Brexit Attention, Cultural Differences and Stock Returns

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Abstract

Around the news of Brexit, this paper studies the relationship between investor attention and the cross-sectional stock returns in four major stock markets in Europe – UK, Germany, France and Sweden. A negative relationship is found between the investor attention on Brexit and the aggregate stock market returns on average across countries, with the exception of Sweden. When google search volume (a proxy for investor attention) is higher(lower), the stock market return tends to be lower (higher). Next, in response to the market's speculation that "which European financial center would win at London's expense", I further analyze whether the cultural differences (represented by Hofstede's six dimensions of national culture) across above four countries have an impact on the attention-return relationship individually. I find that UK's high individualism level and France's high uncertainty avoidance provide explanations for the significant negative attention-return relationships for the two countries. This study tests and provides evidence for the important roles of investor attention and culture differences in the financial market.

Keywords: Brexit, Investor attention, Stock market, Cultural dimensions

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1. Introduction

In this paper, I look into two cross-related topics: the impact of investor attention on stock market upon Brexit news, and whether cultural differences play a role in influencing such relationship among potential European financial centers – I focus on UK, Germany, France, and Sweden for their relatively important positions in the European stock market as well as the speculation from media that "European Cities Battle for London's Finance Crown After Brexit Vote" (the Wall Street Journal, 1 July 2016).

An abbreviation for the term "British exit", Brexit refers to the possibility of Britain withdrawing from the European Union (EU). The financial consequences of the news of Brexit are instant and significant. In reaction to UK's Brexit vote, sterling had its biggest drop in the era of free floating currencies, equities fell and gold jumped as Britain's historic decision to leave the EU reverberated across financial markets. Investors, who have been confident that the British public would choose to stay in the UK, also dumped bonds of the Eurozone periphery countries and punished European banks shares as the future of the EU is questioned. Among all the financial market indications, in this paper I focus on the reaction of stock markets which supposedly came under heavier pressure following the UK's historic vote.

The classical theories try to rationalize investor behavior, but in many times it turns out to be difficult if not impossible. Traditionally, people assume that new information will be immediately reflected into the stock price which is reflected as full attention. But this might not be the case. Then it is expected that attention matters for how quickly new information is incorporated into the stock prices. Da, Engelberg and Gao (2011) pointed out that traditional Asset Pricing models assume investors pay enough attention to assets when making decisions so that the prices have automatically reflected all information. However, in reality attention is a scarce cognitive resource and especially retail/individual investors have limited attention. Looking first sight at the returns of UK stock market and google research volumes around June 23 which was the Brexit's polling day for the EU referendum, I observe the pattern of a jump of Google search volume (a proxy of investor attention) and a decrease in return in the stock markets. Based on this intuition, I expect a relationship between investor attention on Brexit and the stock market returns. And in this paper I test the quantitative representation of such relationship.

In the schools of Behavioral Finance, investor attention is incorporated and presented by developing measures. In this paper the market level attention of investors is revealed by

studying daily Internet search volume from households. Google makes the Search Volume Index (SVI) of search terms public via the product Google Trends (http://www.google.com/trends). The Search Volume Index (1) is correlated with but different from existing proxies of investor attention; (2) captures investor attention in a more timely fashion; (3) likely measures the attention of retail investors (Da, Engelberg and Gao, 2011). To capture attention paid to Brexit news, I examine the daily search volumes on ten most searched words such as "Brexit, democracy, racism" collected from OxfordDictionaries (http://blog.oxforddictionaries.com/2016/06/word-trends-brexit/) within selected period of Brexit news. Gathering stock market indices from UK FTSE All-Share Index, German CDAX, French SBF 250 and Swedish OMX 30, I construct a simple linear regression model to test the relationship between stock market return and the attention level on Brexit, and look into whether Brexit benefits financial markets in other continental European countries in terms of the stock market performance by analyzing further the individual domestic stock market indices in Germany, France and Sweden.

Moreover, inferred from that individualism and information uncertainty are positively associated with trading volume and volatility (Chui, Titman and Wei 2010), this paper also examines whether the culture differences between countries influence the attention-return relationships. Industry reports such as "How culture impacts investment behavior" proposed that investor behavior continues to differ around the world, impacting investment strategies and returns on the financial markets. Anglo-Saxon investors for example tolerate the greatest losses, while Germanic investors are the most patient (Credit Suisse, 18 Feb 2015). Drawing on recent developments in cultural psychology, particularly research on culture and reasoning, I examine whether the same level of attention will have the same impact on return and if not, whether the differences depend on culture (or fundamentals). I provide explanations based on model of cultural clusters - Hofstede's six dimensions of national culture which are uncertainty avoidance, long term orientation, indulgence, power distance, individualism and masculinity. The six dimensions of national culture are based on extensive research done by Professor Geert Hofstede, Gert Jan Hofstede, Michael Minkov and their research teams, and this national culture composition is considered one of the most comprehensive studies of how values in the markets are influenced by culture. Therefore, by connecting the result of attention-return relationships with the culture differences between countries, I explore whether culture dimensions have an impact on such relationship. I look for potential explanations from culture dimensions and hypnotize that uncertainty avoidance index and other evident concerns from financial

market participants to have an impact. Lastly, I relate the results in this paper with previous studies, and propose predictions and open up for future research.

From the analysis, I find significant negative attention-return relationships for UK and France, while the positive relationship for Sweden and the negative one for Germany are not significant. High scores in individualism, high avoidance of uncertainty and low masculinity provide explanations for relationship between investor attention and stock market return.

The study is unique in its time dependent analysis. Currently in the wave of Brexit news, financial markets globally are undergoing significant movements and shocks. This study examines the effect of attention on Brexit news on stock market returns in four major stock markets in Europe and is expected to contribute in the behavioral finance research field. The study also provides insights regarding the impact of cultural dimensions on the attention-return relationship that will help investors for decision makings in the stock markets. The rest of the paper has been organized as follows: next section reviews some relevant literature on the topic, followed by research design, methodology and data collection in Section 3. Section 4 analyzes the results drawn. Section 5 discusses the alternative explanations and some potential improvements. The final section concludes the findings of the research and suggests for future research.

2. Background
Brexit

Brexit, the process that the United Kingdom (UK) intends to withdraw from the European Union (EU), arouses heated debate globally. Though undoubtedly a historic decision, Brexit is also only the latest development in the conflicted relationship between the UK and the EU that has played out over the past 50 years. Dating back from 1957 when European Economic Community (EEC), the predecessor of today's European Union, was established, to 1973 when UK joined the European Economic Community, Europe and UK have long battled politically and economically, including a united foreign policy, common citizenship rights and (for most member nations, not including the UK) a single currency, the euro. One of the important considerations behind is the interest of the protection of financial sector.

Against the backdrop of economic unrest in the Eurozone and an ongoing migrant crisis, a possible sentiment on British exit from the EU – or Brexit – increased over the past several years. The latest referendum was held on 23 June 2016 to decide whether the UK should leave or remain in the European Union. Leave won by 52% to 48%. Since the initial shock of the Brexit vote, the UK economy has appeared to be weathered. The 30-year low in value of the British pound, the loss of top AAA credit rating, the share price slump of for British-based business and series of other financial indicators witnessed the rundown of the UK financial market after the news spread. Boulanger and Philippidis (2015) suggested UK equivalent variation (EV) gains of 8.9 billion pounds on withdrawal from the EU budget. Tielmann and Schiereck (2016) found that the referendum had strong negative valuation effects focusing on logistic companies and the market response was in line with the notion of efficient markets. Moreover, by analyzing the reaction of banks' stocks and CDS spreads to the Brexit announcement, Schiereck, Kiesel and Kolaric (2016) showed that especially EU banks' share prices declined following the Brexit announcement, and this drop in share prices was more severe than following Lehman's bankruptcy. No matter investors worry about "Brexit uncertainty weighs on global groups with UK assets (Financial Times, 26 June 2016)" or the sentiment is eased by news like "Impact of post-Brexit uncertainty overstated" (Financial Times, 23 November 2016), the uncertainty resulting from the news of Brexit is speculated to have the tendency to change the economic arrangements in Europe. PwC predicted in the report "What does Brexit mean for London, the UK and Europe?" that London could lose its position as Europe's strongest financial center if the UK does not remain a member of the European Economic Area when it leaves the EU. Whether UK will

still lead the crown of the center of European economy leaves the financial market a question mark and might lead to the next steps for thousands of companies and market players.

