

Impact of Brexit on Financial Performance in UK Airline

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Abstract

The United Kingdom took part in the vote that saw it leave the entire European Union and its independence following Brexit vote required a referendum of 30 million people on 23rd June 2016. Brexit has an impact on economic development which was the aim of the study. Studying the impact of Brexit on financial performance in the UK Airline industry comprised of only quantitative variables with the source of information being secondary. Research entirely depended on techniques and steps which added up to the gathering of raw facts, entering, scrubbing and analysis of the data. From the findings, exiting the European Union had an adverse effect and negative implications in the UK in different ways. There are negative implications that are already felt on the high levels of effects on the inflow and the outflow of the commodity goods within and without the UK territories. The average European exports for the period of study were found to be $1.29e+11$ sterling pounds with a standard deviation of $4.71e+10$. It implied that there was a large disparity between the highest and lowest exports recorded in view of the large standard deviation. The minimum CO₂ emission rate recorded within the period of study was 15.68126 while the highest value recorded was 22.51058, indicated that there was a lower difference between them. 4.453% of the variation in the exports among countries was due to the variation in the membership of EU in relation to 0.0336 u_i. the findings of the study showed that the exports are affected by GDP and CO₂ emission of a nation. These results showed that an increase in GDP and CO₂ emission is most likely to increase exports of a given nation. it might be because setting up of more industrial activities is most likely to increase the GDP as well as the CO₂ emissions.

Keywords

Impact of Brexit, Financial Performance, UK Airline.

1. Introduction

The United Kingdom took part in the vote that saw it leave the entire European Union. The United Kingdom is now independent following the Brexit vote. The referendum that was carried out by 30 million people on 23rd June 2016 resulted in the separation of the UK from the European Union (Clarke, Goodwin & Whiteley, 2017). The EU constitutes 28 European nations that emerged to be united based on similar economic and political alliances. The first step that had to be taken was to ensure economic cooperation after the *Second World War*. Different states would be able to trade their goods with other member nations leading to the economic interdependence. No more conflict would occur following trade interdependence. The inception of the alliance led to the *European Economic Community* (EEC) founded in 1958. The EEC led to the enhanced cooperation with different nations such as France, Italy, Netherlands, Germany and Belgium (Colantone & Stanig, 2018). Later, other 22 states joined the union to form a vast single market that was regarded as an internal market. The reason for the Brexit is that the UK has had a different history from other European neighbours. The UK has had a parliamentary style of leadership with an ingrained sense that it can handle its issues effectively. The social changes that slowly reshaped political behaviour and public opinion is a symptom of the Brexit. The departure of the UK from the European Union comes

in versions that can be considered as either soft or hard versions (Khalili, 2017). The soft version of the Brexit is a proponent's opinion to see where UK would retain their membership form in the EU's market in free movements' exchange (Fahy et al., 2017). The hard version of the Brexit concerns the better option of leaving the EU and its market entirely but ensures that the relationship is still based on the WTO rules

2. Aims and Objectives

2.1. General Objective

The paper is aimed at establishing the impact of Brexit on the economy's financial performance as found in the UK Airline sector. Brexit has impacted negatively on the aviation market regarding financial performance. Over the past years, the air traffic in EU member states had soared, leading to improved financial performance. Some of the rights that the UK was receiving were such as the right to fly from one EU country to the other. Therefore, the freedoms have to be removed by the EU or else an agreement is to be signed. The paper covers how financial performance is affected due to the fewer airlines serving the market regarding the increase in airfares and competition restrictions. The impacts that could be considered significant is the impact created on both the EU citizens and the UK firms in trying to fly between the member nations of the EU. The arrangement on the open skies has an impact on the UK airline activities and their approvals. The jurisdiction decisions on how free trade would occur following the Brexit becomes even more difficult with the EU based citizens and the airline entities. The matter on Brexit has both the opportunities and the risks involved in ensuring that both harm and uncertainty are not subject to the UK businesses. Brexit has hit the share markets such that there is value reduction that has impacted on the share prices compared to other firms and industries.

2.2. Specific Objectives

The paper can determine how Brexit influence EBT margin in the UK Airline industry. A deal that is not struck by the EU and the UK means that the aviation standards have not been attained. One of the main specific objectives would be to determine how the EBT margin is affected by the Brexit in the UK Airline. Secondly, the paper aims at ensuring that there is the establishment of any influence regarding operating expense ratio that could be faced by the process of the UK being involved in the Brexit. Thirdly, the research study is based on the establishment of the current ratio regarding short term quality that would influence the UK as a result of the Brexit. The current ratio is considered to be the capability of any economy to settle its short term financial obligations. The financial duties that the UK based airlines incur are also included in the resulting regulations. The regulations have been placed that have an impact on the prudent behaviour that could be applicable for financial performance. The regulatory strategies by the EU ensure that productive purposes are instilled to increase productivity. The paper is also aimed at establishing the issues on Liquidity in the UK Airline Industry and how it is affected by the Brexit. The paper tries to find out matters related to the financial performance of the UK Airline Industry. There are uncertainties expressed concerning some issues that influence the aviation industry due to the process of Brexit. Issues such as decreased economic growth would lead to lowered air traffic. What impacts the financial performance for the UK Airline sector is passenger traffic. If Brexit affects the EU passenger traffic, then reduced growth in financial performance is inevitable. Also, the cases of increased air costs are likely to be offset. Free intra-EU duty could return at the UK airports.

3. Literature Review

Breinlich et al. (2017) analyze the impact of the Brexit vote on living standards of the UK people and an impact on the economy's inflation rate. The authors examine a theoretical framework whereby the exposure of households to certain imported goods is directly established through the utilization of final imported goods. Also, the households are exposed to different products through foreign intermediaries that are present in the economy's domestic production. The author generates an effective empirical measure that captures the indirect and direct exposure to foreign products based on the output-input tables used in the UK. Breinlich et al. (2017) assert that the pound saw depreciation in its value by 10% following the Brexit vote. The author writes that there are provided product groups that have both the indirect and direct import shares of which experience increased inflation. The study results show that the UK's economy rate increased by 1.7% points in one year aggregate after the Brexit referendum. The study mentions the expenditure patterns that display the expenditure differences. The results of the inflation increase show that the rate is not shared across all regions but the distribution of income alone (Pindyck & Rubinfeld, 1998).. The study shows that the areas that are most affected by the inflation rates are Wales, Scotland and Northern Ireland. London is one of the areas that is least hit by the inflation increase. The author concludes that the Brexit vote has negatively affected the lives of the UK people through the increment in the living standards and utilization of UK households.

