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THE COST OF BREXIT UNCERTAINTY: MISSING PARTNERS FOR FRENCH EXPORTERS

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Summary

More than three years after the unexpected Brexit vote of June 2016, there is still no exit agreement between the United Kingdom and the European Union. Although the conditions of Brexit and the corresponding economic consequences are still unknown, the referendum has already had a real economic impact. The long discussion surrounding Brexit can be seen as a long-lasting uncertainty shock, which has affected firms' investment decisions. In this note we use highly detailed customs data before and after the vote to measure the impact of Brexit on French firms' exports to the UK. We find that the referendum had no effect on average on the value of exports but depressed export growth in sectors such as transportation or chemical industries which are more upstream in value chains. The number of new trade relationships involving French exporters and British importers has significantly declined after the Brexit vote, in comparison with other destinations. This is consistent with the uncertainty shock reducing French firms' investment in their customer base, which is likely to penalize French exporters in the future. These results are suggestive evidence that uncertainty has a real cost and that any decision of delaying the Brexit further should compare the benefit of reaching a better deal with the economic cost induced by uncertainty. It is also important that the next EU-UK trade agreement should guarantee the stability and predictability of the trade policy that European exporters will have to face.

- The Brexit vote has generated a surge in uncertainty for the UK firms and the EU firms trading with them.
- The uncertainty has had a zero average effect on the value of French exports to the UK but a significantly negative impact on some industries which are more upstream in value chains (with more production stages left before final consumption).
- The formation of new trade relationships between French exporters and British importers has declined in the average product market. This will penalize French exporters in the future.
- Negotiations should balance the benefit of delaying and obtaining a better deal with the economic cost of uncertainty.
- The new deal should guarantee stability in future trade relationships which is even more needed as production now takes place through Global Value Chains.



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Introduction

On June 26th 2016, British voters have decided to leave the European Union, almost 45 years after their entry into the European Economic Community. Not much can be said yet about what will be the actual economic consequences of the country exiting the European Union, nor actually under what conditions the country will leave the free trade area.¹ But it is possible to estimate how the Brexit vote and the subsequent uncertainty, fueled by seemingly unproductive negotiations, have already affected the real economy in both the UK and the rest of the European Union.

Over the last three years, economic performances in the UK have been rather stable, with an annual growth of real GDP at 1.9% in 2017 and 1.4% in 2018. The unemployment rate has even decreased, from 5 to less than 4%. Still, the decision of the UK to leave the European Union has had consequences that will be costly in the medium to long-run. According to Bloom et al. (2019), British firms' investment has gradually declined by about 11% over the three years following the June 2016 vote, which has caused a reduction in UK productivity by 2 to 5%. They explain these patterns by the massive and long-lasting uncertainty shock for the UK and the rest of the European Union that followed the Brexit vote.

Uncertainty can have real effects on the economy through its impact on investment behaviours. In periods of high uncertainty, firms are reluctant to take decisions engaging them over the future, thus postponing investments (Dixit and Pindyck, 1994). These effects extend to trade decisions as developing a firm's foreign network requires to make specific investments which firms postpone when the future international environment is uncertain (Handley and Limão, 2017). Finally, the effect of uncertainty is magnified within "Global Value Chains", i.e. when goods are produced with a sequence of production stages spread across borders. The reason is that some firm-to-firm relationships within value chains involve a lot of specific investments such as tailoring the intermediate product to the specific needs of the producer in the next stage of the production process. Moreover, decisions at one

point of the chain can propagate along the chain.

By its size and its length, the Brexit vote offers a unique opportunity to study empirically the real economic effect of an uncertainty shock. In this note, we discuss its empirical impact on export decisions by French firms to the UK, France being one of the UK's major trading partners. We take benefit of highly detailed firm-to-firm trade data from French customs to study the network of trade flows linking French firms with the British economy, and the dynamics of two variables: the overall value of French exports to the UK and the number of newly-created trade relationships. Our results can be summarized as follows.

First, whereas Brexit was expected to depress trade, the post-referendum period does not feature a significant decline on average in the value of exports to the UK.² Exports of some final consumption goods have actually increased. This might be a consequence of British firms stockpiling to prepare for a possible hard Brexit that could temporarily disrupt the supply of foreign goods, in which case the effect is likely to be temporary.

Second, we find that such an effect varies according to the location in value chains. Sectors that are more upstream have suffered a contraction in exports. This is coherent with the fact that upstream relationships are more sensitive to changes in trade policy.

