STOCK MARKET REACTION OF SELECTED EUROPEAN UNION COUNTRIES TO THE BREXIT

BY

CHNG JIA NI
SIM JING HUI
SOO YI YIN
TAN QI ZHOU
TOO SHI XUAN

A final year project submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF FINANCE (HONS)

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE
DEPARTMENT OF FINANCE

APRIL 2020

DECLARATION

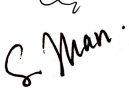
We hereby declare that:

(1) This undergraduate FYP is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the FYP.

(4) The word count of this research report is 13165 words.

Name of Student:	Student ID:	Signature:
1. Chng Jia Ni	16ABB04086	
2. Sim Jing Hui	16ABB05356	
3. Soo Yi Yin	16ABB02947	
4. Tan Qi Zhou	16ABB03134	
5. Too Shi Xuan	16ABB03013	

Date: 20.04.2020

ACKNOWLEDGEMENT

As undergraduate students, Final Year Project has to be completed before we can attain our honor degree. This project would not be made possible without the help of the amazing people whom we would like to sincerely express our deepest gratitude to, and we are greatly indebted to.

First of all, we are thankful to University Tunku Abdul Rahman for supporting us by allowing us to gain access to all the resources in or out of the university. The completion of this paper could not have been accomplished without the support of the university.

Next, we wish to express our deepest gratitude to our project supervisor, Dr. Wong Chin Yoong who has shown his keen interest and provided us with precious knowledge at every stage of the research that enabled us to complete this research successfully.

Last but not least, it is a genuine pleasure to convey our deep sense of thanks to our examiner, Dr Ahmad Nazri Bin Wahidudin who had given us valuable advice and insightful comments.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

PREFACE

Since Brexit (British Exit) is an ongoing issue, it would be a great opportunity to have undertaken an academic research study on it. Brexit is a quite challenging topic as it is a new topic and constantly changing. The date of withdrawal is kept on delaying for the past 3 years and finally United Kingdom (UK) had been successfully withdrawn from the European Union (EU) at the end of January 2020.

A significant number of academics have been writing and blogging about various aspects of Brexit over the past few years and much of it has focused on UK Constitutional Law - the role of referenda within the UK's constitutional arrangements, Parliamentary Sovereignty, Prerogative Power to trigger Article 50, the extent of powers (or lack of them) of the devolved administrations, especially Scotland and Northern Ireland. We would like to look into more on the aspect of the stock market of the EU as well as the UK. Stock market tends to react sensitively to any news that has announced. Therefore, it would be a great chance for us to observe how the stock market react to the Brexit.

ABSTRACT

This paper will be focused on the impact of the Brexit on the stock return of the selected European Union (EU) countries which are Austria, Bulgaria, Finland, France, Ireland, Italy, Malta, Netherlands, Poland, Portugal, Romania, Slovenia as well as Spain. The Brexit referendum that happened on the 23rd of June 2016 is taken into account in this paper and the entire period was partitioned in two periods, before and after the Brexit referendum (Brexit factor). The stock market of the selected EU countries will be observed by the three main factors which are domestic factor, global factor and Brexit factor that we have classified. Time series data will be from January 2014 to November 2019 will be fitted into the regression equation by using various types of econometrics methodologies. Their relationships will be measured and examined by the models and calculations that are in the Autoregressive Conditional Heteroscedasticity (ARCH) family. The models are Generalized ARCH (GARCH) test and also the Exponential GARCH (EGARCH) test. According to the empirical results, the stock returns of selected EU countries have been influenced by the uncertainty that created by the Brexit. As a result, Brexit has hit the UK and also the other EU countries in both direct and indirect manners.

CHAPTER 1: INTRODUCTION

1.1 Background of Study

European Union is a union in economic and political of 28 countries which are Austria, Belgium, Bulgaria, Croatia, Cyprus Republic, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom (UK). EU runs an internal market also as known as the single market within the EU countries. It refers to the free movement of goods, services, capital and people between EU, European Economic Area (EEA) and Switzerland. Switzerland and EEA which include Iceland, Liechtenstein, and Norway is part of the single market although there are not members of the EU. They also allow free movement in goods, services, capital, and people in the single market. (n.d.) The referendum in 2016 recorded a new milestone in the history of the UK. The Briton voted for leaving EU by 53.4 percent on 23 Jun 2016. Leaving the EU means that the UK will be brought an end to the country's membership of the EU. (Goodwin, Milazzo, n.d.)

According to the European Parliament (2016), Article 50 is the only legal mechanism for EU countries to leave by notify the European Council and there is a negotiation period of up to two years. The former Prime Minister of UK, Theresa May invoked Article 50 by writing the letter to the President of European Council, Donald Tusk and started the countdown of two years to Brexit which means that the UK will exit the EU on 29 March 2019. In the early of 2019, the government of the UK sought permission to extend Article 50 from the EU and agree to postpone a later Brexit date twice. Theresa May has forced a delay to the UK's scheduled departure date from the EU due to the member of parliament (MP) in the UK had rejected the Brexit deal for the third time. The schedule of Brexit

falls on 31 October 2019 which is approved by the other 27 EU government. The main reason the MP rejected the deal is that the controversial backstop in Irish (Edgington, 2019).

There are some of the reasons behind the happen of Brexit. The main reason behind the happen of Brexit is the immigration issue. The Week (2019) said that the law of European Union (EU) has clearly stated that British could not prevent a citizen from another member state of EU living in United Kingdom (UK). The freedom of movement allows the citizens of EU own the right to travel, live and work in the other EU countries freely. With the permission of free movement of labor, this has resulted in an increase of a significant amount of immigration into UK. According to Smith (2016), the net immigration of UK in 2015 was 330,000 people of which 184,000 came from the EU. The net immigration shows the difference between the number of emigrants and immigrants of the UK. Therefore, the Brexiteers vote leave in order to gain back the control over their immigration and borders. Friedman (2016) stated that British see immigration as a national issue as they feel that the free movement has affected the internal life of UK.

The second main reason of Brexit is the sovereignty issue. British feel that their sovereignty has been threatened by the EU. British think that the decisions about UK should be taken in UK not by EU. They do not want their law to be made through the shared decision with other EU states members. The laws should be made by the people they can choose and kick out which is a more democratic way. Over the past few decades, a series of EU agreements under international law have shifted a growing amount of power from individual member states to the central EU bureaucracy in Brussels (Lee, 2016). EU has been granted authority such as competition policy, agriculture, and copyright and patent law. This has made the EU rules override the national laws.

Membership fee is also one of the key driven to Brexit. Wheeler, Seddon and Morris (2019) claimed that British has been holding back by the EU. This is

because too many rules have been imposed on business and billions of pounds a year has been charged as membership fees. The Week (2016) published that the Brexiteers argued that leaving the EU can help the UK to have an immediate cost saving as UK would no longer have to pay the membership fee to EU as a contribution to EU budget. Based on Full Fact (2019), UK contributed £13 billion to the EU in 2018 and UK also received £4 billion worth of spending. The net contribution of UK was estimated to be roughly £9 billion. According to Clarke, Goodwin and Whitley (2017), EU costs UK £350 million per week which is enough to build a new National Health Service (NHS) hospital every week. With Brexit, UK will be able to save £350 million and spend the money on their priorities such as NHS, schools and housing.

The boundary problem between Northern Ireland and Republic of Ireland is always the controversial issue of Brexit. In year 1998, Republic of Ireland and the parties from Northern Ireland had reached a peace agreement to end the conflict for almost 30 years (Jen, 2019). As a result of the agreement, the border checkpoint that is created at the border between Republic of Ireland and Northern Ireland had been abolished. It is known as "soft border" which implies that there is free flow of goods and people between both countries with only few restrictions and without border check such as customs until Brexit happened. Theoretically, Northern Ireland will follow United Kingdom to leave European Union. In this case, the border between Republic Ireland and Northern Ireland will change from border between two countries to border between European Union countries and non-European Union countries. The flows of people and goods which are crossing European Union need to be passed through the border checkpoints with customs and standards which indicate as "hard border" and few border checkpoints will be formed. In regard to this matter, European Union thinks that those border inspections may trigger conflict.

United Kingdom opposed the special status given by European Union to Northern Ireland which is staying inside EU single market and custom union. This is because this will lead to the inspection for customs or standards of the goods and

people from UK when they enter Northern Ireland. Thus, the sovereign rights of UK will be harmed. Furthermore, the other option for the trade-offs would be hard border which means that there is checking on the goods that passed by Irish border. However, the political leaders from EU and UK think that conducting the checking at Irish border would be the worst consequence as hard border might cause political dissatisfaction. In this case, UK and EU had reached an agreement before. If both sides could not negotiate a better suggestion about the trading of Northern Ireland in the transition period of Brexit, then backstop will be applied at the end of the transition period. The transition period of post-Brexit will be 21 months (Noel, 2019). The purpose of backstop is to prevent the occurrence of hard border which are customs between Republic Ireland and Northern Ireland (Jason, 2019). However, the backstop is not ought to be a way to solve the problem but a temporary solution until another good solution could be found by UK. Through the backstop, Northern Ireland has to obey the Single Market rules for trading of goods.

Some British might worry that Northern Ireland will be separated from United Kingdom and this might become a major factor hindering the approval of Brexit agreement by the lower house of British Parliament. Theresa May, prime minister of United Kingdom suggested a proposal that besides accepting a large amount of breakup fees, she also will provide a backup plan after Brexit for Republic of Ireland and Northern Ireland which roughly means that retain the free flow of goods and people between Republic Ireland and Ireland for two years after Brexit. After two years, if UK and EU wish to change this relationship, it just can be processed after discussion between two countries. If Theresa May agreed with British-European Custom Union and remain to carry out labour protection law of European Union after Brexit, Jeremy Bernard Corbyn, the leader of labour will lead the labour party to support the amended proposal of Brexit (Hilary, 2019). However, the amended proposal is rejected by EU and. This is because if without guaranteed by UK, custom barrier will be formed between Republic of Ireland and Northern Ireland once Brexit happened and it might hurt Republic of Ireland seriously. Meanwhile, the reason UK does not want to retain the proposal before is because of the sovereign rights of Northern Ireland. In this case, EU could

unlimited intervene the general affairs of Ireland if the proposal is retained. This already become an opposite direction to the original purpose of Brexit.

In July 2019, when Boris Johnson became new UK Prime Minister, he assured to eliminate backstop as he mentioned that this was undemocratic. Boris Johnson and European Union had reached a consensus on an amended withdrawal agreement. Both sides wish to avoid hard border between Northern Ireland and Republic of Ireland. The new withdrawal agreement had replaced the argument of border protection plan that offered by former Prime Minister, Theresa May. UK will leave European Union Custom Union. This means that UK can achieve trade agreement with other countries in future. There will be a legitimate custom border between Northern Ireland and Republic of Ireland. However, in fact, the legally custom border will exist between United Kingdom and Ireland, and the inspection of goods will be at the "entry" of Northern Ireland. There is no tariff for the goods transported from United Kingdom to Northern Ireland. However, the tariff is required if some goods might be transported to Republic of Ireland.

In the aspect of supervision of cargo, Northern Ireland will follow the rules of European Union Single Market but not follow the rules of UK. The government of UK will carry out the regulations at Northern Ireland entry point. However, EU has the right to let the government of EU to participate also. These governments from EU can most probably overthrow the decision that made by UK government.

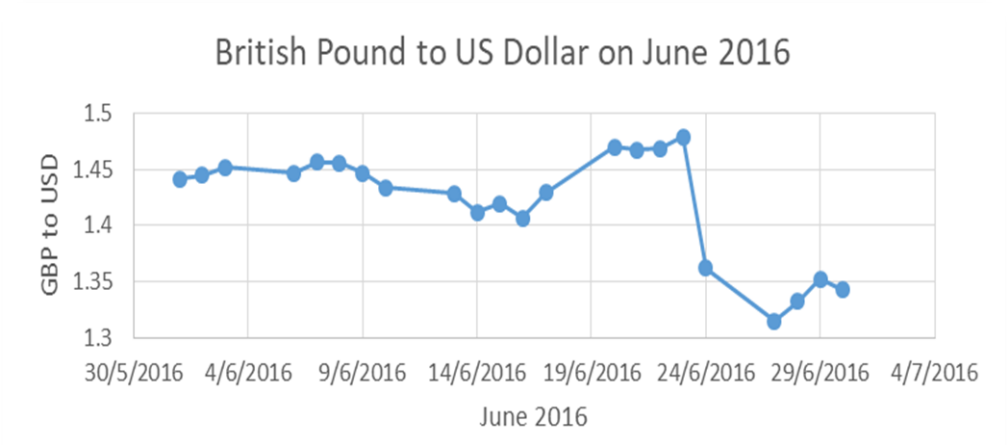
In the end of Jan 2020, UK successfully exit EU with no deal. UK leaving the EU will have triggered a transition period until the end of 2020. There will have discussion about the future trade and security relationship between UK and EU. The current rule related to trade, travel, and business will remain unchanged during the transition period. New rules would be effective on 1st January 2021. (n.d.) UK has the option to extend the transition period by one year or two years. However, the extension letter must be submitted to EU before 1st July 2020. UK Prime Minister Johnson does not have intention to extend the transition period.

