European citizenship and allowed citizens to reside and move freely between countries in the EU, a common foreign and security policy was established, and closer cooperation for judiciary matters amongst the countries was agreed upon (European Central Bank, 2017). The Treaty also went on to establish the European Central Bank, which was given the responsibility of maintaining price stability for the euro (European Central Bank, 2017). Although the United Kingdom signed The Maastricht Treaty, they continued to remain comparatively distant to the newly forged European Union. Thatcher's successor, John Major, agreed to enter the European Union but only under certain conditions. For example, he negotiated 'opt-outs' where the United Kingdom did not agree to use the single-currency (euro) system (Jones, 2007). Although the United Kingdom continued to remain in the European Union, they were never as committed to the cause when compared to the other eleven signees.

The signing of The Maastricht Treaty became the tipping point for UK citizens who were anti-Europe. On September 3, 1993, the UK Independence Party (UKIP) was formed based on opposition to UK membership in the European Union (Hunt, 2014). UKIP was able to gain support amongst UK citizens due to their stance on immigration. The European Union supported pro-free movement for immigrants within the European Union, while the UKIP party wanted Britain to leave the EU and create a far stricter immigration policy (Hunt, 2014). The presence of UKIP was originally overshadowed by the high-profile Referendum Party but eventually began to gain voting share in national elections as UK citizens became more opposed to open-immigration policies. In 1999, UKIP only managed to gain a 7% vote share in European elections, but by 2014 their party enrollment increased, and they gained a 27.5% share of European election votes (Hunt, 2014).

The growth of UKIP does not come as a surprise, as the time of 1993 through 2016 is associated with growing “Euroscepticism” amongst the people of the United Kingdom. Euroscepticism is the phrase used to describe UK citizen’s belief of either completely cutting ties off with the EU or reducing UK’s role but remaining a member nation (Curtice, 2016). Statistical analysis conducted by researcher John Curtice sheds light on the growing rate of Euroscepticism. For example, the percentage of UK citizens who wanted to leave the EU grew from 10% in 1992 to 22% in 2015 (Curtice, 2016). It is also interesting to note that the percentage of citizens who wanted to stay in the EU, but reduce its powers increased from 30% in 1992 to 43% in 2015 (Curtice, 2016). To gain a better perspective on the specific changes UK citizens would like to see, 68% agreed that the UK should reduce the ability of migrants from other EU countries to claim welfare benefits in Britain, 60% agreed that they should reduce how much the EU regulates companies and businesses, and 51% agreed that they should end the automatic right of people from other EU countries to come to Britain to live and work (Curitce, 2016). In terms of cultural issues, 80% of those who wanted to withdraw claimed that the EU is undermining Britain’s distinctive identity (Curtice, 2016). In terms of the economy, 80% of the individuals who wanted to withdraw believed the economy would be much better if the UK left, while 98% of those who wanted to continue in the EU claimed the economy would be much worse if they left (Curtice, 2016). This statistical analysis goes to show that the citizens of the UK were torn on key issues such as immigration and economic policy, and this deep-rooted strong political divide became the driving force behind the move towards Brexit.

The political figures in the UK saw a clear trend towards Euroscepticism and decided to use it for their own political gain. The Prime Minister at the time, David Cameron, was a staunch advocate of remaining within the European Union and would often reject the idea of holding a vote to leave the bloc. However, as the UK elections in 2015 arrived, Cameron claimed that if his Conservative government was re-elected he would bring an EU referendum to a public vote (Iyendar, 2016). Considering the hard (and growing) divide amongst the UK citizens regarding the future of the UK and the EU, it came to no surprise that David Cameron won the election and was re-elected as Prime Minister. As promised, the European Union Referendum Act 2015 was introduced in the British Parliament and ultimately led to the Referendum vote held in June 2016 (Iyendar, 2016).

B. A Discussion of Brexit

On June 23rd, 2016, 72.2% of the voting age population of the United Kingdom voted in the Referendum which decided the fate of their membership in the European Union. To the surprise of the United Kingdom and the rest of the world, 51.9% of those who voted chose to leave the EU, while 48.1% voted to remain (Tendera-Wlazczuk, 2018). The people who supported Brexit tended to be older, white, working class, and had lower levels of education. Those who did not support Brexit tended to have deep social values and considered themselves to be more liberal (Corbett, 2016). Although the vote came as a surprise, a careful analysis of the literature on the causes of Brexit shines a light on the inevitable exit of the European Union.

As discussed in the previous section, growth in Euroscepticism is a key driver behind the shocking referendum vote. Specifically, only 33% of Europeans trusted the EU, and 27% were negatively inclined towards it (Tendera-Wlazczuk, 2018). A strong devotion to British Euroscepticism can be traced back to the fall of the British Empire and the general economic decline that many Brexit supporters claim is associated with EU membership (Corbett, 2016). Specifically, research conducted by Nicholas Starten claims that the three largest drivers for moving Euroscepticism towards main-stream British politics are the Maastricht Treaty in 1992, the EU member state expansion in 2004, and the global financial crisis in 2008 (Corbett, 2016). In fact, history claims that opposition to European integration has always been a major factor in British politics; dating back to the 1975 referendum, Britain has always taken a critical stance on EU decisions (Corbett, 2016).

In recent times, the expansion of the EU in 2004 accompanied with increasing mitigation (free movement between member states) created more competition for low-income middle-class workers in the UK. A combination of poor economic conditions and an inflow of workers into the UK created a lot of unease for blue-collar workers, and it became very easy for the right-wing news outlets to place blame on the immigrants, help fuel the negative feelings towards EU membership, increase UKIP membership, while also developing a strong sense of independent-English nationalism (Corbett, 2016). This sense of English nationalism is deeply rooted and was re-ignited amongst the older generation; the increase of immigrants entering the country threatened to dilute the traditional English identity (Corbett, 2016). In fact, the rise of immigration is crucial to Brexit. Under the Blair government, immigration reached record high levels. By 2013, 1.24 million people born in Eastern Europe now lived in the UK, as compared to 170,000 in 2004 (Coleman, 2016). Between 2013 and 2014, the UK's population increased by over 500,000 million people, which resulted in the biggest inflow of people in the nation's history and helped deepen the resentment towards the EU, create an over-capacity problem, and make low-skill jobs more competitive (Coleman, 2016).