There are those that argue for and those that argue against Brexit. The opponents have their reasons for various business benefits that are included when the EU is intact (Emerson, 2017). There are business benefits that are accompanied by the UK's participation in the one market system that was founded by the European Union. The arguments against the Brexit were based on different perspectives, such as economic and ideological approaches. The opponents argue that there are business benefits that arise from being part of the EU (Kierzenkowski et al, 2016). The opponents merit tax-free items that do not have any taxation imposed on them making prices of different commodities cheaper. Also, being a member of the EU helps in the process of opening up multiple opportunities for the member nations or states. Another benefit of being part of the EU includes the freedom and the social justice that member states obtain without any internal borders (Ebell & Warren, 2016). Also, there are instances of sustainable development that arises that leads to both the price stability in the market and economic growth (Baldwin, Wyplosz & Wyplosz, 2006). The market economy becomes highly competitive, with adequate environmental protection and social progress. Territorial and economic cohesion is achieved in all the member nations (Dhingra, 2016). No nation suffers from the elements of either social discrimination or exclusion. Being a member nation with EU helps foster non-discrimination and inclusion in all the member nations' activities Lawless & Morgenroth, 2019). EU countries enjoy the tolerance, non-discrimination and solidarity that are required to have an active enabling environment. Different policies have been created ranging from environment, climate and health to security and external relations.

The EU has ensured that all the member nations are both prosperous and economically stable. Being part of the EU has provided that the living standards of the people are improved. The currency that the member nations use is the euro. Millions of EU citizens within the different 19 countries are privileged to have the effective services of using a single trade currency and the benefits that accrue (Tetlow & Stojanovic, 2018).. Various people who have membership recognition can travel and put the residence in any European country. There are no passports or restrictions required for the member states' individuals (Van der berg, 2016). Also, governing institutions have become democratic and more transparent. Brexit is not seen as a good idea as it has severe repercussions than what it consists. The impact of the Brexit when felt leads to the cut off trade commodities.

There are no vast prospective buyers, and the movement of goods is hindered as the UK is one of the strongest markets that were within the EU. Brexit impacts on nations such as France and Germany with their internal markets (Corten, 2011). The UK would lose the essential trading partners such as Spain too. Uncertainty concerning Brexit also impacts the currency used, which is the euro. UK's connection to EU is coupled with different benefits as compared to when the tie with the EU is broken. UK's exit is a wrong turn made when analyzing the economic relationship that she had with the EU (Gudgin et al., 2018). Moving from the EU means that the UK's market co-operation and integration with the immediate neighbours are experienced. The situation shows that the UK is reopening various opportunities concerning trade deals with other non-EU states (Los et al., 2017). Different analyses have attempted to estimate the impact of the Brexit on the UK's economy. The economic considerations are essential in scrutinizing what the deal details between the UK and EU (Sascha, Thiemo & Dennis, 2017).

It is true that Brexit would impact negatively on the financial performance in different sectors of the UK industries. Brexit has increased the levels of value polarization, priorities and a different outlook. Both long and short term impacts are felt due to the Brexit. Both the opponents and the proponents of Brexit are battling single market prioritization regardless of the encroaching uncertainties (Belke, Dubova & Osowski, 2018). Brexit is coupled with unpredictable consequences for the European market and the economy. Those who voted for the Brexit have shown low government trust and expect a change in both the economic and social changes that they do not support. Such cases are impossible to accomplish. Therefore, the Brexit origins can be attributed to the previous decades that the British old and socially conservative persons felt marginalized the government's mainstream politics (Cingano, 2014). The conservative British were against the socially liberal political persons. The challenges due to Brexit are unending.

Walulik (2019) investigated the relationship between aviation law and Brexit. The author writes that multiple issues need to be addressed as urgent. Firstly, the author mentions that the relations that the UK has created with its aviation sector play a central role in the economy and would be negatively impacted by the loss of the relevant traffic rights. The author mentions that there is a need for simultaneous completion and the negotiations of the aviation deals with other states. Walulik (2019) asserts that there is a possibility for the reliance on either reciprocity or comity despite being unstable. The writer adds that the EU aviation would require forming new arrangements with different foreign partners. The author addresses the impact of the bilateral agreements on the control and the ownership clauses regarding the European Union. For instance, the study asserts that the air carriers will not use the Operator Certificates as Leiva et.al (2004) described in the provisions. Hence, there would be a need to renegotiate according to the study. The author mentions that the duplication of the EU's security and sky system regulatory is mandatory through the new arrangement that would have the UK's participation in the security agency.

Daugèliené and Puskunigis (2018) studied on both the specificity and the economic relations' scope between the UK and the European Union following the Brexit referendum. The authors identify the statement problem of which the objective is to ensure future prognostication of the relations between the UK and the European Union after the Brexit. The writers have asserted that the study was based on expert opinions on the research study. The authors used literature analysis as their research methods that focused on both secondary and primary sources. Daugèliené and Puskunigis (2018) have used the secondary analysis that helps identify the effective strategy for the Brexit and the impacts of any probable scenarios. The authors write that even though Britain became one of the primary Economic integration conceptualists, the UK took a long period of 20 years to become an EU member. The study states that the twenty years had negative implications on economic growth (Prellezo, 2012).

The UK lacked the opportunities that were based on the prevailing market. Following the last entry into the EU, the UK experienced an increase and positive impacts on the integration (Virdee & McGeever, 2018). The authors write that regardless of the definite increase in the UK's economic growth, there were disagreements that were present such as the issues on immigration and the required budget contribution to the EU. Daugėlienė and Puskunigis (2018) assert that the best way that the UK should have performed the Brexit would be through the "hard" strategy that would ensure that the ties between the UK and the European Union are considered limited. The strategy is that there is presumable bilateral trade or the Free Trade policy that is factored in the WTO rules. The authors conclude that not any of the two solutions would have both quantitative restrictions and trade tariffs.

Cumming and Zahra (2016) address the economic implications following Brexit for the economy's entrepreneurship and its engagement in international business. The authors state that their perspective is based on the academic literature that they did cover for the beginning month after the Brexit. The writers assert that there are negative implications that surround the Brexit vote regarding its individual and global market. The research study identifies the negative effects based on immigration and the trade barriers through the Brexit uncertainty. The authors write that the negative consequences are likely to impact by North America, which had past strong socioeconomic and political relationship with the UK. Cumming and Zahra (2016) write that the companies that are North America based will desire to have retention of their mutual relationship as it has had positive implications being EU member. The positive impact that North America has gained is education and the prevalence of skilled labour and innovation.