The EU will have trade talk with UK from March 2020 onwards. However, the EU does not have sufficient confidence to have a long term deal with UK within 10 months since the negotiation might take several years. (Grose, 2019)

1.2 Problem Statement

Brexit brings the economic downturn during the period of after referendum and the period of negotiation. Figure below shows the British Pound to US Dollar on June 2016. The decision to leave the EU on 23rd June 2016 led a sharp decrease of sterling. The sterling against US dollar fell to £1.315, lowest in this 31 years after the 'Black Wednesday' of 1992. The Brexit brings the significant shocked to the economy of the UK (Plakandaras, Gupta, & Wohar, 2016). The happen of Brexit led the currency investor to foresee the barrier of trade between UK and EU in the future. The decision made by the currency investor led the depreciation of sterling (Breinlich, Leromain, Novy, & Sampson, 2019).

Figure 1.1: Sterling Exchange Rate Index.



Many firms worried about the threat of UK loss market access after Brexit, thus they start to expand or relocate their business in other EU countries. The happen of Brexit will lead to a higher barrier to trade and migration between the EU and the UK. The higher trade barrier means that the UK export the good and services to countries of the EU become more high-priced. The foreign direct investment (FDI) outflow of UK to EU is increasing after the referendum and there are no changes in FDI outflow of UK to non-EU countries. The FDI inflow also reduced around 11%, amounting to £3.5 billion after the referendum. The reduction in FDI inflow will consequently make the UK become a less attractive place to invest and create a job (Breinlich et al., 2019).

Breinlich et al. (2018) mentioned that the sharp depreciation on sterling and the economic slowdown affect the stock price one day after the referendum. The exporters and firms get higher abnormal returns, but the importers get lower returns. Most of the multinational firm earns revenue in foreign currencies since the firm earns higher mark-up. However, the importer gets lower returns since the increase in the cost of foreign input. There is greater exposure to the UK market for firms with more subsidiaries in the UK. The firms experienced a more negative abnormal return. Thus, the impact of trade barriers in the future will affect the stock price in the UK.

1.3 Research Questions

In this study, we are going to figure out how Brexit will affect the stock return. The volatility of stock return movement will be examined. We will select some European Union countries in this research. The research questions are shown as below:-

1. How stock return reacts after economic and financial variables to be observed?
2. To what extent stock return movement can be attributed to Brexit?
3. What's the dissimilarity of predicted stock return and actual stock return of selected European Union countries?

1.4 Research Objectives

The general objective of this study is to investigate the impact of Brexit on the stock return of selected European Union countries. Meanwhile, the specific objectives is as shown below:-

1. To identify the determinants of stock return of selected European Union countries.
2. To quantify the impact of Brexit on the stock return movement by adding Brexit factors.
3. To forecast and compare the predicted stock return and actual stock return of selected European Union countries.

1.5 Significance of Study

Brexit is the political action taken by United Kingdom to promote the withdrawal from European Union so that United Kingdom wouldn't be restricted by European Union law and regulations, European Union Single Market and free trade agreement. The long-term impact of Brexit on selected European Union countries cannot be captured. However, the short-run effects of Brexit can be determined by studying stock return movement of selected European Union countries. The research is to determine how stock market return of selected European Union countries could be affected by Brexit and to identify the positive or negative impact of chosen independent variables on stock return of selected EU countries. The stock market absorbs faster than what the fundamentals inform. This can be shown that the stock price of banks especially European Union banks falls dramatically after the referendum that about United Kingdom would leave European Union (Schiereck, Kiesel & Kolaric, 2016). The lessons that extracted from Brexit are that development of a country must give attention towards the lost group to avoid polarization. According to Sascha, Tiemo and Dennis (2017), the British who stayed at the area that poverty with regard to income level, employment opportunity and education level were most probably voted to leave European Union. Under the period of new normal, the reformation and innovation have to be persisted to get the new motivation.

1.6 Structure of Study

This research consists of total five chapters. Chapter 1 is a chapter for introduction which includes the background of study, problem statement, research questions, research objectives and significance of study. For Chapter 2, this chapter is the literature review that is relevant to Brexit that found in the studies from journals, newspapers and articles from different websites. The reasons voted for Brexit, the

Irish border issue and the flow of money and people after Brexit will be discussed in this chapter. The definitions for each variable will also be included. In Chapter 3, research methodology that used for conducting research will be comprised. The theoretical framework and the empirical framework which is the model used for the research will be developed. Besides, the sources of data and event study will also be presented in this chapter. Chapter 4 analyses the result for research. The data found will be running through E-view and the positive or negative relationship of the variables will be determined. Last but not least, Chapter 5 will include a conclusion for the research and the research questions of this study will be answered. The discussion and recommendations for Brexit based on the results found in study will also be provided in this last chapter.

CHAPTER 2: LITERATURE REVIEW

2.0 Consequences of Brexit

The event of Brexit brings consequences to the United Kingdom (UK) and also the European Union (EU) countries which is in the flow of people, goods and services, money, relocation of company and impact on stock market. These consequences had caused UK and EU to face some problems in some sectors. Hence, the government of UK and EU had enforced the rules to solve these problems.

2.1 Flow of People

Flow of people is important to a country which includes the flow of labour and immigration. As Brexit nears, EU workers are increasingly likely to leave the UK (Jackson, 2019). The number of EU workers working in the UK has fallen by 86,000 to 2,279,000. This is because most of the EU workers are worry about their residence right in the UK will be affected by Brexit.

Other than that, there is highly apparent in the nursing workforce in England, the NHS in England is short of nurse workforce. It is because there is 10 percent of the NHS European nurse workforce had quit in 2017, and the UK current stock of nurses is ageing (Matthews-King, 2018). The latest data from the Nursing and Midwifery Council (NMC) indicated a decrease of worker in 87 percent from 6382 people in 2016 to 805 people from the EU to work in the United Kingdom in

2017. This shows that in the context of the Brexit uncertainty, UK employment development is slowing (Pronczuk, 2019).

Since UK had decided to leave EU, a significant reduction on net migration of EU citizens could be seen which is mainly caused by major population of immigrants sourced from Poland (Irwin, 2015). Hence, the net amount of EU migrants has declined even though there has been no real change in their legal status. This indicates that the importance of the pound and the political climate of the UK are likely to play an important part in migration choices for many EU employees in terms of their future rights of residence (Portes,2017). UK government has stated clearly that they will design an immigration system to ensure that they are able to control the numbers of people who come here from EU. Therefore, the Free Movement Directive will no longer apply in the future and the migration of EU nationals will be subject to UK law.

After the Brexit event, the EU citizens will be able to continue to move freely at UK until the end of transitional period which is December. Nonetheless, they will need to apply after that and will have no choice more than applicants from other continents. If they don't apply by June 2021, in turn they will be illegally in UK (Adam & Booth, 2020). Other than that, the new immigration rules of UK will turn off the tap of the foreign labour with low-skilled. For those skilled workers, UK require them to earn enough points to work in UK which means the skilled workers need have a company job offer, English language skills and meet the salary requirements, these requirements will start and run from 2021 (CNA, 2020).

2.2 Flow of Goods & Services

Barriers to trade in goods and services would increase or decrease depending on the agreement reach between United Kingdom (UK) and European Union (EU)

since the UK relied heavily on trade with EU (Chen, 2018). The UK's membership in EU means that UK can enjoy free trade agreement in the EU single market. The single market refers to the European Union (EU) country can trade goods and services freely within the EU territory in order to helps stimulate competition, reduce cost of trade barriers and increase the efficiency in trade between EU. Leaving EU means that UK cannot enjoy the free trade between EU. The economic integration will be reduced between UK and EU since EU is the largest trading partner in UK, followed by United States. UK accounted for 46 percent of EU export and 53 percent of EU imports of goods and services in year 2018 (2019). There are two options that UK will reach the agreement in term of trade with EU.

First, the UK enters Free Trade Agreement (FTA) with EU including an agreement on service trade. UK will suffer higher trade cost with EU since UK is outside of EU's custom union after Brexit. Second, the UK trade with EU under World Trade Organisation (WTO). Goods and services will be traded subject to nation tariffs and behind the border non tariffs would be increase. The multilateral trade liberalization under WTO will help to reduce the instability in export revenue. The instability export revenue exerts a negative impact on economic growth and economic growth will become volatile (Gnangnon, 2018). However, export revenue in non-tariffs barrier is difficult to lower under multilateral trade liberalization. Thus, there will have largest increase in trade barriers between UK and EU under WTO agreement (Sampson, 2017). The UK economy has been negative after the Brexit vote. There is significance fall in sterling pushed up the price level of goods and services, and the business investment reduced (Bevington, & Portes, 2019).

On 31st January 2020, the UK is finally leaving the EU membership. The border procedure and tariff's issues could lead to shortages of foods and other goods. This also causes the UK potential of serious deficiencies supplies of drugs (Burki, 2019). Nevertheless, the health minister claim that, there should no worry of the supplies of medical products as but the experts state that there is still uncertainty

for that. Furthermore, UK had been given 28% of their overall foods, and other 11% are via trading from the EU countries in 2018 (Lang, 2019). The scarcities of foods and medical products will be a significant consequence for UK after the Brexit take place.

2.3 Flow of Money

Flow of money is important in participant's daily life since every trade or business is in term of money. Firm pay wages to employee in the return for their work and contribution to the corporation; individual spend their money to purchase for goods and services provided by the firm; the government makes policy to reflect economic condition; domestic and foreign investor makes investment in other country.

Brexit turns up as bad news and uncertainty as well as reflects bad economy condition in UK. Before the Brexit event occurred, UK able to access the single market as being a member of EU's countries. UK becomes an attractive export platform for multinational companies (MNC) due to the membership with EU that the UK possesses before the Brexit. Consequence, the MNC also able to possess the benefits of free trade with other EU's countries and also attracts large multinational companies which have complex supply chain to operate its subsidiary in UK due to free movement of labour within EU.

After the Brexit, the UK will be going to loss in accessing the single market and the passporting right. Passporting right is allows registered firm to do business in EU countries without further authorization from each country. This is very convenient and also a competitive advantageous for the corporation that based in the UK to operate their business. Brexit affect the future relationship between UK

and EU in financial industry. UK based bank, companies and insurance companies might have to move abroad as a consequence of Brexit since passporting right does not involve third party regime.

On the other hand, with Brexit, branches of EU insurers lose this privilege and become subject to UK supervision. There will be costly clearing on clearing activities in the derivatives market due to reduced liquidity and restructuring activities. A possible increase in the initial margin could cause further additional costs (Hohlmeier, & Fahrholz, 2018). The foreign direct investment inflow in UK will be affected negatively and foreign direct investment outflow will increase since the production in UK become less attractive. The lower foreign direct investment inflow will put pressure on UK's central bank to implement contractionary monetary policy by increase the nominal and real interest rate (Tetlow, & Stojanovic, 2018).

After the vote for Brexit, the UK firms have made decision to invest in the EU countries which have increase the foreign direct investment (FDI) in the EU countries. The increase of UK FDI to EU countries is exclusively focused the servicing industry, but not for the manufacturing sector. This results because the ability to access EU market is desired by the UK firms. Simultaneously, the study shows shrinkage nearby 9% of EU's countries financial activities in the UK (Breinlich, Leromain, Novy & Sampson, in press).

2.4 Relocation of Company

Once the UK leaves the EU, the financial services companies located in the UK will lose their passporting rights and leave the EU single market (Harmon, 2019). If the Brexit happened, the UK based and EU based companies will lose the

benefit of single market in EU countries and UK countries respectively. Therefore, the companies that operated in the states of EU or UK need to move their headquarters to other countries. Hence, location decision is very important to a company.

The location decision influences on cost of operation and ability to serve customer directly. Headquarter location also influences attitudes and is closely linked to location advantages to investing in the seceding jurisdiction. Those companies who have their headquarters located abroad, for example, are likely to be more willing to relocate business activity to other countries if their businesses are exposed to downside risks from a vote to secede (Bruch, Wiktorsson, & Bellgran, 2014). Many companies plan to relocate their company to other countries due to Brexit.

James Dyson relocated his company headquarters (HQ) from the United Kingdom to Singapore. This is because Singapore provides tax incentives and benefits for companies that locate their global or regional HQ there (Moskvitch, 2019). Panasonic disclosed that its headquarters would move from UK to the Netherlands in October 2018. The reasons for the movement were uncertainty about corporate tax rules after Brexit (Joe, 2019). Other than that, HSBC also shifts their European branches to French to avoid disruptions that will caused by Brexit. After the referendum, HSBC executives have retained that the bank will be among the last to have to make such moves because it has a fully licensed French banking subsidiary rather than branches that other banks have to convert. According to Mccann, Schreuer and Tsang (2019) the exit of Britain could also be advantageous to the countries of the EU which are succeeding in bringing home some companies currently based in Britain.

After Brexit, there are more than thousands of EU financial companies that plan to open their office at UK. The companies that plan to move span all financial

services sectors which including asset managers, insurers, exchanges, and the firms with FinTech. The reason of this decision is to continue serving UK clients directly from their home base (2020). However, the companies need to apply the temporary permission for the operation in UK after 31 January 2020 when UK leaves EU.

2.5 Impact on Stock Market

The event of Brexit caused stock price changes negatively due to the depreciation of 4.3 percent of sterling against US dollar on 24 June 2016 which was the first trading day after the referendum. The researcher forecasted that UK stands to lose nearly $5 billion in investment over the next five years which are from 2019 to 2023 once the UK exit from EU. It is because UK will exit from both the EU Customs Union and the Single Market. Hence, the UK based firms will loss the benefit from the EU Customs Union and the Single Market. These uncertainties of Brexit had causing economic uncertainty amongst the investors as well as the UK business investment (Škrinjarić, 2019).