Political Events and Stock Market

Political events such as elections, transition of governments, regulations and policies are connected with the financial markets. It is implied from the theory of investment under uncertainty that political uncertainty may increase stock volatility and reduce output at the same time. Political events are more clearly the source of volatility, and the results support the view that the relationship between volatility and output reflects the joint effects of political factors (Bittlingmayer 1998). Vuchelen (2003) found that efficient stock markets react to news about political events and the news content of these events depends on the electoral system. Mei and Guo (2002) found that there is a significant relationship between political election and financial crisis after controlling for differences in economic and financial conditions, and they observed increased market volatility during political transition period. In Beaulieu, Cosset, and Essaddam (2006), the uncertainty surrounding the referendum outcome has an impact on stock returns of Quebec firms, and the importance of political conditions on volatility of stock market around the world is analyzed. Li, Pincus, and Rego (2008) revealed significant evidence of a positive relationship between the stock returns following Sarbanes-Oxley Act of 2002, the most important legislation affecting corporate financial reporting enacted in US, and the extent of earnings management. Relationship among crime, political uncertainty and market returns volatility in Colombia were checked by Laverde et al., 2009 and the link was confirmed. An important conclusion is that political uncertainty and crime are important determinants of market returns volatility. Khalid and Rajaguru (2010) confirmed the changes in the market volatility as a result of some domestic and international events have impact on the domestic economy and the financial market. Moreover, the markets are implied to have some weak short-run linkages but do not support a long-run causal relationship. In the study of Mahmood (2014), evidence from Pakistan Karachi Stock Market proved that political instability involves in movement of prices and that returns are negatively abnormal, so investors are reluctant to invest more and some call back their investment which lead negatively in overall market returns.

2016 is deemed to be a spectacular year due to the important political happenings. The most eye-catching incidents include UK's vote in referendum to leave the European Union, US election, and Italy's referendum to have rejected prime minister's constitutional reforms. All of these events trigger enormous attention from the public. The impact of these

political incidents cover not only the national governmental policies, but also the country's economy and the global economy as whole. In a globalized world as it is today, news spreads fast. It is obvious to see political events' impacts on the stock markets from the fluctuations of stock returns this year. As was argued in Beaulieuet al. (2006), Aktas and Oncu (2006), Bailey et al. (2005) and Frey and Waldenstrom(2004), political events had a strong effect on the returns and trading volumes of the financial markets. Rajan and Zingales (2000) argued that shifts in political coalitions determine shifts in the character of financial development. And all the previous research findings about the relationship between political events and financial markets set the background and knowledge base for the analysis of attention on Brexit news and stock market returns in this paper.

Investor Attention and Stock Market

Consistent with the efficient market hypothesis, stock prices would fully reflect all available information and expectations including investor sentiment, so current prices are the best approximation of a company's intrinsic value. Investors are assumed to be rational in the classical stream, but behavioral finance accepts that investors react to the financial market differently and irrationally sometimes. In reality, attention is a scarce cognitive resource (Kahneman (1973)), and investors especially individual/retail ones have limited attention.

A stock market fluctuation can therefore be explained by the behavioral methods. In markets where irrational investors can move prices, investor attention reflects the difference in asset valuations between arbitrageurs and retail investors (Lee et al. 1991). The bull-bear spread from Investor Intelligence predicts stock market returns over the next one to three years (Debondt 1993, Fisher and Statman 2000). Therefore, the attention may be categorized as the not (entirely) rational evaluation of asset characteristics (Shleifer 2000; Baker et al.2008). Peng and Xiong (2005) showed limited investor attention leads to "category-learning" behavior, i.e., investors tend to process more market and sector-wide information than firm-specific information. Baker and Wurgler (2006) concluded that a wave of investor sentiment has larger effect on securities whose valuations are highly subjective and difficult. Furthermore, when beginning-of-period proxies for sentiment are low, subsequent returns are relatively high for small stocks, young stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme growth stocks and distressed stocks. When sentiment is high, these categories of stock earn relatively low subsequent returns. Barber and Odean

(2008) concluded that individual investors display attention-driven buying behavior. They are net buyers on high-volume days, following both extremely negative and extremely positive one-day returns, and when stocks are in the news. Furthermore, Peng and Xiong (2009) found that price momentum profits are higher among high volume stocks and in up markets, but that earnings momentum profits are higher among low volume stocks and in down markets. In the long run, price momentum profits reverse but earnings momentum profits do not. There is a positive correlation between the sentiment of newsletter writers and retail investors. Also Bank and Brustbauer (2014) reviewed the literature in finance and economics on the theory and evidence relating to investor attention.

The empirical theories indicate a relationship between investor attention and stock market performances. Based on the nature of Brexit, I expect to observe that along with the increase of investor attention, there is decrease in the stock market returns to reflect investors' perception of uncertainties and risks.

The Role of Cultural Difference in Investment Behavior

The study of cultural difference in investment behavior has been developed along with time.

Grinblatt and Keloharju (2001) showed that investors exhibit a preference for closer firms when they analyze the impact of distance, language, and culture on investment decisions of Finnish investors. Amadi (2004) found that familiarity factors such as common language, trade, and possibly, immigrant links significantly influence equity home bias. Guizo, Sapienza and Zingales (2006) indicated that cultural hypotheses can be rigorously tested and are economically important for fundamental economic issues like national rates of saving. Ji, Zhang and Guo (2008) documented that people with different cultural backgrounds may behave quite differently in the stock market due to their different reasoning styles and lay theories of change. Breuer and Salzmann (2008) showed that national culture is statistically significant in differentiating countries with different corporate governance systems. Breuer and Quinten (2009) proposed the concept of "Cultural Finance" which considers cultural aspects in the analysis of financial issues, has the potential to highlight and to eliminate weak points in established fields of research. Chui, Titman and Wei (2010) found that individualism is positively associated with trading volume and volatility, as well as to the magnitude of momentum profits. The study conducted by Hens, Wang, and Rieger (2014) on patience and risk aversion proved that culture drives individuals' investment

behavior, even when control variables such as inflation rates or accumulated wealth were taken into account. Moreover, Zhang (2006) suggested that stocks in the United States which exhibit higher uncertainty indicate stronger momentum. Therefore, market momentum is strongly correlated to the degree of individualism – in individualistic countries, there are more "ego-traders" seeking quick gains, leading to a higher market momentum. Anderson et al. (2011) showed that uncertainty avoidance is positively related to the degree of home bias. On the other hand, utilizing portfolio holdings survey data from IMF, Aggarwal et al. (2012), found that uncertainty avoidance does not significantly explain cross-border holdings of either debt or Equity.

In this paper, faced with the news of Brexit, it is natural to raise the hypothesis that European countries which represent assorted cultures lead to different levels of market reaction. With different values and business mindsets, countries differ in the behavior in the financial markets. Therefore, the result in this paper is useful for investors to understand how the markets of speculated "new European financial center" such as Germany, France, and Sweden perceive and react to the news of Brexit.

