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If Nothing is Achieved: Who Pays for the Brexit?

The United Kingdom will depart from the European Union in March 2019. Numerous open questions remain about details and conditions especially with regard to post-Brexit EU-UK trade relations. In case of a negotiation failure, a "hard Brexit" could cause considerably high costs on both sides of the Channel. In the short run, companies will be charged more than 15 billion euro as tariffs. In the long run, UK-EU trade could be reduced up to 50 percent.

On 23 June 2016, the Brexit referendum gave the British electorate the choice to remain in the European Union, with its freedom of capital, goods, services and people as well as its budgetary requirements, or to leave it and redefine Britain's relationship with its former partners as well as with the rest of the world. Exactly what this new relationship between the EU and the UK will lock like is still murky. Recent cumbersome negotiations within Britain revealed little concrete strategy for the negotiations. After a hasty election failed to result in any clear Brexit mandate, Britain sought to buy additional time by declaring a presumably two-year transition period starting on 29 March 2019. However, this can only serve to give households and businesses more time to adapt, but not to prolong negotiations.

The instability and disorientation of the British negotiation position increases the risk of a hard Brexit that would cut off most ties with the EU in a more or less chaotic and sudden manner. In the newly-opened void, trade from across the Channel could be charged WTO tariffs, exposed to new non-tariff barriers (NTBs) comparable to those faced by US exporters to the EU, and cut off completely from market access for many service exporters in the British financial and legal sectors. In the face of this insecurity, businesses are starting to react and are increasingly deciding to pull out of the British market and relocate plants to the continent in order to prevent harmful frictions in their value chains.

From an economic point of view, it had always been obvious that splitting these two highly-integrated regions would create a lose-lose situation. Nevertheless, the jury is still out on who is going to pick up the tab – both on a regional and on a sectoral basis. A quick refresher on the development of trade within the EU clarifies the different interests in Anglo-Euro trade. While the EU27 prepare for the exit of one of the most important economic regions in the EU, the UK faces the loss of market access to all EU27 member states. Nevertheless, for the British, the EU market was never as vital as for export driven business models like that of Germany.

Figure 1 shows the share of goods-exports into the EU28 countries from Germany and the UK. Between the introduction of the European single market in 1993 and the introduction of the euro in 2002, German exports into today's EU28 countries quickly increased from 12% to 18% of GDP. As ten Eastern European economies entered the EU in 2004, the importance of the single market for German industry grew as intra-EU exports climbed to one quarter of its GDP in (pre-crisis) 2007. During this period of expansion and integration – prominently triggered by the UK – the importance of the EU market for British goods-exports remained relatively constant and finally declined to seven percent of GDP in 2016. Today, the EU27 market accounts for roughly 47% of all British exports and 57% of all German exports. For the UK, Germany is the second most important exportmarket, after the US, whereas the UK is Germany's third most important exportmarket, after the US and France.

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Figure 1
Share of goods exports into the EU

in % of GDP

Exports from Germany

Exports from the UK
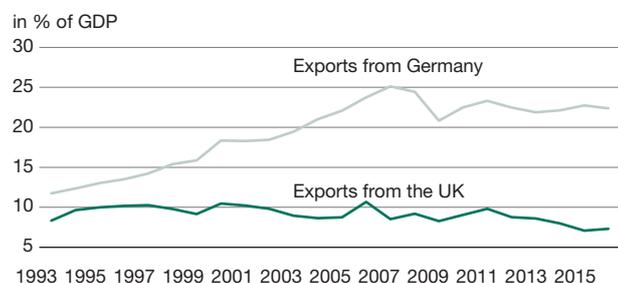
Source: Worldbank (WITS, WDI), own calculations.

Figure 2
European Value Chains, 2014

Note: Based on the national networks of gross value added in billion euro.

Source: M. Fritsch, J. Matthes: Factory Europe and its Ties in Global Value Chains, 2017, GED Focus Paper.