Other than that, Bohdalova, & Gregus (2017) claimed that the impact of Brexit affected on EU countries. There is negative significant relationship between the EU stock market and Brexit uncertainty. The EU stock market plunged significantly one day after referendum. For instance, the German stock index (DAX), France stock index (CAC 40), Ireland stock market (ISEQ) and Spanish stock index (IBEX 35) had plunged 7 percent, 8.6 percent, 9.5 percent, and 11 percent respectively.

The pound had fell sharply on currency markets when Michel Barnier, the EU's chief negotiator, and Boris Johnson, the UK prime minister will set their

negotiating positions ahead of next month's trade talks which is March 2020. On the other hand, the comments of Johnson had revived the fears of a no-deal Brexit. Hence, the sterling is down 1.3% against the dollar at $1.3028, and has lost 0.88% against the euro, at €1.1795 (Kollewe, Jolly, Makortoff, & Inman, 2020).

2.6 Literature Review's Gap

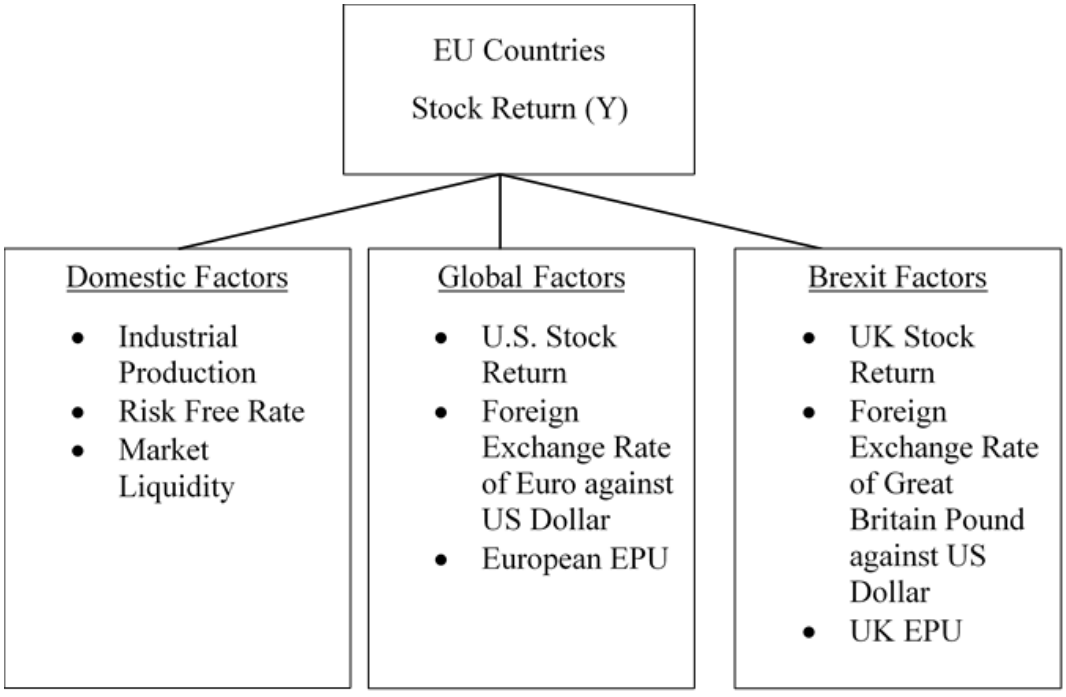
In previous studies, there are number of researches investigate the impact of Brexit referendum on different sectors for instances, the impact to the flow of people, flow of goods and services, flow of money, relocation of company, as well as impact to the stock market. After the review of previous studies, there are still papers not yet contributed the Brexit event has bring significant effect to the EU stock market. Nevertheless, there are studies showed the negative impact of Brexit event to the stock market, but they take different factors into account. Due to there are many factors to influence the stock market return, in this paper will consider the domestic factors, global factors and Brexit factors on examining the stock market reaction in selected EU countries to the Brexit. Since the Brexit event brings most impact to the EU countries and UK stock market. Stock market movement always is the first consideration to the individual, firm and business that are in the financial sector. Therefore, this study is to forecast the stock market movement in a short term period after the vote of Brexit referendum.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Theoretical Framework

In this paper, the independent variables have written off as three categories which are domestic factor, global factor, and Brexit factor. The research will be investigating the relationship between the EU's countries stock market return and the three factors. The independent variables that have taken into account are industrial production, risk free rate, market liquidity, U.S. stock return, foreign exchange rate of Euro against US Dollar, European economic policy uncertainty, UK stock return, foreign exchange rate of Great Britain Pound against US Dollar and UK economic policy uncertainty.

Figure 3.1: The Relation Between EU's Stock Return & Three Factors



In domestic factors there are three independent variables involves which are industrial production (IP), risk free rate (R_f) and market liquidity (ML). In previous research, IP has taken into consideration to examine the effect of industrial production on stock market return (Tsagkanos & Siriopoulos, 2015). Hence, in this study also believed that the stock market conditions will be influenced by the production of goods and services. The stock return is relied on the firm's performance and the firm's revenue is related to how many goods and services they have produced. Therefore, the relationship between IP and EU stock market return is expected to be positively interrelated. Before the Brexit referendum the UK can access free trade agreement with EU in the single market. After the Brexit has comes in means that the UK's goods and services are not allowed to trade freely with the EU's membership. Next, Gardtman and Svensson (2013) found that when the R_f is low, the stock returns will be high and vice versa. The relationship between stock returns and R_f is negative. Based on the results, when the stock returns are higher during low R_f, it appears to be less appealing for companies to fund their operations by using equity during these periods. ML is also one of the significant issues that the investors will be considered for them to make investment decision. Liquidity is the ability and ease to make transaction of securities with a lower cost. Generally, a high return and risk stock will be expected with a low liquidity. According to Shammakhi and Mehrabi (2016), they claimed that the relationship between liquidity and stock return is positively correlated. After the Brexit the UK will loss in accessing the single market and passporting right, this will reduce the liquidity and restructuring activities in UK. Consequently, there will be an increase in cost on clearing activities in derivatives market.

On the other hand, global factors have including the US stock return, foreign exchange rate for euro against dollar (EX_{EU}) and European economic policy uncertainty (EPU_{EU}). US stock market is considered as one of the largest and the main financial market in the world. Therefore, the US stock market is sensitive to the new information as well as changes in the world, and we believe that Brexit event will have an effect on the US stock market as well and consequence the US

stock market will affect to the European stock market. Thus we want to study the relationship between the US stock market and European stock market. The U.S. stock market volatility is estimated to have a positive impact to the EU stock market, in other word means they are positively correlation. In the same time UK stock market return also take into consideration as Brexit takes place in the UK and EU countries. In addition, the Brexit event has bring the shockwave to the EU countries' stock market and foreign exchange market. According to Lim and Sek (2014), the past study in had examined the relationship between stock market return and exchange rate in India market, and had identified that they are both correlated between stock market return and exchange rate. Besides, there is also an investigation of the impact of exchange rate and stock market return for three industrialized countries; they are Japan, United States and United Kingdom. The study had come out with the result shown that the relationship between both variables is significant. Based on previous researches identify that both exchange rate changes and stock market return are significant positive relationship, however there are few studies report that both variables are negative relationship. Hence, this paper is interested to study the impact of foreign exchange rate on the EU countries' stock market. The stock market will be affected by the economic and political uncertainties event across the world (Škrinjarić, 2019). Thus, we use economic policy uncertainty index (EPU) as one of the variable for the economic uncertainty category, to study its relationship with the European stock market. The EPU will help us to capture the uncertainty of Brexit event. The expectation for the relationship between EPU and stock market return should be a negative relationship. This is because when the market is under high economic policy uncertainty, the investor will lose confidence to invest and this will turn down the stock market return and vice versa.

Last but not least, the Brexit factors contained within UK stock return (R_{UK}), foreign exchange rate for pound against dollar (EX_{UK}), and UK economic policy uncertainty (EPU_{UK}). The independent variables in Brexit factors are similar with the global factors. The reason for involving these variables is to take into account the Brexit effects.

3.2 Empirical Framework

3.2.1 Capital Asset Pricing Model (CAPM)

Capital Asset Pricing Model (CAPM) is to calculate the expected gain and the systematic risk taken in an asset such as stock. It is commonly used by the investor for valuing return of stock given the risk to invest in the particular stock and cost of capital. The components of CAPM are risk-free rate, expected market return, Beta of the investment which is also the systematic risk of the investment, and also the expected return of investment. These components are sensitive to the information that will affect the market condition (Kumar, et al., 2008). For example, our case the referendum of Brexit will be the information that affects the market condition. Therefore, risk-free rate as one of our independent variables. As (Palandri, 2014) found that the risk-free rate and stock market both are related. Risk-free rate is the zero rate of return of an investment, which means that no risk; usually it is referred to the government bond rate.

The CAPM is presented as below:

$$Y_t = Rf + \beta_1 Rm_t + \beta_2 Rf_t + \mu_t \quad (1)$$

Where $\beta_{1,2}$ is the market beta of investment, Rf is risk free rate, Rm is the mean of the investment return, μ is the error term.

3.2.2 Expanded CAPM

This study is to examine the stock return of selected EU countries (Y) as dependent variable with independent variables into three categories, which are domestic factor, global factor and Brexit factor from 2014 January until 2019 April.

Based on the Equation 1, a new model for the stock return of selected EU countries is derived:

$$Y_t = \beta_0 + \underbrace{\sum_{i=1}^{3} \beta_i X_{i,t}}_{Domestic\ Factor} + \underbrace{\sum_{j=4}^{6} \beta_j Z_{j,t}}_{Global\ Factor} + \underbrace{\sum_{q=7}^{9} \beta_q K_{q,t}}_{Brexit\ Factor} + \varepsilon_i$$

$$where\ \sum_{i=1}^{3} \beta_i X_{i,t} = \beta_1 Rf_t + \beta_2 IP_t + \beta_3 ML_t\ ;\ \sum_{j=4}^{6} \beta_j Z_{j,t} = \beta_4 R_t^{US} + \beta_5 EPU_t^{EU} + \beta_6 EX_t^{EU}\ ;\ \sum_{q=7}^{9} \beta_q K_{q,t} = \beta_7 R_t^{UK} + \beta_8 EPU_t^{UK} + \beta_8 EX_t^{UK} \quad (2)$$

Where β_i is the coefficients of independent variables; X are risk free rate (Rf), industrial production (IP), and market liquidity (ML); Z are stock return of US (R_{US}), economy policy uncertainty of EU (EPU_{EU}), and exchange rate of Euro against US Dollar (EX_{EU}); K are stock return of UK (R_{UK}), economy policy uncertainty of UK (EPU_{UK}), and exchange rate of Great Britain Pound against US Dollar (EX_{UK}); ϵ is the error term.

Before the happen of Brexit, the stock return of selected EU countries (Y) is impact by the domestic factor and global factor. The independent variables involved in domestic factor are risk free rate (R_f), industrial production (IP), and market liquidity (ML). The independent variables in the global factor contains stock return of US (R_{US}), economy policy uncertainty index of EU (EPU_{EU}), and exchange rate of Euro against US Dollar (EX_{EU}). The Brexit factor will be included when the happen of Brexit. Stock return of UK (R_{UK}), economy policy uncertainty index of

UK (EPU_{UK}), and exchange rate of Great Britain Pound against US Dollar (EX_{UK}).

3.2.3 The ARCH Family

Autoregressive conditional heteroscedasticity (ARCH) model is a statistical model for time series that describes the conditional variance of the disturbance term upon previous lag. GARCH model is generalized ARCH model. It allows the changes in the time dependent volatility. According to Rupert (2011), GARCH model is the time series model used to capture the volatility inconsistent. The GARCH model makes the conditional variance of past value ploughed into the conditional variance of present value. The main purpose of the study is to investigate how the stock return of selected EU countries impact by the event of Brexit. Data from financial industry often expose in volatility clustering.

The equation 3 shows the GARCH model for the impact on stock return of selected EU countries fore and post Brexit:

$$Y_t = \beta_0 + \underbrace{\sum_{i=1}^{3} \beta_i X_{i,t}}_{Domestic\ Factor} + \underbrace{\sum_{j=4}^{6} \beta_j Z_{j,t}}_{Global\ Factor} + \underbrace{\sum_{q=7}^{9} \beta_q K_{q,t}}_{Brexit\ Factor} + \varepsilon_i$$

$$\sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{t-1}^2 + \cdots + \alpha_q \epsilon_{t-q}^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i \ \epsilon_{t-i}^2 \ , where\ \alpha_0 > 0\ and\ \alpha_i \geq 0, i > 0 \qquad (3)$$

One of the limitation of the GARCH model is the process of GARCH fails in explaining the leverage effect, which means that the differences in impacts of positive lagged residual and impact of negative lagged of residual. Therefore, the Exponential GARCH (EGARCH model) accounts this limitation and volatility clustering. The EGARCH model allows the

volatility of stock price response immediately to the price reduction rather than price increases (Matei, 2009).

