

ERASMUS UNIVERSITEIT ROTTERDAM

Erasmus School of Economics

Bachelorscriptie Algemene Economie

The Brexit vote and trade

How it is harming trade by creating uncertainty

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Abstract

The Brexit vote created a lot of economic uncertainty in Great Britain. Since uncertainty affects the decisions of businesses, it also affects those of traders. This paper provides evidence that the uncertainty created by the Brexit vote affected the international trade of the United Kingdom. The descriptive analysis points out that imports and exports from and to the European Union did decline. The general effect, however, is negligible. It turns out that there is no difference in effect between different kinds of goods. These results highlight that the economic impact of the Brexit is not perceived positively by businesses, though the negative sentiment is not strong enough to have significant impacts.

Introduction

Since a narrow majority of the British people voted in favour of a so-called 'Brexit', the newspapers have published many stories on the negative effect of the Brexit on trade and investments. In these articles, many firms warned that they will move operations from Great Britain to the Continent if the Brexit becomes real. What these stories have in common, is that they are all signs of the fact that the departure of Britain from the European single market will have a large and probably negative economic impact on Britain. Moreover, they show that many with economic interests in Britain are worrying about this impact and its magnitude. They show as well that firms and individuals are already preparing for the Brexit, and even more so since Theresa May set a deadline for it by triggering article 50 of the Treaty of Lisbon.

Many researchers have already investigated the consequences that the Brexit will have on the British and European economy. However, no one has yet examined whether the imminent Brexit already influences the British economy, and specifically the British trade flows. Therefore, this paper investigates the following research question:

Does the imminent Brexit, before actually happening, influence the international trade flows of Great Britain?

On one hand, there are many statements available of firms that are already moving their operations out of Britain. On the other hand, firms might also just be preparing to move, without actually moving until the Brexit happens. Moreover, the literature shows us that firms diminish international orders if uncertainty increases. It is therefore unclear in advance whether or not the Brexit influences trade negatively. Thus, empirical research is needed to determine whether firms are already moving their operations out of Britain and whether trade is indeed already negatively affected.

In the next section, the theoretical framework with respect to the effect of uncertainty on business and trade is explained. In the third section, the data that this paper uses are discussed. Extensive attention is paid to the descriptive statistics of the data, both in graphical and tabular form. The fourth section describes the outcomes of this descriptive analysis. The fifth section concludes.

Literature and theoretical framework

Essentially, the imminent Brexit is a case of uncertainty. No one knows exactly what the outcome of the Brexit negotiations will be. This means that firms have to deal with uncertainty with respect to the future terms of trade between the European Union and Great Britain. Therefore, the question is how severely trade is affected by this policy uncertainty.

In a seminal paper, Dixit (1989) investigates how firms decide on entry and exit under uncertainty. He finds that the combination of uncertainty and sunk costs induces firms to be inactive. That is, they stay in their actual state, whether that is a state of having entered the market or of not having done so. In other words, there are less entries and less exits. In his theoretical analysis, uncertainty increases the effects of sunk costs. Bloom, Bond and Van Reenen (2007) tested the theoretical predictions of Dixit empirically. They find that the predicted effects of uncertainty hold indeed for a sample of British firms: the firms were less responsive to sales shocks if uncertainty was higher. Therefore, their paper confirms Dixit's results.

In another seminal paper, Baldwin and Krugman (1989) relate a theoretical model of firm behaviour similar to Dixit's one to changes in the exchange rate. They find that small changes in the exchange rate have a negligible effect on the entry and exit of exporting firms, but that big shocks are able to push many firms into or out of a country. On top of that, a big shock creates a new status quo, due to the presence of hysteresis.

Building on the basic model of Dixit, Handley and Limão (2015) made an important contribution with respect to the effect of policy uncertainty on trade. In their model, firms have to make an investment in order to export, which is considered a sunk cost after the investment is done. In their model, only the expectation of increased tariffs will diminish exports, but the expectation of lower tariffs does not have any effect. They call this the 'bad news-principle'.

Moreover, they apply their model to the situation of Portugal. Portugal enjoyed since 1977 no tariffs on trade with the European Union, but it was not until 1986 that Portugal became a member state. Until it became a member, there was uncertainty with respect to the duration of duty-free trade. This uncertainty was eliminated in 1986. Their paper finds that eliminating this uncertainty led to a large increase in the Portuguese exports.

Handley did comparable research in 2014, when he investigated the effect of tariff uncertainty for Australian exports. He defines tariff uncertainty as the difference between the actual tariffs and the WTO upper bound. This research yields the result that a higher difference between the two, and thus more uncertainty about trade policy, decreases exports.

It can be concluded from this literature that uncertainty decreases international trade. Since the Brexit vote increased uncertainty with respect to future terms of international trade between the UK and the EU, the following hypothesis is established:

Hypothesis 1: The uncertainty created by the Brexit vote has a negative impact on British international trade.

Novy and Taylor (2014) also investigated the effect of uncertainty on trade with a sophisticated model built on the ideas of Bloom (2009). They tried to theoretically determine the mechanism by which uncertainty affects trade, using the reasoning established by Bloom. They find in this way that uncertainty induces firms to halt imports and consume their existing stocks, postponing new orders until they are absolutely necessary. Consequently, an increase in uncertainty has a large effect on trade, and even more so on international trade since it is riskier. Trade in durable goods trade is therefore affected far more than the trade of perishable goods, since those goods are used less frequently and ordering them can be postponed far longer. Their predictions are confirmed when tested with data on US imports and exports. Conclusively, they have constructed a valuable mechanism to explain the effect of uncertainty on trade.