Germany's export boom is built upon its highly competitive manufacturing sector, which has made up 23% of its GDP since 1993. The German manufacturing sector strongly profited from new markets in Eastern Europe and China throughout the 2000s. Due to its geographical proximity to Eastern European intermediate manufactured goods suppliers and lower labour costs, Germany could take advantage of the newly created pan-European value chains on both the supply and demand side as both an exporter and importer of intermediate manufactured goods.[1] On the other side of the Channel, the UK, whose manufacturing sector has dwindled from 16% to 10% of GDP since 1993, profited less from continental integration and today plays a significantly smaller role in European production chains. The law of gravity still bears strong explanatory power in international goods trade relations (see Figure 2).

The importance of the German manufacturing sector is also reflected in its dominance in intermediate goods trade. The automotive sector is the prime example of this imbalance: 17.3% of value added in British automotive consumption originates in Germany, whereas only 3.2% of value-added in German automotive consumption originates in the UK. This same phenomenon can be observed, albeit to a lesser extent, in all manufacturing sectors.[2]

Focusing on the services sector, the importance of the EU market is only slightly higher for the UK (4.6% of GDP) than for Germany (4.1% of GDP). When one factors in the joint production between services and manu-

facturing, however, the trade picture again points toward a German advantage: German industry, already 23% of GDP, is enlarged by another net nine percent of GDP in intermediate services supply into the manufacturing sector. In the UK, this latter share is slightly negative; consequently, the services sector consumes more manufactured goods than vice versa. Hence, after incorporating these indirect effects for service exporters, the European market is more important not only for German manufacturing but also for the German services sector than for the British.

Political economy of a hard Brexit

Analysing the trade networks between the UK, Germany and the EU provides insight into the different interests at play in the negotiations. For Germany, the European Union and its single market are indispensable. Since an easy Brexit might incentivise copycats to cut a similar deal in the future, under no circumstances can the Union's integrity be put at risk by offering too lenient conditions to the United Kingdom. In the short run, however, German industry will suffer significantly, especially under a hard Brexit.[3] The manufacturing-intense regions in Germany face the highest Brexit exposure on the continent, with roughly five percent of GDP being directly or indirectly

1   M. Fritsch, J. Matthes: Factory Europe and its Ties in Global Value Chains, 2017, GED Focus Paper.
2   B. Busch: The network of production and supply links between British industries, the EU and Germany, IW-Report No. 23/2017.

3   B. Busch, M. Diermeier, H. Goecke, M. Hüther: Brexit and Europe's Future – A Game Theoretical Approach, IW policy papers No. 18/2016.

dependent on UK trade – compared to an exposure of up to 16% of GDP in British regions through EU27 trade.[4] In the end, British exposure might become even higher, as certain British services-exports could lose all market access.

Until now, the EU27 stood together quite monolithically and followed Michel Barrier's tough negotiation campaign. Rather than dividing the EU27, Brexit welded together the Union's member states. The recently negotiated financial framework for 2021 to 2027 is progressing in spite of the loss of British contributions to the EU budget.[5] Despite Margaret Thatcher's famed 1985 UK-rebate, British contributions remained significant: between 2010 and 2016, the UK had a net contribution of 9.4 billion euro to the EU budget annually.[6]

At first glance, the EU might ironically have an inherent financial incentive to negotiate a hard Brexit to close this hole in its budget; revenues generated from newly introduced tariffs, collected by the member states, are gathered into the EU budget. This convention adheres to the EU risk-and-revenue-sharing concept as internal countries would face disadvantages if tariff revenues were withheld at external borders only. To compensate countries for the costs of charging tariffs, the EU granted a 20% commission on all tariff revenues to the collector. This fee will be reduced to 10% in the next Multiannual Financial Framework. Thus, the EU will retain 90% of tariff revenues charged in its budget.[7] On the other hand, the UK will be able to fully withhold the tariffs charged on imports from the EU and will, in turn, gain a significant contribution to its own budget.