Third, we estimate a significant decline in the number of new trade relationships involving French exporters and British importers, immediately after the Brexit vote. This result is consistent with French firms being reluctant to invest in their British customer base given uncertainty about future trade policy. These "missing trade relationships" will prove costly for France's export performances over the medium run.³

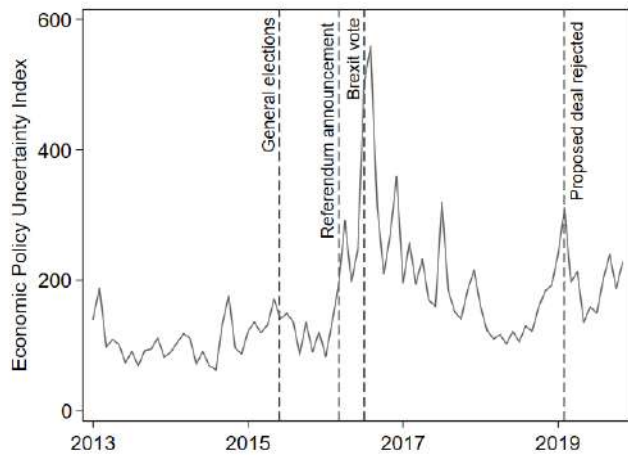
¹A large literature tries to evaluate the potential impact of Brexit on welfare through calibration exercises based on various scenarios. Dhingra et al. (2017) estimate the impact to vary between 1 and 3% less real consumption in the UK. The estimated impact on France varies between .3% and .6% of real consumption (Cornuet et al., 2019; Mayer, Vicard, and Zignago, 2019).

²This is true despite the depreciation of the pound, which has deteriorated French firms' relative competitiveness: in the British market, French imported products have become more expensive and therefore less competitive than British-made products.

³Using the same data, Lenoir and Patault (2019) show that in the medium to long-run, one can explain half the variance in exporters' growth by the rate at which firms develop their portfolio of foreign partners. Under-investing in its customer base is a drag in a firm's growth prospects.

Brexit as an uncertainty shock

Figure 1: Evolution of uncertainty as measured by the “Economic Policy Uncertainty” index



Source: “Measuring Economic Policy Uncertainty” by Scott Baker, Nicholas Bloom and Steven J. Davis at www.PolicyUncertainty.com.

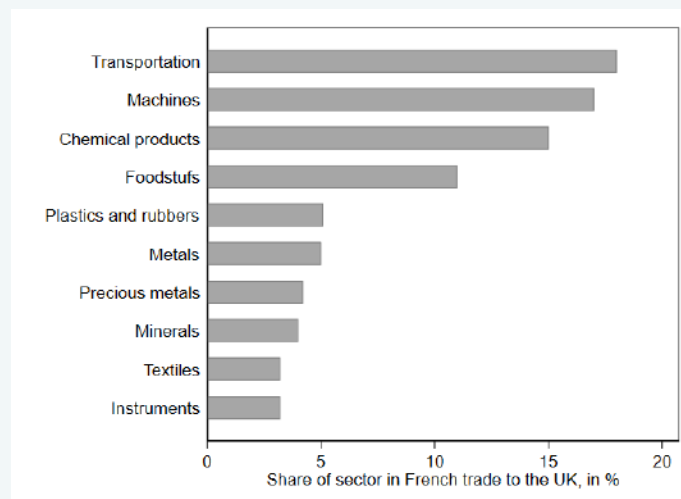
Figure 1 shows the evolution since 2013 of the UK “Economic Policy Uncertainty” index computed by Baker, Bloom, and Davis (2016).⁴ The figure shows a break around the date of the referendum, with an increase in the level and volatility of the index. Uncertainty has first increased after the announcement of the referendum in February 2016, before peaking when the results have been announced, on June 26th. Since then, uncertainty has fluctuated, decreasing steadily in 2017 to start raising again at the end of 2018, when the UK parliament has voted against ratifying the proposed withdrawal agreement. This long period of uncertainty has had important consequences for firms conducting business in or with the UK.

⁴The index uses text-analysis techniques to identify and compute the frequency of appearance in newspapers of a family of words related to uncertainty.