Negotiations have been created between the EU and North America on becoming one vast investment zones. The writers state that the relationship between the three- EU, UK and North America has become very unpredictable. Considerable negotiations would take time to have concrete solutions. Cumming and Zahra (2016) stated that both North America and UK companies are the significant market operators in the world with multiple operations. The companies are considered to have the most effective managerial practices and innovative technological market. The two had experienced huge growth and expansion of the world markets. Since both companies have had vibrant and technological growth, the Brexit would have severe consequences for the companies (Norris & Inglehart, 2019). The writers have mentioned that negative implications are in places such as the reduced profit margins and reconsideration has been experienced that sees the UK as the unattractive business zone. Some multinationals consider the case of operational retrenchment; operational discontinuation and business expansion have stagnated for some time (Sampson, 2017). The reason for the situation is that there is uncertainty based on political and currency fluctuations.

One of the essential implications of the Brexit is the proper assessment of the multinational roles and the issue of globalization. Cumming and Zahra (2016) state that there are views that are used to establish how business and political elites take control of both political and economic institutions to serve their interests. Such companies have displayed less regard to unfair labour strategies and the unsafe environment as their workplaces. Globalization has often been considered as the platform where economies improve the peoples' living standards. More concern is raised in either North America or the UK whereby the expanded political and economic power by the multinationals have made multiple millions of people with no economic power. The writers assert that there is a need for the balance of both technological and economic progress with the features of inclusiveness and national sovereignty.

Cumming and Zahra (2016) also assert that Brexit is expected to have severe implications for business funding and various business start-ups. North America is considered to have the most effective financial institutions that have multiple attractive opportunities, both globally

and domestically. Such decisions are based on the uncertainty that Brexit creates and how long it would persist considered unknown. Some of the UK's new startups would consider locating in either the USA or Canada where the competitive game rules are viewed as similar. Both the technological and financial uncertainties due to Brexit would make the startups move to enable environments in different business zones. One survey indicates that there is 20% of entrepreneurs that are from the UK consider finding new business locations (Dishman, 2016).

Cumming and Zahra (2016) have stated that both the Canadian and the American business officials are willing to attract such vast talent that would fill the existing companies regarding their capabilities and skills that the new startups would create. Direct government involvement through the spending programs and private partnerships would alter due to the uncertainty that Brexit establishes. The situation would lead to a negative implication to both the international investment and the regional entrepreneurship.

Goldman & Shulte-Strathaus (2017) write that there are seismic implications that Brexit on both the EU and the UK. The aviation sector also suffers through the same seismic consequences. The article addresses the failure of failing negotiations that saw the part ways regarding the exit terms. The study then focuses on the aviation relationship based on either the "soft" or "hard" Brexit. The author's term Brexit as "soft" based on the approach that both the Labor Party and the UK government consider in their negotiations.

Furthermore, the authors argued that other consequences would follow if the "soft" Brexit led to the "hard" Brexit whereby the UK trade would become disoriented. The authors add that the WTO rules that the EU-UK trade relations are founded would mean that complicated procedures would be encountered by the aviation market to make the earlier bilateral deals. On the part of the EU, they lose their negotiating leverage following the UK's exit as it is one of the large economies in Europe (Lewis-Beck & Stegmaier, 2007). The writers have mentioned that the French, the Dutch and the Germans have been disputable over the recent past and Spain's constitutional fall out has left the EU to become weakened regarding uncertainty in the entire EU governance. The article mentions the separate negotiations that have taken place and some arranged on the Brexit issue. The issues discussed concern the status of the nationals and financial statement matters. Other matters that are featured on the negotiations are on the territorial boundary that occurs between Northern Ireland and the Republic of Ireland. Due to the unclear goals that the UK government has put in place, the negotiations have often failed (Mathew and Oliver, 2016)

Goldman & Shulte-Strathaus (2017) mentions that the aviation market is also impacted as the aviation stakeholders are cautious that the market would receive no political attention. For the case of aviation, two essential issues are raised. The authors assert that the aviation relationship that is present between the EU and the UK needs to undergo renegotiation. The article states that the EU has maintained various unlimited access to specific EU points that are connected to the UK's agreement on the freedom of movement. The authors state that it would require different policy agreements such as the data exchange, security and immigration policies. UK's airline benefited greatly compared to other nations by having different EU destinations for their services (Harold, 2017). For instance, the EasyJet had unlimited organic growth on their services and the company in entirety. The company had grown in different EU states and had acquired multiple airlines. The writers assert that the EasyJet had earlier intended to protect and safeguard their position on the EU's intra-markets through the establishment of a different airline in Vienna (Ozga, Seddon & Popkewitz, 2013). The expansion of the airline is now on hold following the Brexit uncertainties. The article has mentioned the implications that the UK faces on Trans-Atlantic aviation. First, there is a Skies Agreement that the UK and the USA that is to be considered a compulsory affair. The authors mention that for the agreements to be considered successful there is the other option on the

restructuring of the Bermuda II and the USA-based traffic lights (Felbermayr et al., 2017). The authors assert that the recent European thoughts are that the negotiators would not achieve the unit aviation market condition unless there is an agreement by the UK based on its citizens' free movement. The only feasible solution to the fall out between the UK and the EU, as mentioned by the authors is the "soft" Brexit option whereby the UK would have the freedom exchanges with the European Union. The UK would still play a central part in the single aviation platform but with no single role provided in the EU.

4. Methodology

4.1. Introduction

Studying the impact of Brexit on financial performance in the UK Airline industry comprised of only quantitative variables. Therefore, in this paper, the methodology selected is a quantitative research method involving quantitative approach as explained in this portion of the paper. The chapter is mainly concerned with the analysis of the research method which will be used in the study and the manner in which the case study will be conducted. The major components are the definition of variables, gravity model approach, data used, specification of the model used, the Treasury approach, data analysis that was employed in the study. Information regarding the presentation of the findings will also be provided in the chapter.

4.2. Data Sources

In order to acquire accurate information, the study relied mainly on secondary sources of data. This type of data was obtained from Eurostat's' database on the topic of international trade. The database contained different data sets related to the trading activities of countries within Europe, regardless of whether they are exporting or importing. Exports data is used to avoid any data exclusion when we could have used imports instead. The data contained several variables but we only extracted variables useful in our research. The variables chosen were based on the research objectives of the study as well as research questions.

4.3. Research Design

The research involved gathering of raw data, entering, scrubbing and analysis. The method of collection utilized aimed at enhancing the success of the study (Denscombe, 2014). Data collection is of descriptive or numerical kind with sustenance of arithmetical methods so that the final need provides an exploratory method that investigates and analyzes the qualitative nature of the information. In this study, the design utilized mixed processes for the whole project. A quantitative research methodology requires use of data that has varied approaches which are accessible for use while the qualitative approach requires a deep investigation on the causative factors as well as explanation of an underlying phenomenon (Bryman and Bell, 2015). The reason behind choosing this method of research is based on the data features and steps highlighted in the first chapter of this paper in which variables are clearly clarified. Moreover, the data was further assessed using statistical software Stata if it indeed fit the quantitative methodology which is employed in the entire process of study. This is because different methodologies fit a given data attributes and thus the paramount way of determining the kind of research methodology to follow is based on the kind of data used in the given study (Clarke, 2014). Therefore, the study employed a descriptive research design since all the variables under study were quantitative in nature.