The EGARCH model used in estimation in order to eliminate the drawback of GARCH model. The equation 4 below shows the study of the response of stock return of selected EU countries pre and post Brexit.

$$Y_t = \beta_0 + \underbrace{\sum_{i=1}^{3} \beta_i X_{i,t}}_{Domestic\ Factor} + \underbrace{\sum_{j=4}^{6} \beta_j Z_{j,t}}_{Global\ Factor} + \underbrace{\sum_{q=7}^{9} \beta_q K_{q,t}}_{Brexit\ Factor} + \varepsilon_i$$

$$\log \sigma_t^2 = \omega + \sum_{k=1}^{q} \beta_k g(Z_{t-k}) + \sum_{k=1}^{p} \alpha_k \log \sigma_{t-k}^2 \ , where\ g(Z_t) = \theta Z_t + \lambda(|Z_t|) - E(|Z_t|) \quad (4)$$

σ_t^2 is the conditional variance, $\omega, \beta, \alpha, \theta, \lambda$ are coefficients.

3.2.4 Forecasting the Stock Return of Selected EU Countries

This study will use the equation to forecast the stock return of selected EU countries from May 2019 to November 2019. The steps of forecast is shown as below:-

Step 1: Compute the estimation of the Y_t by using GARCH and EGARCH model.

Step 2: Analyze the best estimation from the model.

Step 3: Compute predicted stock return for the estimated model.

Step 4: Compare actual and predicted return.

3.3 Sources of Data

These are the sources of data which will be used in this study.

Table 3.1: Sources of Data

Variables	**Data**	**Unit Measurement**	**Sources**
Stock Return (Y)	Changes in stock index	%	Investing & Fred Economy
Domestic Factor:			
Risk Free Rate (R_f)	Long Term Government Bond Yields	%	Fred Economy & Eurostat
Industrial Production (IP)	Purchasing Manufacturing Index	%	Country Economy
Market Liquidity (ML)	Transaction Volume	Euro Currency	Investing & Yahoo Finance
Global Factor:			
Stock Return of US (R_{US})	Changes in stock index	%	Investing
Exchange Rate of Euro Against US Dollar (EX_{EU})	Changes in exchange rate index	%	Investing
Economic Policy Uncertainty (EPU_{EU})	EPU	Index	Economic Policy Uncertainty
Brexit Factor:			
Stock Return of UK (R_{UK})	Changes in stock index	%	Investing
Exchange Rate of Great Britain Pound Against US Dollar (EX_{UK})	Changes in exchange rate index	%	Investing
Economic Policy Uncertainty of UK (EPU_{UK})	EPU	Index	Economic Policy Uncertainty

CHAPTER 4: EVENTS AND DATA SOURCES

This chapter will include further information of two events such as pre-Brexit and post-Brexit. The stock market reaction had been analyzed towards these two events. There is a total of 63 observations in this research. The monthly data adopted for pre-Brexit is from January 2014 to April 2019 while the time period taken for post-Brexit is from May 2019 to December 2019. There are two models constructed for both events, which is Model 1 for pre-Brexit and Model 2 for post-Brexit. For post-Brexit, some Brexit factors had been added into model to identify how Brexit could affect the stock return of selected European Union countries. Generalized Auto Regressive Conditional Heteroscedasticity (GARCH) and Exponential GARCH (EGARCH) models had been used for time series data in this research.

4.1 Basic Model

4.1.1 Pre-Brexit

Figure 4.1 shows the summary of Model 1 result. Based on the findings, for all selected European Union countries except Malta, there is positive relationship between US stock return and the respective countries' stock return. Meanwhile, Daniel and Simon (2013) mentioned that risk free is negatively influencing the stock return as the fund managers will be motivated to enlarge their variance of return. However, based on the results, the risk free shows positive impact on stock return of Poland. For the independent variable of industrial production, the results show that it

has negative impact on stock return of Austria, Bulgaria, Malta, Poland and Spain. This had opposed with the expectation of positive relationship as Burcu (2016) mentioned that the expected future cash flows will be increased if industrial production increases. Hence, the firms may get more profit.

Moreover, we expected that there is positive relationship between exchange rate which is Euro against USD and stock return of respective countries. Based on Figure 4.1, the relationship between exchange rate of EU and the stock return of selected European Union countries had met our expectation except Bulgaria, Portugal and Romania. According to Baker, Bloom and Davis (2012), the confidence of banks might decrease when there is high economic policy uncertainty. As a result, the limited credit availability causes the cost of finance to increase due to the risk faced by economy. The tendency of investment will be postponed by foreign investors if there is high uncertainty and thus the stock return will get lower. Based on the results, the relationship between EU economic policy uncertainty and the respective countries' stock return is negative for all selected European Union countries except Bulgaria and Malta. On the other hand, Hamid and Azita (2016) explained that liquidity has a negative impact on stock return. This is because the risk will be higher when the liquidity is low and thus results in higher return. From the table above, the variable of market liquidity shows negative impact on the selected European Union countries' stock return except Bulgaria, Poland, Romania, Slovenia and Spain.

We had conducted the test at a significance level of 10%, 5% and 1%. If the p-value is smaller than 0.1, there will be one asterisk. There will be two asterisks if the p-value is lower than 0.05 and three asterisks if p-value is smaller than 0.01. The variable of US stock return is highly significant for all selected European Union countries except Bulgaria and Malta. Meanwhile, for all the selected European Union countries except Austria,

France, Italy, Malta and Portugal, the risk free rate is insignificant. For the independent variable of industrial production, it is significant for some European Union countries such as Austria, Ireland, Poland and Portugal. In addition, the exchange rate which is Euro against USD is significant for Finland, France and Netherlands. The economic policy uncertainty for Bulgaria, Finland, France, Italy, Malta and Netherlands is insignificant. Furthermore, the market liquidity is insignificant for all selected European Union countries except Bulgaria and Slovenia.

Figure 4.1: Pre-Brexit Model

	C	R_{US}	R_F	IP	EX_{EU}	EPU_{EU}	ML
Austria	2.3621	0.9528***	-3.2828***	-0.1248*	-13.0711	-4.3762**	-0.5275
Bulgaria	1.2415	0.0999	-0.5239	-0.0280	13.7055	0.0430	0.7851***
Finland	1.6919	0.6542***	-1.4871	0.0001	-47.6045***	-1.8570	-1.6821
France	0.1893	0.7743***	-0.6170***	0.0971	-22.7590**	-1.5546	-3.8773
Ireland	0.7221	0.7119***	-0.6405	0.0589*	-24.5976	-3.5842**	-1.1048
Italy	2.8605	0.7022***	-1.3726***	0.0508	-2.8212	-3.8406	-1.3182
Malta	2.0311	-0.1988	-0.9611*	-0.0388	-9.9506	0.4962	-0.5686
Netherlands	0.4003	0.8146***	-0.5274	0.0566	-26.7368**	-0.6159	-3.8171
Poland	-3.0594	0.7128***	1.0889	-0.1662**	-4.2984	-3.4845*	1.6622
Portugal	1.2161	0.7503***	-0.7304***	0.1574**	4.1032	-3.5210*	-0.1367
Romania	0.0208	0.0057***	-0.0059	0.0007	0.2058	-0.0328*	0.0076
Slovenia	-0.3305	0.4005***	-0.0290	0.08286	-8.3214	-2.7679**	1.1504*
Spain	0.4467	0.7351***	-0.1982	-0.0057	-2.5838	-4.2044**	1.3872

Note: R_{US}: US Stock Return of US; R_F: Risk Free ; IP: Industrial Production ; EX_{EU}: Exchange Rate EU (Euro/USD) ; EPU_{EU}: Economic Policy Uncertainty EU ; ML: Market Liquidity. ***(**)*: 1%(5%)10% significant level

4.1.2 Post-Brexit

Figure 4.2 shows the summary of Model 2 result for post-Brexit. Based on the table above, for all selected European Union countries except Malta, there is positive relationship between US return and the respective countries' stock return which meet our expectation of positive relationship. The coefficient of RUS becomes smaller in Model 2 which means that for the 1% increase in RUS, there is smaller % increase or decrease in stock return of selected European Union countries. Meanwhile, theoretically, risk free might have negative impact on stock return. However, based on the results, there is positive relationship between risk free rate and the countries' respective stock return for all selected European Union countries except Austria, Finland, Malta, Portugal and Romania. The coefficient of risk free is larger compared to Model 1 which indicates that there are larger percentage changes of stock return for 1% increase in risk free. For the independent variable of industrial production, the results show that it has negative impact on stock return of Austria, Bulgaria, Malta and Poland which in oppose with the expectation of positive relationship. The average coefficient of IP in Model 1 and Model 2 are almost same.

Moreover, the relationship between exchange rate which is Euro against US dollar and the selected European Union countries' stock return shows negative except Bulgaria, Malta, Poland and Romania. The coefficient of EXEU becomes smaller compared to Model 1 which indicates that smaller percentage changes of stock return for 1% increase in EXEU. Besides, the relationship between economic policy uncertainty and the respective countries' stock return is negative for all selected European Union countries except Bulgaria and Malta. In addition, based on the findings, market liquidity might have negative impact on stock return. However, based on the results, there is positive relationship between market liquidity and stock return of all selected European Union countries except Finland,

France, Malta and Netherlands. The average coefficient of ML is larger which means that for 1% increase in ML, the larger percentage changes for stock return.

The stock return of United Kingdom has positive impact on the stock return of selected European Union countries except Malta. This indicates that if stock return of UK falling, the stock return of EU countries will also drop. In addition, from the result above, the exchange rate which is GBP against USD shows positive relationship with all selected European Union countries' stock return which in oppose with our expectation of negative impact except Bulgaria and Malta. The last independent variable which is economic policy uncertainty of United Kingdom has negative impact on selected European Union countries' stock return except Austria, Poland, Portugal, Romania and Slovenia.

The variable of US stock return is significant for all selected European Union countries except Bulgaria, Ireland, Italy, Malta, Poland and Slovenia. Meanwhile, for all the selected European Union countries except Austria, Bulgaria and Portugal, the risk free rate is insignificant. For the independent variable of industrial production, it is insignificant for all selected European Union countries. In addition, the exchange rate which is Euro against USD is significant for Bulgaria, Finland, France, Ireland, Netherlands and Portugal. The economic policy uncertainty for Austria, Poland, Portugal and Slovenia is significant. Furthermore, the market liquidity is insignificant for all selected European Union countries except Bulgaria, Netherlands and Poland. Meanwhile, the stock return of United Kingdom is only insignificant for Bulgaria, Malta and Romania. For Austria, France, Ireland, Netherlands, Portugal and Spain, the variable of exchange rate which is GBP against USD is significant. Last but not least, the economic policy uncertainty of United Kingdom is insignificant for all selected European Union countries except Netherlands and Poland.

Figure 4.2 Post-Brexit Model

	C	R_{US}	R_F	IP	EX_{EU}	EPU_{EU}	ML	R_{UK}	EX_{UK}	EPU_{UK}
Austria	2.1626	0.6624***	-2.8839**	-0.1126	-29.3697	-5.0528**	0.8841	0.4756***	35.0296**	0.4681
Bulgaria	-0.9216	0.1470	0.1599***	-0.0679	37.8974***	0.9438	0.5702*	0.2399	-11.9283	-1.5025
Finland	0.6807	0.4610***	-0.8621	0.0268	-47.8876***	-0.2331	-1.3057	0.4174***	7.2383	-0.8558
France	-0.5021	0.3426**	0.5256	0.0952	-43.8636***	-2.1452	-0.9228	0.7266***	30.7226**	-0.3675
Ireland	0.0211	0.2375	0.0967	0.0544	-44.0049**	-1.2119	1.3201	0.4877**	36.4997*	-2.2451
Italy	-1.1887	0.2875	0.5120	0.0229	-28.7375	-4.1384	2.8084	0.7983***	29.6186	-0.9937
Malta	2.0555	-0.1266	-0.5335	-0.0107	1.4002	1.5447	-0.5189	-0.0125	-13.9944	-0.5695
Netherlands	0.0183	0.4451***	0.1769	0.0496	-31.1236***	-0.1799	-3.4134*	0.5710***	23.3326**	-1.3520*
Poland	-1.7741	0.1249	0.6198	-0.0846	3.8214	-8.2100***	2.8029**	0.4567***	26.1605	4.8438***
Portugal	1.5503	0.1829**	-0.6994**	0.1129	-37.7679**	-4.8697***	0.6825	0.7317***	71.8360***	0.2024
Romania	0.0137	0.0035*	-0.0030	0.0009	0.1058	-0.0413	0.0109	0.0022	0.0735	0.0237
Slovenia	-0.3727	0.1080	0.3548	0.0743	-6.1288	-4.1350**	0.6985	0.6007***	11.8739	1.5593
Spain	-0.8525	0.4502***	0.2069	0.0587	-27.0096	-2.9347	0.6453	0.4900***	30.3720*	-1.8343

Note: R_{US}: Stock Return of US ; R_F: Risk Free ; IP: Industrial Production ; EX_{EU}: Exchange Rate EU (Euro against USD) ; EPU_{EU}: Economic Policy Uncertainty EU ; ML: Market Liquidity ; R_{UK}: Stock Return of UK ; EX_{UK}: Exchange rate UK (GBP/USD) ; EPU_{UK}: Economic Policy Uncertainty UK. ***(**)*: 1%(5%)10% significant level

4.2 Dynamic Model for Stock Movement

4.2.1 Taking Asymmetry Seriously on Pre-Brexit

Figure 4.3 shows the summary of EGARCH model 1 result. Based on our studies, the stock return of US shows positive impact on stock return of selected European Union countries except Malta. The result of risk-free rate and the Ireland, Italy, Poland and Spain stock return have positive relationship. On the other hand, the study believes the industrial production is positive relationship with the stock returns of selected European Union countries but some of the country shows negative relationship which are Austria, Malta and Poland.

