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**Assessing the impact of Brexit on UK banking industry**

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## **ABSTRACT**

Great changes have taken place in Britain's economy since the country voted to leave the European Union. As the financial center of the world, Britain's financial industry has been hit hard from Brexit. In this thesis, I will study whether Brexit has a certain impact on the UK's macro economy and the UK's banking sector, as well as the changes in the UK's economic performance before and after Brexit. For this reason, I used regression model and correlation model to analyze some data. The results of the analysis show that Brexit has reduced the connection between the UK economy and the EU, the link between the UK stock index and the German stock index, and the link between the UK banking sector and the UK stock market has also declined significantly. In a word, Brexit has brought great negative impact on the UK banking industry and even British economy

## 1. INTRODUCTION

On June 23, 2016, Britain decided to leave the EU after a referendum. This is not the first time for Britain to leave Europe. As early as 1975, Britain held the first referendum on whether to stay in the European Economic Community or not. At that time, 67% of the people chose to stay in the organization that had joined for less than three years. As the combination of Britain and exit, Brexit means Britain leaves the EU. However, after almost 40 years, 52% of people in the country support to leave the EU. Most of those people are older, less educated and in a lower social class. In contrast, those people who support to remain in the EU are relatively younger, educated and in a higher social class. (Mueller, 2019)

Why does the UK have such a big contrast in its attitude towards the European continent and the European Union in the past 40 years? Leaving the EU means the end of free trade and the free flow of people between the UK and the EU, which means both the UK and the EU will pay a huge price for this. For Britons who want to leave the EU, only a sufficient return of benefits will enable them to support Brexit. These people think that after Brexit, Britain can get more benefits in politics and economy, such as more autonomy in politics, more independence in economic policy and saving large EU membership fees. (The Week UK, 2014)

These obvious direct benefits make those who support Brexit ignore the possible bad effects of Brexit, and do not take the negative effects of Brexit into account. The consequences of Brexit are that the economic situation and economic environment of Britain pay a heavy price. After careful consideration, many highly educated people decided to leave the UK for the European Union to avoid the possibility that people could not continue to move freely between the two regions. Some of the big factories also moved to the continent to avoid high tariffs that could not be brought about by free trade. The EU is the largest trading partner of the UK, so the failure of the free circulation of goods will have a serious impact on the UK economy. (Clarence-

Smith, 2017)

As an important part of the British economy, the financial industry cannot be alone in this crisis. After the referendum, the British stock market plummeted, the value of the pound fell, and London's position as the world financial center inevitably declined in the crisis. As part of the financial industry, the banking industry is trying to reduce the damage caused by the crisis. The most common measure is to move some of its business to major cities in Europe. (Clarence-Smith, 2017)

. After the decision to leave Europe in 2016, the UK should have officially left on March 29, 2019. The date has been delayed because there is no consensus in the UK. At present, the date of Brexit agreed by the EU is October 31, 2019. However, there is a high probability that Britain will not officially leave the EU on this day. The drama of Brexit will continue. (Amadeo, 2019)

In view of the fact that the UK has not officially separated from the EU, this thesis will discuss the reasons why the British wanted to leave the EU, the economic situation of the UK after the decision of Brexit, and the impact of Brexit on the UK financial industry, especially the banking industry at present situation.

## **2. LITERATURE REVIEW**

Britain decided to leave the EU after a referendum on June 23, 2016. 52% of British citizens have achieved their idea of leaving the EU by a narrow margin. In their view, leaving the EU may have adverse effects on their daily life and the UK, but the benefits are enough for them to bear these disadvantages. Three years have passed. The UK has already exceeded its original time plan for Brexit on March 29, 2019. The British continue to move towards the goal of Brexit, and there is no end to it. (Mueller, 2019)

## 2.1 Reasons for Brexit

There are always people in Britain who hold the Euroscepticism that the European continent has hindered the development of Britain, so the voice of secession from the EU has always existed. In 2013, David Cameron, the then British Prime Minister, promised a referendum on Brexit. Cameron's Conservative Party also has a voice of Brexit, so he hoped to eliminate differences through a referendum. In his opinion, the power to stay in Europe is greater than to leave. He believes that this referendum will have the same result as the referendum to leave the European economy in 1975. But some scholars and politicians of Brexit have put forward their views, which make many people who support Brexit turn to Brexit. (Mueller, 2019)