4.4. Procedures for Conducting Research

The research is for educational purposes and thus, the steps entailed first concentrating on obtaining the needed consent for conducting a research process (Didier & Marie, 2012). (John & Vicki, 2017). Upon obtaining permission, a research proposal was drafted to guide the

entire research process. The prime role of a research proposal was to direct the researcher on procedures and ways of undertaking the whole study. As mentioned in this chapter the study used secondary data sources and thus, there was no need for drafting any primary data collection tool. The data obtained was first cleaned and manipulated using Microsoft Excel since not all the variables were required in this research and also the data might contain both missing values and outlying cases. The refined data was then exported to Stata software for analysis. The output of the data run was subjected to analysis founded on the presentations in both graphical forms and table formats in accordance with the scientific format of results presentation. An interpretation and discussions of the results obtained and their presentation was then performed directing to this study output.

4.5. The Gravity Model Approach

Exiting the European Union would have an adverse effect and negative implications in the UK in different ways. As earlier stated, there are negative implications that are already felt on the high levels of effects on the inflow and the outflow of the commodity goods within and without the UK territories. Since the UK has often made its trade on a free trade criterion with the European Union, a new agreement on the free trade should be manageable than the recent agreements that EU did with Canada and the multiple countries that needed the dismantling process of the protectionist strategies. Secondly, there are instances of the non-tariff caveats that would occur in the form of various trades regulatory constraints that increase over a given time. Thirdly, cases such as the border delay are likely, and increased administration costs are inevitable. It is likely possible to have an assessment of how exiting the European Union has an impact on the UK using different methods. Some measures have been based on the tariff basis used by the WTO. The gravity approach has been used to measure the general benefits of Brexit to both the foreign direct investment and trade. The gravity approach has been used more often by statistical analysts to analyze the flows of the bilateral trade. The approach makes use of the linkages between the trade costs and the different countries' economic sizes. The model captures the pattern regularities of international trade. Multiple attempts on the gravity models make use of the model in an aggregated approach. The model helps in the measurement of all the ways that can be used in the determination of the EU membership's benefits without the consideration of the deterministic aspects such as regulations and tariffs, among others. It is also essential to note that the gravity model is used often in the analysis by empirical economists. The analysis of data using the gravity model brings about the ripple effect of the trade flows in all aspects of the bilateral routes. The result of such a model is the essence of the trade theory. The model is allowed by the economists' researchers typically during the estimation period due to the inclusion of the appropriate fixed variables. The model provides the simulation framework that helps offer unbiased estimates that help in the conduct of effective counterfactual simulations suggested by the equilibrium theory. Emphasis should be put on the approach as the results provided using the gravity approach are not the primary forecasts but are considered estimates

In the previous formulation for the gravity model, it is expressed as a multiplicative form that is shown as in equation 1. T_{ij} represents the economy's trade flows that occur between the two nations j and i relative to the Y_j , Y_i and GDP, and also inverse to the expressed bilateral distance such as β_0 , β_1 , β_2 , and β_3 which are considered as unknown parameters. Both the exporters' and the importers' GDP are considered as proxies used for the countries' supply and demand (Silva & Tenreyro, 2006). The bilateral distance variable is considered to be the trade costs that are incurred between the two nations for instance. To perform any estimation simplification for the gravity approach, transformation for the equation is done into a "natural logarithmic form" as shown in equation 2. The transformation of the equation helps in the

application of the OLS estimation- “ordinary least squares” method. The two equations, that is equation 1 and equation 2 are shown below:

$$T_{ij} = \beta_0 Y_i^{\beta_1} Y_j^{\beta_2} D_{ij}^{\beta_3} \quad (1)$$

$$\ln T_{ij} = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln D_{ij} + U_{ij} \quad (2)$$

The form expressed for the gravity model as a logarithmic expression is useful in the coefficient estimation that is later interpreted or expressed as elasticities, that is, the change in the percentages of the dependent variable after a change in the percentage of the independent variables *ceteris paribus*. For the case of the dummy variables, moving from 0 to 1 is established by the estimated calculation of the coefficient by making use of $\exp(b) - 1$, where b can be considered as the estimated coefficient.

The dependent variable in the case of the research is the EU exports. The independent variables are such as the GDP for the exporters and the importers, population, employment rates and CO₂ emissions to test on their significance to the economies' contribution following the Brexit. U_{ijt} is included as the disturbance or the error term. The i and j variables show the importer and the trades' exporter respectively, t denotes the period. The variables that have been included in the gravity model are essential within the approach as the variables help in the effective establishment of a good fit model and are also considered as important in the model's literature analysis. The use of such variables that have commonly been used and employed in empirical analyses makes comparison with other studies relatively easier.

The regression for the gravity model used for the analysis makes use of panel data to help show the importing and the exporting nations. The primary independent variable in which case is EU dummy variables that would take the value 1 when both nations in the bilateral pair are considered member states of the European Union and 0, otherwise.

The gravity equation model could therefore be expressed as follows in equation 3:

$$\ln \text{Exports}_{ijt} = \beta_1 \text{EU}_{ijt} + \beta_2 \ln \text{GDP}_{it} + \beta_3 \ln \text{GDP}_{jt} + \beta_4 \ln \text{POP}_{it} + \beta_5 \ln \text{POP}_{jt} + \beta_6 \text{Border}_{ij} + \beta_7 \ln \text{DIST}_{ij} + \beta_8 \text{ComLang}_{ij} + \beta_9 \ln \text{EMP}_{ij} + \beta_{10} \ln \text{CO}_2_{ij} + \beta_{11} \ln \text{TourExp}_{ij} + \tau_t + U_{ijt} \quad (3)$$

Exports_{ijt} is considered a dependent variable that represents the EU exports. The data is obtained from the Eurostats' database on the topic of international trade. Exports data is used to avoid any data exclusion when we could have used imports instead.

EU_{ijt} is considered a dummy variable that takes the value of one when either nations or countries in any bilateral pair are said to be European Union members and 0 otherwise. The dummy variable expressed in the section helps to capture the shift from EEA membership to the EU membership as a result. Such an effect occurs when the nations such as Finland, Austria and Sweden move into the EU as full members, for instance. Previous studies have often offered support to the idea that being part of the EU results in positive effects for the nations that indulge in trade while EU members. As a result, the EU's dummy coefficient is expected to have positive values. The positive value or variable is often manually constructed by the research scholar.