If the theory of Novy and Taylor is correct, a differential effect for durable and perishable goods should be observable in the British case as well. Therefore, the following hypothesis is established:

Hypothesis 2: The Brexit vote decreases British international trade in durable goods more than trade in perishable goods.

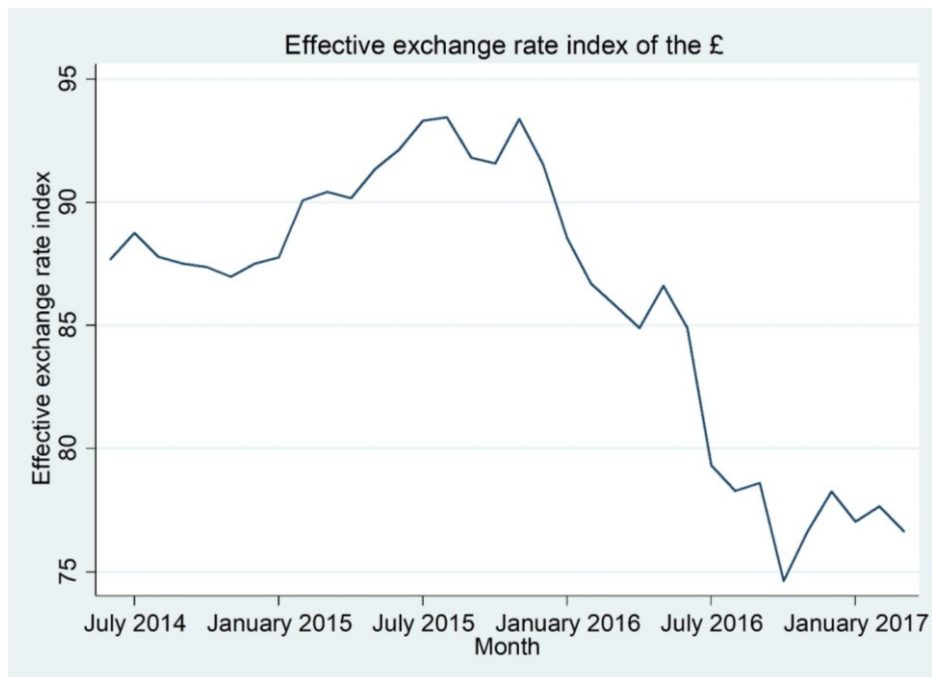


Figure 1: Development of the effective exchange rate of the pound sterling.

When the macroeconomic situation of the United Kingdom after the Brexit vote is considered, one direct effect of the Brexit vote stands out: the change in the exchange rate of the British pound. The exchange rate, according to the effective exchange rate index, dropped after the vote by 6,57%, and continued to drop by another 5,53% in the three months thereafter, as shown in figure 1.

This decrease in the exchange rate is the consequence of the increase in uncertainty. Since the actual conditions after the Brexit are unknown, the market already accounts for its current uncertain expectations in its valuation of the British economy. These negative expectations, or downward uncertainty, according to the bad-news-principle of Dixit, Handley and Limão (2015), thus lead to a decrease in the value of the pound sterling.

Since this decrease in the effective exchange rate makes imports more and exports less expensive, this change will probably affect the international trade of the United Kingdom. It will probably lead to a further decrease in imports, and will alleviate the decrease in exports. The following hypothesis is therefore formulated with respect to the expected effects:

Hypothesis 3: The negative impact of the Brexit vote is smaller for the exports of the United Kingdom than for its imports.

Finally, there is also reason to expect that the trade of the United Kingdom with the EU is affected more than the trade with other countries. After all, trade with the EU will probably be harmed after the Brexit if tariffs between them return. On the other hand, there should be little impact on trade with the rest of the world, although there remains some uncertainty about tariff levels. Finally, a small effect is probably discernible in trade with countries that have a preferential trade agreement with the European Union. These countries will also be affected by uncertainty about tariff levels, but the possible increase in their tariff levels is smaller. These PTA countries are listed in appendix A. Therefore, the fourth hypothesis is:

Hypothesis 4: The Brexit vote affects the trade of the United Kingdom with the European Union more negatively than trade with preferential trade partners of the European Union, and trade with the rest of the world is affected to a lesser degree.

Data & Summary statistics

The data that is used to test the hypotheses, has been collected from the website of the British Office of National Statistics. It concerns the trade flows of Great Britain on a monthly basis at the national level. The data consists of information on the international trade flows from June 2014 until March 2017. Moreover, the data consists of two different sets.

First data set

The first data sample contains the trade values in pound sterling of the trade of the United Kingdom with different groups of countries. These trade values concern international trade in all goods and services. The first group of countries consists of those that have no free or preferential trade agreement with the European Union. The second group of countries consists of those that have a preferential trade agreement with the European Union, as listed

Table 1
Summary statistics of the first sample

	Mean	Std. Dev.	Min.	Max.	Obs.
Import/Export	1,714	0,701	1	3	238
Country Group	2,286	1,032	1	4	238
Date	669,5	9,831	653	686	238
Value in million £	18393,24	18573,11	1125	69789	238

Note: The meaning of the variables is explained below.

in appendix A. The third group of countries consists of those within the European Union and the European Economic Area. The sample contains the variables Date, Import/Export, Country group and Value in million £. Table 1 reports the summary statistics.