For the EU, tariffs charged on British products will somewhat compensate for the loss of British contributions to the EU budget. As with any tax or fee introduced, higher costs will be followed by a reduction in quantity – e.g. lower exports from the UK to the EU and vice versa. Higher tariffs might therefore not automatically result in higher revenues. Depending on the individual elasticity of substitution, consumers find cheaper alternatives that are not subject to such high tariffs and producers adjust their value chains, for example by supplying to customers via direct investments. From economic theory, domestic actors have different incentives to lobby for the introduction of tariffs. There is a revenue-seeking incentive for the redistribution of tariff revenues as well as a tariff-seeking incentive regarding the protectionism of domestic industries.[8]

The Brexit "Leave" campaign brought up arguments in line with both sides of this tariff discussion. Pro-Brexit campaigners posed such arguments as "USA imposes a 266% tariff on cheap steel allowing its own industry to thrive", and "As a sovereign nation, China is able to impose tariffs. Inside the EU we aren't. We are powerless […]". Such logic reflects the expectations that tariffs will protect domestic industries or even shift production to the UK. On the other hand, statements such as "By leaving the EU we could create a free trade deal with India, reducing tariffs and increasing exports", and "The great gain from leaving the EU is being able to remove tariffs", mirror the belief that cutting tariffs will increase the domestic country's competitiveness.[9]

The second bundle of arguments is more in line with the *Bremain* position arguing in favour of low trade barriers: "They've admitted that leaving will mean "higher tariffs" – now the "Leave" campaign must explain how UK businesses will be hit".[10]

Hard Brexit: First order effects

Assuming that actors need time to adjust to newly introduced tariffs, it can be expected that trade does not immediately react to higher prices, i.e. demand is totally inelastic. In the case of a hard Brexit, bilateral trade will fall back to WTO rules and tariffs. For the EU as a trading bloc, this would mean charging British companies a weighted average of 2.8% tariffs on a trade volume of

4 W. C h e n, B. L o s, P. M c C a n n, R. O r t e g a - A r g i l é s, M. T h i s s e n, F. v a n O o r t: The continental divide? Economic exposure to Brexit in regions and countries on both sides of The Channel, in: Regional Science, Vol. 1, No. 97, 2018, pp. 25-54; European Committee of the Regions: Assessing the impact of the UK's withdrawal from the EU on regions and the cities in EU27, 2018.

5 B. B u s c h, J. M a t t h e s: Neue Prioritäten für die Europäische Union, IW-Report No. 17/2018.

6 European Commission: EU expenditure and revenue 2014-2020, 2018, http://ec.europa.eu/budget/figures/interactive/index_en.cfm.

7 Bundesrat: Unterrichtung durch die Europäische Kommission – Vorschlag für einen Beschluss des Rates über das Eigenmittelsystem der Europäischen Union COM (2018) 325 final, Drucksache 168/18, 2018.

8 J. B h a g w a t i, T. S r i n i v a s a n: Revenue Seeking: A Generalization of the Theory of Tariffs, in: Journal of Political Economy, Vol. 6, No. 88, 1980, pp. 1069-1087.

9 LeaveEUOfficial: Available at https://twitter.com/LeaveEUOfficial/status/715138501835165697 (Accessed: 19 July 2018), 2016; LeaveEUOfficial: Available at https://twitter.com/LeaveEUOfficial/status/715923988019593217 (Accessed: 19 July 2018), 2016; LeaveEUOfficial: Available at https://twitter.com/LeaveEUOfficial/status/717396511227817987 (Accessed: 19 July 2018), 2016; LeaveEUOfficial: Available at https://twitter.com/LeaveEUOfficial/status/725652437479088129 (Accessed: 19 July 2018), 2016.

10 peoplesvote_hq: Available at https://twitter.com/peoplesvote_hq/status/704991494269243392 (Accessed 07 August 2018), 2016.