An article written by Brian Griffiths presents an interesting argument in defense of Brexit. The first claim is a rather simple one; the EU is not working (Griffiths, 2016). The euro was originally a good idea when it was first implemented between the original six members, who economists claimed were in an "optimal currency area"; intuitively this makes sense, as free movement was expected to cross these countries borders. However, the euro is now dispersed to 19 countries with vastly different economies (Griffiths, 2016). Also, the euro was set up as a monetary union but does not have a banking union, a political union, or a fiscal union. Without the ability to devalue or revalue currencies, EU countries must rely on adjusting domestic fiscal policy and change the level of wages (Griffiths. 2016). Another aspect of the EU that is not working is the issue with open-borders. As the borders have become open amongst member nations, terrorist attacks have increased, and EU nations have begun to make attempts at better controlling their borders. However, this goes against the purpose of the EU, as free movement is one of the pillars of the union (Griffiths, 2016). To Griffiths, these flaws in the EU are the reason behind the "ever closer union" movement. By re-branding themselves, the EU has hopes of having more control over taxes, immigration quotas, and even proposing a European army (Griffiths, 2016).

With the re-branding occurring, Griffiths claims that now is the time for the UK to regain control of their own affairs. He goes on to claim that the UK leaving the EU is also good for the eurozone. Britain has always been critical of closer EU integration, and with their dismissal, EU countries will be able to progress far faster when progressing legislation, such as creating a European army (Griffiths, 2016). Research conducted by Annette Bongardt and Francisco Torres supports the same claims. With roughly 1.2 million more votes placed towards the Leave campaign, there is little doubt that a large majority of British citizens wanted to leave the EU, and that this removal of membership will lessen some of the burdens the EU faces when drafting policy (Bongardt & Torres, 2016). Even more so, the relationship between the EU and the UK may even strengthen due to this separation. The two separate entities can develop their relationship on areas of common ground such as free-trade, while the EU no longer must negotiate with the UK over topics of further European integration and open-borders (Bongardt & Torres, 2016).

Supporters of Brexit do acknowledge the risks of leaving. First, there are short-term economic consequences associated with leaving the EU which can lead to uncertainty and reduce consumer and investment spending. Second, the UK may be permanently removed from the Single Market which will decrease the profitability of their exports into EU countries. Third, Scotland may vote for independence so that they can rejoin the EU (Griffiths, 2016). However, the vote for Brexit is the step in the right direction for re-creating and strengthening the British economy while pursuing policies that are better suited to the United Kingdom (Griffiths, 2016).

On the other side of the debate, a vast number of British citizens supported the Remain campaign. Those who supported the Remain campaign claimed that leaving the EU would hurt the economy, decrease international investment, and lesson the UK’s global influence (Coleman, 2016). Specifically, leaving the EU Single Market system would be detrimental to the economic well-being of the United Kingdom (Coleman, 2016). The Remain campaign focused their efforts towards broadcasting the threats associated with the EU, as opposed to broadcasting the benefits of EU membership such as ever-closer union and borderless nations (Coleman, 2016).

Research conducted by Ansgar Belke and Daniel Gros support the negative economic implications associated with Brexit. There is substantial research and past precedent that supports the claim that the disconnection of the Single Market system will create economic costs for both the UK and the EU. It comes to no surprise that the economic costs will be large, as 306 billion British pounds are sent into the UK from the EU, while the UK exports 184 billion British pounds (Belke & Gros, 2017). However, the EU will absorb less of the economic burden due to being five times larger than the EU economically and having greater market power in general (Belke & Gros, 2017). Further, past research also supports the claim that smaller parties have more to gain from eliminating trade barriers, so the EU has a stronger negotiating position (Belke & Gros, 2017). According to model-based simulations, the EU-27 on average will suffer losses associated with trade coming in at 0.08 to .44% of GDP. The United Kingdom, on the other hand, will suffer proportionately greater losses at approximately 1.31 to 4.21% of GDP according to optimistic and pessimistic scenarios (Belke & Gros, 2017). Since the ratio of the UK economy to the EU-27 is approximately 1:5, these disproportionate results come to no surprise (Belke & Gros, 2017).

The ’Britain Stronger in Europe’ campaign did not only focus efforts on the economic impact but also discussed the better leadership and better security associated with EU membership (Vasilopoulou, 2016). Being a member of the EU enabled Britain to be a leader in world events while having a strong pull in EU decision making, and terrorism and cross-border crime was more effectively addressed through the EU (Vasilopoulou, 2016). Also, attitudes towards EU migration and free-movement were strong voting predictors of the Brexit referendum. Therefore, those who believed that immigrant-blaming was a fear-tactic and not a true cause behind negative economic implications and terrorist attacks would most likely vote against Brexit (Vasilopoulou, 2016). It is also interesting to note that research suggests that those with superior educational backgrounds would typically support this type of thinking, would be more likely to express positive EU attitudes and experience the economic benefits of European integration, and be less likely to feel threatened by the other integrated cultures (Vasilopoulou, 2016).

An important factor of predicting no-Brexit support was whether the individual supported free-movement and globalization. The free movement of capital, goods, services, and labor are considered the cornerstones of the EU and ultimately have an enormously positive impact on the UK's economy (Doherty, 2016). To gain support, the Remain campaign had to try and attempt to address the free-movement criticisms from the Leave campaign. The Remain campaign would be most effective when they discussed how EU citizens contributed to Britain's growth, investigated educational backgrounds, analyzed the sectors they worked in and finished with an explanation on how the EU migrants brought skills to the UK economy which were previously lacking (Vasilopoulou, 2016). However, some research suggests that income and education are not related to attitudes towards EU freedom of movement, which goes against consensus (Vasilopoulou, 2016).