3. Data and Methodology

The test of quantification of investor attention has been explored by different streams of academic scholars. Survey-based indices, market-based measures such as trading volume, closed-end returns, IPO volume, option implied volatilities (VIX) or mutual fund flows have been utilized to proxy investor sentiment. Compared with the above mentioned measures, Da, Engelberg and Gao (2011) proposed a new and direct measure of investor attention using search frequency in Google (Search Volume Index (SVI)). Similarly, the proposed Financial and Economic Attitudes Revealed by Search (FEARS) index (Da, Engelberg and Gao 2014) showed the ability of Google Search Volume to predict monthly survey results of consumer confidence and investor sentiment. Based on my study area, I therefore construct a BARS (Brexit Attention Reveled by Search) Index as a proxy of investor attention.

Google Trends is an online search tool that allows the user to see how often specific keywords, subjects and phrases have been queried over a specific period of time. Compared with the above measures of investor sentiment, the Google Search Index measurement used in this paper can better reveal investor attention for the following reasons. First, the search index data is available daily online which ensures that my analysis reflects the in-time fluctuation of investors' reaction to the news of Brexit. The stock return changes in stock markets are quick. By relating the daily returns and the same day Google Search results, I observe the coherent relationship. For example, on November 3, 2016 when British court ruled that the government needed parliamentary approval to start the process of leaving the European Union which potentially would delay Brexit plans, I observe in the Google Trends that the same day search volume for "Brexit" showed a local maximum indicating immediately increased attention at this point. This observation proved my assumption that Google Search Index is advantageous at catching the short-time attention. Second, search index genuinely reflects the attention of people: if you search for "Brexit, uncertainty" on Google, there is no doubt that you are paying attention and showing concern about it. In fact, when I look at the ten most searched terms post-Brexit in UK: Brexit, democracy, racism, referendum, xenophobia, mendacious, India, plebiscite, practice and sovereign, it is not difficult to spot the close co-movement between the attention and the events. Third, with the popularity of Google, I have confidence to interpret the result of search index as market level attention.

The source is "Google Trends" which is public online at http://www.google.com/trends. Figure 1-1 shows the daily search result for "Brexit" for UK

from 1 May 2016 to 4 November. I choose the study period based on the representation and availability of search volume data. The results in Google Trends are normalized meaning that sets of search data are divided by a common variable, like total searches, to cancel out the variable's effect on the data (Google 2014). For example, given a huge jump of search volume for "Brexit" in UK around June 23, search volume indice before May have been normalized to 0; therefore, those datum are negligible for the purpose of effective research. Also considering to cover the major political events about "Brexit" – from May 5 when elections were held for the Welsh Assembly, Scottish Parliament and Northern Ireland Assembly, to June 23, the polling day for the EU referendum, then to November 3 when news about "Brexit court defeat for UK government" was announced. I acknowledge there is limitation about my selection of data period for its relatively short length. Previous academic research about the relationship between investor attention and stock market was generally based on time series of years. The fact that I am focusing on the Brexit news period leads to the relatively short study period – 6 months. However, there are also advantages exactly because of this short time period. First, country macro data is known to be noisy and it is difficult to hedge away all idiosyncratic risk at country levels. The common approach taken by previous papers allows for exploration of possible determinants of cross-country differences such as GDP, CPI which are reported annually; thus with my daily data selected within one year, control for macro economic factors are not the main focus in this paper. Moreover, this relatively short period narrows down the comparison focus and therefore provides a more accurate analyzing period.

Figure 3-1 Google search trend for "Brexit" search volume for UK from 1 May 2016 to 4 November 2016
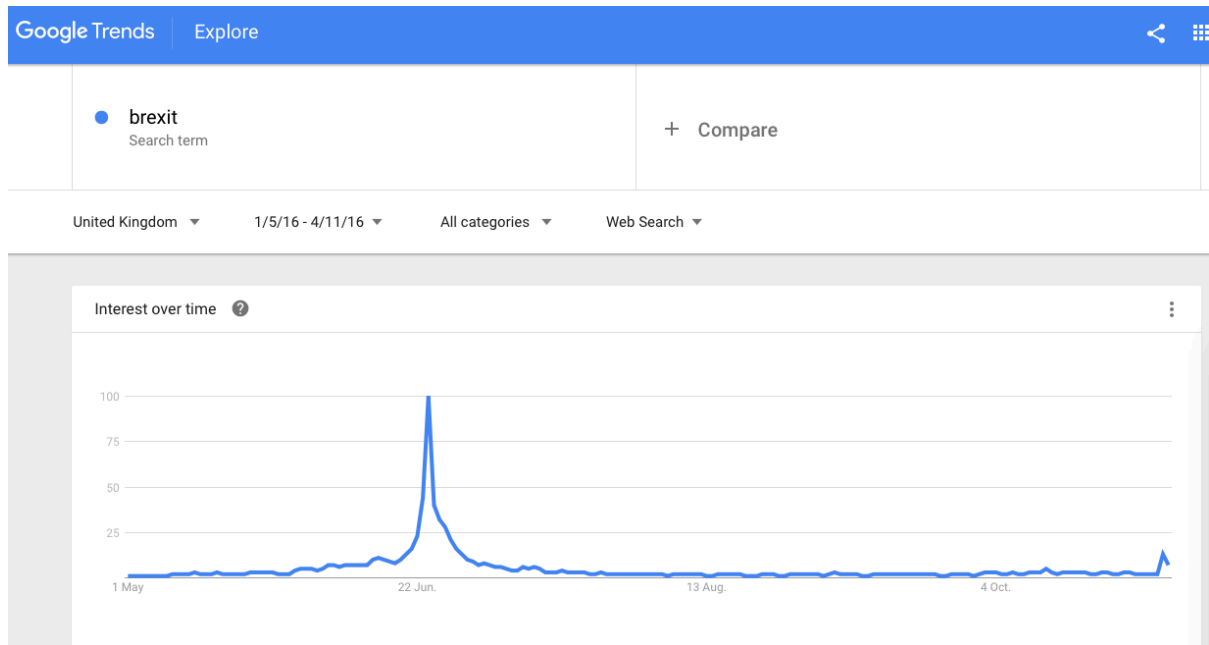
To explain the cultural differences between countries, Hofstede's six dimensions of nature culture are compared among analyzed countries. The six dimensions are power distance, individualism, masculinity, uncertainty avoidance, long-term orientation and indulgence. Hofstede conducted the comprehensive study of how values in the workplace are influenced by culture based on employee value scores collected by IBM between 1967 and 1973 covering 70 countries and including about 88,000 respondents. One of the most interesting dimensions that are related with this paper's area of focus is uncertainty avoidance. Amirhosseini (2012) showed that the main hypothesis which examined whether there is a significant relationship between cultural dimensions and investment decisions in the Tehran stock exchange was confirmed, and subsidiary hypothesis of the research based on the relationship between Masculinity and Uncertainty Avoidance and investment decisions was significant at a meaningful level and confirmed. About the cultural dimensions in a UK context, ElKelish and Pointon (2012) highlighted the influence of cultural values on the stock market development on a continuous scale which encourages policy makers, regulators, and international investors to have a more comprehensive approach in dealing with reform programs in the United Kingdom as well as in other countries worldwide. This study provides explanations on the connections between cultural differences and the attention-return relationships.

3.1 Construction of BARS (Brexit Attention Revealed by Search) Index

Theoretical and empirical evidence on that investor attention affects stock prices has been reviewed and developed, but the continuing problem lies in how to precisely measure investor attention and quantify its effects. There have been two major approaches of measurements: "bottom up" and "top down". Barberis, Shleifer, and Vishny (1998) and Daniel, Hirshleifer, and Subrahmanyman (1998) proposed the model of using bias in individual investor psychology to investigate how investors react abnormally to historical prices. And these models indicate future forecasts on investor attention, as well as price and volume. The "top down" approach to behavioral finance focuses on the measurement of reduced form, aggregate attention and traces its effects to stock returns. Moreover, there are two empirical ways to measure investor attention: market-based measures and survey-based indices.

