



Business, Management and Economics Research

ISSN(e): 2412-1770, ISSN(p): 2413-855X

Vol. 3, No. 6, pp: 57-61, 2017

URL: <http://arpgweb.com/?ic=journal&journal=8&info=aims>

The Impact of 'Brexit' on Japanese International Trade in EU

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Abstract: Brexit is an abbreviation for “British exit,” meaning the United Kingdom’s (UK’s) decision on June 23, 2016, to leave the European Union (EU). The national vote’s result surprised global markets and caused immediate turmoil. As the UK has a large and traditional financial market and is a gateway to the EU for international investment and trade, people have much fear, which has caused serious recession all over the world. Japan, which has taken advantage of the relationship between Japan and UK and between the UK and EU, is not an exception. This paper examines the impact of Brexit on Japanese activity in the UK and EU. The gravity model of international trade was employed for empirical analysis. This model states that bilateral trade flows based on the economic sizes and distances between two units can be used to examine reasons for international trade. Empirical analysis in this paper indicates that Brexit has impacted Japanese international trade considering the relationship between the UK and EU.

Keywords: EU; Gravity model; International trade; Japan; UK.

1. Introduction

Brexit is an abbreviation for *British exit*, meaning the UK’s decision on June 23, 2016, to leave the EU. The national vote’s result shocked global financial markets, for example, causing the British pound to depreciate against the US dollar to its lowest level in 30 years. Also, though there was a rise in oil prices because of the recovery of the world economy and sharp inflation occurred via the depreciation of the pound. Prime Minister Cameron, who campaigned for the UK to remain in the EU, resigned after the vote was tallied. The vote was to decide whether the UK should leave or remain in EU and *leave* won by 51.9% to 48.1%.

Opponents of Brexit provided a number of reasons for their views. One was the risk involved in leaving the EU’s decision-making system, as it is by far the largest destination for British exports to the EU. Another was the economic and societal benefits of the EU’s freedoms: free movement of goods, services, capital, and people across borders. They thought that Brexit would destabilize the British economy and could make the country poor.

Leave voters supported Brexit on many and complex factors. Some of them feared declining international competitiveness of UK businesses. Others feared the burden from the EU debt crisis and concerns about immigration. At that time, problems of immigrants, especially unadmitted ones, had caused much trouble in the EU. It should be noted that Britain never opted into participating in the common currency, the Euro. *Leave* campaigners argued that Brussels’s bureaucracy is like a drag on the UK economy and that EU laws and regulations threaten the sovereignty of the UK. The UK is surrounded by sea, and its relationships among the EU may be somewhat different from almost all EU countries. Britain elected a new Prime Minister, Theresa May. She was against the UK leaving the EU, but she played only a small role in the campaign. Prime Minister May will have to trigger the two-year process to leave the EU from now on.

Article 50 is a plan for countries that wish to exit the EU. For the UK to leave the EU, it had to invoke Article 50 of the Lisbon Treaty, which gives two years to agree the terms of the departure from the EU. No one can anticipate how the Brexit process will work, as Article 50 was recently created, in 2009, and it has never been employed. It will be a tricky process. For example, the terms of Britain’s exit will have to be agreed upon by all of the members of 27 national parliaments.

Bouoiyour and Selmi (2016) showed that Brexit damaged stock markets in the EU. This study showed that Germany suffered the most, followed by France and the UK. Grant (2016) indicated that Brexit would not eliminate many of the structural and competitive circumstances of UK farmers, such as relationship with supermarkets and processors. Much dispute will occur, not only in the business fields, but also in the academic fields.

However, the results of Brexit cannot be predicted easily. Foreign direct investment (FDI) in the UK from other nations is driven as it is a member of EU; however, it is not the only driving force. Kneller and Pisu (2004) indicated that both horizontal and vertical motives can be found for the use of the UK as an export platform by foreign firms. Dimitropoulou *et al.* (2013) showed that London obtains benefit primarily from the new investments of immigrants, the majority of which are related to service sector activities. Beck (2016) showed that other factors include the UK’s

business friendly environment as reflected in global competitiveness and a relatively deregulated labor market. The UK will try to negotiate the conclusion of the Free Trade Agreement (FTA) or the Economic Partnership Agreement (EPA) with many countries, including Asian countries such as Japan. The results will have large impacts on the UK and EU economies; however, the results cannot be anticipated.