Besides, the exchange rate of euro against us dollar and the selected countries stock return have positive relationship which are Italy, Portugal, Romania and Spain. Furthermore, the economic policy uncertainty is positive relationship with the stock return of Bulgaria, Finland and Ireland. The last variable which is market liquidity is positive relationship with the stock return of Bulgaria, Italy, Poland, Romania and Slovenia.

In this model 1, the variable of US stock return is significant for all selected European Union countries. Besides, there are five countries from the selected European Union countries is insignificant in risk free rate which are Ireland, Italy, Romania, Slovenia and Spain. Moreover, the industrial production shows insignificant in Bulgaria, Finland, France, Ireland, Italy and Romania.

The exchange rate of Euro against USD is insignificant in France, Ireland, Italy, Poland, Romania and Spain. Furthermore, there are six countries insignificant in economic policy uncertainty which is Austria, Finland, France, Ireland, Portugal and Romania. For most of the selected European Union countries except Ireland, Italy, Romania and Spain is significant in market liquidity.

Figure 4.3: Taking Asymmetry Seriously on Pre-Brexit

	C	R_{US}	R_F	IP	EX_{EU}	EPU_{EU}	ML
Austria	2.8753	0.8938***	-3.4176***	-0.1171***	-20.7011***	-0.4770	-2.1711***
Bulgaria	0.9019	0.0992*	-0.3915***	0.0014	-16.0055**	3.3080**	0.4569***
Finland	0.8529	0.6791***	-1.8142***	0.0667	-45.2243***	0.0480	-2.8260**
France	1.1880	0.8576***	-1.6061***	0.0578	-3.3918	-1.2186	-5.0516***
Ireland	-0.5324	0.6542***	0.1788	0.0142	-7.6874	1.4082	-1.4885
Italy	-0.3647	0.6823***	0.0030	0.0651	0.3649	-6.8105***	0.9077
Malta	2.1591	-0.1930***	-0.7475***	-0.04801***	-10.6832***	-0.8086**	-0.8994***
Netherlands	0.4825	0.9230***	-1.1972**	0.1148***	-28.2307***	-1.4252**	-5.3527***
Poland	-2.3421	0.6287***	0.8665***	-0.2438***	-0.0920	-3.2958***	1.8290***
Portugal	3.0467	0.8573***	-1.8488***	0.3899***	18.7604*	-1.5793	-1.6864***
Romania	0.0360	0.0056***	-0.0079	0.0006	0.1498	-0.0212	0.0097
Slovenia	-0.4176	0.3566***	-0.0890	0.0671**	-28.4689***	-5.6189***	3.3721***
Spain	0.1772	0.5928***	0.3969	0.5698***	6.8029	-8.9803***	-0.5357

Note: R_{US}: US Stock Return of US; R_F: Risk Free ; IP: Industrial Production ; EX_{EU}: Exchange Rate EU (Euro/USD) ; EPU_{EU}: Economic Policy Uncertainty EU ; ML: Market Liquidity. ***(**)*: 1%(5%)10% significant level

4.2.2 Taking Asymmetry Seriously on Post-Brexit

Figure 4.4 shows the summary of Model 2 data by using EGARCH model. Based on the result in table 5, all the countries show positive relationship between the stock return of US and the stock return of selected European Union countries. The coefficient of RUS is smaller compared to Model 1 which means 1% increase in RUS the smaller % increase or decrease in stock return of selected European Union countries, holding all the independent variables constant. There are five selected European Union countries show positive relationship with the risk-free rate which are France, Italy, Netherlands, Poland and Spain. The coefficient of risk free is bigger in Model 2. This indicates that there are more % changes of stock return for 1% increase in risk free. Besides, the industrial production is positive relationship with the stock return of Finland, France, Ireland, Netherlands, Portugal, Romania and Slovenia.

Meanwhile, the exchange rate of euro against us dollar is positive relationship with the stock return of Bulgaria, Poland, Romania and Spain. The next variable is economic policy uncertainty, it shows negative relationship with Bulgaria, Finland and Netherlands stock return. Furthermore, the market liquidity is negative relationship with the stock return of six selected European Union countries which are Austria, Finland, France, Ireland, Malta and Netherlands. In Model 2, the coefficient of market liquidity is larger which means that more % increase or decrease in stock return for 1 % increase in market liquidity.

However, all the selected European Union countries is positive relationship with the UK stock return. Moreover, Bulgaria, Malta, Romania and Spain stock return are negative relationship with the exchange rate of pound against us dollar. The stock return of six selected European Union countries which are Austria, Ireland, Poland, Portugal,

Romania and Slovenia is positive relationship with the economic policy uncertainty of UK.

In this EGARCH model 2, the US stock return show significant in all selected European Union countries except Slovenia. Besides, the risk-free rate is significant in Austria, Bulgaria, Malta and Spain from the selected European Union countries. There are four countries significant in industrial production which are Austria, Malta, Slovenia and Spain.

Furthermore, most of the selected European Union countries is significant in the exchange rate of euro against us dollar except Poland, Portugal, Romania and Spain. The economic policy uncertainty is insignificant in Austria, Bulgaria, Finland, France, Romania and Spain. Moreover, there are six selected European Union countries is insignificant in market liquidity which are Austria, France, Poland, Portugal, Romania and Spain. The stock return of UK shows significant in all selected European Union countries except Bulgaria, Malta and Romania. Meanwhile, there are five selected European Union countries is insignificant in exchange rate of pound against us dollar which are Bulgaria, Finland, Poland, Romania and Spain. The economic policy uncertainty of UK is significant in Austria, Ireland, Italy, Netherlands, Poland and Spain.

In conclusion, the result of the EGARCH model is the most accurate model compared with the GARCH model. It is because EGARCH can make a better prediction of the volatility of tomorrow. Hence, the EGARCH model allows stock price reaction flexibility to the price reduction instantly, rather than price increases. On the other hand, most of the result shown in EGARCH model is more significant than GARCH model.

Figure 4.4: Taking Asymmetry Seriously on Post-Brexit

	C	R_{US}	R_F	IP	EX_{EU}	EPU_{EU}	ML	R_{UK}	EX_{UK}	EPU_{UK}
Austria	2.2573	0.5470***	-2.9642***	-0.2122***	-25.6669***	-4.3500	-0.4821	0.4425***	33.7183***	1.5637***
Bulgaria	1.1906	0.2622***	-0.7351***	-0.1852	25.4131*	2.4968	0.4927**	0.0011	-18.0028	-1.0045
Finland	0.6515	0.5949***	-1.1425	0.0164	-51.2218***	0.6562	-2.6952**	0.3007*	5.7531	-0.7603
France	-0.4613	0.3448**	0.5021	0.0879	-42.0561***	-2.4015	-0.4855	0.7364***	30.0049*	-0.1746
Ireland	0.2320	0.2069*	-0.3553	0.0352	-35.3513***	-8.4648***	-1.6901**	0.2936**	31.1395***	2.4827*
Italy	-0.9272	0.1478*	0.2609	-0.0212	-34.6185***	-4.8946***	3.1936***	0.8873***	34.2535***	-1.1536*
Malta	1.8766	-0.2133***	-0.7222***	-0.0377*	-6.4475*	-1.3121***	-0.7317***	0.0790	-16.4447***	-0.3629
Netherlands	0.1969	0.5809***	0.023	0.0507	-32.0608***	1.6071*	-2.1698**	0.4361***	11.0820*	-1.5774**
Poland	-2.9577	0.3754**	0.9502	-0.1574	7.3128	-6.0916**	0.6485	0.2969**	14.3054	3.7656**
Portugal	0.4096	0.2208**	-0.3035	0.0814	-26.6693	-4.7400**	0.4583	0.6559***	58.1161***	0.1144
Romania	0.0349	0.0052**	-0.0077	0.0007	0.1566	-0.0322	0.0107	0.0004	-0.0112	0.0099
Slovenia	0.3830	0.0462	-0.2434	0.1056***	-33.2540***	-6.3179***	1.9909***	0.6343***	34.0999***	0.9921
Spain	-1.4808	0.6103	0.6559	-0.2118	4.5323	-1.1442	0.2290	0.4028	-1.6432	-3.3428

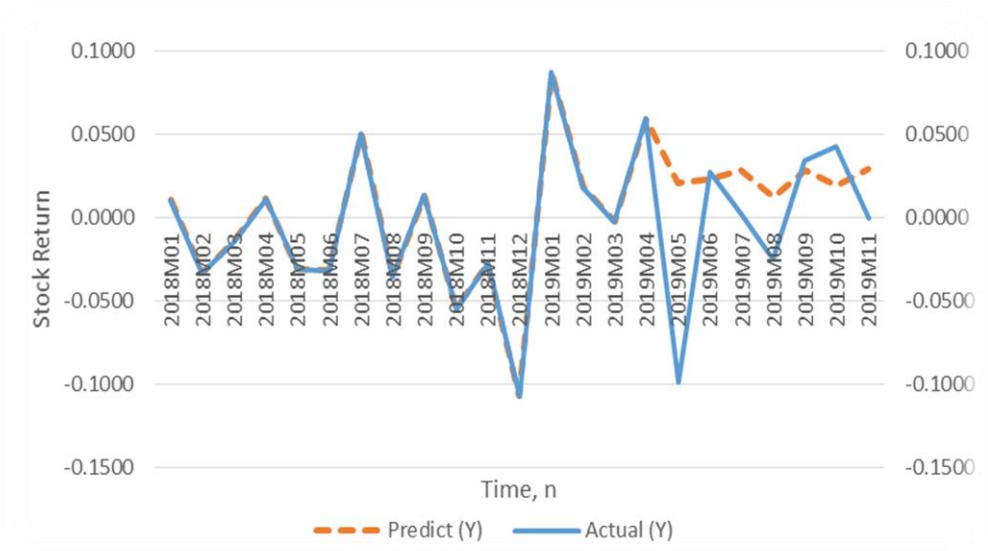
Note: R_{US}: Stock Return of US ; RF: Risk Free ; IP: Industrial Production ; EX_{EU}: Exchange Rate EU (Euro against USD) ; EPU_{EU}: Economic Policy Uncertainty EU ; ML: Market Liquidity ; R_{UK}: Stock Return of UK ; EXUK: Exchange rate UK (GBP/USD) ; EPU_{UK}: Economic Policy Uncertainty UK. ***(**)*: 1%(5%)10% significant level

4.3 Will the Stock Return Forecast Follow the Trend? What is the Forecast Precision?

4.3.1 Actual Stock Market Performance versus Forecast Precision

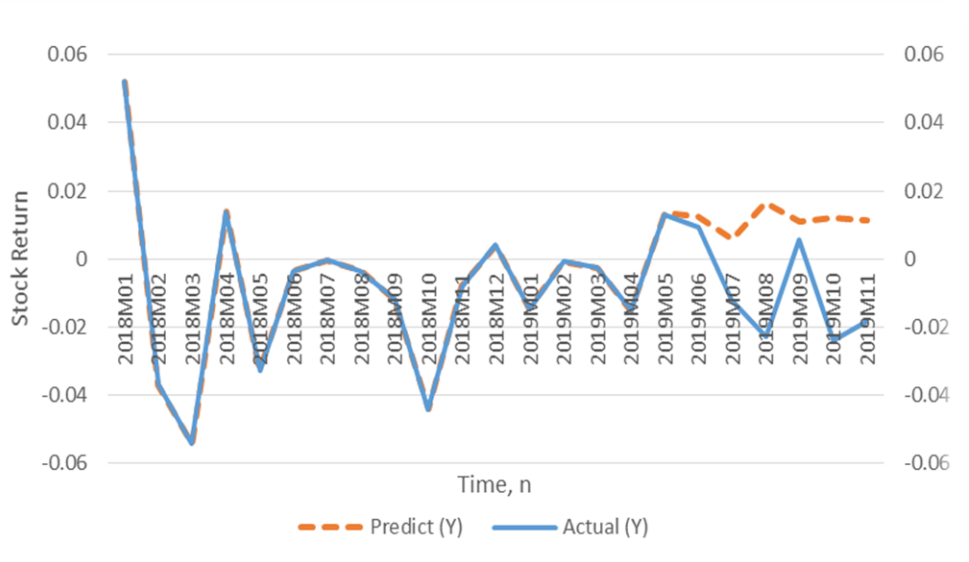
This part of the research is to conduct the stock return forecast for the selected European Union (EU) countries. We collect the data for US and the EU stock return, risk free rate, industrial production index, currency of Euro against US Dollar, Economic Policy Uncertainty of the EU and UK, market liquidity and also the currency of Great Britain Pound against US Dollar from May 2019 to November 2019. We then substitute the actual data that we collected into our forecast model and make the comparison from May 2019 to November 2019.