UK citizens also supported the Remain campaign due to the socio-cultural consequences that would develop out of Brexit. Those who were against Brexit were fearful of the deteriorating social conditions that could solidify with leaving the EU and closing the UK's borders. Most younger voters desired to remain a part of the EU in opposition to racism and xenophobia towards immigrants (Corbett, 2016). Those who wanted to remain in the EU saw their fears play out as the UK saw a significant increase in racist and xenophobic attacks in the country, with a 42% increase in recorded hate crimes the week before and after the vote (Corbett, 2016). The increase in racist remarks can potentially be traced back to those who felt threatened by the increasing immigrant population and did not have the proper skills to survive in a post-industrial economy (Corbett, 2016).

C. Key Brexit Events

To analyze the economic impact of Brexit, stock market and currency returns surrounding notable Brexit events will be analyzed. The list of the dates can be found below:

1) June 23, 2016: The Referendum takes places, and the UK votes to leave the European Union. Prime Minister David Cameron, who led the Remain movement, steps down as prime minister (Erlanger, 2016).
2) January 17, 2017: Prime Minister Theresa May gives an anticipated speech on the UK's Brexit Strategy (Castle & Erlanger, 2017).
3) March 29, 2017: The United Kingdom invokes Article 50 and sends a formal letter to EU President Donald Tusk regarding their intention to leave the EU (BBC, 2017).
4) June 19, 2017: First round of EU-UK exit negotiations begin (Bienkov, 2017).
5) December 8, 2017: The UK and the EU come to terms on some aspects of the Brexit deal, which allows Brexit negotiations to move on to the next phase (BBC, 2017).
6) June 20, 2018: The House of Commons Approves the EU Withdrawal Bill (Dorff & Braiden, 2018).
7) July 9, 2018: The UK's Foreign Secretary Boris Johnson and Brexit minister David Davis resign due to disagreements associated with her negotiated "soft Brexit" deals (Booth & Adam, 2018).
8) October 16th, 2018: Trump Administration announces intent to negotiate trade agreements with the UK and EU separately (Trump Administration Announces Intent to Negotiate Trade Agreements with Japan, the European Union and the United Kingdom, 2018).

9) October 19, 2018: A Brexit summit takes place during this week, and a Brexit deal has not yet been reached (BBC, 2018).
10) November 14, 2018: British Prime Minister May secured cabinet approval for her soft Brexit deal (Colchester, 2018).
11) November 15, 2018: The resignation of six U.K. ministers over a proposed Brexit deal rattle the British pound and the European Markets (Gold & Menton, 2018).
12) November 16, 2018: Letters of no confidence in May's leadership begin to be submitted (Stewart & Elgot, 2018).
13) November 21, 2018: Theresa May is meeting up with European Commission President Jean-Claude Juncker in a bid to finalize a Brexit deal in time for Sunday's EU summit (Lawless & Cook, 2018).
14) November 25, 2018: EU and Theresa May agree on a Brexit deal (Colchester & Norman, 2018).
15) December 10, 2018: Theresa May delayed a critical parliamentary vote on her proposal to leave the EU (Colchester, 2018).
16) December 11th, 2018: Theresa May is set to face a vote of no confidence (Colchester & Fidler, 2018).
17) December 12th, 2018: Theresa May survives the no confidence vote (Colchester & Douglas, 2018).
18) December 21st, 2018: Firms told to prepare for a no-deal Brexit (BBC, 2018).
19) January 15th, 2019: UK Parliament votes down Brexit deal (Booth, Adam & Birnbaum, 2019).

20) January 25th, 2019: Northern Ireland's Democratic Unionist Party has privately decided to back Prime Minister Theresa May's Brexit deal on a conditional basis (Dunn, 2019).
21) March 12th, 2019: Parliament votes down second deal (Colchester & Douglas, 2019).
22) March 13th, 2019: Parliament votes down no-deal option (Booth, Adam & Birnbaum, 2019).
23) March 14th, 2019: Parliament votes to delay Brexit (Booth, Adam & Birnbaum, 2019).

III. Research Questions

The research is designed to analyze the relationship between Brexit news headlines and financial market volatility. One specific area that will be explored is the comparative returns of the United Kingdom and European Union benchmarks. By doing so, this will determine how investors factor in the interconnectedness of the soon-to-be separate entities and ultimately will see if they react in the same direction to positive and negative news. I suspect that the European Union and United Kingdom ETFs and currencies will move in the same direction, but the United Kingdom will have wider variations of return when compared to the European Union. This will indicate, from a financial market standpoint, that investors do not believe Brexit is good for the European Union but is not as detrimental as it is for the United Kingdom.

This research will also explore the impact Brexit has on a global financial market scale outside of Europe. We live in a globalized economy, and because of this wide-spread connection and reliance, I believe that non-Brexit related ETFs will tend to provide similar returns (in relation to news announcements) as the United Kingdom and European Union. Lastly, the relationship between European and non-European currencies will be studied as well. Since the currency markets react differently than equity markets, I do not expect to have the same pattern of returns between the two, and non-European currencies will not be negatively affected to the same degree as the pound and the euro.

IV. Methodology

The first step in the research process consists of evaluating all the major news headlines associated with Brexit and ultimately determining the research sample. The scope of the Brexit news selection process ranged from the announcement of the results from the Referendum in June of 2016 up until the Parliament vote to delay Brexit in March of 2019. In total, twenty-three different Brexit events were used for the study. To evaluate the global market's reaction to the selected news headlines, various exchange-traded funds (ETFs) and currencies have been chosen as benchmarks. The specific ETFs selected are iShares MSCI United Kingdom (EWU), iShares MSCI Germany (EWG), iShares Europe (IEV), iShares Core S&P 500 (SPY), and iShares MSCI South Africa (EZA). The specific currencies selected are the British pound, the euro, the US dollar, and the South African Rand. The United Kingdom and European ETFs and currencies were selected because of their direct involvement with Brexit, the United States was used due to its strong global presence and ties to the European Union, and South Africa was selected to assess a country that is not as directly impacted by Brexit but may still react in accordance with the rest of the world.