To imply the investors' attention upon the news of Brexit, I structure a pool of search terms that are representative and available. The trending look-ups on

OxfordDictionaries.com are often a good way to have a quick snapshot of the national and international topics of the day (*source: OxfordDictionaries.com*). I find in Oxford dictionaries the 10 most popular words looked up post-Brexit: Brexit, democracy, racism, referendum, xenophobia, mendacious, India, plebiscite, practice and sovereign. I follow the procedures conducted in Da, Engelberg and Gao (2014) testing the feasibility of including the above 10 searching terms. Since these are the most popular words searched by people, I would use them as representatives of the attention by the public.

First, I verify the amount of available search results for the words. I input the above mentioned 10 searching terms into Google Trends and remove insufficient item, if any. As the searching volume index result shows, each 10 word produces sufficient amount of results without having any of the word having too few data for the purpose of analysis also because these 10 words are already selected as "most searched".

For the time horizon of our analysis, I use the daily SVI data from May 1 to November 4 (excluding weekends to match the date of stock market indices). Since the EU Referendum was on 23 June, the selected time horizon is able to cover the period of investors' perception around major Brexit events. Also this period covers the news on November 3, 2016 when British court ruled that the government needs parliamentary approval to start the process of leaving the European Union. I am confident that the major news announcements about Brexit are included in my analysis time horizon. To ensure that I do not miss important data series, I also input the above searching words in Google Trends and lengthen or shorten the time range, for example, increasing to a one-year period to see if there could be changes for improvements of the timeline. When the time period is lengthened, because of the significant search volume jump around certain date, the indices before May have been almost 0 and therefore there is less meaning to include the prolonged data before May. The significant result is fully covered by my selected data period: May 1 to November 4. Because for the market stock return indices, I employ data from the overall national stock markets and therefore I assume that unsystematic risk is diversified away. Moreover, my time horizon are 6 months. Therefore, it would be considered to have the minimum number of observations.

Therefore, I take the period from May 1 to November 4 mainly because that this paper is based on the established and tested relationship between investor attention and stock market return from previous papers while applying the news of Brexit to test whether it holds for the theory. I acknowledge some simplification utilized in this paper might miss some risk adjustments, but with the focus of the event of Brexit I feel comfortable that reasonable effort

is made to clean the attention variable of this risk. This paper focuses on culture as a possible determinant of country specific differences, making controlling market risk, macro risk factors not the most important concern. I then download the SVI for each of the 10 most searched terms. Since I first focus our analysis in UK stock market, I restrict SVI results to British households. My daily BARS Index is the sum of the 10 most popular searching items. I define the daily BARS for country i at date j as:

$$BARS_{i,j} = SVI_{Brexit(i,j)} + SVI_{democracy(i,j)} + SVI_{racism(i,j)} + SVI_{referendum(i,j)} + SVI_{xenophobia(i,j)}$$
$$+ SVI_{mendacious(i,j)} + SVI_{India(i,j)} + SVI_{plebiscite(i,j)} + SVI_{practice(i,j)} + SVI_{sovereign(i,j)} \qquad (1)$$

Graph 3.1.1 The BARS indices for UK, Germany, France and Sweden

BARS (UK)

BARS (DE)

BARS (FR)

BARS (SE)
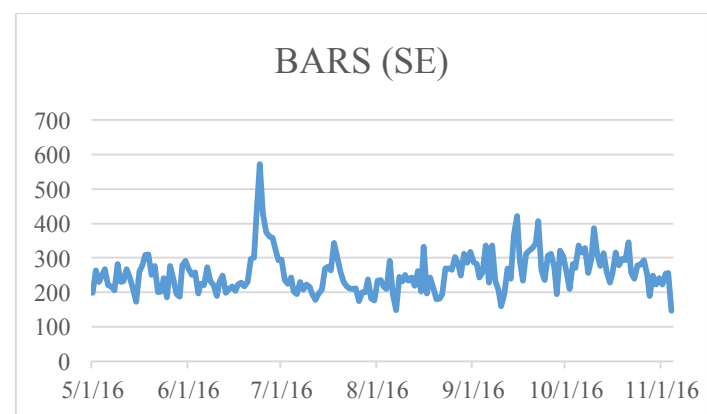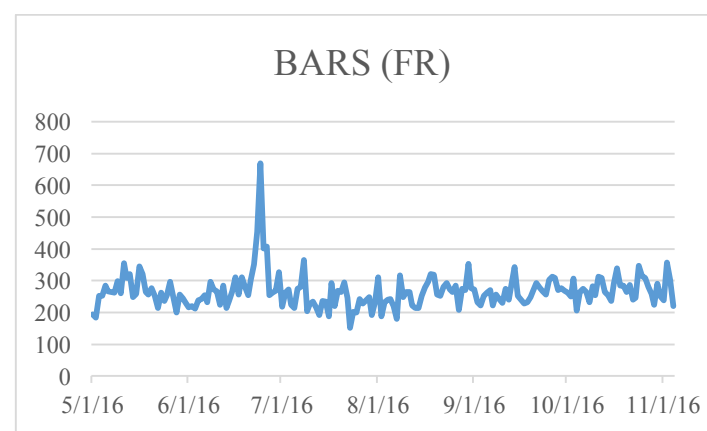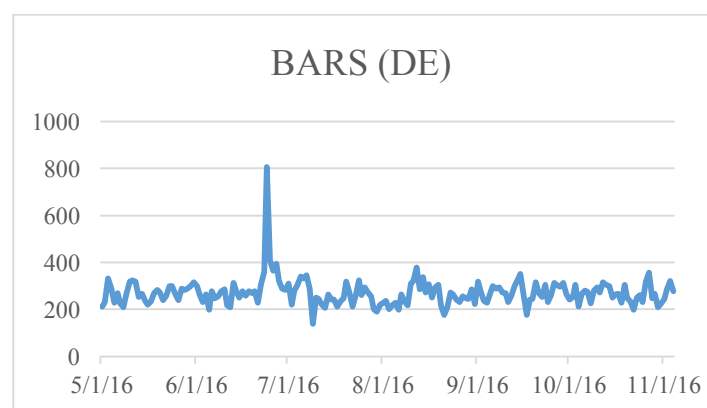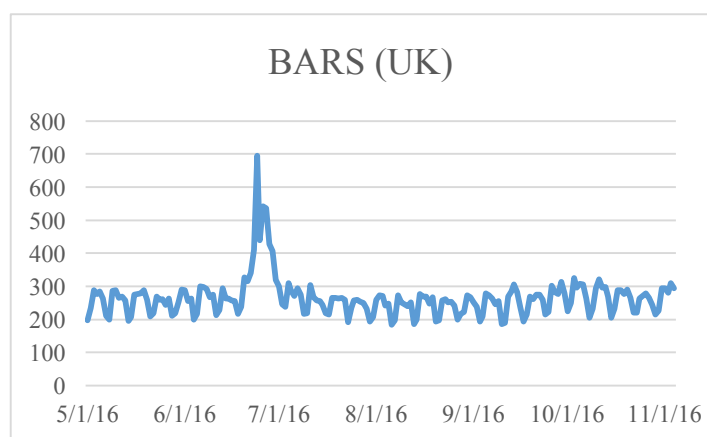
Considering the possible extreme value problem, when looking into the four distributions above for google search volume changes with date, it is clear that around June 23 there are obvious jumps of search volumes for all the four analyzed countries. The jumps are not considered to be "outliers" or "abnormal observations" because they exactly reflect the especially high public attention around those days, and thus become important experimental data. Also, in terms of possible seasonality and heteroscedasticity in the data, since I would actually focus the analysis around the news shock, that is, the near period that the public perceived the announcement of the Brexit news, I take into consideration the time period in this paper (May 1 to November 4) is free from the significance influence of seasonality and heteroscedasticity for the relatively short examining period. Therefore, when I look into the time series, I assume it has the ability of reflecting the actual fluctuation of the market reaction.