Box 1 : Anatomy of French exports to the UK

In 2017, France has exported about 32B euros to the UK. This amounts to 7% of French exports, making the UK the fourth destination in the EU for French exporters after Germany, Italy, and Spain. The French economy is thus highly exposed to economic developments on the other side of the Channel.

Composition of French exports to the UK



Source: Observatory of Economic Complexity at www.oec.world. Data are for 2017.

French exports to the UK are widely diversified as shown in the above histogram which displays the share of various sectors. Ten broad sectors account for 85% of French exports to the UK. Transportation is the most represented sector (18%), with aircraft, cars, and trucks being among the most exported products to the UK. Machines are the second most exported category (17%), in which engines and part of engines are the most traded. Third comes chemical products, including drugs which represent 3% of French exports to the UK. Foodstuff ranks fourth in this list, with grape wines being the most important item within this sector. Jewelry products which are part of precious metals account alone for 3.7% of French exports to the UK.

Data and Methodology

The data used is provided by the French customs and covers the period from 2011 to 2017. This data includes each single export transaction between all French firms and their individual partners in the European Union (restricted to trade in goods). Each transaction is characterized by a product category at the 8-digit level of the European nomenclature which covers more than 8,000 different products. We also have information on the date of the transaction at the monthly frequency, as well as the value and volume of the transaction. Importantly, both firms involved into the transaction are identified by a time-consistent identifier.

Most of the analysis focuses on transactions involving exporters in France and their partners in the United Kingdom. Between 2011 and 2017 this represents 20,750

different French exporters that interacted with 103,863 British importers. In the rest of the note, we call a “trade relationship” a series of transactions involving a particular French firm and one of its clients for a particular product. There are about 1.2 million such trade relationships, that we observe on average over 6.7 different transactions.⁵ Among France’s most important export flows to the UK, one can mention transport equipment, machines, in particular engines, and drugs (See details in Box 1).

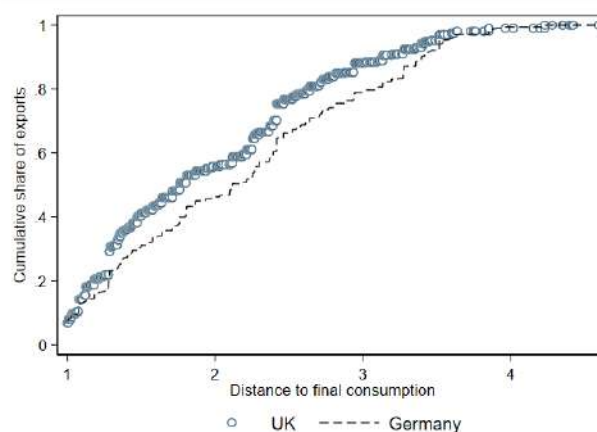
Such data offer a unique opportunity to study transactions within global value chains. In this context, we interpret French exporters as upstream firms selling their output to downstream foreign partners. Unfortunately, it is not possible to observe the rest of the value chain,

⁵A caveat of this data is that intra-firm trade cannot be identified. This means that some of these trade relationships can take place between affiliates of the same multinational company.

Box 2 : French exports to the UK along the value chain

An increasing feature of international trade is that trade flows take place within value chains, i.e. sequences of production steps in which output produced at an upstream stage is used as intermediate consumption in the production of the next stage. The international trade literature increasingly discusses the specialization of countries in terms of their position in value chains.

French exports to the UK and Germany : average distance to final consumers



Interpretation: 55% of French exports to British firms are products with a distance to final consumption below 2 i.e. are either sold to final consumers or to firms that use the French product to produce a final consumption good, compared to only 45% of French exports to Germany.
Source: Customs trade data, export flows at the firm-to-firm level and distance from final consumption computed by Antras et al. (2012).

The above figure displays a cumulative distribution of French exports to the UK and to Germany as a function of the product average distance to final consumers. Distance to final consumers is measured in Antras et al. (2012) and should be interpreted as the number of stages between the production stage and the final consumer. A product that has a distance to final consumption of one is exclusively sold to final consumers while at four, the product is on average used in a value chain that has four more stages before reaching the final consumer.

On average, French exports to the UK are relatively low in value chains, with almost 55% of products that have a distance to consumers below 2. In comparison with exports to Germany, exports to the UK are less upstream on average. Examples of products that are very downstream in value chains in which France has a competitive advantage include luxury goods, food products and drugs.

i.e. production stages that take place upstream the French firm or downstream its European partner before reaching the final consumer. We use information on the type of product being traded to infer the firm's position in the value chain. Some products like food or drugs are directly sold to final consumers, while other goods such as chemical products tend to enter value chains more upstream. Using a systematic classification of products in terms of their average distance to final consumer, it is thus possible to infer the average position of the corresponding transactions in Global Value Chains (See details in Box 2).