The most obvious benefit of Brexit is that the UK no longer has to pay high EU dues. In 2016, the UK paid a net expenditure of £ 8.5 billion, which is considerable. Refugees and migrants are also important factors in promoting support for Brexit. If the UK stays in the EU, the policy of the free flow of people will make it difficult for the UK to block immigrants and refugees from the European continent, which adds a great burden to the UK's security work. Under the threat of terrorism, it is a good choice to leave the EU and then restrict the free movement of people. In addition to refugees, people, especially low-income people, are afraid of immigrants competing for jobs with themselves. (The Week UK, 2014)

In addition to the above two reasons, people who support Brexit also think that staying in the EU is not conducive to free trade in Britain. Because the EU has set up a unified tariff, it will be relatively difficult for goods outside the EU to enter this huge market, and people cannot get their satisfactory goods and services. (Niño, n.d.) At the same time, the uniform gargle tariff is not conducive to the country's advantages but makes Britain itself restricted by the European Union everywhere. It is also believed that staying in the EU has hindered Britain's access to new

technologies. (Grant, 2018) Some business leaders and industry practitioners believe that Brexit will make the British industry more competitive, and they can enter more regions to develop business, so they firmly support Brexit. (Clinch, 2016) (Partington, 2018)

These reasons and statements are accepted by more and more people, and the result of the referendum is out of Cameron's expectation. Britain announced the beginning of Brexit.

## **2.2 Impacts of Brexit on Britain**

People who support Brexit all hope that the expectations of Brexit can be fulfilled one by one, but when they don't think of it, the negative impact they ignore makes these expectations less attractive. People can intuitively feel the change of life belt from the fall of the pound. Before Brexit in 2016, a pound was about \$1.50, while in July 2019, a pound was about \$1.25. The fall in the value of the pound means an increase in the price of imported goods, and these extra costs have finally turned up for the lower class of people who support Brexit. Some experts even say that inflation in the UK is likely to double to 4-5%. (Horowitz, 2019) To some extent, the continuous decline of the pound price also represents the declining status of the UK. The United States and developing China are seizing its living space. (Zaroli, 2019)

For those who support Brexit, the inability to move freely may be a good thing, as refugees and low-end labor can be restricted from entering the country. What they didn't expect, however, was that talents in high-end industries chose to leave the UK for the EU considering their future. After the separation of the UK from the European Union, the UK visa makes people no longer free to travel between the UK and the European continent, so people will naturally measure the prospect and make the right choice. In reality, the EU is far more attractive than in the UK. (Clarence-Smith, 2017)

The future of the UK is full of uncertainty, which reduces people's investment in the UK.

As a result, the UK's economy has been greatly weakened and the UK's real estate industry has become sluggish. (Horowitz, 2019) What's more, as a world financial center, London's international status is also declining. The financial industry will consider its future business and decide whether to go to continental Europe. London's position is inevitably weakened. (Sjolin, 2016)

### **2.3 Impact on Banking**

The financial industry is a very important part of the British economy. In 2017, financial services contributed £ 119 billion to the UK economy, accounting for 6.5% of the UK's total economic output. In the financial industry, the banking industry accounts for a considerable proportion. UK financial services exports are dominated by investment banking, of which nearly three quarters and one third sent to the EU are related to investment banking. After the UK decided to leave Europe, the high degree of uncertainty made the whole banking industry worried about the future. Due to possible policy differences between the EU and the UK, the banking industry is trying to find ways to avoid the damage caused by regulatory uncertainty. (Warner, 2019)

There is no good way for banks to avoid losses completely. They can only spend money to move part of their business in the UK to the Europe (Clarke & McNulty, 2019) Many banks have set up new offices elsewhere in the EU to maintain their regional operations, which means they also have to move large amounts of assets there to meet the requirements of EU regulators. There are experts say that these assets account for about 10% of the total assets of the UK banking industry. (Kottasová, 2019)

### **3 METHODOLOGY & DATA**

#### **3.1 DataSet:**

In this thesis, I focus on judging the UK's economy by analyzing changes in economic indicators. There are many indicators that can show the macroeconomic situation, among which the stock market index and GDP are relatively intuitive two indicators. First of all, I will compare the GDP before Brexit with that of the world in the same period to find out whether there is a positive relationship between them. Secondly, I will compare the GDP after Brexit with the world GDP in the same period to determine whether Brexit will have an adverse impact on the UK's economic situation. I will also use the stock market index before and after Brexit to compare with the main stock market index in Germany to determine whether Brexit has strengthened the connection between them.