Before the data collection took place, a prediction was made for each ETF and currency. For example, if a news headline had positive connotations and seemed to be a good development for either a specific country or all parties involved, and a positive return was to be expected, it was assigned a "+". For news headlines with negative connotations and a negative return was expected, the benchmark was assigned a "-". Each ETF and currency received a prediction (+ or -) and were evaluated independently for each of the twenty-three Brexit events. Further, because equity markets move differently than currencies, they were evaluated independently of each other. For example, the ETF benchmark for the United States did not have the same positive or negative return predictions as the US Dollar.

The daily stock return data for events up until December 2018 were collected from CRSP – The Center for Research in Security Prices. CRSP did not contain data beyond 2018, so for the Brexit events that took place during 2019, the daily return data was collected using the graphical chart (GP) function within Bloomberg services. Currency return data was also obtained through Bloomberg's GP function. To evaluate the market reaction to the news headlines, total returns (including dividends for the ETFs) were evaluated after the event took place. The daily return used was dependent on the timing of the release of the news; if the event took place after the markets closed, the following day's returns were selected (t+1). However, if the news broke during regular trading hours, the same day's returns were used (t). Returns were not analyzed from a prior-day standpoint (t-1); as stated, returns were either the day of the event or the next day.

The data was analyzed individually for each benchmark as well as through an inter-connected lens. For stand-alone assessment of market reactions, the total average return, average return for all positive return predictions, average return for all negative return predictions, average return for all actual positive and negative returns, the variation between the actual and predicted positive and negative returns, and the count of total positive and negative returns were recorded. To investigate the relationship between the ETFs and currencies, correlation and the degree of movement in the same direction were assessed.

V. Results

A. Stock Returns Compared to Brexit News Headlines

The results for the ETF analysis can be found in Table 1, *Stock Returns Compared to Brexit News Headlines*. According to the data in the table, it appears that the results of the Referendum vote, as well as Theresa May's delay of the first parliamentary vote for her Brexit proposal, were the largest negative-return market movers. In terms of positive returns, Parliament's vote to delay Brexit in March 2019, as well as Parliament's vote-down of a no-deal Brexit, were both the two headlines that caused the most market movement. By counting the returns based on whether they were "positive" or "negative", the United States had the most negative return count at 18 out of 23 headlines, with the United Kingdom following with 16 out of 23 headlines, Germany had 15 out of 23, South Africa had 15 out of 22 (0% return on one event) and the European Union had 14 out of 22. With the remaining returns being positive, the European Union and Germany had the highest positive return count of 8, followed by the United Kingdom and South Africa (7) and the United States (5).

On an average return basis, the United Kingdom lags with the only negative return of -0.01%. Germany, the European Union, the United States, and South African ETFs finished with average positive returns coming in at 0.25%, 0.12%, 0.46%, and 0.80%, respectively. When looking only at the positive returns, the United Kingdom came in lower than the other countries with an average return of 0.98%, while Germany had a return of 1.20%, EU returned 1.18%, the United States returned 0.99%, and South Africa came in at the highest with a 2.21% return. When observing only negative returns, the United Kingdom had the lowest average return at -2.29%, with Germany having a return of -1.53%, EU with a return of -1.73%, the United States with a return of -1.43%, and South Africa with a return of -2.08%. By solely observing the ranges between the average positive and negative returns for each ETF, it was determined that South Africa had the highest at a range of 4.29%, with the United Kingdom coming in second with a range of 3.27%, followed by the European Union, Germany, and the United States with ranges of 2.92%, 2.73%, and 2.42%, respectively.

An analysis of the average returns gives great insight into how investors value the different stakeholders in Brexit. The United Kingdom, the main party involved with leaving the European Union, is the only ETF that did not have a positive average return. This intuitively makes sense as negative news associated with Brexit will pull down the United Kingdom ETF further than the others observed in this sample. This strong negative reaction resulted in the United Kingdom having the lowest overall "actual negative return" average; the average is even lower than the very cyclical South African ETF. However, this momentum did not carry over to the news headlines that generated positive returns. On an "actual positive return" basis, the United Kingdom had the lowest average compared to all other benchmarks, and most notably, Germany and the European Union. Although the United Kingdom is the most impacted, positive news associated with the development of Brexit appears to be more beneficial for Europe (and other countries) as opposed to the United Kingdom individually. Investors seem to be pricing in the idea that a smooth Brexit is beneficial for the global economy, especially when the outside countries do not have a direct hand in the negotiation process. However, Brexit appears to be perceived as a negative (or uncertain) development for the United Kingdom solely on the basis that they have the lowest average positive and negative returns.