POP_{it} and POP_{jt} are coefficients that show the population sizes of both the exporting and the importing nations. The population coefficients could take any value that could be either negative or positive. Any population size may indeed impact on exports negatively considering the reduced exports that the country offers when there is an increased population

growth due to the intra-trade increments. The other side of the effect is that if there are increased exports, there is a positive implication for the economy.

$DIST_{ij}$ is the distance between any two nations, which is the exporter and the importer. The distance is considered to be in kilometres between the capital cities of the two nations. The variable on distance is often used for trade costs since it is believed to experience more costs when two nations that are rendered far trade with one another. The variable on the distance element is expected to impact negatively on the exports.

$ComLang_{ij}$ is considered a dummy variable that also takes the value of 1 when the two nations or economies under analysis are of the same primary language or share an official language, 0 otherwise. Countries or nations that share or have a common language would trade more highly compared to others that do not have a common language to use as their communication way, and it would become less costly when sharing a common form of communication. Having a common language would also impact positively on lowering the trade costs as the communication processes become less costly and lead to easier and quicker trade operations. $Border_{ij}$ is also a dummy variable that is expected to have positive implications on the trading economies. The dummy variable of the $Border_{ij}$ takes the value 1 when the pair economies or nations are considered to have a similar border that helps in performing the trading activities such as the exports, and 0 otherwise. The likelihood of such a dummy variable is that it would aid in the reduction process of the trade costs.

τ_t is known as the fixed time effects that are considered as a variation that occurs between the years in the given sample size. The dummy variable τ_t is expected to show specific events for the different years that could have an impact on the trade flows that could have been neglected by other variables. τ_t are essential in the gravity model as they measure the impacts of the given common factors in the whole dataset of the different nations which have varied periods such as the trade cycles and prices. The τ_t variables measure the various trade flows within the current prices, whereas GDP is measured using the "*real purchasing power parity*."

EMP_{ij} is also considered a dummy variable that also takes the value of 1 when the two nations or economies under analysis benefit from employment opportunities created due to the trade ties, 0 otherwise. The trade ties would indeed have a positive implication on the employment opportunities of both the United Kingdom nationals and the trade partners. Hence, the coefficient of the EMP_{ij} variable would be positive. Otherwise, the high tariffs and the Brexit would lead to the negative implication on the employment opportunities and the living standards of the trading partners and their nationals. The negative coefficient for the employment variable means that the trade barriers that emerge as a result of Brexit become adverse and has a negative impact as it reduces employment chances for multiple people who depend on such instances for survival.

4.6. The Treasury Approach

The Treasury approach begins its analysis through the similar gravity model that is used in the estimation of the FDI increases and the trade flows that result from the EU and the FTA memberships. The Treasury approach describes the gravity model as provided below:

$$\ln X_{ijt} = \alpha_{ij} + \gamma_t + \alpha_1 \ln (Y_{jt} Y_{it}) + \alpha_2 \ln (POP_{jt} POP_{it}) + \alpha_3 Border_{ij} + \alpha_4 \ln DIST_{ij} + \alpha_5 ComLang_{ij} + U_{ijt}$$

Where,

X_{ijt} represents the trade flows between the two nations i and j at the time, t

$Y_{jt} Y_{it}$ represent the GDP for both nations in the year, t

$POP_{jt} POP_{it}$ represents the population of the two nations in a given period, t

$DIST_{ij}$ represents the distance that occurs between the two trading nations

ComLang_{ij} is considered a dummy variable that also takes the value of 1 when the two nations or economies under analysis are of the same primary language or share an official language, 0 otherwise.

Border_{ij} is considered a dummy variable that also takes the value of 1 when the two nations or economies under analysis have a similar border or are of the same origin, 0 otherwise.

The Treasury approach is often used as it includes the population variable that is at times omitted in the gravity model. The population variable in the Treasury approach is used in the estimation process of the per capita impact in which case a negative coefficient is expected to show that for any provided GDP, the trade flows would be reduced as the population is increasing. The case means that the trade levels may increase respect to both the exporters' and importers' GDP. Hence there would be a reduction in the per capita GDP.

The Treasury approach also acknowledges the fact that the gravity model institutes the fixed time effects in the model.

5. Results and Discussion

5.1. Introduction

The data was downloaded from the Eurostat's online platform as indicated in the previous chapter. The data contained several variables which included the EU exports in sterling pounds, GDP for the exporters and the importers, population, employment rates and CO₂ emissions. The data was opened in Excel and check whether there existed some missing values. There were no missing values found in the data set. Outlying cases was also checked since the presence of these values might render analysis to be performed not meaningful and erroneous. It is because outliers in any data would lead to inaccurate results from analysis (Vartanian, 2011). Moreover, the variables in the data were not in the required format by the research, there was a need to transform into the required format. The EU variable was coded 1 for a country member of the European Union and 0 otherwise, it also acted as the panel id in the Stata software. Similarly, comlang considered a dummy variable that also takes the value of 1 when the two nations or economies under analysis are of the same primary language or share an official language. Consequently, the variable border was regarded as a dummy variable that also takes the value of 1 when the two nations or economies under analysis have a similar border or are of the same origin, 0 otherwise. On the other hand, variables such as population, GDP, CO₂ emissions, employment rates for both importers and exporters were transformed to natural logarithms before fitting the regression model. Descriptive statistics were first workout namely; measures of dispersion and measures of central tendency. This decision of computing the measures was considered most appropriate for quantitative variables (MacInnes, 2017). It provided an overview of the data used in the study before fitting the regression model considered appropriate for the data based on the nature of the variables. Hence, the outputs below show the output obtained from the analysis performed in Stata software.

5.2. Descriptive Statistics

In regard to the table above, the average European exports for the period of study was found to be 1.29e+11 sterling pounds with a standard deviation of 4.71e+10. It implied that there was a large disparity between the highest and lowest exports recorded in view of the larger standard deviation. Majority of the exports did not lie within one standard deviation of the mean, and thus reflecting the fluctuation of exports because of differences between countries. There was a significant economic impact of the export before Brexit on the Britain's trade within the major trading partners inside and outside European Union. However, after Brexit there resulted a significant impact on the economy of Britain's trade, as there was a great

fluctuation on the GDP. The fluctuation was as a result of suffering with productivity and weakening of the internal trends. Brexit referendum has therefore led to the drop of the figures as the above exports recorded are the lowest.