Figure 3
Hard Brexit first order tariff cost, by EU27 country

Total tariff cost in million euro, weighted effective tariff rate in percent
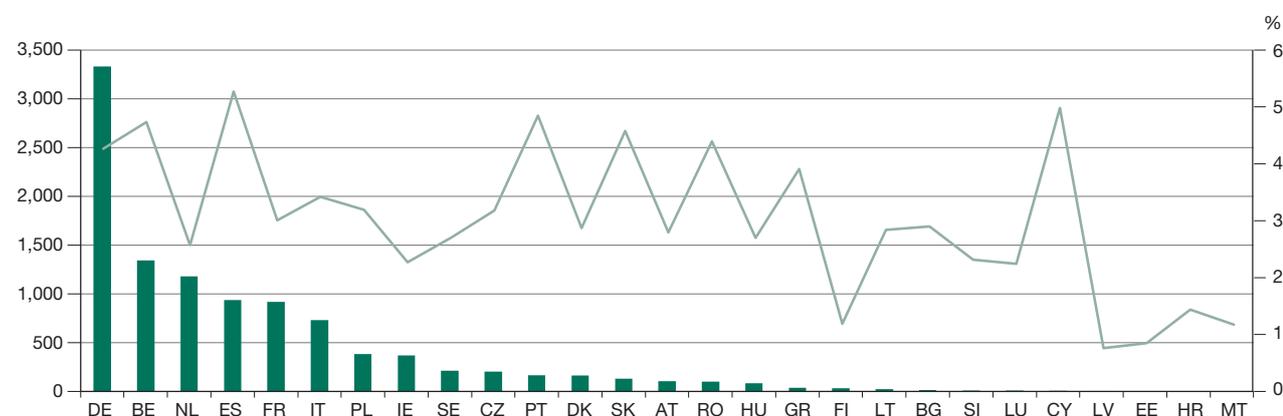
Sources: WTO, Eurostat, own calculations.

186 billion euro; correspondingly, it would be charged an average of 3.6% tariffs on its 294 billion euro in exports.[11]

All in all, this results in tariff revenues of 10.5 billion euro for the UK and tariff revenues of 5.1 billion euro for the EU. Hence, assuming unchanged trade volumes, a hard Brexit will refund half of the loss of UK net contributions to the EU Budget. The higher tariff revenues for the UK compared to those of the EU stem from higher imports in general, and more specifically from importing goods with higher WTO tariff rates. In absolute terms, this shows a higher burden for EU than for UK companies. In terms of GDP, however, the tariff burden for UK companies is 2.5 times higher than for EU companies (0.08% of the EU27's GDP versus 0.22% of UK's GDP).

Figure 3 plots the total WTO tariff first order costs for the EU27 countries. Given its size and its strong bilateral trade link to the UK, the German export sector bears the highest total first order costs of 3.3 billion euro followed by 1.3 billion euro in Belgium and 1.2 billion euro in the Netherlands. In terms of GDP this reduces to 0.1% in Germany but amounts to 0.16% in the Netherlands and 0.31% in Belgium. Thus, in this specific regard, the Belgian ex-

porters are more strongly exposed to a hard Brexit than even the UK.

A relatively high total tariff sum can reflect a rather high weighted effective tariff rate – e.g. 4.3% in Germany and 4.7% in Belgium versus only 2.6% in the Netherlands – resulting from the sectoral trade composition. The vehicle sector faces especially high weighted WTO tariff rates of around 7.5% (UK), 8.4% (DE) or 9.7% (BE) depending on the HS six-digit level composition of the respective exports goods. Because the vehicle sector is the largest export sector in Germany, the UK, and Belgium, high WTO tariffs explain the high overall effective tariff rate. Conversely, in the Netherlands, pharmaceuticals are the most important export product. Since pharmaceuticals are basically tariff free under WTO ruling, the overall tariff rate for the Netherlands is low.