The relationship amongst the ETFs can be observed in Table 5, *Stock Return Correlation*. As shown in the table, The United Kingdom has a strong relationship with the European Union and Germany with correlations above 97%. The United Kingdom also has a relatively strong relationship with the United States and South Africa with a correlation around 80%, but it is not as strong when compared to the European counterparts. A more in-depth look at the interconnectedness of the benchmarks can be observed in Table 3, *United Kingdom Stock Return Movements in Relation to Other Countries*. As seen in Table 3, 86.96% of the time the Germany and the United Kingdom ETFs moved in the same direction in relation to the news announcements (in terms of being either a positive or negative returns). A similar relationship is found between the United Kingdom and the European Union as well as the three European countries collectively; they all moved in the same direction 78.26% of the time. Movements appear to be most related when the news headlines generated positive returns, as 70% of the same return movements between Germany and the United Kingdom were positive, and 72.2% between the United Kingdom, the EU, and Germany. A similar relationship is found when comparing all benchmarks as they moved in the same direction 56.52% of the time, of which 84.62% were positive returns. However, with negative returns shared between the UK and Germany, the United Kingdom has lower-negative returns 83.33% of the time, as well as 60% of the time between the European Union and Germany together. When looking at shared positive returns, the United Kingdom exceeded Germany returns only 28.57% of the time, while exceeding Germany and the EU collectively 30.77% of the time. This appears to reinforce the previous findings that the United Kingdom, Germany, and the European Union ETFs are often affected in a similar manner regarding Brexit news announcements. However, most of their shared movements tend to be positive returns as opposed to negative which emphasizes the point that good news is beneficial for all. The same relationship is found between the United Kingdom ETF and the United States and South African ETFs. The United Kingdom and the United States benchmarks moved in the same direction 73.91% of the time; 82.35% of those movements were associated with positive news developments. The United Kingdom and the South African benchmarks moved in the same direction 69.57% of the time; 81.25% of those movements were also associated with positive news developments. This goes to show that the globalized connection in the financial markets is strong, investors believe Brexit will impact the world economy, and positive Brexit news headlines are considered a plus for countries outside Europe as well. Although positive developments are a universal benefit, the data again shows that it is more beneficial for the European Union and Germany because their positive returns tend to outperform the United Kingdom benchmark. Further, same-direction negative returns affect the United Kingdom to a greater degree when compared to the rest of Europe, which shows investors pricing in the potential negative (or uncertain) implications of Brexit.

B. Currency Returns Compared to Brexit News Headlines

An analysis of currency returns regarding Brexit news headlines can be found in Table 2, *Currency Returns Compared to Brexit News Headlines.* According to the data, the Referendum, the resignation of six United Kingdom ministers, Theresa May's delay of the first parliamentary vote on her Brexit proposal, Parliament voting down no-deal Brexit, Theresa May's anticipated Brexit strategy speech, and Theresa May surviving the no confidence vote were all the largest currency market movers. However, the movements amongst all four currencies (pound, euro, dollar, and rand) were not uniform, and reacted differently in accordance with each news headline. When counting total negative currency return movements, the US dollar had the most with 13 out of 23, the euro had 12 out of 22 (one event had 0% return), the pound had 10 out of 22, and the rand had 8 out of 23. For total positive currency return movements, the rand had the most at 15 out of 23, the pound had 13 out of 23, the euro had 10 out of 22, and the dollar had 10 out of 23.

When observing the average return, the dollar had the highest at 0.058%; this is mostly attributed to the 2.05% increase on the day of the Referendum. The pound had the lowest average return at -0.291%, the rand's average return was -0.081%, and the euro was -0.042%. When observing only positive returns, the rand had the highest average return at 1.318%, then the pound at 0.782%, the dollar at 0.435%, and the euro at 0.374%. For only negative returns, the pound had the lowest average return at -1.117%, the rand had a -0.827% average return, the euro had a -0.545% average return, and the dollar had the highest negative-only average return at -0.432%. By observing the range between the average positive and average negative returns, it was determined that the rand had the highest variation at 2.14%, then the pound at 1.90%, the euro at 0.92%, and the dollar with the least amount of variation at 0.87%.

It intuitively makes sense that the pound would have the lowest average return and lowest average negative-only return, similar to the United Kingdom ETF, as the United Kingdom is the main party involved with Brexit and any investor uncertainty or negative forecasts will directly impact their currency. However, unlike the UK ETF, the pound had the second highest average positive return behind only the South African Rand. In the case of the pound, it appears that when positive news-headlines eliminated a degree of uncertainty with Brexit, investors began to value the pound to a higher degree and placed their money within the UK economy. Although this is the case, and the pound itself had less negative return events than the euro and the dollar, investors still outweighed the negatives associated with Brexit more than the positives which resulted in the overall-lowest average return amongst the currencies in this sample. To go alongside the inconsistency with Brexit developments, the pound had a relatively high variation between the average positive and negative returns, which was only 0.24% less than the cyclical South African Rand. In contrast to the pound's variation, the US dollar had the least amount of movement between the positive and negative average returns, and even though it had the most instances of negative returns (13 occasions), it was the only currency with a positive average return. This may indicate that investors tend to value the consistency and strength of the US economy as opposed to the United Kingdom and the rest of the uncertain Eurozone and will opt to place their investments into the safe dollar.

The relationship amongst the currencies can be seen in Table 6, *Currency Return Correlation.* According to Table 6, the pound and the euro have a strong positive relationship with a correlation of 84.71%. When comparing the pound to the dollar and the rand, it appears that they have a negative relationship with correlations of -85.60% and -69.82%, respectively. Further analysis of the relationship between the currencies can be found in Table 4, *United Kingdom Currency Return Movements in Relation to Other Countries.* As the correlation matrix suggested, the euro and the pound moved in the same direction 69.57% of the time; this is not as strong as the ETF correlation but is still a meaningful relationship that shows investors generally associate the pound and the euro with uncertainty (although the pound has more uncertainty than the euro). The pound and the rand do not appear to have a strong connection as they only moved in the same direction 39.13% of the time. The most interesting finding is that the US dollar and the pound only moved in the same direction 8.70% of the time, which goes alongside the nearly perfect negative correlation found in Table 6. This indicates that investors will use the dollar as a safe-haven currency when uncertain Brexit events take place. However, when positive Brexit events occur, investors begin to gain more confidence in the future of the United Kingdom and will shift their money from the dollar to the pound. Unlike the ETFs, the currencies do not always react in the same manner; the euro and the pound tend to be positively correlated with the pound having a greater variation of return, the pound and the rand appear to be unconnected, and the pound and the dollar have a negative-correlation relationship that depends on the status of Brexit progress.