In order to analyze the relationship between Brexit and UK macro-economy, the data I am looking for include the change of GDP in the UK and the change of GDP in the same period of the world, the FTSE 100 index in the UK and the DAX index in Germany. I will analyze the links between these data to explain the UK's macro-economy. All the data comes from the official website of the world bank, Office of National Statistics and Investing.com.

#### **3.2 Sample:**

Since the Brexit referendum was held on June 23, 2016, and the Brexit has not yet been officially completed, the data in this paper will be collected from the GDP data of the previous five years and the next five years with June 23, 2016 as the symmetry point. Since I only found data on the DAX index after May 2015, the date range of the stock market index I will analyze is from May 7, 2015 to November 5, 2019.

### 3.3 Methodology:

On the one hand, first of all, I will use correlation analysis to analyze whether the trend of the UK GDP before Brexit is consistent with that of the world, and then analyze whether the trend of the UK GDP after Brexit is consistent with that of the world. On the other hand, I will continue to use correlation analysis to determine whether the UK and Germany stock market indexes are related before and after Brexit. In addition, I will take the GDP of the UK as the dependent variable and the stock market index as the independent variable, and use the regression equation to judge whether the GDP of the UK has different influence on the stock market before and after Brexit.

### 3.4 Model and Hypotheses:

Model 1: to test the relationship between the GDP of the UK and the world

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

$r_{xy}$  – the correlation coefficient of the linear relationship between the variables x and y

$x_i$  – the values of the GDP of the UK

$\bar{x}$  – the mean of the GDP of the UK

$y_i$  – the values of the GDP of the world

$\bar{y}$  – the mean of the GDP of the world

Hypothesis:

1. The GDP of the UK before Brexit has no relationship with the GDP of world
2. The GDP of the UK after Brexit has no relationship with the GDP of world

Model 2: to test the relationship between the FTSE 100 index the DAX index

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

$r_{xy}$  – the correlation coefficient of the linear relationship between the variables x and y

$x_i$  – the values of the FTSE 100

$\bar{x}$  – the mean of the FTSE 100

$y_i$  – the values of the DAX

$\bar{y}$  – the mean of the DAX

Hypothesis:

3. The FTSE 100 before Brexit has no relationship with DAX
4. The FTSE 100 after Brexit has no relationship with the DAX

*Model 3:* to test whether the GDP would affect the stock market

$$y = \beta_0 + \beta_1 x_1 + e_i$$

$y = FTSE\ 100\ Index$

$x_1 = GDP\ of\ the\ UK$

$e_i = Error\ term$

Hypotheses:

5. The factors did not have any significant impact on the stock market.

*Model 4:* to test whether the bank stock prices would affect the stock market index.

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

$x_i$  – the values of the bank stock price

$\bar{x}$  – the mean of the bank stock price

$y_i$  – the values of the FTSE 100

$\bar{y}$  – the mean of the FTSE 100

Hypotheses:

6. The four banks' stock price has strong correlation before Brexit than after Brexit

#### **4. ANALYSIS & FINDINGS**

According to the articles I mentioned in the literature review, the current mainstream voice is that Brexit has seriously affected the British economy, which has declined. The value of the pound is much less than before. Trade between the EU and the UK is not as free as it used to be, which is bad news for companies in the UK that need to export goods. Some companies have moved their business from the UK to other Western European countries to avoid possible losses. As a result of the exit of enterprises from the UK, there are fewer jobs and brain drain, which undoubtedly aggravates the plight of the UK economic downturn.

In order to show how the Brexit has affected the UK economy, this thesis uses some data to analyze. These include GDP growth rates in the UK and the EU over the same period, the FTSE 100 index in the UK and the DAX stock index in Germany. GDP data starts in the second quarter of 1995 and ends in the third quarter of 2019. Stock market Index data starts on May 7, 2015 and ends on November 5, 2019. Since I need to compare the FTSE 100 index with the GDP of the UK, I additionally use the quarterly growth rate of the FTSE 100 index. By using these data, I will compare whether the relationship between UK GDP and EU GDP changes before and after Brexit, whether the relationship between FTSE 100 index and DAX index

changes before and after Brexit, and whether the change of UK GDP affects the FTSE 100 index.

