

# Short-Term Impact of Brexit on the United Kingdom's Export of Goods

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## Abstract

The short-term impact of Brexit on goods exports is assessed using the Overall Trade Restrictiveness Index of the United Kingdom's major trading partners. The analysis shows that in the short run, leaving the European Union may cause the United Kingdom's exports to the European

Union to decrease by 2 percent, and the prospect of a major trade collapse post-Brexit is unlikely. This is because the European Union's Most Favored Nation (MFN) tariffs are higher on products that are less responsive to tariffs, and lower on products that are more responsive to tariffs.

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# Short-Term Impact of Brexit on the United Kingdom's Export of Goods\*

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# 1 Introduction

On June 23, 2016, UK voters stunned the world by deciding to leave the EU. The news sent the British pound to a 30 year low, stock markets plummeted as much as 8 percent around the world, and David Cameron resigned as the Prime Minister. The vote result went against the advice of many experts. In fact, most economists thought that Brexit was a bad idea (see Baldwin, 2016). Some actually predicted a big short-term drop in trade and income per capita post-Brexit (see Dhingra, Ottaviano, Sampson and Van Reenen, 2016). More than a year has passed, contrary to these experts' advise, the exports of UK to the EU have in fact increased by 2 percent since July 2016.<sup>1</sup> While the full impact of Brexit is yet to show, particularly because the UK has not yet officially left the EU and thus currently still enjoys the tariff free access to the EU market, there are reasons to be optimistic even after the divorce is finalized.

This paper analyzes the short-term fallout of trade in goods from Brexit, through potential changes in the trade policies of its main trading partners. We construct the Overall Trade Restrictiveness Index (OTRI) of the UK's major trading partners.<sup>2</sup> Our analysis shows that in the absence of any trade agreement between the UK and the EU post-Brexit, facing the EU's Most Favored Nation (MFN) tariffs could cause the UK's export of goods to the EU to drop by 2 percent. The impact is not larger because the higher tariffs are placed on the less elastic products that the UK exports, while the lower tariffs are placed on the more elastic products that the UK exports. The negative relationship between the MFN tariffs and demand elasticity softens the potential collapse in the UK's exports of goods to the EU, in the event the UK and the EU fail to strike any trade agreement post-Brexit. We assume

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<sup>1</sup>Data source: Eurostat.

<sup>2</sup>The OTRI was developed in Kee, Nicita, Olarreaga (2008 and 2009) based on the theoretical foundation of a series of seminal work by Anderson and Neary (1992, 1994, 1996, 2003 and 2007). More recently, Kee, Neagu and Nicita (2013) has used the OTRI framework to quantify the minimal impact of trade policies in causing the global collapse in trade in the aftermath of the financial crisis in 2008.

that there are no further compliance costs associated with the existing NTMs facing UK firms should the UK leave the EU.

It should be noted that this paper will not talk about services trade, “passporting” and the role of London as a financial center post-Brexit, or immigration and the social aspect of Brexit.<sup>3</sup> It also will not speculate about the optimal timing to invoke Article 50 and “soft Brexit”. Finally the long-run impact of Brexit could depend on whether the UK can continue to retain and attract foreign direct investment, which surely will shape the UK’s exports for years to come, which is beyond the scope of the current paper. Recent firm survey evidence from Bloom and Mizen (2017) suggests that while most firms expect a negative impact of Brexit on sales, investment and costs, only larger firms and those that are more exposed to international markets are likely to think that they might move part of their business abroad. Thus, there are reasons to be optimistic post-Brexit.

The paper proceeds as follows. Section 2 briefly describes the theoretical framework underpinning OTRI. Section 3 provides a data description for the paper. Section 4 presents the OTRI of the UK’s major trading partners, while Section 5 concludes the paper.

## 2 Overall Trade Restrictiveness Index

The Overall Trade Restrictiveness Index (OTRI) summarizes the trade policies stance of a country. For a country,  $c$ , OTRI takes into account the trade responsiveness of all product  $n$ ,  $\varepsilon_{n,c}$ , with respect to its trade policy,  $T_{n,c}$ , weighted by its total import,  $m_{n,c}$ :

$$OTRI_c = \frac{\sum_n m_{n,c} \varepsilon_{n,c} T_{n,c}}{\sum_n m_{n,c} \varepsilon_{n,c}}. \quad (1)$$

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<sup>3</sup>For the impact of Brexit on services trade, please refer to Mulabdic, Osnago and Ruta (2016).