Figure 4.5: Austria Stock Return Forecast



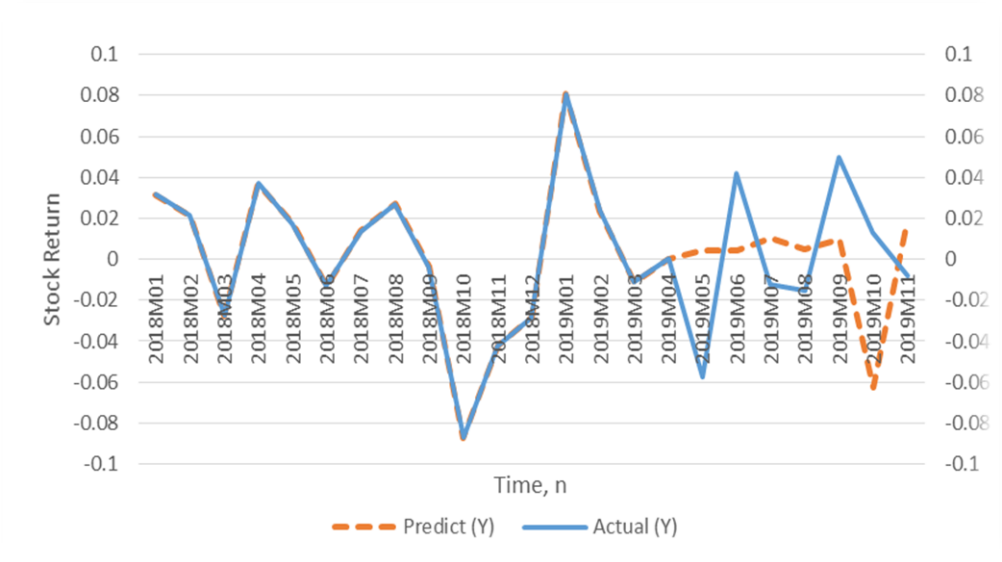
The graph above shows the stock return forecast of Austria. Based on the graph above, we could see that in May 2019 and August 2019 the actual stock return is in negative but the forecast is in positive. The actual stock returns from June 2019 to July 2019 and September 2019 to November 2019 are the same as the predicted results which are in positive.

Figure 4.6: Bulgaria Stock Return Forecast



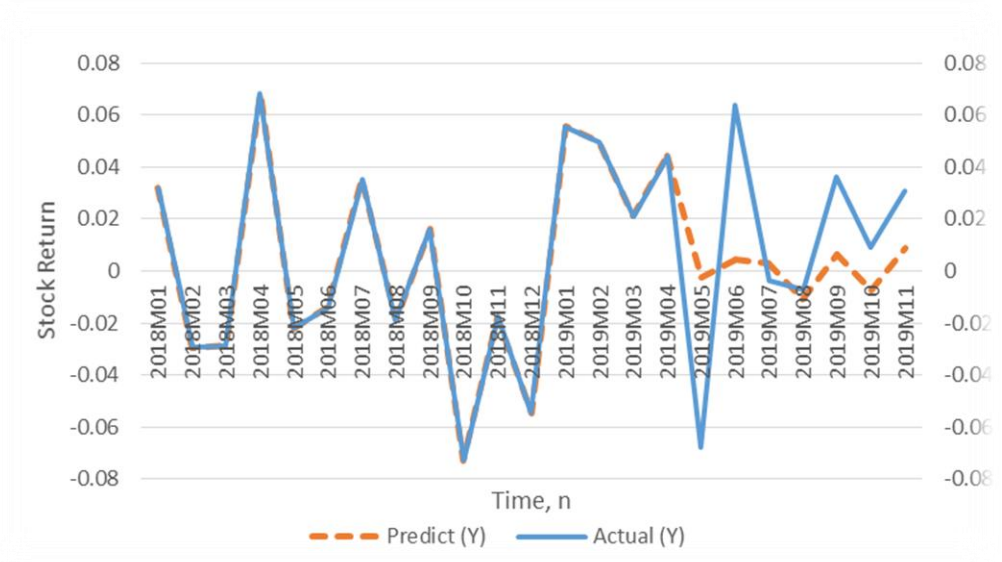
From Figure 4.6, we could know that the forecast results turn out to be different with the actual stock return. In August and October 2019, the stock return is supposed to be going down but the predicted stock return is going up. From May to July 2019, when the movement of the actual stock returns is doing down, the predicted stock returns also the same.

Figure 4.7: Finland Stock Return Forecast



From May to July 2019 and November 2019, the magnitude and the turning point of the actual stock return and the forecast stock return is inaccurate and different. From August to October 2019, when the actual stock return is going up, the forecast stock return is also going up and vice versa.

Figure 4.8: France Stock Return Forecast



Based on the graph above, although the magnitudes are not accurate, the turning points of the forecast are the same as actual data. This means when

the actual stock return is going down, the predicted stock return is also going down. The predicted stock return is not volatile as the actual stock return.

Figure 4.9: Ireland Stock Return Forecast

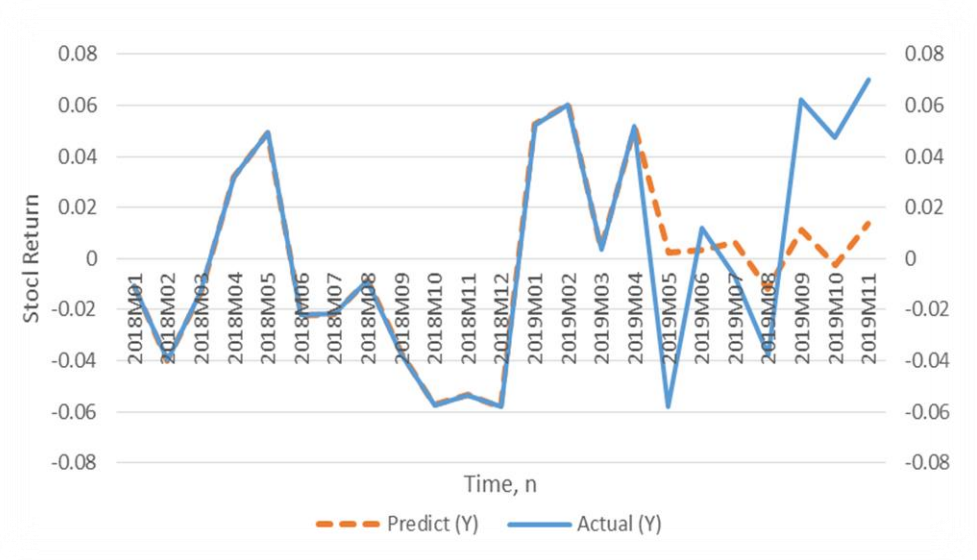


Figure 4.9 above shows that from May to November 2019 the movement of predicted stock returns follows the actual stock return except July 2019 where it is supposed to be going down but the predicted result shows that it is going up. The actual stock return is much more fluctuated as compared to the predicted stock return.

Figure 4.10: Italy Stock Return Forecast

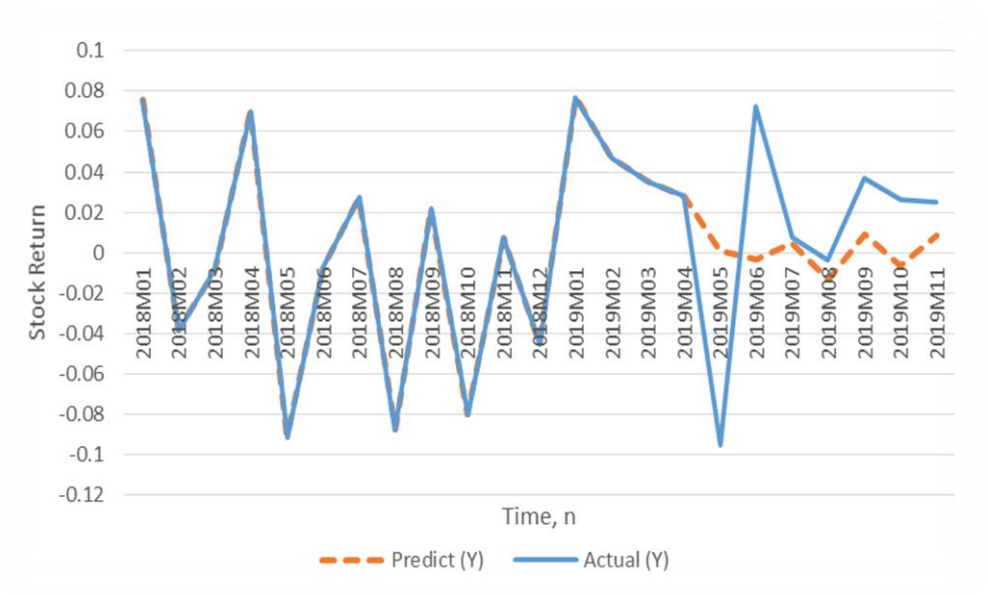
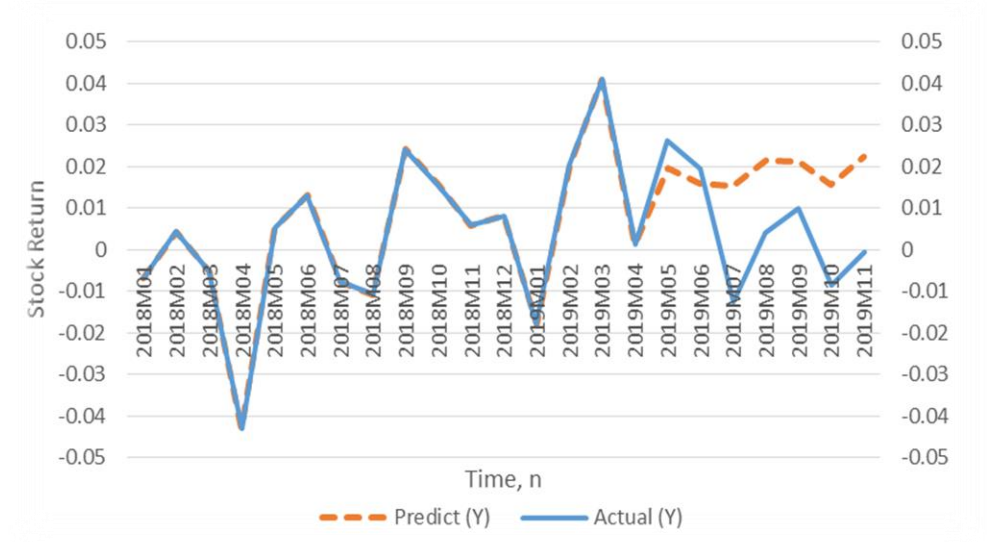


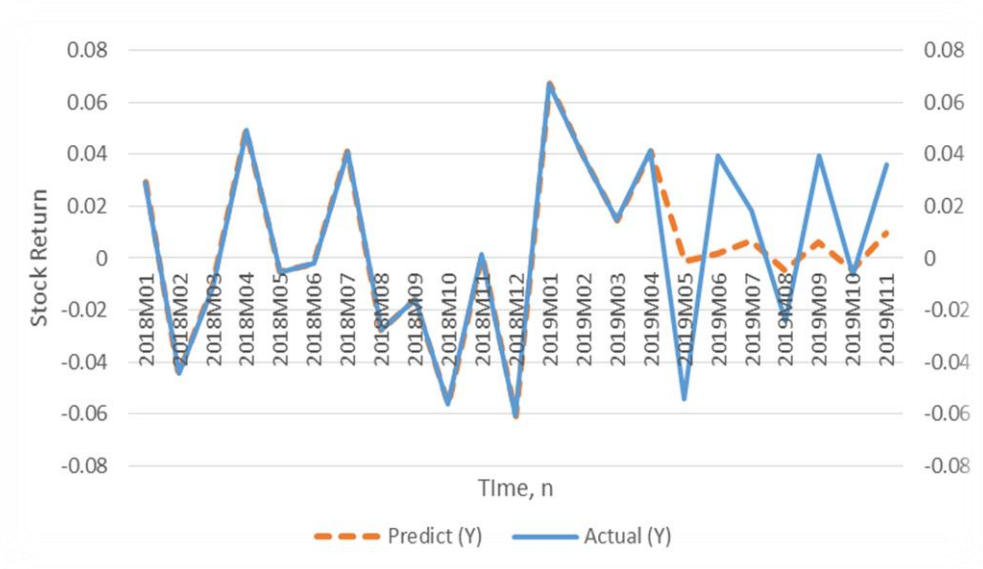
Figure 4.10 shows that even though the magnitude of the actual stock return and predicted stock return for May 2019 and from August to October 2019 are moving in the same direction which means when the actual stock return is going up, the forecast stock return is also going up. Meanwhile, the actual return and the forecast stock return for June, July and also November 2019 are moving in the opposite direction.

Figure 4.11: Malta Stock Return Forecast



Based on Figure 4.11, the magnitudes of Malta Stock Return Forecast from May 2019 to August 2019 and October 2019 are not accurate but the turning points are the same. In September 2019 and November 2019, the predicted stock returns show us the vice versa results compared to the actual stock returns.

Figure 4.12: Netherlands Stock Return Forecast



The graph of the above shows us a much more accurate result compared to other countries as the magnitudes and the turning points of the forecast result for May, June and also from August to November 2019 are the same. Only the forecast of July shows the different magnitude and turning point compared to the actual data.