Table 1: Summary statistics of quantitative variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Euexports	55	1.29e+11	4.71e+10	3.32e+10	1.96e+11
Co2emission	55	19.54197	1.534655	15.68126	22.51058
employment~e	55	2.152318	.4800819	1.738	3.654
GDP1	55	6.35e+12	5.31e+12	5.43e+11	1.74e+13
GDP2	55	7.40e+11	7.08e+11	4.43e+10	2.44e+12
Distance	55	3671.868	5259.901	517.979	28184.63
populationi	55	1226562	803338.5	723489	6916498
populationj	55	798452.8	133889.4	529207	987696

Based on Co2 emissions, the Co2 emission average rate was obtained to be 19.54197 with a standard deviation of 1.534655. It indicated that there were no such disparities in the CO2 emission since the standard deviation was too low. Majority of the emission rates lies around the average value and thus, resulting in the lower standard deviation. The minimum CO2 emission rate recorded within the period of study was 15.68126 while the highest value recorded was 22.51058, indicated that there was a lower difference between them.

In regard to the employment rate, the average employment rate was found to be 2.153, with a standard deviation of 0.4796025. It implied that there was a very minimal difference between the highest and lowest rate of unemployment. Majority of the employment rate values lies around the average value and thus, resulting in the lower standard deviation. The minimum employment rate recorded within the period of study was 1.738 while the highest value recorded was 3.654, indicating that there was the least difference between them. It means that the employment rate has not changed much during the period of Brexit, and thus, the Brexit policies being implemented have not changed much during the period of study. However, such changes are expected according to the studies since the Brexit will render some of the people unemployed and also the implementation of Brexit policies will likely impose some restrictions on British citizens. Moreover, there will no more free movement of the British citizens in countries under European. Also, the trade ties indeed had a negative implication on the employment opportunities of both the United Kingdom nationals and the trade partners. Hence, the coefficient of the EMP variable was found to be negative. The high tariffs and the Brexit are likely to lead to the negative implication on the employment opportunities and the living standards of the trading partners and their nationals. The negative coefficient for the employment variable means that the trade barriers that emerge as a result of Brexit become adverse and has a negative impact as it reduces employment chances for multiple people who depend on such instances for survival.

The average distance between the two nations considered in this study was established to be 3671.868 kilometres, with a standard deviation of 5259.901. The higher standard deviation than mean value implied that there was a huge difference between the farthest and nearest nations (MacInnes, 2017). In addition, the majority of the countries which traded to the United Kingdom did lie around the average distance shown above. The nearest country lies

within 517 kilometres while the farthest trading country lies 28184.63 kilometres away from the country.

Based on GDP of importers and exporters of the countries under European Union and those not under the union, it was evident that the average GDP of the importing nation was found to be 6.35e+12 sterling pounds, with a standard deviation of 5.31e+12 sterling pounds. It implied that there was a large disparity between the highest and lowest GDP recorded within the time period. The majority of GDP from the findings did not lie within one standard deviation of the mean, indicating that the large fluctuation is because of issues and reasons associated with Brexit. The minimum GDP recorded by the nation during the period was 5.43e+11 while the highest GDP recorded was 1.74e+13 as shown above. Additionally, the fluctuation in GDP will affect the purchasing power of the nation, especially its participation in the international trade. Reduction in GDP means the country will have to reduce its imports and exports in order to maintain the balance of trade. The variations in the standard deviation of each country from the findings might have resulted from Brexit intervention which led to the fluctuation of GDP of the nation importing.

Similarly, the average GDP of the exporting nation was established to be 7.40e+11 sterling pounds, with a standard deviation of 7.08e+11. The GDP of the nation is a bit smaller than that of the importing nation, as indicated by the lower average value. Large standard deviation showed that there was a large disparity between the highest and lowest GDP recorded within the time period. Majority of the GDP did not lie within one standard deviation of the mean, and thus, the fluctuation of GDP might be due to several reasons associated to Brexit. Brexit is therefore the reason for the fluctuation of GDP as most of the gross domestic product is not within a standard deviation of the average. The minimum GDP recorded by the nation during the period was 4.43e+10 while the highest GDP recorded was 2.44e+12 as shown above. Additionally, the fluctuation in GDP will affect the purchasing power of the nation, especially its participation in the international trade. Consequently, the fluctuation of GDP means that the nation does not have a stable economy which translates to the balance of trade. Therefore, its participation in international trade is affected by different forces and hence, hindering the nation to fully participate in trade.

It is evident in the table above that the average population of the importing nation was found to be 1,226,562 with a standard deviation of 803,338. It means that there was a huge difference between the highest and lowest number of people in the importing nation recorded within the time period of study. It also implied that the population growth rate in this nation was rapid along with the increase in the nation's GDP. The population fluctuated almost at the same rate as the GDP. Consequently, the average population of the exporting nation was found to be people, with a standard deviation of 798,452,000 people, with a standard deviation of 133889.4. It means that there was a huge disparity between the highest and lowest number of people in the exporting nation recorded within the time period of study, as supported by the minimum and maximum values above. However, the population of the nation was lesser than that of the importing nation, which was also reflected in their GDP's.