In order to identify the effect of the raise in uncertainty that followed the Brexit vote, we first compare the dynamics of trade before and after the vote in June 2016: it is the simple design of an *event study*. All regressions control for product-month fixed effects to account for the seasonality of product-level sales. The dynamics of exports to the UK observed after the referendum may however reflect other trends affecting French firms during this period. To isolate the specific effect of uncertainty linked to Brexit, we also estimate the impact of the Brexit vote in a *difference-in-difference* setting. Namely, we estimate whether the post-referendum dynamics of French exports to the UK is statistically different from the dynamics of exports to other EU destinations. These other destinations, which are supposedly affected by the same trends in trade as the UK, but are not affected by the uncertainty shock, constitute a *control group*. If uncertainty surrounding the Brexit has an impact on French firms' exports, we shall observe that exports to the UK display statistically different dynamics than exports to the control group. For comparability purposes, we use the other four main partners of French firms, namely Belgium, Germany, Italy and Spain, as control group.

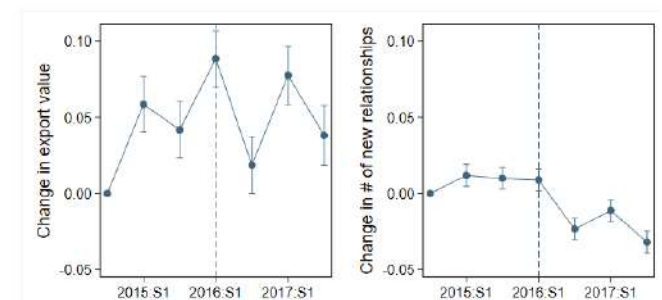
Our main outcome variables are the value of bilateral trade and the number of new trade relationships between firms. A new trade relationship is identified by the first transaction involving a particular pair of French and British firms. All these variables are defined in levels, per product and per month, and transformed into logarithms before being introduced in the regressions.

Evidence on the trade impact of Brexit

Figure 2 shows the evolution of the value of exports (left panel, in log) and of the number of new trade relationships (right panel, in log) before and after the Brexit vote.

Point estimates on these graphs can be interpreted as percentage growth from the 2014 values. Consider first the dynamics of exports, illustrated in the left-hand side graph. Although the value of trade has slightly increased on average, it has been rather volatile over the period of analysis, both before and after the shock. While it has decreased immediately after the Brexit vote, it has then recovered almost entirely in 2017. Part of the recovery may be attributable to British firms constituting inventories of French products to prepare for potential disruption in their value chain in case of a Brexit agreement.

Figure 2: French exports and the Brexit uncertainty Event study



Interpretation: In comparison with 2014, the value of exports to the UK was 8% higher at the end of the first semester of 2016 (on the dashed line), to go back to roughly the same value as in 2014 six months after the vote.
Note: Regressions include product \times month fixed effects to control for the seasonality of trade. The left-hand side graph shows the evolution of the value of trade while the right-hand side measures changes in the number of new firm-to-firm relationships (both in relative terms with respect to the second semester of 2014).
Source: Customs trade data, export flows at the firm-to-firm level.

Whereas the impact of the Brexit vote on the growth of bilateral exports is unclear, the right panel in Figure 2 shows a clear break, in the aftermath of the vote. This graph displays the evolution in the number of new trade relationships that French firms have established with British partners before and after the referendum. The number of these new trade relationships is significantly reduced, by about 2.5%, in the second half of 2016, in comparison with the pre-referendum numbers. Since then, these numbers have not recovered and may even have further contracted. Further statistical tests suggest that these missing trade relationships are not diverted to other trade destinations.

While these statistics are useful, they do not say much about the trade effect of Brexit, since they cannot be compared with the dynamics of trade that would have been observed in the absence of the uncertainty shock. In Table 1, we use other popular destinations of French exports as a control group.