Figure 4.13: Poland Stock Return Forecast

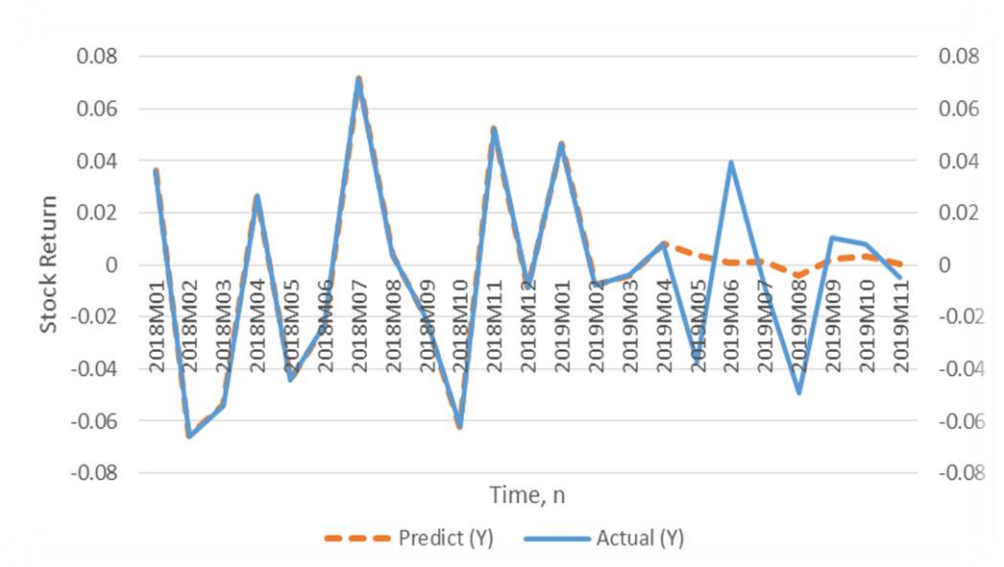
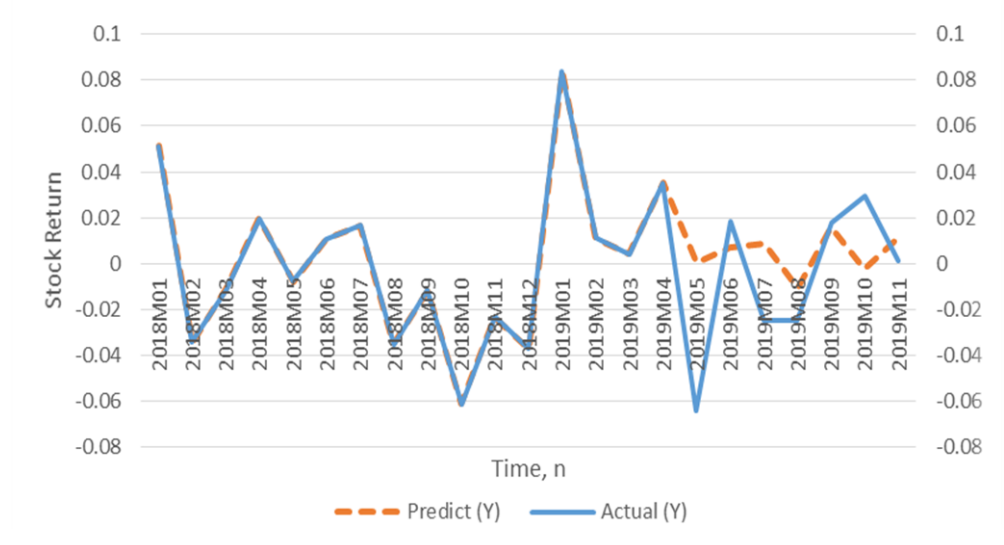


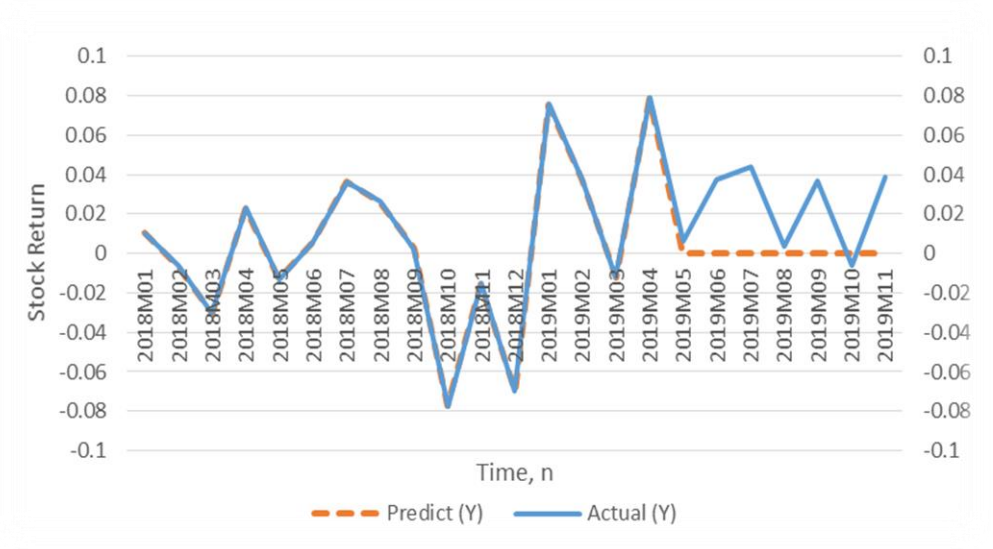
Figure 4.13 shows when the actual stock returns in May, August and November 2019 are decreasing, the predicted stock returns are also decreasing. In September 2019, the predicted stock return follows the actual stock return to go up. As for June, July and October 2019, the predicted results are not the same as the actual stock return in terms of turning point.

Figure 4.14: Portugal Stock Return Forecast



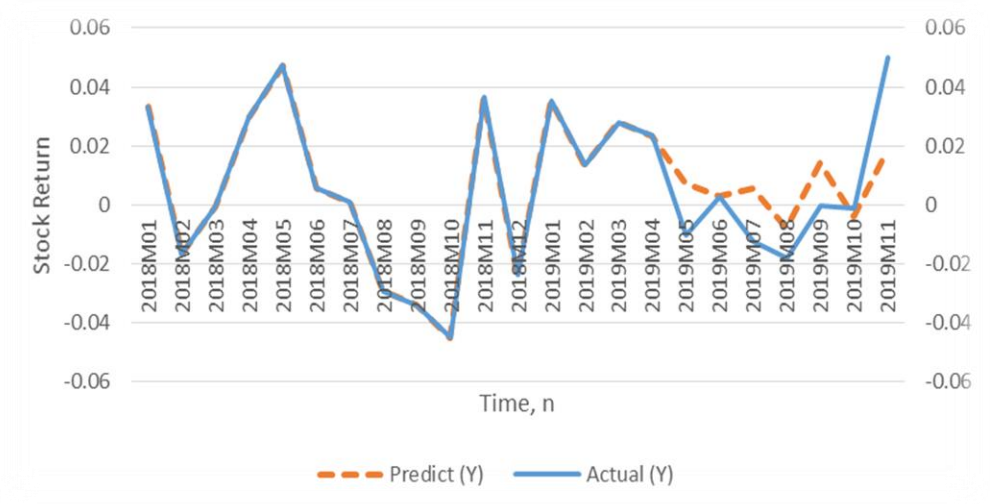
The graph above shows that the turning points in May, June and September 2019 are the same as the actual stock return although the magnitude is inaccurate. In July, August, October and November 2019, the forecast shows a completely different result compared to actual stock return.

Figure 4.15: Romania Stock Return Forecast



The stock return forecast is appeared to be flatter as compared to the actual stock return. We could see that when the actual stock return of May and August 2019 is going down, the predicted stock return is also going down. In September and November 2019, when the actual stock return is going up, the predicted stock return also goes up.

Figure 4.16: Slovenia Stock Return Forecast



From the figure above, the predicted stock return in May, August, September, October and November 2019 moves in the same direction as the actual stock return. The magnitude of forecast stock return in June 2019 is the same as the actual stock return but the turning point is different. Both magnitude and turning point are different in July 2019.

Figure 4.17: Spain Stock Return Forecast

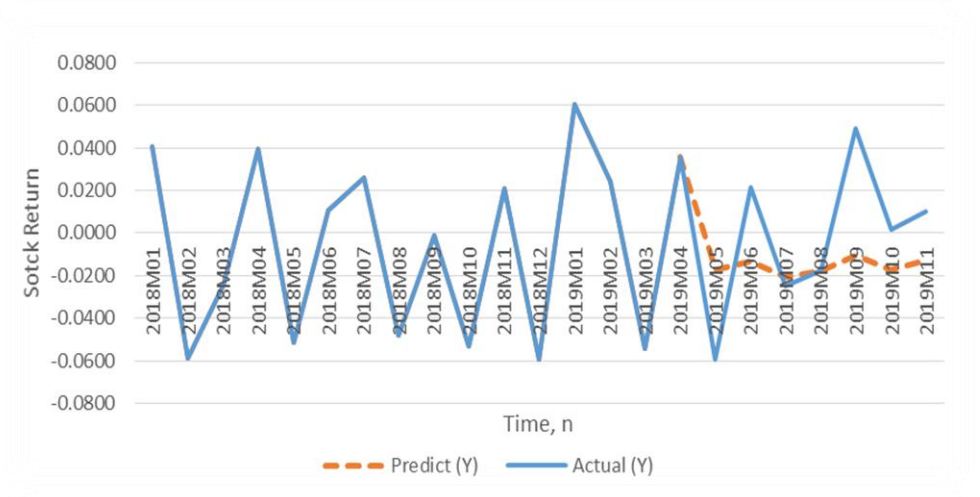


Figure 4.17 shows that even the magnitude of predicted stock return from May to November 2019 is not accurate but the turning point is the same as the actual sock return. For example, in May 2019, when the actual stock return is going down, the forecast of stock return is also going down.

4.3.2 Why are the Forecast Results Differed from the Trend?

Among the forecast stock returns of the 13 countries, even though the magnitudes for France and Spain are inaccurate, the turning points are still the same. Next, the Bulgaria stock return did not perform well as we predicted compared to the actual stock return. Novinite.com (2019) reported that Bulgarian National Bank (BNB) says the declining economic situation in Turkey and the increased uncertainty of the Brexit will still be the risk factors with potential negative effects on external demand for goods and services of Bulgaria. In May, July, August and November, the actual stock return of Finland has reached negative where the forecast shows the positive results. Capital.com Research Team (2019) said that the external factors such as Brexit and the trade war started by the US have caused the downturn of Finland stock market. Besides, the actual stock return of Italy is much more fluctuate than the forecast stock return is due to the political issue between the anti-establishment Five Star Movement and the centre-left Democratic Party. Poland ranked as the sixth largest economy in the EU might make the Polish stock market absorbs the shock of the Brexit event faster in the short run that caused the actual data to be differed from the forecast stock return. Mullaney (2019) stated that with the prospects for a hard Brexit are seemingly fading, Irish Stock Exchange Quotient (ISEQ) are recovering and evaluations of the Brexit hit by the Emerald Isle are steady. As for Romania the actual stock return turns out to be more volatile as compared the forecast results. According to Romania Insider (2019), the Romania stock market indices have grown by double-digit rates from January to August in 2019. The dividends and the performances of listed companies showed to the investors have strongly supported the market development this year. Austria, Malta, Netherlands, Portugal and Slovenia predicted results do same as the actual stock return as these 5 countries reacts to the Brexit uncertainty.

4.3.3 Strength of the Correlation Coefficient

In this part of the study is to find the strength and direction between the forecast and actual stock return. r (Forecast, Actual) represents the correlation coefficient between stock return forecast and actual stock return.

Figure 4.18: Correlation between Predicted & Actual Stock Return

Countries	r (Forecast, Actual)	Interpretation
Austria	0.282542725	Very weak positive correlation
Bulgaria	0.005533517	Very weak positive correlation
Finland	-0.121214826	Very weak negative correlation
France	0.501740807	Moderate positive correlation
Ireland	0.60233691	Moderate positive correlation
Italy	0.054476014	Moderate positive correlation
Malta	0.2551964	Very weak positive correlation
Netherlands	0.707222242	Strong positive correlation
Poland	0.365528538	Weak positive correlation
Portugal	0.335188515	Weak positive correlation
Romania	-0.038856457	Very weak negative correlation
Slovenia	0.700911664	Strong positive correlation
Spain	0.781373694	Strong positive correlation

Figure 4.18 shows that Austria, Bulgaria and Malta have very weak positive correlation between the predicted results and the actual stock

returns but Finland and Romania have very weak negative correlation. The forecast and actual data of Poland and Portugal have weak positive correlation while France, Ireland and Italy have moderate positive correlation. For Netherlands, Slovenia and Spain, the correlation show a strong positive relationship. In conclusion, all the countries show a positive correlation between the forecast and actual data except Finland and Romania. This means prediction and actual stock returns move in the same direction.

CHAPTER 5: CONCLUSION

5.1 Findings

From the estimations, we can found that the EGARCH model is better than GRACH model for pre and post-Brexit. The EGARCH model abolish the effect of leverage. Leverage effect define as the opposite direction of correlation between an asset and volatility change. The estimation for pre-Brexit in EGARCH model shows that most of the variables are concur to the fundamental. The stock return of US and industrial production show the positive relationship to the stock return of selected EU countries. Risk free rate, exchange rate, economy policy uncertainty and market liquidity show negative relationship. After take the Brexit factor into account, the other independent variables show the same relationship with the pre-Brexit estimation. The factor of Brexit, stock return of UK shows the positive relationship to the stock return of selected EU countries. Economy policy uncertainty of UK and the exchange rate of Great Britain Pound against US Dollar shows opposite relationship to the stock return of selected EU countries.