Correlation of quantitative variables

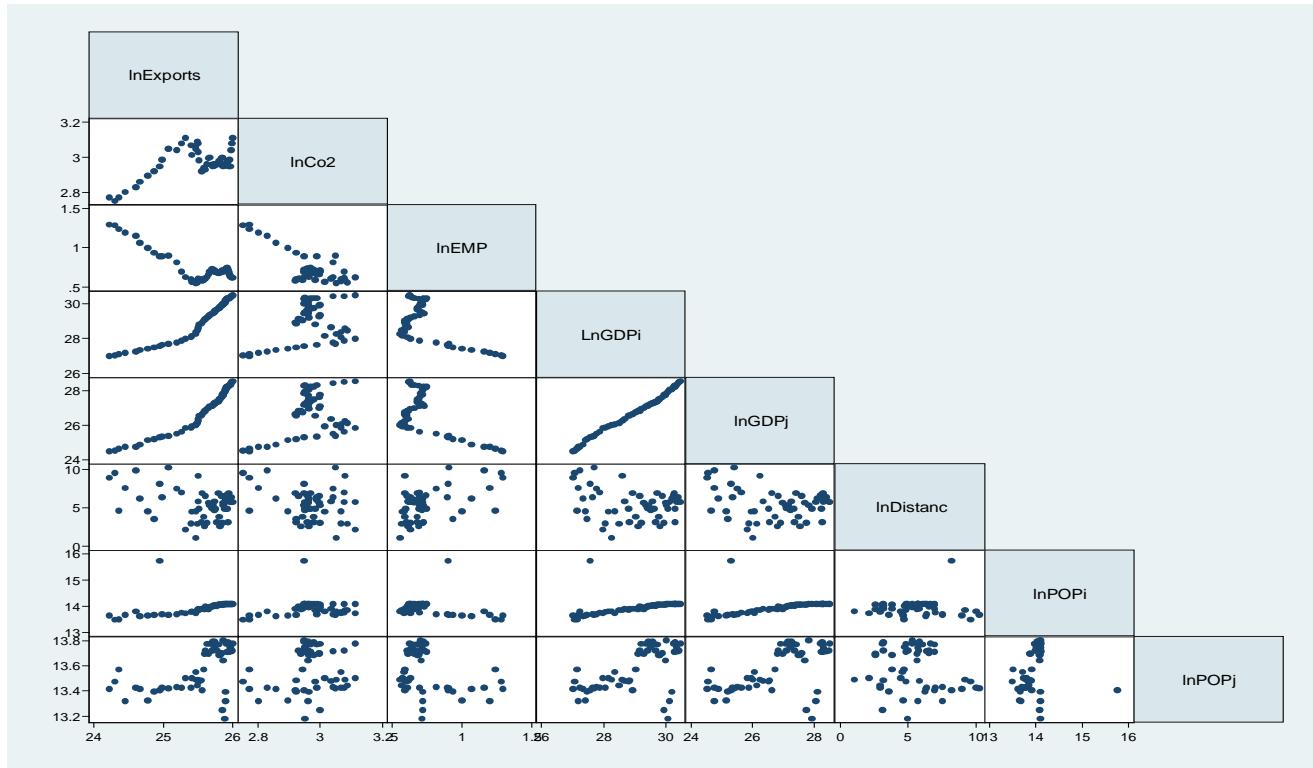


Figure 1: Scatter plot matrix

The scatterplot above shows the relationship which exists between quantitative variables which were later used to fit a regression model (Brzeziński, 2013). There was a moderate positive linear relationship between the natural logarithms of exports and CO2 emissions. Similarly, there was a relatively strong positive association between the natural logarithms of exports and GDP for both exporting and importing nation. Consequently, there was a weak positive relationship between the natural logarithms of exports and populations of both exporting and importing nations as shown above (Nayakam et al., 2016). However, the population of the importing nation showed a stronger relationship with the exports than that of the exporting nation. On the other hand, there was a relatively weak negative relationship between natural logarithms of distance and exports, also there was no evidence of any linear relationship which existed between it and other independent variables. There was evidence of a strong positive relationship between natural logarithms of GDP of exporting and importing nation as shown by a perfectly linear plot. In addition, there was no evidence of the linear relationship between the population of exporting nation and other independent variables as shown by its plots which no recognized pattern. moreover, there was a moderate negative relationship between the natural logarithms of exports and employment.

5.3. Regression Model

The study, same as that done by McNabb (2015) included CO2 emissions to establish the correlations between independent variables. The study as well incorporated the population of the importing and exporting nations, the distance between the nations and their GDP, employment rates and dependent variable exports, a linear regression model was fitted. The model took care of importing nations and exporting nations as well as the time period of the data recording. Hence, the data were treated as for panel data in Stata software with time variable being a year and panel id being EU, which was an indicator variable with 1 as member of EU and 0, otherwise. When fitting the regression model, we chose the fixed model since we wanted to test for only fixed effects which are due to each of the independent

variable included in the model. There were several other options which could have been chosen which included only random effects, both random and fixed effects, but we choose the other method which takes care of only effects since we were a concern with the effects of the individual independent variables (Dornyei, 2007). The output of the procedure was as shown below

Table 2: Regression model

Fixed-effects (within) regression	Number of obs	=	55		
Group variable: Country	Number of groups	=	2		
R-sq: within = 0.9914	Obs per group: min =	16			
between = 1.0000	avg =	27.5			
overall = 0.9912	max =	39			
	F(8, 45)	=	649.25		
corr(u_i, Xb) = 0.0336	Prob > F	=	0.0000		
<hr/>					
lnExports	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
lnCo2	.5970199	.1589514	3.76	0.000	.2768754 .9171645
lnEMP	-.7912718	.0808463	-9.79	0.000	-.9541046 -.628439
LnGDPi	.4524821	.0959231	4.72	0.000	.2592831 .6456811
lnGDPj	-.1342843	.0868735	-1.55	0.129	-.3092565 .0406878
ComLang	-.0019495	.0146709	-0.13	0.895	-.0314983 .0275993
lnDistanc	-.0010593	.0039484	-0.27	0.790	-.0090118 .0068932
lnPOPi	.0208876	.025409	0.82	0.415	-.0302888 .0720639
lnPOPj	-.0261393	.0504161	-0.52	0.607	-.1276824 .0754039
_cons	14.85398	1.067115	13.92	0.000	12.7047 17.00326
<hr/>					
sigma_u	.01128475				
sigma_e	.04842306				
rho	.05151228				(fraction of variance due to u_i)
<hr/>					
F test that all u_i=0:	F(1, 45)	=	1.01	Prob > F = 0.3213	

The variable country was categorized into two groups depending on the membership of the European Union, where countries which are members of the EU was coded as 1 while those not members of the EU was coded 0. Since Prob> F was found to be 0.000, we rejected the null hypothesis that all the coefficients of independent variables are zero and make a conclusion that at least one of the coefficients is different from zero ($0.00 < 0.05$). The hypothesis was tested with a significance level higher than 5%. After establishing that at least one of the coefficients is different from zero, we went ahead and test the individual coefficients. In addition, the significance of the model showed that the model fitted was not as bad as the null model which have none of the independent variables. The results were also echoed by the F value associated with the probability value used for rejecting the null hypothesis. There were only two groups used in the study, who are members of the EU and those who are not members. Splitting the countries based on membership helped in assessing whether there are trading benefits associated with EU membership also showing whether there are negative effects of the Brexit to the United Kingdom based on trading activities. The relationship between the errors associated with the grouping of the variable based on EU membership and those resulting from the regression model indicated was weakly positive as

shown their coefficient (0.0336) in the table above. On the other hand, 5.151% of variation in the exports among countries was due to the variation in the membership of EU as the u_i was 0.0336 and the F test of u_i of 0. This indicates that the changing of membership of a country from EU to a different one like in Brexit is most likely to cause only 5.151% variation of the export of that nation as shown by rho coefficient. The coefficient is usually used to show variation across panels of the data set, which is 0.05151 in our case. In addition, testing of whether all the u_i 's was equal to zero, we found that the grouping of the countries due to their membership was not statistically significant since the probability value associated to the grouping variable was found to be greater than the chosen level of significance ($0.3213 > 0.0$). As a result, we failed to reject the null hypothesis that grouping of the nations was not necessary (Bernard & Bernard 2013). The studies by Rodrigues (2018) concluded that EBT margin is affected by the Brexit in the UK Airline hence the rejection of the null hypothesis.