Trade policy includes both tariffs and the ad valorem equivalent (AVE) of non-tariff measures (NTM).<sup>4</sup> The OTRI was first developed in Kee, Nicita and Olarreaga (hereafter, KNO, 2008, 2009), based on Feenstra's (1995) partial equilibrium simplification of the theoretical framework of Anderson and Neary (1992, 1994, 1996, 2003 and 2007).<sup>5</sup> It measures the uniform ad valorem equivalent tariff that could replace the current tariff and NTM structure, while keeping the trade volume of a country constant. KNO (2008, 2009) further include the AVE of NTMs in trade policy. Hence, the basic ingredients for the calculation of OTRI are import value, trade elasticities, tariff and AVE of NTMs at Harmonized System (HS) 6 digit-level.

HS 6 import demand elasticities were first estimated in KNO (2008), while the AVE of NTMs were estimated in KNO (2009). Based on these estimates, KNO (2009) constructed the OTRI of a wide range of countries and showed that NTMs contribute significantly to the level of trade restrictiveness, and developing countries tend to have higher trade barriers than developed countries. In a more recent paper, Kee, Neagu and Nicita (2013) used the OTRI framework to assess the role played by trade policy in the collapse of world trade between 2008 and 2009. They concluded that, while the rise in tariffs and antidumping duties may have jointly caused global trade to drop by US\$43 billion, it explained less than 2 percent of the collapse in world trade during the crisis period.

For our current application, we will construct the OTRI for the major trading partners of the UK, namely, the EU, US and China. Given the bilateral nature of the exercise, we expand the OTRI framework to allow for bilateral differences in trade policies and trade responsiveness. Specifically, the OTRI of a country,  $c$ , with respect to the imports from a

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<sup>4</sup>NTMs consist of Sanitary and Phytosanitary Measures, such as requirements on labeling, hygiene, maximum pesticide residue limits and testing; as well as Technical Barriers to Trade, such as requirements on labeling, product quality, packaging, and certifications, as well as other measures.

<sup>5</sup>Anderson and Neary's work focuses on general equilibrium feedback of tariffs, Feenstra's simplification focuses on partial equilibrium and ignores the substitution or income effects of import demands when the tariff changes.

partner country,  $p$ , is the weighted average of its bilateral trade policy,  $T_{n,c,p}$  on all imported products,  $n$ , with their weights reflect the size of their imports,  $m_{n,c,p}$ , as well as their respective bilateral import demand elasticity,  $\varepsilon_{n,c,p}$  :

$$OTRI_{c,p} = \frac{\sum_n m_{n,c,p} \varepsilon_{n,c,p} T_{n,c,p}}{\sum_n m_{n,c,p} \varepsilon_{n,c,p}}. \quad (2)$$

For the relevant bilateral import demand elasticity,  $\varepsilon_{n,c,p}$ , we will utilize the most recent estimates facing UK exports in these markets from Kee and Nicita (2017). These bilateral import demand elasticities are estimated from product level quantity-based gravity regressions, jointly with bilateral AVE of NTMs. The econometric model also takes into account the large presence of zero in the bilateral trade statistics, and at the same time uses instrumental variables to address the endogeneity issues of tariffs and NTMs. Based on these estimates, we assess short-term trade impacts based on the potential changes in tariffs and NTMs in these markets post-Brexit according to the first difference of Eq (2):

$$\Delta OTRI_{c,p} = \frac{\sum_n m_{n,c,p} \varepsilon_{n,c,p} \Delta T_{n,c,p}}{\sum_n m_{n,c,p} \varepsilon_{n,c,p}},$$

where bilateral imports will be kept at the current, pre-Brexit level to isolate the trade policy impacts on trade flows. The total impact of trade due to potential trade policy changes will be

$$\Delta m_{c,p} = m_{c,p} \bar{\varepsilon}_{c,p} \Delta OTRI_{c,p}, \quad (3)$$

with  $m_{c,p}$  and  $\bar{\varepsilon}_{c,p}$  measure the aggregate imports and import weighted trade elasticity of country  $c$  with respect to imports from partner  $p$ . We will use data on 2016 to calculate trade impact according to Eq (3) .

### **3 Data**

Data used in this study come from UN-Comtrade for HS 6 digit-level import and export data, and UNCTAD TRAINS for tariff and NTM data. Most of the NTM data were collected around 2015/2016, so that determines the year coverage of the sample used in the analysis. Figure 1 presents the time series plot of the UK's exports by destination country from 2000 to 2015. The EU is by far the top destination market for the UK exports, even though its importance has steadily declined over time, from about 60 percent in 2000 to 44 percent in 2015. The US has absorbed about 15 percent of the UK's exports throughout this period, while China is gaining from 2 percent to close to 10 percent. Figure 2 presents the export profile of the UK by sector. Machinery, Chemical Products and Transportation jointly accounted for more than half of the UK's export in 2015. Table 1 presents the some summary statistics that capture the trade policies of the UK's main partners. With the exception of the EU, both the US and China do not currently give tariff preferences to the UK's exports. Products from the UK enter the US and China facing the Most Favored Nations (MFN) tariff with no preferences. The EU on the other hand gives full preference to the UK's exports under the EU Single Market arrangement, so products from the UK enter the EU with no tariffs.