3.2 Stock Market Returns

In this paper, I look into the stock market returns at a country level. I use the overall stock market index by country because I base the conclusion on the analysis of the general market reaction. So market stock indices from national stock exchanges of UK, Germany, France and Sweden are collected to represent the financial market reaction.

In previous academic papers exploring the representation of market reaction, there are other choices of indicators. For example, starting from Black (1986) there has been research suggesting that investor sentiment and the resulting noise trading can affect both the level and the volatility of asset prices which can be measured by realized volatility (RV) and daily market volatility index (VIX). Additional methodologies of representation include limits to arbitrage, fund flows, trading volumes and so on. In this paper I focus the representation of market reaction by average stock market returns. French (1986) used stock returns around exchange holidays to suggest that private information is the principle factor behind high trading-time variances. Rosen (2006) suggested that since the shocks can boost overall stock prices, the cumulative abnormal announcement return can be positively correlated with recent returns in the stock market. Therefore, the stock market return is utilized as one of most direct and salient representations which I also use as measurement in this paper.

In UK, FTSE All-Share Index is a capitalization-weighted index, comprising around 1000 of more than 2,000 companies traded on the London Stock Exchange. It represents 98-

99% of UK market capitalization, and is the aggregation of the FTSE 100, FTSE 250 and FTSE Small Cap Indices. I download the daily FTSE All-Share Index from Financial Times (https://markets.ft.com/data/indices) and calculate the return using the following equation:

$$Return_{UK,j} = (Index_{UK,j} - Index_{UK,j-1}) / Index_{UK,j-1} \qquad (2)$$

Besides UK, I am interested to further explore the stock markets in Germany, France and Sweden. For Germany, I gather stock market data on CDAX which is a German stock market index calculated by Deutsche Börse. It is a composite index of all stocks traded on the Frankfurt Stock Exchange that are listed in the General Standard or Prime Standard market segments. For France, the SBF 250 is a French stock market index representing all sectors of the French economy. It contains all the component stocks of the SBF 120 Index. For Sweden, the OMX Stockholm 30 (OMXS30) is a stock market index for the Stockholm Stock Exchange which is a capitalization-weighted index that consists of the 30 most-traded stock classes. I download CDAX, SBF 250, and OMXS 30 all from Financial Times under "Markets Data" (https://markets.ft.com/data/).

Since I focus the analysis around the news of Brexit and I focus on a period of 6 months, those yearlong macro factors are not able to distinguish. Therefore, this regression would give an overall view of a possible attention-return relationship for the four countries combined. And country effects are assumed to be netted out from the attention proxy.

3.3 Cultural Factors

Culture has been defined in many ways; Hofstede (2011)'s shorthand definition is: "Culture is the collective programming of the mind that distinguishes the members of one group or category of people from others".

In such a globalized world as it is now, it is gradually more and more important to understand the role of culture in impacting financial behavior. Long streams of research on culture suggest that cultural differences between countries can have an important impact on the financial outcomes ranging from values, methodologies, and preferences. It has been justifiably described that culture is "a fuzzy, difficult-to-define construct" (Triandis et al.,1986). According to Adler (1997), culture has an impact on our values, which in turn affects our attitudes and then behavior. The studies by Stulz and Williamson (2003) and by Grinblatt and Keloharju (2001) relating culture to investors' protection, and to stockholding, respectively, are now largely acknowledged by the financial community. Breuer and Quinten

(2009) suggested the establishment of "Cultural Finance" as an autonomous discipline. Levinson and Peng (2007) examined how cultural background informs economic decision-making and to test whether framing, morality, and out-group information affects judgment financial value and property ownership across cultures. Cultures differ in their value estimations and property ownership judgments, as well as their tendencies to take social and contextual information into account when making those estimations. While financial markets are becoming more inter-related, there remain discrete differences in financial practices across countries; therefore, it is significant to evaluate the way that the cultural factors impact the financial decisions in a country level.

DiMaggio (1997) focused on how people use culture, rather than the production of culture, ideology, or culture embedded in the physical environment. The "four levels of social analysis" proposed by Williamson (2000) included the first level which represents social embeddness and informal social norms and values, the second level which represents institutional environment, the level three representing governance structures and the fourth level representing resource allocation. The higher levels would impose constraints on the lower levels while the lower levels provide feedback to the higher levels. According to Stulz and Williamson (2003), a country's principal religion predicts the cross-sectional variation in creditor rights better than a country's natural openness to international trade, its language, its income per capita, or the origin of its legal system. A country's natural openness to international trade mitigates the influence of religion on creditor rights. Culture proxies are also helpful in understanding how investor rights are enforced across countries. Culture may lead to some attitudes that are more conductive to certain outcomes (Guiso, Sapienza and Zingales, 2006) and can exert influence by affecting institutions in a country (Stulz and Williamson, 2003). Breuer and Quinten (2009) proposed that how the field of "law and finance" and cultural finance are discussed to explain "different international financial practices". About the measurement of culture, because of its characteristics of subjectivity and complexity, different approaches are proposed to seek to find "the ultimate, most frugal, and yet most meaningful basic set of axes, with which to explain the broad range of attitudes, beliefs, life styles and the diversity of practices among large populations and/or organizations across societies" (Vinken, Soeters and Ester, 2004 from Reuter, 2010). The challenges are that values and attitudes may impact the public's involvement in the financial market but the extent is hard to quantify nor observable, but become visible through undisguised behaviors in certain situations.

Another popular system of measurement of culture is Hofstede's model of cultural difference which has been used widely for exploring aspects of culture in measuring work-related values, for example consumer behavior (Milner, Fodness and Speece, 1993), implications for international projects (Anbari, Khilkhanova, Romanova, Umpleby 2003), motivations for using social network sites (Kim, Sohn, and Choi 2010) and many other areas of study. There are two significant goals that the research of Hofstede intends to achieve: (1) to develop a commonly acceptable, well-defined, and empirically based terminology to characterize cultures; and (2) to use systematically collected data about a large number of cultures, rather than just impressions. Hofstede claims that values have intensities and directions, explaining how holding a certain value "means that the issue involved has a certain relevance for us (intensity) and that we identify certain outcomes as 'good' and others. It is maintained that if there are no outside influences, cultures are comparatively stable as the social norms make patterns of behavior that reinforce the societal norms. A country's score on a particular cultural dimension is related to how the society views and solves the fundamental problems that face the society (Hofstede, 1983). Even with some limitations such as an oversimplification of cultural differences, inconsistencies between his categories, lack of empirical evidence from some settings and overall a model of culture as static (instead of dynamic), Hofstede's dimensions of cultural differences have been effectively applied in many areas to financial settings. Hofstede (2011) described briefly the Hofstede model of six dimensions of national cultures: Power Distance, Uncertainty Avoidance, Individualism/Collectivism, Masculinity/Femininity, Long/ Short Term Orientation, and Indulgence/Restraint. And it warned against confusion with value differences at the individual level.

Uncertainty Avoidance Index (UAI): This dimension measures the likely degree of overreaction across countries. It is about the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity. Countries with high uncertainty avoidance try hard to avoid ambiguity and uncertainty. Weak UAI societies are more easygoing with weaker resistance to change. Uncertainty means that the effect of overconfidence (Daniel, Hirshleifer, and Subrahmanyman, 1998), conservatism (Barberis, Shleifer and Vishny, 1998) and representativeness is more pronounced.