Testing the individual significance of the independent variables included in the model, we established that variables such as GDP of exporting nation, the common language of the two nations, the distance between the capital cities of trading nations, and population of both exporting and importing nation. The variables were found to be insignificant because the probability values associated to their coefficient were greater than 0.1% level of significance, and thus, there was no need to include in the regression model ($0.129, 0.895, 0.790, 0.415, 0.607 > 0.05$) according to Door (2013). On the other hand, only three variables were found to be significant, they included CO2 emission, employment rate and GDP of the importing nation. They were established to be statistically significant since probability values related to their individual coefficients were found to be less than the chosen level of significance ($0.000, 0.00, 0.00 < 0.05$). Therefore, these variables are considered the only variables that should be included in the model (Lowry, 2014).

Consequently, only three variables were established to have positively influenced the exports of a country, they included CO2 emission, GDP and population of the exporting nation. On the other hand, all the other variables were found to be negatively influenced the natural logarithms of exports namely GDP and population of the importing nation, employment rate, distance between the capital cities of trading nations, and common language of trade. However, as highlighted above not all of these variables were statistically significant and thus, meaningless to interpret all of them. Instead, model building procedures were supposed to be performed (Goodwin, 2012).

Model building procedures were performed in order to obtain the best model fit for the data set used in this study. Backward elimination method was used to use to obtain the best model (Wagner, 2011). The method entails the elimination of the most insignificant variable from the model, the process is repeated until all the variables in the model are found to be significant. The final model is thus obtained when all the variables remaining in the model are found to be significant. The above steps were followed and the final model was generated having only three variables CO2 emissions, GDP of importing nation, and employment rate as shown in the output below.

Table 3: Final regression model

Fixed-effects (within) regression	Number of obs	=	55			
Group variable: Country	Number of groups	=	2			
R-sq: within = 0.9908	Obs per group: min =	16				
between = 1.0000	avg =	27.5				
overall = 0.9907	max =	39				
	F(3, 50)	=	1801.54			
corr(u_i, Xb) = 0.0350	Prob > F	=	0.0000			
<hr/>						
lnExports	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnCo2	.4830476	.1316041	3.67	0.001	.218713	.7473822
lnEMP	-.8265093	.0673193	-12.28	0.000	-.9617241	-.6912945
LnGDPi	.3060577	.0078379	39.05	0.000	.2903148	.3218007
_cons	15.80258	.547821	28.85	0.000	14.70225	16.90292
sigma_u	.0102454					
sigma_e	.04745651					
rho	.044533	(fraction of variance due to u_i)				
<hr/>						
F test that all u_i=0:	F(1, 50) =	1.04			Prob > F = 0.3131	

Since Prob> F was found to be 0.000, we rejected the null hypothesis that all the coefficients of independent variables are zero and make a conclusion that at least one of the coefficients is different from zero ($0.00 < 0.05$). The hypothesis was tested with 5% level of significance (Fahrmeir & Tutz, 2013). After establishing that at least one of the coefficients is different from zero, we went ahead and test the individual coefficients (Wagner, 2011). In addition, the significance of the model showed that the model fitted was not as bad as the null model which have none of the independent variables, which was obvious after performing model building procedures (Chu et al., 2015). Testing individual significance, it was evident that only three variables significant, it included CO2 emission, employment rate and GDP of the importing nation. They were established to be statistically significant since probability values related to their individual coefficients were found to be less than the chosen level of significance (0.000, 0.00, 0.00 < 0.05). on the other hand, the relationship between the errors associated to the grouping of the variable based on EU membership and those resulting from the regression model indicated was weakly positive as shown their coefficient (0.0350), which was increased in the process of model building. The 4.453% variation was consequently because of the differences in the membership of EU in relation to 0.0336 u_i , (that is,) as well the change on, membership of the countries from the union. The relation is different to the one in Brexit which is most likely the cause only 4.453% variation of the export of that nation as shown by rho coefficient. This value of rho was also reduced during the model building process, it might be due to the fact that the model contained only variables who are members of the EU. All the variables associated with nations not members of the EU were eliminated during the model building process (Cameron & Trivedi, 2009).

It was also evident increase in every unit of the natural logarithm of CO2 emission, there was 0.4830 unit increase in the natural logarithm of exports. Similarly, for every unit increase in the natural logarithm of employment rate, there was 0.82651 unit decrease in the natural logarithm of exports. Consequently, for every unit increase in the natural logarithm of GDP of exporting nation member of EU, there was 0.0306 unit increase in the natural logarithm of

exports. Excluding all the variables in the model, for every unit increase, there was 15.80258 unit increase in the natural logarithm of exports keeping other factors constant.

The adjusted R squared of the model was found to be 0.9908. it implied that 99.08% variation in the natural logarithm of exports of the nation was explained by variation in the independent variables in the model (CO2 emissions, GDP of exporting nation, and employment rate) while the variable not included in the model explained the other remaining 0.92%. It means that the final model fitted was the best model for the given data since other variables' only account for a very negligible portion of the dependent variable (West, Welch & Galecki, 2014).

6. Conclusion

The paper is aimed at establishing the impact of Brexit on the economy's financial performance as found in the UK Airline sector. Brexit has impacted negatively on the aviation market regarding financial performance as claimed by many scholars who have research on this topic. The findings of the study showed that EU membership of a country has greatly influenced its trading operations. It was evident in the model that EU membership of a nation influenced its trading activities by 4.43%. This percentage of variation might be due to the advantages associated to EU membership such as EU has maintained various unlimited access to specific EU points that are connected to the UK's agreement on the freedom of movement. Unlimited access to many to EU points will most likely affect the economic growth of EU since the regulatory strategies by the EU ensure that productive purposes are instilled to increase productivity and Brexit means that the British airline will no longer enjoy the privileges. Breaking the relations that the UK has created with its aviation sector plays a central role in the economy and would be negatively impacted by the loss of the relevant traffic rights (Walulik, 2019).

Consequently, the findings of the study showed that the exports are affected by GDP and CO2 emission of a nation. These results showed that an increase in GDP and CO2 emission is most likely to increase exports of a given nation. it might be because setting up of more industrial activities is most likely to increase the GDP as well as the CO2 emissions. Increase in GDP and the emissions would also translate to an increase in exports activities, which in turn cause an increment in the number of exports. However, EU membership entitled a nation some rights to trade and penetrate into the EU market without any restrictions, and thus, GDP of non-member does not have much implication on the exports of that nation compared to EU members. In addition, GDP affects financial duties that airlines making them incur an extra cost resulting from regulations. The regulations have been placed that have an impact on the prudent behaviour that could be attributed to the financial performance of the sector and the whole economy (Breinlich, et al., 2017).

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