### **4 Overall Trade Restrictiveness Index of UK's Main Partners**

Table 2 presents the OTRI of the UK's main trading partners, based on trade elasticity and AVE estimates from Bown, Kee and Nicita (2016). For details about the estimations of trade elasticity and AVEs, please refer to that paper. For the EU, the import-weighted average



MFN tariff is 3 percent, while the import weighted AVE of NTMs is 3.4 percent. However, given that the UK currently is part of the EU Single Market, the OTRI in the EU facing UK exports is 0. Both the US and China impose MFN tariffs on UK exports. For the US, the import-weighted average MFN tariff is 1.2 percent, while for China, it is 5 percent. When factoring in import demand elasticity and AVE of NTMs, the OTRI of US and China facing UK exports is 0.5 percent and 2.4 percent respectively.

Table 3 presents the potential trade impact of Brexit in the short run, according to Eq (3). Here we assume that no new trade agreements will be signed between the UK and its partners, so the UK's exports will face MFN treatment in all markets. For the US and China, nothing will change in terms of tariffs and NTMs, so the potential trade impact is zero. For the EU, moving from no tariff to MFN tariff will lead to the OTRI to increase to 0.93 percent, which may cause trade to decrease by almost 2 percent, which is equivalent to a loss of USD\$3.14 billion. The short-term disruption in trade due to trade policy is likely to be small: the OTRI of the main partners are low, even after factoring in possible compliance costs of NTMs facing the UK exporters in these markets.<sup>6</sup> The bottom line is that, without any new trade deals, UK exports to the EU may drop by less than 2 percent, while UK exports to the US and China may not be affected by Brexit in the short term, before any relocation adjustment of FDI.

It may be surprising that the short-run trade impact of Brexit is not larger. This is because OTRI can be decomposed into the sum of the import-weighted tariff (and AVEs) and the covariance between tariff (and AVEs) and import demand elasticity.<sup>7</sup> For the EU, the covariance between tariff and trade elasticity is negative, meaning higher tariffs are placed

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<sup>6</sup>It should be noted that NTMs consist of many different areas, including standards conformity and assessment, certification requirements and more. Currently UK firms exporting to the EU satisfy all their NTMs requirements. We assume that there are no further compliance costs associated with the existing NTMs should the UK leave the EU.

<sup>7</sup>Please see Kee (2007), which shows that OTRI equals import weighted average tariff and the import weighted covariance between tariff and trade elasticity.

on less elastic products (such as Transport Equipment, Plastics, Foods and Apparels), while lower tariffs are on the more elastic products (such as Pulp and Paper, Scientific Instruments, Precious Stones). This negative relationship between tariff and trade elasticity causes the EU's OTRI to be lower than its import-weighted average tariff, which leads to a smaller trade impact in the short run.

## 5 Concluding Remarks

This note constructed the overall trade restrictiveness facing the UK's goods exports in its major markets. Based on new estimates on trade elasticity and the ad valorem equivalent of NTMs, we show that the overall short-run trade impact on the UK's goods trade due to Brexit is less than 2 percent. This result assumes that the UK will not have any preferential access to the EU market and all its products will enter the EU, the US and China on the Most Favored Nations (MFN) basis. This result also assumes that in the short-run, firms and investments are not free to move across borders. The long-run consequences of Brexit most likely depend on whether the UK can continue to attract and retain its foreign direct investment.

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Figure 1: Exports of UK by Country