In this thesis, I use two models to analyze the data. They are regression and correlation.

I use the correlation model to judge whether there is a connection between UK GDP and EU GDP, as well as between UK FTSE 100 index and Germany DAX index. The equation of correlation is

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

$r_{xy}$  – the correlation coefficient of the linear relationship between the variables x and y

$x_i$  – the values of the GDP of the UK or the values of the FTSE 100

$\bar{x}$  – the mean of the GDP of the UK or the mean of the FTSE 100

$y_i$  – the values of the GDP of the EU or the values of the DAX

$\bar{y}$  – the mean of the GDP of the EU or the mean of the DAX

I also use the correlation model to compare the correlation between the four banks' stock price and FTSE 100 index

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

$x_i$  – the values of the four banks' stock price

$\bar{x}$  – the mean of the four banks' stock price

$y_i$  – the values of the FTSE 100

$\bar{y}$  – the mean of the FTSE 100

I use the regression model to judge whether the UK's GDP has an impact on the FTSE 100 Index, the equation is

$$y = \beta_0 + \beta_1 x_1 + e_i$$

$y = FTSE\ 100\ Index$

$x_1 = GDP\ of\ the\ UK$

#### 4.1 The GDP of the UK before Brexit has a positive relationship with the GDP of EU

	UK	EU
UK	1	
EU	0.777483456	1

Table 1-correlation analysis of the GDP of the UK and the EU before Brexit

Output	EU GDP
Input	UK GDP
R Square	0.604480524
P-value	2.14E-18
Coefficients	0.727110582

Table 2-regression analysis of the GDP of the UK and the EU before Brexit

As we can see in the figure 1, the number 0.777483456 shows there are high correlation between the GDP of the UK and the EU before the Brexit. It is also proved in the figure 2. The p-value is 2.14E-18, which is much lower than 0.05. This number indicates that the null hypothesis should be rejected, the GDP of the UK before Brexit has a significant positive relationship with the GDP of world. The R square is almost 0.6, which also means the result is convincing. Britain is one of the member countries of the European Union. Many of their economic policies are common, so it is reasonable that there is a positive link between their GDP.

#### 4.2 The GDP of the UK after Brexit has no relationship with the GDP of EU

	<i>UK</i>	<i>EU</i>
UK	1	
EU	0.531370292	1

Table 3-correlation analysis of the GDP of the UK and the EU after Brexit

Output	EU GDP
Input	UK GDP
R Square	0.282354388
P-value	0.061659704
Coefficients	0.457447877c

Table 4-regression analysis of the GDP of the UK and the EU after Brexit

Although the correlation's result still bigger than 0.5, it is lower than 0.7, which means after Brexit, the GDP of UK has less correlation with EU's GDP. As we can see in the regression analysis, the p-value is lower than 0.1 but higher than 0.05. It indicates that the null hypothesis, the GDP of the UK after Brexit has no relationship with the GDP of EU, should be rejected. In fact, the GDP of the UK after Brexit has a positive relationship with the GDP of EU. I think this can be explained because the UK has not officially left the EU and its GDP is still calculated within the total GDP of the EU. However, through the comparison of the analysis before and after Brexit, we can see that the relationship between EU and UK GDP began to weaken.

#### 4.3 The FTSE 100 before Brexit has a positive relationship with DAX

<i>c</i>	<i>FTSE 100</i>	<i>DAX</i>
<i>FTSE 100</i>	1	
<i>DAX</i>	0.85870569	1

Table 5-correlation analysis of the FTSE 100 and DAX before Brexit

Output	DAX
Input	FTSE 100
R Square	0.737375461
P-value	1.44352E-83
Coefficients	1.117272319c

Table 6-regression analysis of the FTSE 100 and DAX before Brexit

The result of correlation is 0.858706, which means there are high correlation between FTSE 100 Index and DAX Index before Brexit. The p-value in the regression analysis also states that the null hypothesis, the FTSE 100 before Brexit has a positive relationship with DAX, should be rejected as the p-value is lower than 0.05. The R square is 0.74, which means the result is convincing. The coefficient number is bigger than one, so they have a positive correlation. When FTSE 100 index increases, DAX would also increase.