C. Predicted Returns Accuracy

The results of forecasting the positive and negative stock returns per news announcement can be found in Table 7, *Stock Return Prediction Accuracy by Country*. The most successful forecasts were made in the United Kingdom with 78.26% correct, next came Germany at 69.57%, the European Union at 60.87%, the United States with 56.52% accuracy, and South Africa at 43.48%. The results are logical as it was easier to estimate the impact of Brexit events with those who were directly impacted such as the United Kingdom, Germany, and the European Union. It became progressively more difficult to project the outcomes for countries outside of Europe who were incrementally less involved with Brexit. Knowing that the United States has a strong presence throughout the world, it was safe to assume many major-news developments would somehow impact the country as well. South Africa was a challenging country to predict due to a combination of its size as well as its cyclical emerging-market fluctuations. Emerging market ETFs are difficult to predict from an independent stand-point, let alone alongside Brexit news. The return results of the predictions can be found in Table 1, *Stock Returns Compared to Brexit News Headlines*. All average return "+" predictions are actually positive for each country, and for average return "-" predictions, South Africa is the outlier with the only positive return of 0.11%. It is interesting to note that not only on a percentage basis were the United Kingdom predictions successful, but from a return standpoint as well; The predicted average "+" return (1.06%) exceeded the actual "+" return (0.98%). However, the degree of negative returns was underestimated for the United Kingdom as the predicted "-" return (-1.42%) was higher than the actual "-" return (-2.29%). As it became more difficult to forecast the returns, the strong return results began to deteriorate; South African “+” return prediction were lower than actual “+” returns by 0.87%, and “-” return predictions were off by 2.19%.

Return predictions made for each currency in the sample can be found in Table 8, *Currency Return Predictions by Type.* Similar to the ETF predictions, the pound was the most successful at 78.26% correct. However, and unlike the ETF predictions, the dollar return predictions were equally as successful at 78.26%. The reasoning behind this occurrence is because the predictions for currencies were made separately from the ETFs. By knowing that the dollar may potentially appreciate when poor Brexit developments occur, it was less challenging to predict as opposed to forecasting the global connections in the stock market. The success with the European ETFs did not translate to euro return predictions, as the forecasts were correct 56.52% of the time. These results reflect the disconnect between the currency and stock markets and how investors may interpret the value of the two separate investments in a different manner. As expected, the worst prediction results came from the South African Rand with forecasts being right 52.17% of the time. Similar to the South African ETF, it was difficult to judge the reactions of a country that is not directly involved with Brexit. When looking at the numbers, all average “-” predictions were negative, with the most accurate predictions coming from the rand and the dollar (in terms of comparing the actual average of negative returns). The pound was off by approximately 0.47% which was due to underestimating the negative affect Brexit has had on the pound. The most accurate “+” predictions came from the euro and the dollar. The pound was off by 0.797% because of underestimating the currency swings caused by Brexit. South African Rand predictions were off by 0.97% due to the difficulty associated with connecting its currency to Brexit news.

VI. Conclusion

The largest limitation associated with this research is that the ETFs and currencies are not only impacted by Brexit news headlines. Other developments took place each day in this sample; they could range from US and China trade talks, Germany manufacturing data, China fiscal policy data, OPEC oil cuts, and countless other factors. A key aspect of this thesis was the selection process of the news headlines. Each event was selected because an assumption was made that they were major enough to move the market in either a positive or negative way. However, it would be incorrect to not acknowledge the fact that many other world-events affect returns. To go alongside this limitation, it is equally important to note that this study does not analyze returns on an immediate basis. As opposed to looking at the benchmark's minutes after the news announcements, this research looks at next day reactions which gives more time for other events to impact the market. Another limitation associated with this research is the selection process of Brexit events. Each event was hand-picked by tracking Brexit for almost 3 years dating back to the Referendum, so it is not impossible to have missed a news headline that greatly impacted the financial markets.

My research can easily be continued moving into the future. Brexit is still ongoing, and at the time this thesis is being written, the United Kingdom Parliament is still debating its European Union exit strategy. As more headlines appear each day, stock market and currency reactions can continue to be recorded and analyzed. To improve upon my current research, immediate market reaction data could be obtained as opposed to measuring total returns on a daily basis. I would also be interested in comparing Brexit stock market reactions to other United Kingdom and European Union historical events such as the origination or the European Union or the creation of the euro. I would be curious to see if similar patterns in stock market and currency relationships have occurred throughout the shaky relationship between the two entities.

The United Kingdom and the European Union have had a complicated and tense relationship since the very beginning; as the European Union began to take form throughout the 20th century, it always seemed like the United Kingdom was never fully on-board with the concept in its entirety. When looking at the development between two entities, it does not come to a surprise that the people of the United Kingdom voted to permanently leave the bloc. However, this thesis did not look at Brexit and the UK-EU conflict from a historical perspective but focused in on the current events surrounding Brexit and analyzed the connections between news headlines and financial market volatility. By doing so, this research shed light on how investors factor in the interconnectedness of the soon-to-be separate entities by comparing ETF and currency returns as well as analyzing the global scale of Brexit and its impact on non-European nations. From a stock market standpoint, the United Kingdom ETF benchmark was the only one with an overall negative return, and that on an actual positive return basis the United Kingdom had the lowest average compared to all other benchmarks. Further, approximately 70% of the same-direction ETF movements amongst the UK, Germany and EU were associated with positive news developments, as well as 82.35% of the time with the United States. In terms of the currencies in this study, the pound had the lowest average return and the lowest average negative-only return. Global currency connection was showcased as the pound and the dollar had a negative correlation of -85.60% which indicates that because of the uncertainty surrounding the UK economy, investors safe-guarded their assets in the consistent United States economy whenever unfavorable Brexit events occurred. These findings defend the fact that the globalized relations in the stock and currency markets are strong and that positive Brexit news headlines are priced in as a benefit for many stakeholders within and outside of Europe. However, the data also visually displays the fact that positive Brexit developments generate higher returns for the European Union and Germany as opposed to the United Kingdom itself, and that same-direction negative returns affect the United Kingdom to a greater extant when compared to European returns. Investors are clearly pricing in the uncertain and negative implications of Brexit to the point where the United Kingdom has limited upside and plenty of downside within the realms of the financial markets. Until Brexit developments begin to follow a clear trajectory, this trend will persist as the United Kingdom struggles to eliminate the uncertainty surrounding the future of their economy, their global footprint, and their affiliation with the European Union.