The variable Date indicates the month of a trade flow. The difference between the maximum value and the minimum is 33, which means that we have data on 34 months in a row: from June 2014 until March 2017.

The variable Import/Export is a categorical variable that denotes whether the time series considers exports or imports. The number three considers international trade in general, which consists of both imports and exports. The variable Country Group denotes the country group, which can be either the world, the MFN, the PTA or the EU+EEA countries. In the data, a time series 'trade with the rest of the world' concerned data of trade with many countries with which the United Kingdom trades little. This time series has been added to the MFN countries, since it contained more trade with MFN than with PTA countries. The PTA countries that were not in the time series RotW, and thus make up the proxy of the PTA country group, are South Africa, South Korea, Mexico, Egypt, Israel and Switzerland. These variables together make up 6 different time series. Another time series available concerns the value index of the international trade of Great Britain on the whole.

Table 2

Summary of value in m £

	Mean	Std. Dev.	Obs.
Preferential trade agreement/Import/before Brexit	1529	294	25
Preferential trade agreement/Import/after Brexit	1745	297	9
Preferential trade agreement/Export/before Brexit	1727	414	25
Preferential trade agreement/Export/after Brexit	1709	514	9
MFN/Import/before Brexit	17818	1171	25
MFN/Import/after Brexit	19784	1007	9
MFN/Export/before Brexit	13494	709	25
MFN/Export/after Brexit	14418	952	9
EU+EEA/Import/before Brexit	20628	604	25
EU+EEA/Import/after Brexit	23232	1305	9
EU+EEA/Export/before Brexit	11428	506	25
EU+EEA/Export/after Brexit	12796	552	9
All trade/before Brexit	58520	1631	25
All trade/after Brexit	65096	2622	9

Note: The value is in millions of pound sterling. 'Before Brexit' consists of data for the months June 2014 until July 2016, and 'After Brexit' consists of data from July 2016 until March 2017.

Table 3

T-test of difference before and after Brexit vote in mean trade value, per country group

	Diff. of means	St. Dev.	df	T	p
PTA/Import	216	115,00	14	1,882	0,0807
PTA/Export	-18	190,26	12	-0,096	0,9255
MFN/Import	1.966***	409,37	16	4,803	0,0002
MFN/Export	923**	347,73	11	2,657	0,0218
EU+EEA/Import	2.604***	451,32	9	5,770	0,0002
EU+EEA/Export	1.368***	210,00	13	6,515	0,0000
All trade	6.576***	932,78	10	7,0509	0,0000

Note: Df stand for degrees of freedom. ** is statistically significant at the 5% level. *** is statistically significant at the 1% level. 'Before Brexit' consists of data for the months June 2014 until July 2016, and 'After Brexit' consists of data from July 2016 until March 2017. The differences and standard deviation are in millions of £.

The variable Index Value is our primary variable of interest. On the whole, its mean indicates little, since its standard deviation is larger than its mean. It has a rather large variability, as its minimum, maximum and standard deviation indicate. Table 2 summarizes these per time series, in order to obtain more meaningful summary statistics.

This dataset is used to test the first, the third and the fourth hypothesis.

The summary of the volume indices shows in the first place that the mean trade value did not change much over the course of the investigated time span. The mean trade before and after the Brexit does not differ very much. Trade with the PTA countries turns out to be relatively small, approximately 10 times as small as trade with the rest of the world. This might be affected by the fact that some PTA trade was captured by the generic time series Rest of the World, which was attributed to MFN trade, since it consisted of more MFN than PTA countries. However, a detailed break-up of trade data is not likely to change this value much. Due to the fact that all unspecified trade flows are relatively small, and the Most Favoured Nations contains trade with large industrial countries such as the US, China, Japan and India. On top of that, the volatility of trade, as measured by its standard deviation, increased in general.

With respect to the international trade of the United Kingdom in general, it can be said that it increased after the Brexit. Specifically, the increase in trade of the United Kingdom is statistically significant at the 1% level. It can thus reliably be said that trade increased after

the Brexit vote. This is an unexpected result, considering the first hypothesis. Graphical analysis should be used to interpret this statistical outcome, as will be done in the next section.

When the trade flows to the MFN countries are considered, the t-tests, as shown in table 3, shows that trade with the MFN countries increased statistically significantly after the Brexit. This is the case for trade with the EU countries as well. Trade with the PTA countries, however, did not increase by a statistically significant degree. Apparently, trade with the EU and MFN countries has not been affected by the Brexit vote, whereas trade with the PTA countries was possibly affected, since the general trend of trade was an increasing one. However, this result might also be due to confounding factors, since we cannot separate the development of trade over time from the effects of the Brexit vote. For instance, the growth of the world economy on the whole might cause this increase in trade.

Conclusively, there is not significant decrease in trade visible after the Brexit vote. On the contrary, trade with MFN and EU countries increased significantly after the Brexit vote. This result can be due to confounding factors, though.