#### 4.4 The FTSE 100 after Brexit has no relationship with the DAX

	<i>FTSE 100</i>	<i>DAX</i>
<i>FTSE 100</i>	1	
<i>DAX</i>	0.700957197	1

Table 7-correlation analysis of the FTSE 100 and DAX after Brexit

Output	DAX
Input	FTSE 100
R Square	0.491340992
P-value	3.8273E-43
Coefficients	0.892588996

Table 8-regression analysis of the FTSE 100 and DAX after Brexit

The result of correlation is high, but it still lower than the result before Brexit., which

means the correlation between the FTSE 100 and DAX after Brexit is lower than before Brexit. This situation is similar to the result between the GDP of the UK and the EU. As for the regression analysis, the p-value is lower than the p-value before Brexit. The null hypothesis, the FTSE 100 after Brexit has no relationship with the DAX, should be rejected. In fact, the result indicates the FTSE 100 after Brexit has a positive relationship with the DAX after Brexit. The result of correlation is high, but it still lower than the result before Brexit., which means the correlation between the FTSE 100 and DAX after Brexit is lower than before Brexit. This situation is similar to the result between the GDP of the UK and the EU. As for the regression analysis, the p-value is lower than the p-value before Brexit. The null hypothesis, the FTSE 100 after Brexit has no relationship with the DAX, should be rejected. In fact, the result indicates the FTSE 100 after Brexit has a positive relationship with the DAX after Brexit.

4.5 The factors did not have any significant impact on the stock market.

Output	FTSE 100
Input	UK GDP
R Square	0.066844625
P-value	0.026136817
Coefficients	0.031772109

Table 9-regression analysis of the FTSE 100 and GDP of UK

As we can see, the p-value is lower than 0.05, so the null hypothesis, the factors did not have any significant impact on the stock market, should be rejected. The positive coefficient indicates that GDP has a significant positive impact on FTSE 100 Index. If the GDP of UK goes down, it will also make the Index decrease. Britain's GDP, which has been seriously affected by the decision to leave the EU, will also severely hit the UK's stock market.

#### 4.6 The four banks' stock price has strong correlation before Brexit than after Brexit

	Before Brexit	After Brexit
HBSC	0.840931	0.610263
Lloyds Banking Group	0.697851	0.465695
<b>Royal Bank of Scotland Group</b>	0.68392	0.406614
<b>Standard Chartered</b>	0.695119	0.578842

Table 10- correlation analysis of the bank stock price and FTSE 100

By comparing the relationship between the stock prices of the four Banks and the FTSE 100 index before and after the Brexit, we can find that the relationship between the four Banks and the FTSE 100 index before and after the Brexit is stronger than that after the Brexit. This suggests that Brexit has reduced the link between Britain's banking sector and the British economy, with Banks relocating some of their operations to continental Europe, as described in the literature review. Britain's own financial position would be diminished.

## 5. CONCLUSION

This thesis explores the changes of the UK's banking industry and the UK's macro economy before and after Brexit. By using the regression model to analyze the GDP of the UK and the EU, the FTSE 100 stock index, the DAX stock index and the four major Banks in the UK, we can draw the following conclusions. (1) Britain's economic ties with the EU declined after Brexit, but it still maintained strong ties. (2) the relation between the FTSE 100 stock index in the UK and the DAX stock index in Germany has decreased, but still maintains a positive relation. (3) the FTSE 100 index of the UK has a strong positive correlation with the GDP of the UK, and the slow development of GDP caused by Brexit will lead to the decline of stock market performance. (4)

the links between the four major British Banks and the UK stock market weakened after Brexit, but the links remained strong. These conclusions are consistent with the analysis in the literature review. The economic downturn in the UK was caused by Brexit, and the UK banking industry moved part of its business to continental Europe to avoid possible risks, so its connection with the UK economy has weakened.

At the same time, this thesis also has some limitations. Since the Brexit referendum of the UK was held on June 23, 2016, when comparing the correlation between the GDP of the UK and the GDP of the EU before and after Brexit, the GDP data after Brexit was relatively small, which to some extent affected the accuracy of the result. The stock markets in Britain and Germany have different closure systems. When one side is closed while the other is trading, the method adopted in this thesis is to delete the data of the trading day, so there is also discontinuity in the data.