Power Distance Index (PDI): This dimension is about the degree to which the less powerful members of a society accept and expect that power is distributed unequally. When the people in a society have a high Power Distance, people take inequality as granted, tolerate a hierarchical order where everyone has a place, and don't exhibit a strong will to justify the

inequality. On the other hand, in society with a low Power Distance score, there is stronger strive for equal distribution of power and call for justification for inequalities of power.

Long Term Orientation (LTO): This dimension is about the adhering to some links with its own past versus dealing with the challenges in the present and in the future. Long-term orientation societies connect to more present and future, contrary to short-term orientation societies where people more relate to traditions, preservation and fulfillment of social norms and duties. According to Hofstede (2011), students consider success to themselves and failure to luck in the short-term oriented countries, while in countries with a high score in long-term orientation, success and failure are considered to result from degree of efforts. Relating to financial market, it is reasonable to attach investor attention to long term orientation because of its persistency characteristic.

Indulgence (IND): This dimension represents comparatively free gratification of basic and natural human drives related to enjoying life and having fun. This index is closely correlated with the traditional / secular-rational value of Inglehart (2006), which highlights the significance of traditional values for example respect for authority and institutions. Relating to financial market, this index can be used as proximate for market integrity. I assume that countries who are more indulgent to have a significant relationship of investor attention on stock market returns as this stands for worse market integrity.

Masculinity (MAS): This dimension is about if the gender differences or the "manful" characteristics such as aggressiveness, assertiveness, heroicalness lead to differences of preferences in society and roles in activities. Countries scoring high in MAS emphasize factors such as being very assertive and competitive and having a willingness to seek competitive outcomes (de Jong and Semenov, 2002). Relating to financial market, masculinity versus femininity is sometimes related to as "tough versus tender" cultures. I expect countries scoring high in MAS are likely to overact and show overconfidence when they invest shares, thus having an immediate reaction upon Brexit news.

Individualism (IND): This dimension is about the extent to which individuals are integrated into groups. It can be seen as a preference for a loosely-knit social framework in which individuals are expected to take care of only themselves and their immediate families. This dimension is related to psychological factors such as over optimism, overconfidence and self-attribution. I expect that societies that score high in IND to have more significant level of reaction on Brexit news.

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In this paper, one of the most direct concerns faced in front of the financial market is uncertainty. Niamh (2016) identified that or those UK firms that do not trade with the EU, an exit from the EU will also generate costs and uncertainties. This is because of the changes which will be required to the legal operating environment for financial services in the UK. Since the financial services sector is considered to be one of heavily regulated sectors of the economics, which involves the interest of numerous companies and public organizations. Worries of losing "passport" that on exit from EU, the financial services industry will no more have the direct and convenient connection with the single markets if the regulations do not update. This remains an enormous concern for the business for cross-border and international companies which are now located in UK. The access and retainment of financial professionals from the EU region in UK is supposed to be harder which would turn out to be an issue for giant corporations such as investment banks, international conglomerates. U.K. based financial services' companies have also been exploring alternatives to Britain after the country voted to leave the EU. The quarterly growth rate of GDP of UK is expected to continue slowing into next year, as uncertainty over the UK's future trade and migration regime delays business investment and as the fall in the pound squeezes real consumer spending by pushing up inflation. And the outlook for productivity growth remains the biggest and most important uncertainty around the projections for the government coffers. Biggest risk was that the Brexit process would drag on for too long and add "incertitude to incertitude" this would not be good for either or for Europe. The longer it goes on the worse it will be because it creates economic uncertainty. For these reasons, I see value in value in further exploring and comparing the degree of uncertainty avoidance between the selected observing countries.

4. Methodologies and Results

4.1 Regression of overall stock returns on investor attention to Brexit

To test the relationship between investor attention and stock market returns, I run the following regression of the form for the four countries combined:

$$Return_{i,j} = \alpha_{i,j} + \beta * BARS_{i,j} + \varepsilon_{i,j} \qquad (3)$$

With return for country i as dependent variable and several predictors on the right-hand side, including BARS (Brexit Attention Revealed by Search represented by google search volume index, a proxy for investor attention), and error term with i standing for country and j standing for date. I estimate the regressions jointly so that the result represents the overall attention-return relationship for the four countries together. A significant negative relationship between the investor attention and stock market return in general for the four countries combined. It is consistent with my prediction. When investors pay more attention to the news of Brexit, the stock market returns decrease in general at a significant level which reflects the public's concern of uncertainty, risks. Overall the effects are in line with the theory of attention effects. See Table 4.1 for the regression results.

4.2 Cross-sectional regressions for individual countries

From the general impact for the four countries combined, I further look into the individual relationships between investor attention and stock market return by conducing individual regressions:

$$Return_{UK,j} = \alpha_{UK,j} + \beta * BARS_{UK,j} + \varepsilon_{UK,j}$$

$$Return_{DE,j} = \alpha_{DE,j} + \beta * BARS_{DE,j} + \varepsilon_{DE,j}$$

$$Return_{FR,j} = \alpha_{FR,j} + \beta * BARS_{FR,j} + \varepsilon_{FR,j}$$

$$Return_{SE,j} = \alpha_{SE,j} + \beta * BARS_{SE,j} + \varepsilon_{SE,j}$$

Table 4.1 Regression Results

Summary Statistics for UK, Germany, Sweden, France and Four Countries Combined

Countries	Overall	UK	France	Sweden	Germany
Coef.	-0.0000256	-0.0000396	-0.0000722	0.0000135	-0.0000106
t	(-2.81)***	(-2.46) **	(-3.72)***	(0.66)	(-0.62)

Insignificant result, *** Significance at 1%, ** Significance at 5%, * Significance at 10%.

Table 4.2 Country's Scores for Hofstede's Dimensions of Culture

	PDI	IDV	MAS	UAI	LTO	IND
UK	35	89	66	35	51	69
Sweden	31	71	5	29	53	78
Germany	35	67	66	65	83	40
France	68	71	43	86	63	48

Based on the regressions results, I find that the tested relationships between investor attention and stock market return are not as significant for Sweden and Germany as they are for UK and France. However, there is a tendency for a negative relationship between investor attention and stock market returns for UK, Germany and France individually, while a positive coefficient from regression for Sweden suggesting that greater investor attention in Sweden might be associated with a higher stock market return instead.

It is not clear what drives the differences between countries, not clearly location or size. Stimulated by the observation that financial markets vary in managing perceived attention, I conjecture that there may be a link between national cultures and financial markets, and explore the possibility that the culture of a country drives the magnitude and significance level of the attention effect on stock market returns. Financial markets vary in their information processing abilities. However, the realization of digesting information into the fluctuation of stock market should depend on how sensitive the investors of a country are towards risk, uncertainty, and other factors. Individuals in each society also vary in terms of their characteristics, financial literacy, coping mechanisms and their interaction with the financial world. In this study, I examine empirically the role of culture in explaining cross-country variations in the relationship between investor attention on Brexit news and stock market return.

The cultural dimension explanation session is structured in three parts based on the results of the attention-return results above. First, for UK and France, greater investor attention on Brexit is accompanied with significant decrease of stock market return. Second cluster is Sweden, that is, greater investor attention on Brexit is related to a tendency of increase in stock market return. Third group is Germany – a negative coefficient indicates that greater investor attention leads to drop of stock market return but the results are not significant. Therefore, I use Hofstede's dimensions of culture to provide explanations on the differences between the "potential next financial centers" and suggest on the financial reaction. Individual culture dimension scores for the four countries are represented in Table 4.2.