Second data set

The second data sample contains data on the volume indices of trade of the UK with the EU. It consists of the variables EU/non-EU, Import/Export, Year, Month, Volume index, and a division in product categories on the 1-digit level of the Standard International Trade Classification. This data sample is used to test the second hypothesis, since the first sample does not contain information on trade in different goods. Its descriptive statistics can be found

Table 4
Descriptive statistics of the second sample (volume indices)

	Mean	St. Dev.	Min.	Max.	Obs.
Date	669,5	9,8179	653	686	680
SITC	34,2	28,505	3	78	680
EU/non-EU	0,5	0,5004	0	1	680
Export/Import	0,5	0,5004	0	1	680
Durable	0,2	0,4003	0	1	680
Brexit	0,2647	0,4415	0	1	680
Index Value	106,33	14,447	49	221	680

Note: The meaning of the variables is explained below.

in table 3. When the descriptive statistics of the second sample are considered, as shown in table 3, it stands out that there are 680 observations for every variable. The amount of observations is the product of the amount of the possible values of the variables EU/non-EU, Import/Export, SITC and Date, like in the first sample.

The variable Date indicates the month of a trade flow. The difference between the maximum value and the minimum is 33, which means that we have data on 34 months in a row: from June 2014 until March 2017, which is the same as in the first sample. The variable SITC describes the product category, but its descriptive statistics are meaningless, since it is a categorical variable.

Thirdly, consider the four dummy variables EU/non-EU, Export/Import, Durable and Brexit. The dummy EU/non-EU, which indicates whether a time series concerns a trade flow with the EU or with the other countries (thus non-EU), has a mean of exactly an half. This means that we dispose of data for every month on both the trade flow (on product category level) to EU and the other countries. Volume data was not on SITC 1-digit level was not available on the level of PTA/MFN countries, but both were listed together as non-EU. The same holds for Export/Import, which shows that we have also complete monthly data on both import and export of a product category.

The variable Durable indicates whether the trade flow concerns trade in durable goods. Since this only holds for 1 of the 5 product categories, the mean of the variable is 0,2. The categories that are considered perishable, are Food, Beverages and Tobacco (SITC 0+1), Basic Materials (SITC 2+4), Fuels (SITC 3) and Semi-manufactures (SITC 5+6). Finished manufactures (SITC 7+8) are considered Durable. In this case, perishable merely indicates that these goods will be usually consumed within several months after acquisition, whereas durable goods can be used for years at an end.

The variable Brexit indicates whether or not the Brexit vote has taken place. Its mean is 0,2647, which means that roughly a quarter of our time span is after the Brexit, and three quarters before it. Specifically, 9 months are after the Brexit vote, and 25 before it.

The variable Index Value is more interesting. This variable indicates the value of the volume index of trade. This volume is on average 6,33% more than the base year, 2013. Moreover, its standard deviation is not very large. On the other hand, the outliers, though few, show that there is nevertheless a significant amount of variability. Table 4 gives a more detailed summary of the variable Index Value.

Table 5

Summary of the Volume Indices

	Mean	Std. Dev.
Perishable/Import/Before Brexit	104,08	3,16
Perishable/Import/After Brexit	107,14	3,6
Perishable/Export/Before Brexit	103,99	5,55
Perishable/Export/After Brexit	106,38	5,16
Durable/Import/Before Brexit	111,80	4,38
Durable/Import/After Brexit	117,56	5,42
Durable/Export/Before Brexit	107,68	3,09
Durable/Export/After Brexit	111,22	3,6

Note: 'Before Brexit' consists of data for the months June 2014 until July 2016, and 'After Brexit' consists of data from July 2016 until March 2017.

Table 6

T-test of difference in mean trade volume before and after Brexit, per country group

	Diff. of means	St. Dev.	df	t	p
Perishable/Import	3,06**	1,357	13	-2,254	0,0425
Perishable/Export	2,39	2,048	15	-1,165	0,2622
Durable/Import	5,76**	2,007	12	-2,868	0,0142
Durable/Export	3,54**	1,349	13	-2,626	0,0215

Note: Df stand for degrees of freedom. ** is statistically significant at the 5% level. *** is statistically significant at the 1% level. 'Before Brexit' consists of data for the months June 2014 until July 2016, and 'After Brexit' consists of data from July 2016 until March 2017.

Table 4 shows the mean and standard deviation of the Volume Index for the various combinations of trade with the EU or other countries, import or export, and before or after Brexit. The standard deviation of the volume index of trade with EU countries increases after Brexit in this table as well, and not for trade with non-EU countries, too. This is a sign that Brexit does affect trade with the EU, and that the datasets concur in this respect.

Moreover, mainly the volume of the imports from EU countries and exports to countries outside the EU increased. This might be due to the fall of the exchange rate of the pound sterling. On top of this, all means are higher for trade after the Brexit than before it, which is confirmed statistically. The increase in trade is non-significant only for the exports of perishable goods. The increase in the other trade flows is significant at the 5% level.

This result seems to indicate that Brexit was good for trade, but should be interpreted with caution. Trade was steadily rising in the months before the Brexit vote, due to other factors. These other factors might be the actual drivers of the increase, rather than the Brexit vote itself. Nevertheless, this table offers an indication that the Brexit vote might not have had negative effects on trade. In the next section, these results of the t-tests will be scrutinized by graphically analysing the data.