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## APPENDIX

### Appendix A: Excel analytical output

Figure 1-regression analysis of the GDP of the UK and the EU before Brexit

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.777483456							
R Square	0.604480524							
Adjusted R Square	0.599715229							
Standard Error	0.356016372							
Observations	85							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	16.07801658	16.07801658	126.8506015	2.13592E-18			
Residual	83	10.52005557	0.126747657					
Total	84	26.59807215						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.041045717	0.051770165	0.792845013	0.430128639	-0.061923059	0.144014494	-0.061923059	0.144014494
X Variable 1	0.727110582	0.064558614	11.26279723	2.14E-18	0.598706095	0.85551507	0.598706095	0.85551507

Figure 2-regression analysis of the GDP of the UK and the EU after Brexit

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.531370292							
R Square	0.282354388							
Adjusted R Square	0.217113877							
Standard Error	0.179054392							
Observations	13							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.138754522	0.138754522	4.327899745	0.061659704			
Residual	11	0.352665227	0.032060475					
Total	12	0.49141975						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.326602325	0.096620261	3.380267476	0.006139662	0.113942565	0.539262085	0.113942565	0.539262085
X Variable 1	0.457447877	0.219888755	2.080360484	0.061659704	-0.02652401	0.941419765	-0.02652401	0.941419765

Figure 3-regression analysis of the FTSE 100 and DAX before Brexit

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.85870569							
R Square	0.737375461							
Adjusted R Square	0.736440854							
Standard Error	0.008003884							
Observations	283							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.050543026	0.050543026	788.9685621	1.44352E-83			
Residual	281	0.018001465	6.40622E-05					
Total	282	0.068544491						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	8.21511E-05	0.000476012	0.172582226	0.863104061	-0.00085485	0.001019153	-0.00085485	0.001019153
X Variable 1	1.117272319	0.03977674	28.0885842	1.44352E-83	1.03897411	1.195570529	1.03897411	1.195570529

Figure 4-regression analysis of the FTSE 100 and DAX after Brexit

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.700957197							
R Square	0.491340992							
Adjusted R Square	0.489530817							
Standard Error	0.006607771							
Observations	283							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.011851477	0.011851477	271.432957	3.82729E-43			
Residual	281	0.012269199	4.36626E-05					
Total	282	0.024120676						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.000125085	0.000394357	0.31718812	0.7513364	-0.00065118	0.000901355	-0.00065118	0.000901355
X Variable 1	0.892588996	0.05417766	16.47522251	3.8273E-43	0.785943411	0.999234582	0.785943411	0.999234582

Figure 5-regression analysis of the FTSE 100 and GDP of UK

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.258543276							
R Square	0.066844625							
Adjusted R Square	0.053884134							
Standard Error	0.06905991							
Observations	74							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.024597844	0.024597844	5.157568782	0.026136817			
Residual	72	0.343387525	0.004769271					
Total	73	0.367985369						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-0.00700964	0.009928585	-0.70600632	0.482462454	-0.02680192	0.012782629	-0.02680192	0.012782629
X Variable 1	0.031772109	0.013990187	2.271028133	0.026136817	0.00388318	0.059661038	0.00388318	0.059661038

Figure 6- correlation analysis of the bank stock price and FTSE 100 before Brexit

	FTSE 100	HBSC	Lloyds Banking Group	Royal Bank of Scotland Group	Standard Chartered
FTSE 100	1				
HBSC	0.610263	1			
Lloyds Banking Group	0.465695	0.332736	1		
Royal Bank of Scotland Group	0.406614	0.340236	0.752249	1	
Standard Chartered	0.578842	0.567158	0.396619	0.457144	1

Figure 7- correlation analysis of the bank stock price and FTSE 100 after Brexit

	FTSE 100	HBSC	Lloyds Banking Group	Royal Bank of Scotland Group	Standard Chartered
FTSE 100	1				
HBSC	0.840931	1			
Lloyds Banking Group	0.697851	0.639455	1		
Royal Bank of Scotland Group	0.68392	0.670848	0.689037	1	
Standard Chartered	0.695119	0.691162	0.561017	0.620196	1