4.2.1 UK: Highly individualist investors associated with overconfidence

It is not surprising when it comes to the result for UK, the original and central area of Brexit news – a decrease in stock returns when public attaches more attention to the Brexit news. Media attention is putting Brexit as one of the most spotlighted topic. According to Bloomberg (13 July 2016), the current rally is a reflection of a weaker discount rate (i.e. lower bond yields) being worked into valuations models, and that decline in yields tells you that markets think the UK's departure from the EU will be negative for economic growth, and by implication inflation and wages. With almost three quarters of economists who responded to a Bloomberg survey after the vote saying the economy is likely to slip into recession. Seeing stock markets falling at their fastest since the UK's Brexit referendum result as investors fret that central banks around the world are easing up on their monetary stimulus policies. Investors are reacting to highlight fears about, firstly, a Fed rate hike next week and and what it means for diverging global monetary policy, and, secondly, a new layer of political event risk. On exit, and under an EEA model, the UK will not be able to influence CMU-related negotiations, despite their acute importance for the city. The loss of UK's ability to define and concerns over the direction of central bank policy remain to be heated and result in considerable uncertainty. The stock market is dynamic to reflect the performance of the national economy. Shares suffered major falls in the wake of the unexpected Brexit vote around 23 June – but recovered in the subsequent weeks as the shock abated. In this paper, we can relate the shock towards the news of Brexit as the public's quick receiving of and reacting to the news to learn more and thus pay more attention by means of for example searching on google about key words about news of Brexit.

The blow to investor confidence and the uncertainty the vote sparked explained some extent of the result for UK stock market. Shiller (2000) developed a speculative bubble (an unstable situation with expectations for an increase in the short term only), a negative speculative bubble (an unstable situation with expectations for a downturn in the short term only), and investor confidence (a feeling that nothing can go wrong). At a score of 89 the UK is amongst the highest of the Individualist scores, and British are a highly individualist and private people. The emotional self-awareness embedded in British investors have an impact on the investment behavior in the financial market. Chui, Titman and Wei (2010) find Hofstede's individualism index is positively associated with trading volume and volatility, as well as to the magnitude of momentum profits. Individualism is likely to be associated with overconfidence and attribution bias. People in a culturally individualistic society consider more about individual interests and prioritize their own conceptions

(Markus and Kitayama 1991). Focusing on differences in self-attributes raises inconsistencies in the aspects of cognition, emotion and motivation. For example, with respect to cognition, for people who are more interdependent compared to others with more independent selves, the processes involved in and interacted with social and nonsocial thinking are impacted by a perception of "my" role and "our" role in a social context.

Therefore, there are greater possibilities that investors' financial behavior is seen as situationally bound. When thinking about the education of children get in a more individualistic society, it is common to find that they are taught to think for themselves and to find their unique goal in life and how they make an impact to the society as an individual compared to a team contribution which is commonly cited in a collectivist society. In collectivist cultures, people spend considerate amount of weighting whether their behavior are in conformity with the social norms and if not, there is social pressure that accommodation into different social situations and high self-monitoring is observed in this group of people. Biais, Hilton and Mazurier (2004) found that miscalibrated traders, underestimating the conditional uncertainty about the asset value, are expected to be especially vulnerable. High self-monitors are expected to behave strategically and achieve superior results.

Above theoretical evidence justifies the result for UK's high individualism score's impact on the negative relationship between the investor attention and stock return. Being highly self-considering and less self-monitoring, British investors will be active in the markets as they themselves are confident about their abilities. The indications represented in the financial market can be that high individualistic investors receive and process news more quickly with a confidence that they can react to "outperform" the market while other market participants choose to wait a bit and observe. Therefore, returns will be sensitive to attention to Brexit in British stock market.

4.2.2 France: High avoidance of uncertainty is associated with high sensitivity to Brexit attention

The uncertainty avoidance score measures the extent that people in a country feel anxious and uncomfortable by unknown or insecure occasions. And they have the tendency to avoid or mitigate these unknowns. The dimension of uncertainty avoidance measures the likely degree of overreaction. France has a high preference for avoiding uncertainty which is reflected on its high score on the UAI dimension. High UAI countries have a less relaxed

attitude and believe there should be more rules or reactions rather than leaving the situation happen. Therefore, the French market are against surprises. When news shock comes, the markets move accordingly even with some interference from regulators or organizations leading to significant results for a negative relationship between investor attention and stock market returns in France.

The research on uncertainty has been an important and continuously updating real-market topic area. The use of country-specific proxies for information uncertainty is motivated by Zhang (2006), who suggested that stocks in the United States, for which information uncertainty is higher (e.g., those with more dispersed analyst earnings forecasts), and exhibits stronger momentum. House et al. (2004) stated that people in countries with high levels of uncertainty avoidance show a stronger resistance to change. In this way conservatism can be related to this dimension. Andersona, Fedeniab, Hirscheya and Hilla Skiba (2011) find that survey-based country-specific variables on cross-cultural behaviors can contribute to explain both home bias and divarication among foreign equities. Moreover, according to the research, investment funds from countries characterized by higher uncertainty avoidance behavior demonstrate greater home bias and are less diversified in their foreign holdings. Jong and Semenov (2002) built a connection between the factors contributing to cross-country differences in stock market activity with deeply rooted norms and values in the society which are represented by the position of countries dimensions. Countries with a high score of Uncertainty Avoidance accept less uncertainty and does not regard competition as a good way of interacting. Stock markets are relatively more important in countries where inhabitants accept more uncertainty instead.

France scores 86 on the avoidance of uncertainty dimension, belonging to a very high level in the culture dimension. It can be inferred that due to its "dislike of ambiguity and unknown situations", when faced with Brexit news, French investors react significantly in the stock market to mitigate the anxiety of uncertainty from the Brexit news. Same level of news may arouse different levels of attention between societies with diverse levels of uncertainty avoidance. As suggested in Dlugosch and Wang (2014), different attitudes toward ambiguous situations generate an overdiversification of domestic assets and an underdiversification of foreign assets. Moreover, the Brexit news sends shockwaves throughout France's political mainstream parties which triggers risks more than pure financially – a probable boost that Brexit will give the resurgent far-right National Front party less than a year before presidential elections (Financial Times, 24 June). This political uncertainty spillover adds to the concern to French investors. Further, the risk a meltdown

in London's financial markets resulting from a potential weak liquidity support the European Central Bank and the payment system from the Eurozone would be quite severe. And the risk of such meltdown would be quite dangerous for the French financial system and the entire euro zone. After all, the French structural growth is only 0.8 percent compared to 2.5 percent in the UK meaning that France is worse equipped when faced with an economic and financial uncertainty, and its high level of uncertainty avoidance contributes to explain its significant attention-return relationship.

4.2.3 Sweden: Feminine society accepts how the market evolves

Sweden scores 5 on the dimension of Masculinity which is among the lowest range and therefore a feminine society. A low score on the dimension represents that the dominant values in society are less driven by competition, achievement and success, but are caring for others and quality of life. Standing out from the crowd is not admirable but having a high quality of life is. Swedish famous guiding value called "lagom" means something like not too much, not too little, not too noticeable, everything in moderation. In Feminine countries like Sweden investors make sure that all are included and decision making is achieved through involvement. Faced with Brexit news, lagom motivates investors not to boast or try to lift themselves above others. Contrary to the case in high individualism countries, individual investors and portfolio managers in countries with high masculinity are likely to overreact and show overconfidence when they invest in shares, while behave conservatively in countries with low masculinity, that latter being the case for Sweden.