By forecasting the impact of Brexit on the stock return for selected EU countries in the past 5 years, this study has shown how the event of Brexit directly and indirectly affect the stock market of the selected EU countries. This study aimed to identify the impact of Brexit on the volatility of stock return movement for the selected EU countries. Based on the empirical result, it can be concluded that the stock return of selected EU countries impact on the factor of Brexit are volatile. The actual movement of stock return of selected EU countries and predicted movement of stock return of selected EU countries are same despites the predicted return of stock is different. The return of stock different from the predicted is because the predicted return is based on the historical performance to make the estimation. It indicates that the happen of Brexit affected the stock market of

selected EU countries diligently. Other words, the stock market receive and digest the information or news faster than what we predicted. The actual stock return and movement of stock return for some of the country like Bulgaria, Finland, and Italy might be different. It can be affected by other factors. The factors can be take into consideration is the development of the financial market of the country, correlation with UK, and the internal news affect the countries stock.

5.2 Limitation & Recommendation of Study

From the study, we suggest to investigate long term impact of Brexit on trade, productivity, and etc. We believe the happen of Brexit not only affected the stock movement, yet, it also will affect the other aspect. We estimated the event of Brexit impact to stock movement of selected EU countries in the short term. Perhaps, the long term impact of Brexit can be estimated in the future on trade, productivity, consumption of goods and services and etc.

Conjointly, we suggest to diversify the proxy that capture the impact of Brexit. For example, Decision Maker Panel (DMP). DMP is estimates the uncertainty facing by UK business after the happen of Brexit published by England Bank every quarterly. Brexit is an event certainly has great impact on the stock market, but the political policy uncertainty directly linked to the Brexit. It can be another source to distinguish different channel to the Brexit that can be affected rewarding.

5.3 Conclusion

The happen of Brexit do the impact on the stock return of selected EU countries. Brexit hit the UK and other EU countries indirect and direct way. It affects the business and economy development of UK as well as EU countries. Although the Brexit is come to the end, but there is still a long journey to discuss the current relationship between EU and UK.

This paper contributes to the literature regarding the empirical result. The movement of stock return found from the estimation of GARCH and EGARCH on the stock return of selected EU countries. From the movement of stock return, we able to understand and analyse how the stock market of EU countries react to the happen of Brexit. The predicted stock return movement show positively with the expected return. As investor perspective, we can predict the future stock movement from time to time by using this estimation.

REFERENCES

A thousand EU financial firms plan to open UK offices after Brexit. (2020, January 20). CNA. Retrieved from https://www.channelnewsasia.com/news/business/a-thousand-eu-financial-firms-plan-to-open-uk-offices-after-brexit-12287446

Adam, K,. & Booth, W. (2020, January 26). One of the biggest impacts of Brexit? An end to freedom of movement. Retrieved from https://www.washingtonpost.com/world/europe/one-of-the-biggest-impacts-of-brexit-an-end-to-freedom-of-movement/2020/01/26/4ac165ea-3d25-11ea-afe2-090eb37b60b1_story.html

Baker, S. R., Bloom, N. and Davis, S. J. (2016) 'Measuring Economic Policy Uncertainty', Oxford Academic, 131(4), pp1593-1636. doi: https://doi .org/10.1093/qje/qjw024

Bevington, M., & Portes, J. (2019). Brexit: Impacts and Prospects. Retrieved from https://voxeu.org/article/brexit-impacts-and-prospects

Brinliich, H., Leeromain, E., Novy, D., & Sampson, T. (2019). Exchange Rates and Consumer Prices: Evidence from Brexit. Retrieved from http://personal.lse.ac.uk/sampsont/XRatePrices.pdf

Brinliich, H., Leeromain, E., Novy, D., & Sampson, T. (2019). Voting with their money: Brexit and outward investment by UK firms. *Vox.* Retrieved from https://voxeu.org/article/brexit-and-outward-investment-uk-firms

Brinliich, H., Leeromain, E., Novy, D., Sampson, T., & Usman, A. (2018). The economic effects of Brexi: Evidence from the stock market. *Vox.* Retrieved from https://voxeu.org/article/economic-effects brexit-evidence-stock-market

Burcu, D. (2016). Stock Return Indices and Macroeconomic Factors: Evidence from Borsa Istanbul. *Journal of Accounting, Finance and Auditing Studies.* pp 307-322.

Burki, T. (2019). Brexit and Medicine Shortages in the UK. *The Lancet*, 394,1218.

Capital.com Research Team. (2019,). Helsinki stock exchange: why Finland is the new investment safe haven. *Capital.com.* Retrieved from https://capital.com/helsinki-stock-exchange

Chen, J. (2018). The Uneven Path Ahead: The Effect of Brexit on Different Sector in the UK Economy. *International Monetary Fund.* Retrieved from https://blogs.imf.org/2018/12/04/the-uneven-path-ahead-the-effect-of-brexit-on-different-sectors-in-the-uk-economy/

Edgingtton, T. (2019, March 29). Brexit: What deal did MPs reject? *BBC News.* Retrieved from https://www.bbc.com/news/uk-politics-47745831

European Parliament. (2016). Article 50 TEU: Withdrawal of a Member State form the EU.

Fortuna, G. (2019). Italy's government crisis comes to the boil. *EURACTIV*. Retrieved from https://www.euractiv.com/section/politics/news/italys government-crisis-comes-to-the-boil/

Fox, L. (2018). Brexit is a golden opportunity for us to regain our power over international trade. *The Independent*. Retrieved from https://www.independent.co.uk/voices/brexit-uk-international-trade-power-regain-liam-fox-eu-deals-a8277576.html

Friedman, G. (2016). 3 Reasons Brits Voted For Brexit. *Forbes*. Retrieved from https://www.forbes.com/sites/johnmauldin/2016/07/05/3-reasons-brits-voted-for-brexit/#47a6fec11f9d

Full Fact. (2019). The UK's EU membership fee. *Full Fact*. Retrieved from https://fullfact.org/europe/our-eu-membership-fee-55-million/

Gnangnon, S. K. (2018). Impact of Multilateral Trade Liberalization and Aid for Trade for Productive Capacity Building on Export Revenue Instability. *Economic Analysis and Policy.*

Goodwin, M. (2017, May 15). Why immigration was key to Brexit vote. *The Irish Times*. Retrieved from https://www.irishtimes.com/culture/books/why-immigration-was-key-to-brexit-vote-1.3083608

Goodwin, M., & Milazzo, C. (2017). Taking Back Control? Investigating the Role of Immigration in the 2016 Vote for Brexit. *The British Journal of Politics and International Relations.*

GOV. UK. (n.d.). Countries in the EU and EEA. Retrieved from https://www.gov.uk/eu-eea

GOV. UK. (n.d.). The UK has left the EU. Retrieved from https://www.gov.uk/transition

Gardtma, D., & Svensson, S. (2013). The Risk-Free Rate's Impact on Stock Returns with Representative Fund Managers. Retrieved from https://pdfs.semanticscholar.org/a383/84c914757d0c84736d7a320f7a05ca26910.pdf

Grose, T. K. (2019, December 17). Boris Joshnson Determined to Steer a Hard Brexit. *U.S. News & World Report.*

Hamid, R. S. & Azita, M. (2016). Study The Effect of Liquidity of Stock on Stock Returns in the Companies Listed in Tehran Stock Exchange. *International Journal of Economics, Commerce and Management.* Vol. IV, Issue 12, pp 424.

Hilary, C. (2019, April 3). Tories outraged, Jeremy Corbyn happ: What's next for Theresa May's Brexit mess? *South China Moring Post.* Retrieved from https://www.scmp.com/news/world/europe/article/3004429/tories- outraged-jeremy-corbyn-happy-whats-next-theresa-mays

Holmeier, M., & Fahrholz, C. (2018). The Impact of Brexit on Financial Market – Taking Stock. *International Journal of Financial Studies.*

Jason, D. (2019, July 15). British Leadership Rivals Take Brexit Position That Sets Up Clash With EU. *The Wall Street Journal*. Retrieved from https://www.wsj.com/articles/british-leadership-rivals-take-brexit-position-that-sets-up-clash-with-eu-11563231241

Jen, K. (2019). Brexit's Irish border problem, explained. *Vox.* Retrieved from https://www.vox.com/world/2019/2/18/18204269/brexit-irish-border-back stop-explained

Kollewe, J., Jolly, J., Makortoff, K., & Inman, P. (2020, February 3). Pound falls sharply as Boris Johnson prompts hard Brexit fears – as it happened. Retrieved from https://www.theguardian.com/business/live/2020/feb/03/coronavirus-chinese-stock-markets-sterling-brexit-pound-ftse-manufacturing-pmi-business-live

Lang, T. (2019). No-deal Food Planning in UK Brexit. *The Lancet*, 394, 814-815.

Lee, T. B. (2016). Brexit: the 7 most important arguments for Britain to leave the EU. *Vox*. Retrieved from https://www.vox.com/2016/6/22/11992106/brexit Arguments

Lim, S. Y., & Sek, S. K. (2014). Exploring the Inter-relationship between the Volatilities of Exchange Rate and Stock Return. *Procedia Economics and Finance*, 14, 367 -376.

Matei, M. (2009). The Impact of the Flat Tax Reform on Inequality. *Romanian Journal of Economic Forecasting.*

Mccann, A., Schreuer, M., & Tsang, A. (2019, February 7). Where Europe Would Be Hurt Most by a No-Deal Brexit. Retrieved from https://www.nytimes.

com/interactive/2019/02/07/world/europe/brexit-impact-on-european-union.html

Noel, D. (2019, July 24). Dropping the Brexit backstop will not solve Britain's underlying issues. *The Irish Times*. Retrieved from https://www.irishtimes.com/opinion/dropping-the-brexit-backstop-will-not-solve-britain-s-underlying-issues-1.3965118

Novinite.com. (2019, August 25). Lower Consumption and Exports will Slow Growth in Bulgaria in 2020-2021. *Sofia News Agency.* Retrieved from https://www.novinite.com/articles/199649/Lower+Consumption+and+Exorts+will+Slow+Growth+in+Bulgaria+in+2020-2021

Palandri, A. (2014). Risk-free rate Effects on Conditional Variances and Conditional Correlations of Stock Returns. *Journal of Empirical Finance*, (25), 95-111.https://doi.org/10.1016/j.jempfin.2013.12.002

Plakandaras, V., Gupta, R., & Wohar, M. E. (2016). The Depreciation of the Pound Post-Brexit: Could it have been Predicted? *Finance Research Letter.*

Raitio, J., & Raulus, H. (2017). The UK EU referendum and the move towards Brexit. *Maastricht Journal of European and Comparative Law*, 24(1), 25 42.

Romania Insider. (2019). Romania's stock exchange goes up as investors wait for upgrade decision. *Romania-Insider.com.* Retrieved from https://www.romania-insider.com/bucharest-stock-exchange-growth

Ruppert, D. (2011). Statistics and Data Analysis for Financial Engineering. *Springer Texts in Statistics.*

Sampson, T. (2017). Brexit: The Economics of International Disintegration. *Journal of Economic Perspectives.*

Sascha, O.B., Thiemo, F., & Dennis, N. (2017). Who Voted for Brexit? A

Comprehensive District-level Analysis. *Economic Policy*, vol. 33, issue 92, pp. 601-650.

Schiereck, D., Kiesel, F., & Kolaric, S. (2016). 'Brexit: (not) another Lehman moment for banks?'. *Finance Research Letters*, vol. 19, pp. 291–7.

Shammakhi, H. R., & Mehrabi, A. (2016). Study The Effect of Liquidity of Stock on Stock Return in The Companies Listed in Tehran Stock Exchange. *International Journal of Economics, Commerce and Management*, 4(12) http://ijecm.co.uk/wp-content/uploads/2016/12/41227.pdf

Škrinjarić, T. (2019). Stock Market Reactions to Brexit: Case of Selected CEE and SEE Stock Markets. *International Journal of Financial Studies, 7(1)*. https://doi.org/10.3390/ijfs7010007

Smith, G. (2016). 5 Reasons Why the Brits Have Turned in Favor of Brexit. *Fortune.* Retrieved from https://fortune.com/2016/06/14/brexit-britain-eu vote-referendum-supporters/

Tetlow, G., & Stojanovic, A. (2018) Understanding the economic impact of Brexit. *Institute For Government.*

The Week. (2019, December 12). Brexit: pros and cons of leaving the EU. *The Week*. Retrieved from https://www.theweek.co.uk/brexit-0

Tsagkanos, A., & Siriopoulos, C. (2015). Stock Market and Industrial Production in North and South of Euro-zone: Asymmetric Effects via ThresholdCointegration Approach. *The Journal of Economic Asymmetries*, 12(2), 162-172.

UK post-Brexit rules to 'turn off tap' of low-skilled foreign labour. (2020, February 16). *CNA.* Retrieved from https://www.channelnewsasia.com/n ews/world/uk-post-brexit-rules-to--turn-off-tap--of-low-skilled-foreign-lab our-12439362

Wheeler, B., Seddon, P., & Morris, R. (2020, February 17). Brexit: All you need to know about the UK leaving the EU. *BBC News*. Retrieved from https://www.bbc.com/news/uk-politics-32810887

(2019). Statistics on UK-EU trade. Retrieved from https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7851