In order to investigate the hypotheses, the data will therefore be investigated by a graphical, descriptive analysis¹. In order to investigate the first hypothesis, the graph of the development over time of the value of international trade in general will be analysed. In order to analyse the second hypothesis, the development of the trade volume of perishable and durable goods will be examined graphically. The evolution of trade value will be analysed graphically in order to test the third hypothesis. Finally, the fourth hypothesis will be investigated by graphically reviewing the same data, but paying attention to the dimension of country groups rather than the dimension of import/export.

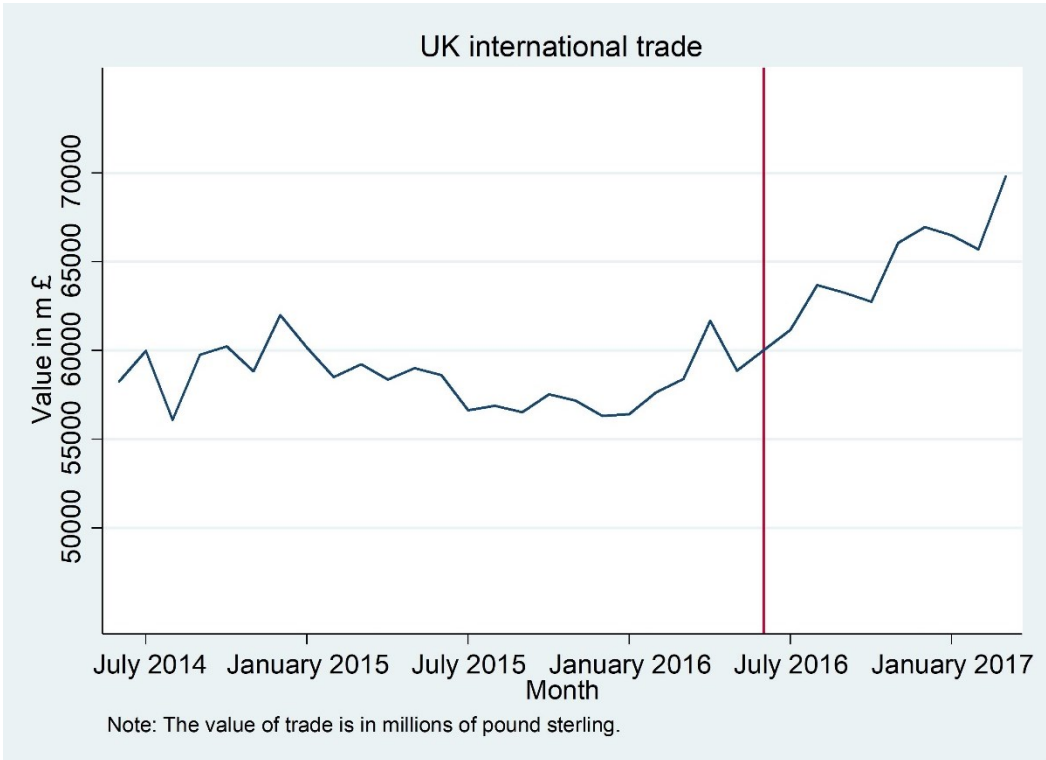


Figure 2: The development of the international trade of the United Kingdom over time. Note: The value of trade is in millions of pound sterling.

¹ A quantitative analysis has been conducted by the author, but did not yield meaningful results. Therefore, it has been left out of the thesis. The quantitative results are nevertheless obtainable from the author.

Outcomes of the descriptive graphical analysis

International trade of the United Kingdom in general

The first hypothesis predicts that the international trade of the United Kingdom decreases after the Brexit vote, due to the uncertainty that it generated. Considering the trend of the value of the international trade of the United Kingdom over time, as shown in figure 2, it appears a rather stable one. However, a certain development is nevertheless visible. The value of trade stays roughly the same until July 2015. Subsequently, it declines somewhat in the first months of 2016. It then returns to its former values, only to fall again before the Brexit vote. Finally, the value of international trade increased by the last months of 2016 and first of 2017.

Thus, this development can be divided in three separate periods: A first one, in which trade stays roughly the same, after the Great Recession; a second one, in which trade declines when the possibility of a Brexit appears to be real; and a third one, in which trade increases after the initial effect of the Brexit vote passed away.

This shows that the Brexit vote probably had some impact on trade. This effect, however, is not easily explained, since it is mainly present before the vote. It is therefore most likely that businesses already started to worry before the Brexit vote about the Brexit and its effects. However, the worries decreased after the Brexit vote and traders started to trade more. As the t-test showed, this increase in trade is statistically significant. Therefore, the effects of the Brexit vote seem negligible, although the increase in the value of trade after the Brexit is also partly caused by the decline of the exchange rate. That makes imports more valuable in pounds, and exports less. Since the British imports exceed the exports, this decline in the exchange rate increased the value of trade as well.

Conclusively, this graphical analysis does not really support the hypothesis that Brexit uncertainty negatively influenced the value of the international trade of the United Kingdom. Therefore, the first hypothesis is rejected by the data in favour of the null hypothesis, which states that the Brexit vote had no significant impact on trade.