The UK has attracted a lot of FDI in the EU. Japan now has many offices in the UK. Automobiles, railway vehicles, health-care equipment, atomic nuclear energy, and financial institutions are examples of markets in which Japan is involved. They are gateways to EU as they can enjoy the lack of tariffs and regulation when they export to the EU from the UK. In Japan, Brexit could have a seriously negative effect on international trade as it affects the value that added businesses to exports of final products to the EU through the UK. The EPA and FTA with EU for Japan has not been agreed yet, so the relationship between the UK and Japan is still more important as it is an *entrance* to the EU. Japan will need to negotiate new bilateral international investment/trade agreements with the UK and the EU because the UK could be excluded for the ongoing international investment agreements negotiations. Also, EU countries will begin to look for other partner(s). The partner(s) might not necessarily be Japan. There seems another possibility: The partner(s) could be other Asian nations. [Hahn and Heo \(2008\)](#) indicated that FDI from both the US and Japan promotes economic growth in eastern association of Southeast Asian nations (ASEAN) but not in Indonesia, Malaysia, and Thailand. [Rawat \(2012\)](#) showed that FDI from respective countries does not affect India's GDP. [Smeets \(2015\)](#) showed that a necessary condition to exploit gains by FTA is not only to abolish tariffs but also to reduce nontariff measures to trade. There seems another and unanticipated possibility that Brexit will not significantly impact trade and investment between UK and Japan; however, it will have a considerable effect, at least on capital flow and the exchange rate. Exchange rates of the UK pound depreciated largely and stock prices fell remarkably just after the national vote in June 2016. [Lannoo \(2016\)](#) showed that final agreement between the UK and the EU will clearly allow much less access than that enjoyed by UK-licensed firms today. [Slater \(2016\)](#) also showed that the main negative impacts on growth would arise in the UK, Eurozone, and Japan. However, there are few to no studies that have examined the effects of Brexit for Japan.

In general, the World Trade Organization (WTO) has been thought to ensure a level playing field for all, thereby contributing to economic growth and development. However, the EPA/FTA threatens the future of the multinational trading system because the exclusive trade preferences of the EPA/FTA, although approved under the provisions of the general agreement on tariffs and trades (GATT), are not consistent with an important principle of the multinational trading system, the most favored nation principle, and causes discriminatory trade practices of trade disciplines [Lee \(2011\)](#). However, they have increased markedly in number and, hence, have become a very important role of the multinational trading system. [Park \(2009\)](#) found that expansionary ASEAN + 3 regional trade agreements (RTAs) could be a sustainable policy option. [Decreux et al. \(2010\)](#) demonstrated that the EU may increase trade performance in several industries. [Xuepeng \(2010\)](#) showed that pro-labor predictions of the median voter model are supported by the full-fledged FTA. [Korinek and Melatos \(2009\)](#) showed that a gravity model suggests that the creation of the ASEAN free trade area (AFTA), the common market for Eastern and Southern Africa (COMESA), and the common market of the southern cone (MERCOSUR) have increased trade in agriculture between their members. However, [Vamvakidis \(1999\)](#) showed that RTAs are not an efficient way to promote international trade. On the other hand, few studies have analyzed RTAs using the gravity model in spite of the fact that this model for international trade has been used often. One of the reasons is that RTAs are recent phenomenon in the world.

On the level of households, Brexit will not have a large impact in the short term, but it will have an impact in the long term. However, it will have impacts on people's lives because of exchange rates and stock prices and business performance. [Goodwin \(2016\)](#) showed that a vote to leave would shock business confidence but consumers also would be adversely affected. However, little research has focused on this issue. [Slater \(2016\)](#) showed that the UK faces negative shocks to consumers and business confidence, but growth will be supported by the weak sterling and likely policy responses.

The gravity model is used in this paper for estimation. The gravity model of international trade states that bilateral trade flows are based on the economic sizes, often using gross domestic product (GDP) and distance between two units (countries). The model also has been used repeatedly in international relations to examine the effectiveness of currency unions and regional agreements. The model is often extended by including variables to explain language relationships, contiguity, colonial history, exchange rate regimes, and other variables. [Krugman \(2001\)](#) stated that if trade encourages greater specialization in production, industry-specific shocks may cause members' business cycles to diverge and that comparative advantages do not predict the relationships in the gravity model. Alternatively, [Baldwin \(2005\)](#) demonstrated that greater trade integration may help correlate national incomes. In this respect, too, there is no consensus.