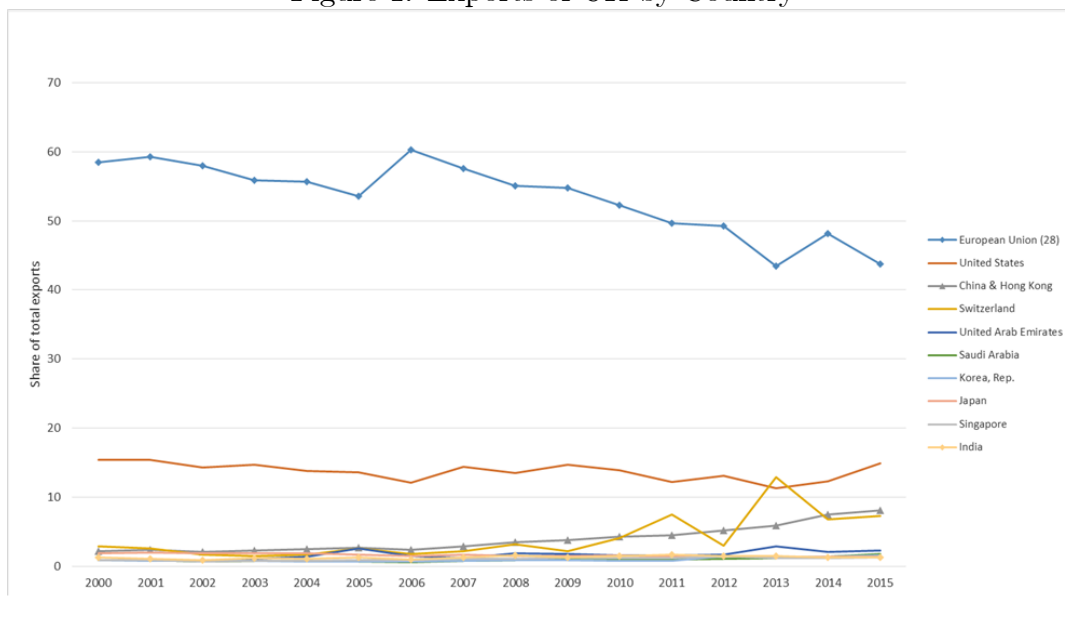


Table 1: Summary Statistics of Trade Policies of UK’s Main Partners

	EU	China	USA
Maximum MFN tariff ( percent)	74.9	65	350
Minimum MFN tariff ( percent)	0	0	0
Product subjected to positive tariff ( percent)	75	93	58
Maximum AVE ( percent)	1725	1627	1900
Minimum AVE ( percent)	0	0	0
Product subjected to positive AVE ( percent)	33	48	25

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Figure 2: Exports of UK by Sector

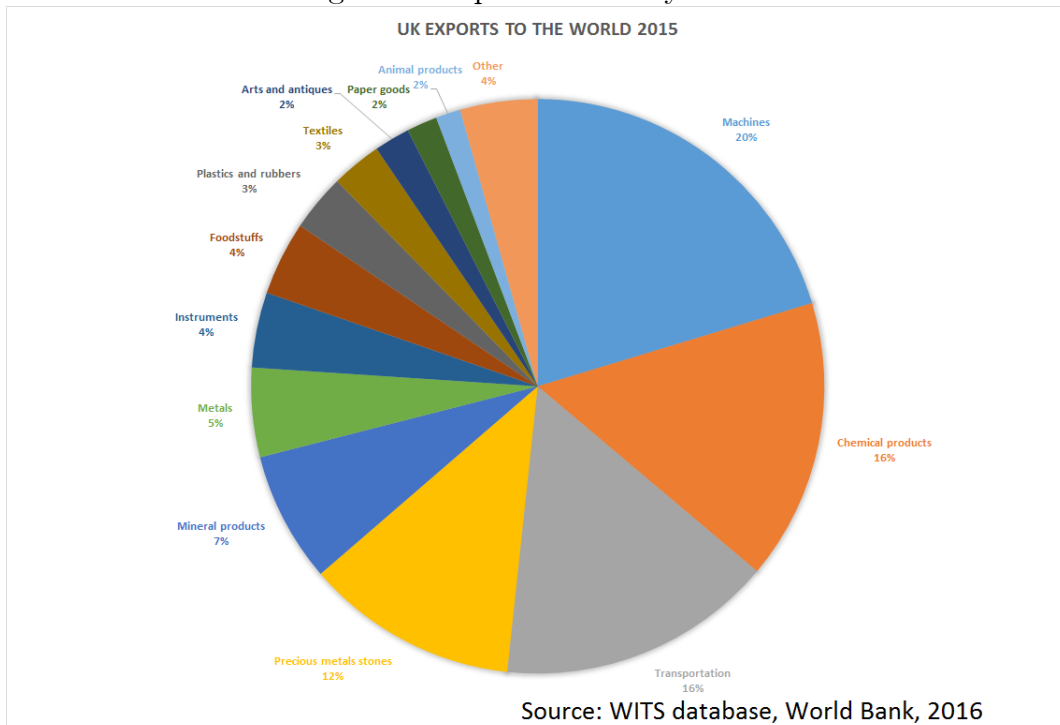


Table 2: Current OTRI of UK's Main Trading Partners

	EU	China	USA
Import Weighted Average MFN Tariff ( percent)	3.04	5.00	1.19
Import Weighted AVE ( percent)	3.43	1.31	4.50
Import Weighted Trade Elasticity	-2.11	-1.57	-1.29
Current OTRI ( percent)	0	2.38	0.53

Table 3: Potential Short-Run Trade Impact of Brexit

	EU	China	USA
Potential Change in OTRI post Brexit ( percent)	0.93	0	0
Potential Change in Trade post Brexit ( percent)	-1.96	0	0
Potential Change in Trade post Brexit (\$Billion)	-3.14	0	0