Trade in durable and perishable goods

The second hypothesis predicts that the trade in perishable goods is decreased more by the Brexit vote than the trade in durable goods. However, at a first glance the trends of the export and import of durable and perishable goods as shown in figure 3 seems rather similar. The slow growth of trade and the decrease in it after the Brexit vote are present in this time series,

but stronger than in the aforementioned one. This implies that the volume of trade might be stronger affected by the Brexit vote than the value of trade. The export and import of perishable goods follow a very similar trend, where the imports lag one month behind the exports. On top of that, the import of durable goods follows a trend that is comparable to the import of perishable goods. The export of durable goods follows a similar trend, but it develops more gradually than the other trade flows. On top of that, the trade in durable goods grew more than the trade in perishable goods with respect to the index' base year, 2013.

With respect to the Brexit vote, a noteworthy observation is that after it the trade in durable goods and the trade in perishable goods start to diverge. The trade in perishable goods decreases more than the trade in durable goods. Specifically, the import of durable goods slowly diminishes, until it starts to surge again in the last quarter of 2016. The import and export of perishable goods strongly decrease in the run-up to the Brexit vote as well, and recovered in the last months of 2016. The import of durable goods, however, follows a peculiar trend. Largely corresponding to the trend of the other trade flows, it however shortly recovers in August and September 2016, to fall again in October, and then return to the relatively high trade level of the last months of 2016 again. In short, it is particularly volatile.

Thus, it cannot be said that the Brexit vote decreased trade in durable goods more than trade in perishable goods. However, the Brexit vote has a clearly different impact on the imports of durable goods. If we interpret this volatility as a reaction to uncertainty, it is not unreasonable to interpret this volatility as a sign that the British importers are more uncertain about the effects of the Brexit than their foreign counterparts. This is a plausible interpretation, since the Brexit will most likely affect the United Kingdom more than other parts of the world. Conclusively, although the data rejects the second hypothesis, this does not imply that trade in durable and perishable goods is affected equally. Uncertainty might rather make trade volatile instead of decreasing it, and does then affect British customers stronger than foreign ones.

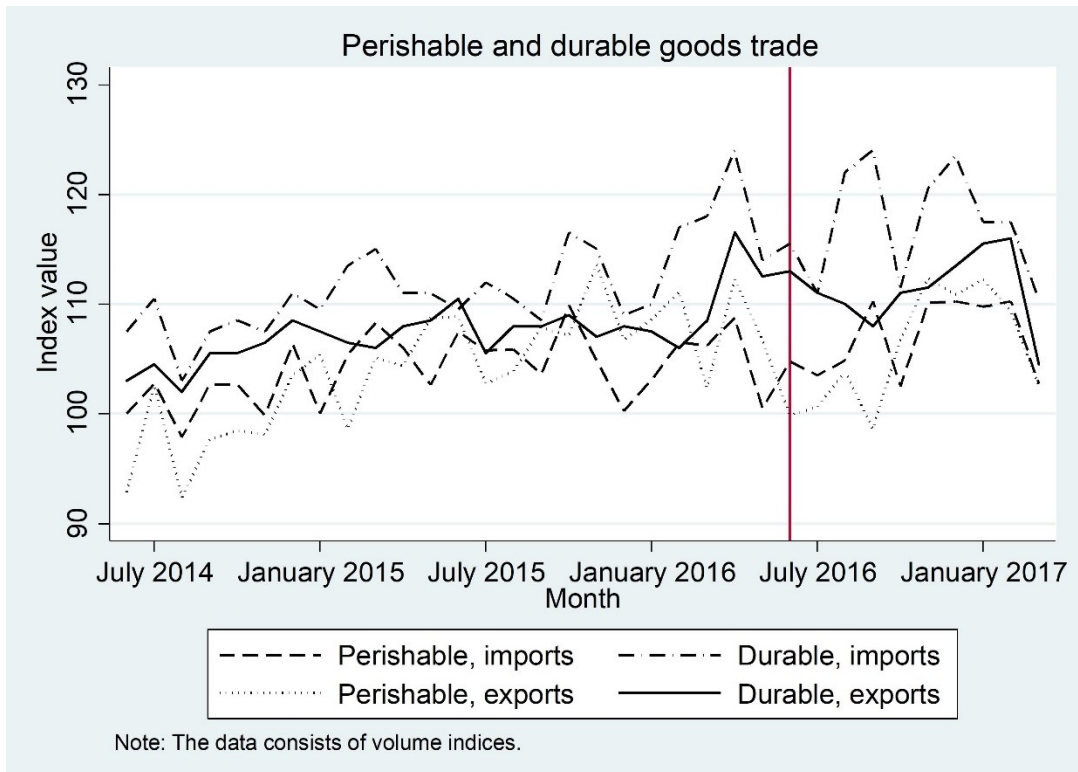


Figure 3: The development of the UK exports and imports of both perishable and durable goods, displayed separately. Note: The data consists of volume indices.