This article is organized as follows. The next section shows theoretical analysis on this issue. Section 3 demonstrates the empirical methods and the data used here. Section 4 shows the results and performs analysis on the results of previous sections. Finally, this paper ends with a brief summary.

2. Theoretical Analysis and Empirical Methodology

This paper's model is divided into two equations. One estimates the relationship of international trade between Japan and the UK and the other estimates the relationship of international trade between the UK and the EU. For the second one, the gravity model is used for estimation.

The first estimated equation is (1):

$$\ln(\text{TRADE}_{ijt}) = a_1 \ln(\text{GDP}_i \text{GDP}_j) + a_2 \ln(\text{GDP}/\text{per}_i \text{GDP}/\text{per}_j) + a_3 \ln \text{EXCHANGE}_{ijt} + \varepsilon_{ijt} \quad (1)$$

Also, the relationship between the UK and the EU is estimated by the gravity model including fixed effect as shown in equation (2).

$$\ln(\text{TRADE}_{ijt}) = a_0 \text{EU}_{ijt} + a_1 \ln(\text{GDP}_i \text{GDP}_j) + a_2 \ln(\text{GDP}/\text{per}_i \text{GDP}/\text{per}_j) + a_3 \text{EXCHANGE}_{ijt} + a_4 \ln \text{EXCHANGE}_{ijt} + \text{DISTANCE}_{ijt} + \mu_{ij} + \varepsilon_{ijt} \quad (2)$$

Where i and j are countries (units). In the equation (1), i denotes Japan and j denotes the UK. For equation (2), i denotes the UK and j denotes the other countries. TRADE is the value of bilateral trade, and EU is a dummy variable that is unity if countries belong to the EU. GDP is the product of their real GDP, GDP/per is the product of real GDP per capita, and EXCHANGE is a variable that compares the UK pound exchange rate against the US dollar. DISTANCE denotes the distance between the capitals. Finally, μ is the country-pair fixed effects. μ_{ij} assumes that $\mu_{ij} = \mu_{ji}$; the fixed effects do not depend on the direction of international trade. Panel data for all over the world is used except for missing cases in the equation (2).

EU nonlinear effects may arise as a result of selection into agreements for international trade by countries that tend to be small, poor, and remote. The impact of a change in the EU condition or slope coefficient is examined in the next section.

Finally, the insignificant variable, DISTANCE, was excluded and the effect of the EU was computed. The calculation equation (3) is as follows:

$$\text{EU's EFFECT}_{ijt} = \exp(a_{EU} + a_{EU \times \ln(\text{GDP}_i \text{GDP}_j)} \ln(\text{GDP}_i \text{GDP}_j)) - 1 \quad (3)$$

I used the panel data for OECD countries in the equation (2). The sample data are from 2005 to 2015. All the data are yearly. All other data are from International Financial Statistics (IMF), Direction of Trade Statistics (IMF), and the US census. Finally, if there were insignificant variable(s), these variable(s) were omitted, the model was estimated again, and it was computed on international trade.

3. Estimated Results and Revised Estimation

The results of equation (1) and (2) are shown in Table 1.

Table-1. Estimated Results for Gravity Model of International Trade

	From Japan to the UK		From the UK to EU		
	(a)	(b)	(c)	(d)	(e)
EU			0.245*** (20.514)	0.243*** (20.408)	0.241*** (20.399)
$\ln(\text{GDP}_i \text{GDP}_j)$	0.501*** (34.291)	0.489*** (29.880)	0.553*** (38.917)	0.532*** (34.108)	0.514*** (32.248)
$\ln(\text{GDP}/\text{per}_i \text{GDP}/\text{per}_j)$	0.438*** (14.907)	0.557*** (16.188)	0.504*** (8.826)	0.547*** (9.617)	0.516*** (8.166)
$\ln \text{EXCHANGE}_{ij}$	0.512*** (4.799)	0.534*** (4.950)	0.525*** (4.028)	0.560*** (5.102)	0.499** (4.679)
$\ln(\text{GDP}_i \text{GDP}_j)^2$		0.029*** (9.007)		0.030*** (8.301)	0.0848*** (11.766)
$\ln(\text{GDP}/\text{per}_i \text{GDP}/\text{per}_j)^2$		0.054*** (6.188)		0.067*** (6.829)	0.064*** (6.509)
$\text{EU} \times \ln(\text{GDP}_i \text{GDP}_j)$					0.139*** (4.769)
$\text{EU} \times \ln(\text{GDP}/\text{per}_i \text{GDP}/\text{per}_j)$					0.099** (2.010)
$\text{EU} \times \ln(\text{DISTANCE}_{ij})$					0.203 (1.408)
EU effect			0.798	0.802	0.755
Adj. R ²	0.801	0.831	0.728	0.760	0.715
DW	1.923	1.930	1.830	1.860	1.817

Note. Numbers in parentheses are t statistics. *** denotes significant at 1%, ** at 5%, and * at 10% level.