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VII. Tables

Table 1

Stock Returns Compared to Brexit News Headlines

Date	Event	UK Return Prediction (EWU)	UK Return	Germany Return Prediction (EWG)	Germany Return	EU Return Prediction (IEV)	EU Return	US Return Prediction (SPY)	US Return	South African Return Prediction (EZA)	SA Return
6/23/2016	Referendum	-	-11.96%	-	-9.70%	-	-10.90%	-	-3.64%	-	-9.99%
1/17/2017	Prime Minister Theresa May gives an anticipated speech on the UK's Brexit Strategy	+	0.13%	+	0.22%	+	-0.08%	+	-0.35%	+	-0.11%
3/29/2017	The United Kingdom invokes Article 50	+	0.12%	+	-0.10%	+	-0.09%	+	0.09%	+	-0.27%
6/19/2017	First round of EU-UK Exit Negotiations Begin	+	0.18%	+	0.70%	+	0.38%	+	0.83%	+	0%
12/8/2017	The UK and the EU come to terms on some aspects of the Brexit deal	+	0.72%	+	0.36%	+	0.51%	+	0.55%	+	0.54%
6/20/2018	The House of Commons Approves the EU Withdrawal Bill	+	0.06%	+	-0.10%	+	-0.02%	+	0.17%	+	1.50%
7/9/2018	The UK's Foreign Secretary Boris Johnson and Brexit minister David Davis resign	-	0.85%	-	0.55%	-	0.64%	-	0.90%	-	3.10%
10/16/2018	Trump Administration announces intent to negotiate trade agreements with the UK and EU separately	+	1.10%	+	1.92%	+	1.60%	+	2.20%	+	4.31%
10/19/2018	A Brexit summit takes place during this week, and a Brexit deal has not yet been reached	-	-0.58%	-	-0.50%	-	-0.59%	-	-0.45%	-	1.15%
11/14/2018	British Prime Minister May secured cabinet approval for her soft Brexit deal	+	0.22%	+	0.37%	+	0.12%	+	-0.68%	+	-0.12%
11/15/2018	The resignation of six U.K. ministers over a proposed	-	-0.59%	-	0.37%	-	0%	-	1.04%	-	4.41%

	Brexit deal rattle the British pound and the European Markets										
11/16/2018	Letters of no confidence in May's leadership begin to be submitted	-	-0.50%	-	-0.07%	-	0.02%	-	0.26%	-	1.04%
11/21/2018	Theresa May is meeting up with President Jean-Claude Juncker.	+	1.67%	+	1.70%	+	1.35%	+	0.34%	+	1.35%
11/25/2018	EU, UK approve Brexit deal	+	1.63%	+	1.88%	+	1.59%	+	1.61%	+	3.03%
12/10/2018	Theresa May delayed a critical parliamentary vote on her proposal to leave the EU	-	-1.12%	-	-0.66%	-	-0.77%	-	0.19%	-	-1.75%
12/11/2018	Theresa May is set to face a vote of no confidence	-	0.30%	-	0.47%	-	0.35%	-	0.02%	-	1.39%
12/12/2018	Theresa May survives the no confidence vote	-	1.17%	-	1.56%	-	1.76%	-	0.50%	-	3.55%
12/21/2018	Firms told to prepare for a no-deal Brexit	-	-0.83%	-	-0.99%	-	-1.24%	-	-2.04%	-	-1.76%
1/15/2019	UK Parliament votes down deal	-	-0.46%	-	-0.15%	-	-0.18%	-	0.77%	-	2.24%
1/25/2019	Northern Ireland Democratic Support	+	0.98%	+	2.94%	+	1.72%	+	1.11%	+	2.75%
3/12/2019	Parliament Votes Down Second Deal	-	0.68%	-	0.74%	-	0.75%	-	1.83%	-	1.27%
3/13/2019	Parliament Votes Down No-deal Brexit	+	2.41%	+	1.60%	+	2.31%	+	2.44%	+	-0.58%
3/14/2019	Parliament Votes to Delay Brexit	+	3.50%	+	2.57%	+	3.44%	+	2.95%	+	1.46%
Average Return			-0.01%		0.25%		0.12%		0.46%		0.80%
Average Return "+" prediction			1.06%		1.20%		1.12%		0.90%		1.34%
Average Return "-" prediction			-1.42%		-0.99%		-1.19%		-0.11%		0.11%
Average Return "+"			0.98%		1.20%		1.18%		0.99%		2.21%
Average Return "-"			-2.29%		-1.53%		-1.73%		-1.43%		-2.08%
Range of Prediction			2.48%		2.20%		2.31%		1.02%		1.23%
Range of Actual			3.27%		2.73%		2.92%		2.42%		4.29%
Number of +			7		8		8		5		7
Number of -			16		15		14		18		15