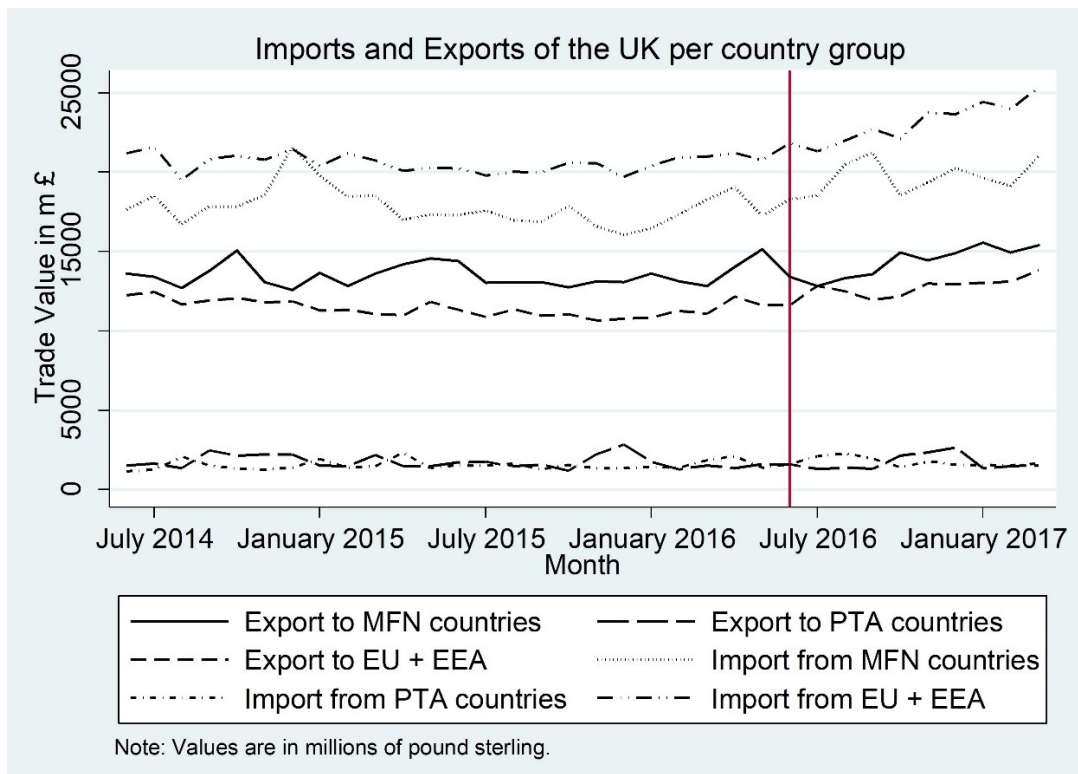


Figure 4: Import/Export to the different country groups. Note : The values are in millions of pound sterling. MFN stand for the Most Favoured Nations, PTA stands for countries with which the EU concluded a preferential trade agreement and EU stands for EU+EEA countries.

Export and import

Consideration of the import and export to different country groups, as shown in figure 4, yields the finding that the trade with the nations that the EU has concluded a preferential trade agreement (PTA countries) with is much smaller than trade with the other country groups. This is due to the fact that, on one hand the EU countries are the nearest and thus Britain's biggest trading partners, and on the other hand the MFN (Most Favoured Nations) countries include large industrial nations such as the USA and China.

Moreover, the trend that trade slowly increases in the first months, is not clearly visible in these graphs. Rather, the trade flows stay rather close to their initial index value. Meanwhile, an effect of the Brexit vote is visible. In the first months of 2016, there is clearly a small decrease in trade that precedes the Brexit vote. However, after the Brexit vote, trade starts to increase. The reason of this increase might be that the value of imports increased, due to the depreciation of the British pound. Since the trade volume stayed roughly the same, this might be one of the drivers of the increase in the trade value.

The third hypothesis predicts that exports will be affected less by the Brexit vote than imports. Therefore, the export and import time series in the graph have to be compared per country group. When the trade with the European Union is considered, it stands out that it is not strongly influenced by the Brexit. In the first months after the Brexit, imports decline somewhat, and exports increase. This effect disappears when some months have passed and both exports and imports increase, though. Therefore, it can be stated that the EU trade offers some support for the hypothesis, at least in the initial months. With respect to the PTA countries, it is visible that imports first increase after the Brexit vote, whereas exports stay the same. Then, exports increase, whereas imports return to their former level. In the last months of the analysis, both trade flows have approximately the same value. Thus, the analysis of trade with the PTA countries does not yield conclusive evidence about the differential effect of the Brexit vote, since the results are mixed. Consideration of the MFN trade yields the finding that exports initially decrease, whereas this is not the case for imports, which still increase after the Brexit vote. Exports recover after some months, though. On the whole, MFN imports increase more than MFN exports after the Brexit vote. This result, however, is also less important, since trade with MFN countries should be the least affected by the Brexit vote.

With these graphs, it is hard to establish whether or not exports are affected less by the Brexit vote. The changes in the most relevant trade flow do show some support for the

hypothesis, but the other trade flows do not do so. Therefore, the evidence is inconclusive, and the third hypothesis is rejected, in favour of the null hypothesis which states that effect of the Brexit vote does not differ between exports and imports.

Country groups

When figures 4 is considered again, but now with respect to differences between the country groups, it turns out that the trade flow with the countries with which the EU concluded a Preferential Trade Agreement (PTA) is much smaller than the other ones, as noticed above. On top of that, trade with the Most Favoured Nations (MFN trade) is of comparable size as trade with the European Union.