For comparison purposes, columns (1) and (3) reproduce

Table 1: French exports and the Brexit uncertainty
Difference-in-difference estimation

Outcome variable	(1) Export Value	(2) Export Value	(3) # New relationships	(4) # New relationships
Post Brexit	0.016** (.005)	0.032*** (.003)	-0.026*** (.002)	-0.006*** (.001)
Post × UK trade		-0.009 (.007)		-0.012*** (.002)
Sample	UK	Top 5	UK	Top 5
Country FE	No	Yes	No	Yes
Product-Month FE	Yes	Yes	Yes	Yes
Observations	256,027	1,403,526	256,027	1,403,526

Interpretation: When including Belgium, Germany, Italy and Spain in the estimation sample (column (2)), the value of exports is found to have grown by 3.2% after Brexit. The estimate on the second line of column (2) shows that the dynamics of exports to the UK is not statistically different from the overall effect.

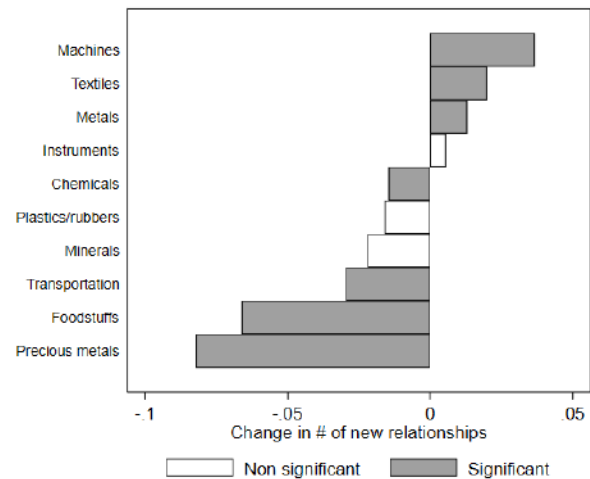
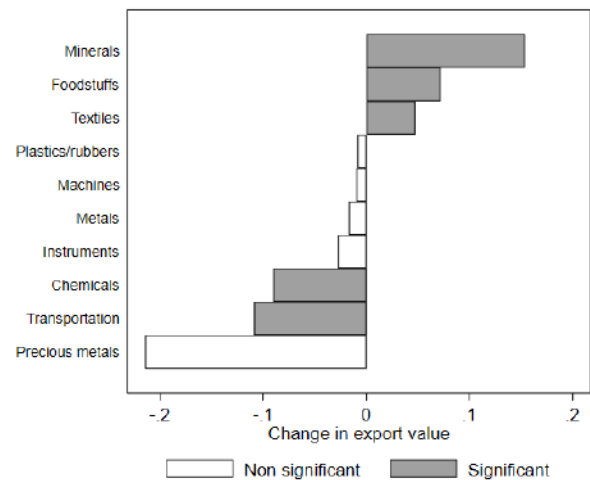
Note: "Post Brexit" takes the value of one after June 2016, "Post Brexit × UK trade" takes the value of one after June 2016, for all trade relationships between France and the UK. All regressions include product × month fixed effects to control for the seasonality of trade. ** and *** denote significance at the 5 and 1% level. **Source:** Customs trade data, export flows at the firm-to-firm level, period 2014-2018.

the average results of Figure 2.⁶ Columns (2) and (4) display results of the difference-in-difference estimation. The value of bilateral trade from France to its main European partners has increased post-Brexit, by 3.2% on average. However, the dynamics of French exports to the UK is not significantly different than for other destinations of French exports.⁷ From this, we conclude that the Brexit vote has not had a significant impact on the dynamics of overall trade. We now turn to the analysis of the establishment of new trade relationships involving French and British firms, namely the extensive margin. As shown in column (4), the establishment of new trade relationships has substantially declined, by 1.2 percentage point more in the post-Brexit UK than in the control group.

Figure 3 illustrates how the consequences of Brexit vary across sectors. The average effects displayed in Table 1 hide a substantial degree of heterogeneity. In value terms, the impact of Brexit is found significantly negative in the transportation and chemical industry while positive for mineral, food and textile products (Figure 3, top panel). When the variable of interest is the number of new trade relationships as in the bottom histogram of Figure 3, we see that the majority of sectors display a negative effect, i.e. a decrease in the number of new trade relationships in the post-Brexit period, relative to the control group. The impact is especially strong for food products and precious metals, two industries in which the contraction of new

trade relationships is beyond 7%.⁸

Figure 3: French exports and the Brexit uncertainty
Sectoral results



Interpretation: The impact of Brexit on the value of sectoral trade varies between +15% for mineral products to -21% for precious metals. The large and negative growth rate for precious metals is not statistically different from zero.