Table 2

Currency Returns Compared to Brexit News Headlines

Date	Event	UK Prediction	GBP Curncy	Europe Prediction	EUR Curncy	US Prediction	DXY Curncy	South African Prediction	ZAR Curncy
6/23/2016	Referendum	-	-8.05%	-	-2.35%	+	2.05%	+	4.62%
1/17/2017	Prime Minister Theresa May gives an anticipated speech on the UK's Brexit Strategy	+	1.90%	+	0.66%	-	-0.84%	+	-0.36%
3/29/2017	The United Kingdom invokes Article 50	+	-0.13%	+	-0.44%	+	0.29%	+	0.38%
6/19/2017	First round of EU-UK Exit Negotiations Begin	+	-0.36%	+	-0.43%	+	0.40%	+	1.47%
12/8/2017	The UK and the EU come to terms on some aspects of the Brexit deal	+	-0.62%	+	0.00%	-	0.11%	+	-0.48%
6/20/2018	The House of Commons Approves the EU Withdrawal Bill	+	0.51%	+	0.28%	-	-0.28%	+	-0.58%
7/9/2018	The UK's Foreign Secretary Boris Johnson and Brexit minister David Davis resign	-	-0.17%	-	0.04%	+	0.12%	-	-0.45%
10/16/2018	Trump Administration announces intent to negotiate trade agreements with the UK and EU separately	+	0.22%	+	-0.04%	+	0.02%	+	-1.44%
10/19/2018	A Brexit summit takes place during this week, and a Brexit deal has not yet been reached	-	-0.86%	-	-0.43%	+	0.31%	-	-0.65%
11/14/2018	British Prime Minister May secured cabinet approval for her soft Brexit deal	+	0.12%	+	0.18%	-	-0.51%	+	-0.43%
11/15/2018	The resignation of six U.K. ministers over a proposed Brexit deal rattle the British pound and the European Markets	-	-1.68%	-	0.16%	+	0.13%	-	-1.51%

11/16/2018	Letters of no confidence in May's leadership begin to be submitted	-	0.47%	-	0.77%	+	-0.48%	-	-1.30%
11/21/2018	Theresa May is meeting up with European Commission President Jean-Claude Juncker in a bid to finalize a Brexit deal in time for Sunday's EU summit	+	-0.08%	+	0.12%	-	-0.13%	+	-1.34%
11/25/2018	EU, UK approve Brexit deal	+	0.10%	+	-0.08%	-	0.16%	+	0.34%
12/10/2018	Theresa May delayed a critical parliamentary vote on her proposal to leave the EU	-	-1.30%	-	-0.20%	+	0.73%	-	1.56%
12/11/2018	Theresa May is set to face a vote of no confidence	-	-0.59%	-	-0.34%	+	0.17%	-	-0.29%
12/12/2018	Theresa May survives the no confidence vote	+	1.14%	-	0.46%	+	-0.35%	-	-1.60%
12/21/2018	Firms told to prepare for a no-deal Brexit	-	-0.09%	-	-0.65%	+	0.71%	-	1.59%
1/15/2019	UK Parliament votes down deal	-	-0.02%	-	-0.49%	+	0.45%	-	-0.28%
1/25/2019	Northern Ireland Democratic Support	+	0.99%	+	0.90%	-	-0.84%	+	-0.75%
3/12/2019	Parliament Votes Down Second Deal	-	-0.57%	-	0.38%	+	-0.29%	-	0.09%
3/13/2019	Parliament Votes Down No-deal Brexit	+	2.01%	+	0.35%	-	-0.40%	+	0.49%
3/14/2019	Parliament Votes to Delay Brexit	+	0.36%	+	0.19%	-	-0.20%	+	-0.94%
Average Return			-0.291%		-0.042%		0.058%		-0.081%
Average Return "+" prediction			0.474%		0.165%		0.304%		0.075%
Average Return "-" prediction			-1.286%		-0.311%		-0.326%		-0.284%
Average Return "+"			0.782%		0.374%		0.435%		1.318%
Average Return "-"			-1.117%		-0.545%		-0.432%		-0.827%
Range of Prediction			1.76%		0.48%		0.63%		0.36%
Range of Actual			1.90%		0.92%		0.87%		2.14%
Number of +			13		10		10		15
Number of -			10		12		13		8

Table 3

United Kingdom Stock Return Movements in Relation to Other Countries

	% Move in Same Direction	% Negative Movements in Same Direction	% Positive Movements in the Same Direction	UK Neg Exceed	UK Pos Exceed
Germany	86.96%	30.00%	70.00%	83.33%	28.57%
EU	78.26%	27.78%	72.22%	60.00%	53.85%
EU & Germany	78.26%	27.78%	72.22%	60.00%	30.77%
US	73.91%	17.65%	82.35%	66.67%	50.00%
South Africa	69.57%	20.00%	81.25%	33.33%	30.77%
All Together	56.52%	15.38%	84.62%	50.00%	15.38%

Table 4

United Kingdom Currency Return Movements in Relation to Other Countries

	% Move in Same Direction	% Negative Movements in Same Direction	% Positive Movements in the Same Direction	UK Neg Exceed	UK Pos Exceed
Euro	69.57%	50.00%	50.00%	50.00%	75.00%
Dollar	8.70%	50.00%	50.00%	0.00%	0.00%
ZAR	39.13%	77.78%	22.22%	57.14%	50.00%

Table 5

Stock Return Correlation

	UK Return	*Germany Return*	*EU Return*	*US Return*	*SA Return*
UK Return	1				
Germany Return	0.973235	1			
EU Return	0.992478	0.987508	1		
US Return	0.800511	0.813305	0.837109	1	
SA Return	0.804506	0.859068	0.837409	0.724195	1

Table 6

Currency Return Correlation

	GBP Curncy	*EUR Curncy*	*DXY Curncy*	*ZAR Curncy*
GBP Curncy	1			
EUR Curncy	0.847133	1		
DXY Curncy	-0.85599	-0.95564	1	
ZAR Curncy	-0.6982	-0.79377	0.77938	1

Table 7

Stock Return Prediction Accuracy by Country

Country	Correct Prediction
UK	78.26%
Germany	69.57%
EU	60.87%
US	56.52%
South Africa	43.48%

Table 8

Currency Return Prediction Accuracy by Type

Currency	Correct Prediction
Pound	78.26%
Euro	56.52%
Dollar	78.26%
ZAR	52.17%