The fourth hypothesis, which predicts that trade with the EU is affected the most by the Brexit, trade with the PTA countries less, and trade with the MFN nations even less, seems to have some graphical support. As noticed above, the EU trade seems to be initially affected by the Brexit vote, but this effect is merely transitory. After some months, trade with the EU follows the general increasing trend again. Thus, a small initial effect of the Brexit vote on trade with the EU countries occurred apparently. The trade with PTA countries seems to be somewhat affected as well, since it does not increase significantly after the Brexit vote, as the t-tests in the last section pointed out. However, both PTA exports and imports peak in different months after the Brexit, although these increases are too small to be significant. Thus, the trend of PTA trade is contrary to the general increasing trend, since it can be classified as stagnation. With respect to the MFN countries, a decrease in exports after the Brexit can be noticed, but this decrease is reversed by the general trend, and is thus insignificant. On the whole, exports to MFN countries increased, as the t-test pointed out. MFN imports are not visibly affected by the Brexit vote, and continue their increasing trend. Therefore, it can be concluded that MFN trade is not really affected by the Brexit, as predicted by the hypothesis.

Conclusively, the data offers some support for the fourth hypothesis. MFN trade is not really affected by the Brexit vote, whereas trade with the PTA countries is stalled by the Brexit vote, and EU trade is somewhat affected. The fourth hypothesis is thus accepted. On the other hand, the dismissal of the first hypothesis implies that the effects of the Brexit vote in general are rather small.

Conclusion & Discussion

The Brexit vote created a lot of economic uncertainty, which has had some impact on the international trade of the United Kingdom. Its international trade declined in the run-up to the vote, but on the whole increased after it, which means that the effect of the uncertainty is rather small. This effect differed not significantly between perishable and durable goods with respect to their means, but did so with respect to their standard deviation: the volatility of the British import of durable goods increased significantly, whereas this was not the case for perishable goods. It turns out that imports and exports did not decline differently, though graphical analysis is insufficient to precisely distinguish the effect. Moreover, trade with the European Union seems to be affected the most, whereas trade with the PTA countries is affected somewhat, and trade with the Most Favoured Nations is not affected at all. Clearly, the economic uncertainty generated by the Brexit vote is not significant enough to strongly influence British trade. However, some effects of it are visible.

Thus, this paper finds that the uncertainty that was caused by the Brexit vote has a small and mostly negligible impact on British trade. This implies that the expected Brexit might be perceived as a threat for the international trade of the United Kingdom, but that businesses are not yet adapting their international affairs. Therefore, the British government is apparently given the trust that it might accomplish an economically successful Brexit. Whether this outcome is really achievable, is something that the future will tell the British traders and their foreign trade partners.

It should however be noted that the scope and the methodology of this research are limited. Firstly, the trade value time series are currently not corrected for any disturbing influence, such as inflation and the development of the exchange rate. Secondly, the Brexit vote is used as a coarse measure of an increase in uncertainty. An uncertainty index could be composed in order to obtain a detailed idea of the actual degree of uncertainty. Moreover, the descriptive analysis and the t-tests which were used are of limited depth. In order to profoundly assess the impact of Brexit uncertainty, a regression analysis would be very useful. However, this analysis should be aware of and accounting for the many confounding factors in trade, which make it hard to establish a plausible causal relationship. On top of that, more research into the effect of uncertainty on trade should be done. The existing literature is small, and the

prevailing theory has little empirical support. In order to really understand whether it pays off to reduce uncertainty, future research should be done into this subject.

Appendix A: Countries with whom the European Union concluded a preferential trade agreement (PTA countries)

As obtained from the European Commission (2017):

- Albania - Stabilisation and Association Agreement, 22 May 2006
- Bosnia and Herzegovina - Stabilisation and Association Agreement, 1 June 2015
- Georgia – Association Agreement, 1 July 2016
- Kosovo - Stabilisation and Association Agreement, 1 April 2016
- Macedonia - Stabilisation and Association Agreement, 1 April 2004
- Moldova - Association Agreement, 1 July 2016
- Montenegro - Stabilisation and Association Agreement, 29 April 2010
- Serbia - Stabilisation and Association Agreement, 1 September 2013
- Switzerland - Agreement, 1 January 1973
- Ukraine - Association Agreement, 29 May 2014
- Algeria - Association Agreement, 1 September 2005
- Egypt - Association Agreement, 1 June 2004
- Israel - Association Agreement, 1 June 2000
- Jordan - Association Agreement, 1 May 2002
- Lebanon - Interim Agreement, 1 March 2003
- Morocco - Association Agreement, 1 March 2000
- Palestinian Authority - Association Agreement, 1 July 1997
- Syria - Co-operation Agreement, 1 July 1977
- Tunisia - Association Agreement, 1 March 1998
- Cameroon – Interim Economic Partnership Agreement, signed on 28 February 2009
- CARIFORUM States - Economic Partnership Agreement, Provisionally applied
- Central America - Association Agreement with a strong trade component, 29 June 2012
- Chile - Association Agreement and Additional Protocol, 1 March 2005
- Colombia and Peru - Trade Agreement, 26 July 2012
- Ecuador - Trade agreement provisionally applied, 1 January 2017

- Ghana - Stepping stone Economic Partnership Agreement provisionally applied, 15 December 2016
- Ivory Coast – Economic Partnership Agreement provisionally applied, 3 September 2016
- Madagascar, Mauritius, the Seychelles, and Zimbabwe Economic Partnership Agreement, August 2009
- Mexico - Economic Partnership, Political Coordination and Cooperation Agreement, 1 July 2000
- Papua New Guinea and Fiji - Interim Partnership Agreement, May 2011
- South Africa - Interim Trade, Development and Co-operation Agreement, 1 January 2000
- South Korea - Free Trade Agreement, 13 December 2015

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