Table-2. Estimated Results for Gravity Model of International Trade from Japan to EU

	From Japan to EU		
	(f)	(g)	(h)
EU	0.201*** (18.302)	0.207*** (18.856)	0.215*** (20.001)
$\ln(\text{GDP}_i\text{GDP}_j)$	0.507*** (35.514)	0.498*** (33.221)	0.482*** (31.333)
$\ln(\text{GDP}/\text{per}_i\text{GDP}/\text{per}_j)$	0.465*** (8.767)	0.534*** (9.879)	0.452*** (8.060)
$\ln\text{EXCHANGE}_{ij}$	0.548*** (4.155)	0.565*** (5.323)	0.576** (4.819)
$\ln(\text{GDP}_i\text{GDP}_j)^2$		0.028*** (8.214)	0.0824*** (10.804)
$\ln(\text{GDP}/\text{per}_i\text{GDP}/\text{per}_j)^2$		0.064*** (6.665)	0.062*** (6.500)
$\text{EU} \times \ln(\text{GDP}_i\text{GDP}_j)$			0.132*** (4.505)
$\text{EU} \times \ln(\text{GDP}/\text{per}_i\text{GDP}/\text{per}_j)$			0.090** (1.992)
$\text{EU} \times \ln(\text{DISTANCE}_{ij})$			0.203 (1.201)
EU effect	0.745	0.787	0.725
Adj. R ²	0.715	0.733	0.708
DW	1.815	1.843	1.808

Note. Numbers in parentheses are t statistics. *** denotes significant at 1%, ** at 5%, and * at 10% level.

The results are almost as expected. The results of columns (a) and (b) in Table 1 indicate that, along with the economic scale, exchange rate between Japan and the UK affects international trade significantly.

Columns (c), (d), and, (e) in Table 1 show that the estimated coefficients for the EU by the equation (3) are from 0.755 to 0.802. All of them are positive. Joining the EU certainly promotes international trade.

The effects of nonlinear trade volume of EU may arise, so quadratic terms of $\ln(\text{GDP}_i\text{GDP}_j)$ and $\ln(\text{GDP}/\text{per}_i\text{GDP}/\text{per}_j)$ are added as in Katayama and Melatos (2011). The results are in columns (e), which demonstrates that both variables are positive and significant and confirms nonlinearity.

On the other hand, the changes in relationships between international trade and distance are not significant. As transportation systems and information and communication technology (ICT) improve, the effect of distance on international trade may decrease.

Table 2 indicates that the trade structure is similar to that in the UK. There is a high possibility that Brexit will not reduce bilateral trade between the UK and the EU if a large country is involved. However, it should be noted that, although some country pairs experience substantially higher levels of trade with other areas when they share a common EPA/FTA, for a significant subset of country pairs, members of the EU are associated with a lower level of bilateral trade. How the EU promotes international trade depends on the constitution of the pair of countries. The EU surely has promoted international trade; however, the proportion is not necessarily proportional. Japan and the UK should consider this fact and use it effectively to gain from international trade.

4. Conclusions

This paper empirically examined the relationship between Japan and the UK and found that there have been significant effects via economic scale and exchange rate on international trade. Also, there is significant evidence that the EU has promoted international trade between the UK and EU member countries. However, as the importance increases, another possibility could arise that the partner for the UK could become other countries including Asian countries. Chen and Li (2017) showed that China-UK free trade area will bring more benefit than harm to both China and the UK. The shock and cost would be very high. Vogiatzoglou (2016) showed that efficient business regulations are significant FDI determinants. Further research is needed in this field.

There are likely to be some differences between the UK and other countries. The differences would exist among developed, developing, and emerging countries, for example. To focus on these issues, for example, would be interesting. Coulibaly (2009) noted that as existing RTAs are deepened and new ones are being negotiated, it will be important to ensure that trade creation dominates trade diversion. It is therefore essential to examine the effects of the EU. Both macroeconomic analyses and microeconomic analyses would be necessary in this paper.

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