Lucey and Zhang (2010) found that portfolio managers in countries with low masculinity are less likely to overreact. When they are involved in investing in shares, they don't show overconfidence and they exhibit characteristics of being more conservative. Gleason et al., (2000) concluded that in feminine countries, investors seem to take less risk as they are motivated by the philosophy of ensuring security. Insurance purchase is more common in feminine societies indicating a connection with uncertainty avoidance. Higher female risk aversion in investment behavior was studied. In feminine societies, investor tend to choose assets which involve less risks. Managers in these societies strive for consensus; conflicts are resolved by helping each other ideally, and less competition is emphasized. Andersona, Fedeniab, Hirscheya and Hilla Skiba (2011) indicated that portfolios from countries with lower levels of masculinity display higher levels of home bias and are less diversified abroad.

Judging from all the information the impact of investor attention is less pronounced in societies with low masculinity, such as Sweden. Seeing the result of a positive coefficient, Swedish investors should take Brexit as a positive shock. A potential positive relationship (even not as significant) between investor attention on Brexit and stock market return during the period does not eliminate the fact that Stockholm stock exchange dropped roughly 6% initially, but later plummeted as traders hit the sell button. The decline is motivated by the fact that investors were taken by surprise on June 24. The result for the regression suggests that when Swedish investors place higher attention on the news of Brexit, the stock market return tends to increase over the study period which is the opposite to direction of attention-return for UK, Germany, and France. The negative surprise still exits, but over a period the disturbance seems to be mitigated and eventually represents a positive attention-return relationship.

Another suggested reason for the abnormal positive relationship between investor attention and stock market return of Sweden is from the exchange rate. Britain is Sweden's fourth biggest trading partner and the two countries have often seen eye to eye on such issues as free trade and reforms within the EU. Impacted by the great drop in value of pounds after Brexit news, companies that involve international operations might find Sweden is a more stable and safer market compared to other more risk-taking countries. Therefore, the sign for the relationship for the investor attention and stock market return for Sweden is positive.

4.2.4 Germany: Long term oriented and uncertainty avoiding investors believing truth depends on time

The relationship between investor attention and German stock market return is not significant, but suggesting a smallest decrease in stock return with the increase in attention on Brexit news.

The dimension of long-term orientation measures the people's sentiment towards future important, in particular saving, perseverance and persistence. Countries scoring high in this dimension are based more on synthetic thinking. According to Park and Lemaire (2011), this dimension is based on adherence to Confucian principles such as perseverance and thrift. Those with a longer term orientation take a more pragmatic approach encourage efforts in modern education and believe that truth depends very much on situation, context and time. In the case of German investors, they do not lack the ability to adapt past information to changed conditions and they have a strong propensity to save and be cautious

when confronting with news shocks. Unlike countries which score low in this dimension, Germany is reputed for preciseness and cautious judgment. Therefore, when the news of Brexit is perceived, German investors have the tendency to evaluate the value of such news and base investment decisions more on analysis than on the factors such as the market wave or the general attention. This justifies my regression result that for German investors, there is no significant relationship between the attention towards Brexit news and the stock market return.

Moreover, the coefficient in the return-attention regression result for Germany is the smallest in absolute value among the four countries in this research. This finding suggests that there is a tendency for German investors that when they pay more attention to the news of Brexit, the stock market returns decreases but with a smallest magnitude. Long term orientation is the most distinctive characteristic for Germany in Hofstede's culture dimensions followed by a higher uncertainty avoidance compared to UK and Sweden. Like in the case of France, a relatively high score in the UAI dimension for Germany indicates that faced with shock from Brexit news with the potential uncertainties and risks it involves, German investors react to deal with the anxiety from uncertainties which is reflected in a trend of decreasing stock returns with increased stock returns. But as discussed above, this attention-return relationship is not significant.

4.3 Discussion on the return-attention relationships

From previous research investigating the relationship between political events and stock market return shocks, I see importance of relating current global political events such as Brexit news to the established theory. As Theguardian (3 December 2016) pointed out, Brexit chaos could change the political map of Britain. A vote for Brexit and the commencement of withdrawal negotiations would rapidly lead to change regarding both the status of UK representatives and nationals in Brussels and the EU's policy agenda (Patel and Reh, 2016). Also they pointed out that in the short run, Germany and France would probably push for deeper Eurozone integration as a display of unity, and in the long run, Germany would become more powerful – one motivation that I include Germany and France in my cross-sectional analysis for comparison and future projections. The question of whether Brexit would pose an existential risk to the stock markets in Britain and EU may depend on the processing mechanism of such markets, the investors' level of attention and receive mode and other reactions.

From the results of the cross-sectional regressions for the four courtiers individually, I find that the relationships between investor attention on Brexit and stock market returns are significant for UK and France, while based on the methodologies and data chosen in this paper, such relationships for Sweden and Germany are not pronounced.

One possible explanation for such results is that when Swedish and German investors google online to search for Brexit information and receive such information, together with an increased level of attention, different aspects of information is also incorporated. As a result, the stock returns for individual companies go with wider directions and disagreement levels also increased. The attention effects on stock market returns are therefore neutralized and insignificant. For France, as concluded in Aouadi, Arouri and Teulon (2013) that higher investor attention (approximated with Google search volume) decreases stock liquidity and increases volatility significantly, the significant relationship found in this paper between investor attention on Brexit and stock market returns in France is not equivalent to saying that France is the only significantly affected country among Sweden, Germany and France. The focused idea of this study is about the relationship between attention and return. And a significant level for the attention-return relationship for France suggests that when French investors pay more attention to the Brexit news, the increased attention is reflected on the decrease of stock market returns.

5. Discussion of Potential Issues

I acknowledge there are shortcomings and potential improvements of this paper. First, since the Hofstede's dimensions of culture are yearly variables, it is hard to accommodate these measurements with the stock market returns which are analyzed daily. Therefore, the second part of this paper focuses on the qualitative analysis based on the cultural traits and the attention-return relationship identified. One possible improvement could be that after several years, I collect data for different years and come up with a more quantitative result on the cultural impact part. Second, due to the specific study interest around the the period that both people paid most attention and covers major Brexit events, I choose a period of 6 months. The study period is sufficient for the purpose of finding relationship between investor attention and stock market return for this currently heated topic, yet the study period remains to be lengthened for future research to have better and comprehensive view on the evolvement of people's attention and the change in stock market return. Third potential improvement is about the control variables. Again due to the data frequency, I did not include control variables such as GDP, CPI since they are yearly based. Therefore, the relationship between fluctuation of stock market and the SVI change might actually involve other determinants. However, due to the relatively short study period and especially based on the previous empirical results in this area, I am comfortable assuming the changes of macro-economic factors' impact on the countries are not the most important and in this paper I focus on the google search volume, which is a proxy for investor attention. Another area worth exploring further is including more countries to understand their stake upon Brexit and the stock market reaction, and therefore to incorporate more dimensions in this research area.

6. Conclusion and Future Research

I investigate that upon Brexit news, the relationships between investor attention and stock market returns for UK, Germany, France and Sweden, and find that google search volume as proxy for investor attention can be a significant predictor of stock market returns on average across countries. Analyzing individually on each country, I find a significant negative attention-return relationship for UK and France while the results for Germany and Sweden are not as significant. The attention-return relationship turns out to be very country specific and to be partially impacted by cultural dimensions of high individualism, high avoidance of uncertainty and low masculinity.

My study tests the empirical evidence on the news of Brexit and suggests explanations for future research. The captured attention in this paper is mostly from retail investors rather than institutional ones. Da, Engelberg and Gao (2011) highlighted that google search volumes capture the attention of individual/retail investors since they are less sophisticated and rely more decision making on the surrounding information, thus having more limited attention.

2016 has been a spectacular year with important political events throughout. From Brexit, US election to Italy's rejection of constitutional reforms, the global political pattern change has brought the public much surprise. Accordingly, the raised concerns and uncertainties have a negative impact on financial stocks. It would be worth researching the political events in more countries (including Asia, US etc.) together and then compare whether the same level of attention will have the same impact on returns and whether cultural dimensions have a role.

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