Note: These figures report the estimated impact of Brexit recovered from the estimation of the difference-in-difference model sector-by-sector. Regressions include product × month fixed effects to control for the seasonality of trade. Each bar shows the estimated impact of Brexit on the growth of trade (upper panel) and new trade relationships (bottom panel). "Non significant" means that the coefficient is not statistically different from zero.

Source: Customs trade data, export flows at the firm-to-firm level, period 2014-2018.

Heterogeneity is further investigated in Figure 4: it illustrates how the impact of Brexit varies along value chains. Namely, we compare the impact of Brexit across French products that differ in their average distances to final consumers (See Box 2). The left panel shows that the impact of Brexit on the value of trade is strongly heterogeneous along the value chain. Product markets that are relatively close to final consumers such as food products or clothing, are more exported in the aftermath of the Brexit vote, which may be due to the previously mentioned stockpil-

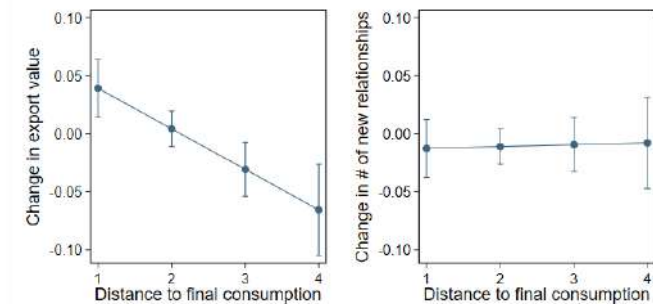
⁸The effect is positive for a few sectors, but the magnitude of the variation is lower.

⁶For example, Column (1) compares the mean value of trade to the UK after the referendum to its value prior to the referendum

⁷It has to be noted that this result is somewhat sensitive to the definition of the control group. The value of trade towards the UK is indeed found to decline post-Brexit vote, in comparison with exports towards Spain and Italy. The reason is that exports towards these two destinations have grown more than in the rest of the EU in the post-Brexit period.

ing effect. At the opposite side of the spectrum, products that enter upstream in value chains (e.g. chemical products) display significantly negative export growth rates. The impact on new trade relationships is instead constant along the value chain (right panel).

Figure 4: French exports and the Brexit uncertainty
Along the value chain



Interpretation: Along the value chain, the impact of Brexit varies between a significant increase of the exported value of around 4% in industries that are one stage away from final consumers to a significant decrease of 6.6% in product markets that are four stages away from final consumers.

Note: The left panel uses the value of trade as outcome variable while the right panel focuses on the number of new trade relationships.

Source: Customs trade data, export flows at the firm-to-firm level and distance to final consumers from Antras et al. (2012).

Policy implications

Whereas the value of French exports to the UK has not been severely impacted yet, the rate at which new trade relationships between French and British firms are established has significantly declined. The missing trade relationships will have further consequences for exporting firms' growth over several years, since building a customer base is a key determinant of exporters' success. Delaying the Brexit may have helped the EU and the UK negotiate a smoother transition from the free trade area to a future trade agreement. However, any additional delay also has costs that shouldn't be ignored.

Understanding through which mechanisms uncertainty creates such a cost is all the more important as uncertainty will not disappear at the signature of the exit agreement. Then negotiations will continue, moving to the trade deal between the UK and the EU, whose benefit does not only depend on the level of tariffs. Details of the future deal's design will have important consequences for trade, especially at upstream levels in value chains. Readability is a first-order concern, as well as the foreseeable nature of the treaty which should be a key aspect of the future trade agreement between the UK and the EU to avoid adjustment costs. Finally, it is essential that the treaty ensures

the stability of the trade policy.⁹ A stable trade agreement should induce a long-lasting reduction in the level of uncertainty that will prevent the economic costs from lasting longer.

Reference study

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⁹A nice illustration of this principle can be found in Handley and Limão (2017). The authors show that trade barriers for Chinese firms exporting to the US have not decreased after China entered the World Trade Organization because the country was already enjoying the "Most-Favored Nation" status before its entry. Still, the trade agreement has had a massive impact on Chinese exports to the US. The reason is that, after entry, Chinese exporters were no longer at threat of losing this status as was the case before, when the Congress was voting each year over this status.

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