Table 1 shows the EU's (Table 1a) and Germany's (Table 1b) ten largest export sectors to the UK as well as the weighted effective tariff rate they will face under a hard Brexit (WTO) scenario. The tables also show the total first order tariff revenues generated for the UK. The combination of strong trade linkages and high tariffs mark the vehicle sector's Brexit exposure: Of the 10.5 billion euro in tariffs by the EU, the vehicle sector makes up 4.6 billion euro. Furthermore, of the 3.3 billion euro that German companies pay in tariffs, the German vehicle industry accounts for the lion's share, two billion euro.

In fact, when analyzing only direct trade linkages, German companies pay roughly one third of the total EU first order Brexit tariffs, and the German vehicles sector itself pays 20%. The effect is expected to be even higher once in-

Table 1
First order UK tariffs

a. First order UK tariffs charged from total trade with EU27					b. First order UK tariffs charged from trade with Germany				
Sector	Goods trade (in billion euro)	Weighted effective tariff rate (in percent)	Total tariff revenue (in billion euro)	Share of total revenues (in percent)	Sector	Goods trade (in billion euro)	Weighted effective tariff rate (in percent)	Total tariff revenue (in billion euro)	Share of total revenues (in percent)
Vehicles, etc.	54,256	8.47	4,594	43.7	Vehicles, etc.	24,096	8.48	2,044	61.3
Machinery and mechanical appliances, etc.	33,981	1.20	407	3.9	Machinery and mechanical appliances, etc.	10,962	1.30	142	4.3
Electrical machinery, etc.	25,673	1.04	266	2.5	Electrical machinery, etc.	5,152	1.20	62	1.9
Pharmaceutical products	22,811	0.00	0	0.0	Pharmaceutical products	4,742	0.00	0	0.0
Plastics, etc.	11,414	4.61	526	5.0	Plastics, etc.	3,425	4.84	166	5.0
Mineral fuels, etc.	10,294	1.87	192	1.8	Optical and medical equipment, etc.	2,519	1.05	26	0.8
Optical and medical equipment, etc.	8,533	0.95	81	0.8	Precious metals, etc.	2,034	0.46	9	0.3
Precious metals, etc.	6,000	0.85	51	0.5	Article of Iron or Steel	1,494	1.17	18	0.5
Organic chemicals	5,626	3.41	192	1.8	Aluminium, etc.	1,391	6.66	93	2.8
Beverages, etc.	5,141	0.77	39	0.4	Aircraft, etc.	1,207	1.54	19	0.6
Total	293,813	3.60	10,518		Total	78,101	4.30	3,331	

S o u r c e s : WTO, Eurostat, own calculations.

termediate goods imports from the UK into the EU27 automotive production are taken into account. The vehicle sector is the largest exporting sector for the UK, accounting for 12% of British goods exported into the EU27 and paying for a third of the British first order hard Brexit bill. As a result, value chain reshuffling will be observed during the following years should a hard Brexit occur, especially in the automotive sector. A hard Brexit would fundamentally reshape European value chains and undermine the progress of economic integration in the EU.

Scenario analysis: Second order effects

The first order effects constitute a simple benchmark for the short run Brexit implications especially regarding the potential amount of tariff revenues. Realistic estimations

of Brexit's trade implications, however, must take into account a certain reaction of the trading partners who face newly introduced costs. In order to have a more precise estimation of hard Brexit costs, non-tariff barriers have to be taken into account. A reasonable approximation of hard Brexit non-tariff barriers is the tariff equivalent of NTBs from EU-US trade.[12] Although trade in services is not subject to tariffs, it is affected by NTBs. This is of particular importance to the UK due to the important role of the British service industry.

We will now look at some of the HS2 aggregated tariffs and HS2 converted NTB for UK imports from the EU

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12 S. D h i n g r a , H. H u a n g , G. O t t a v i a n o , J. P e s s o a , T. S a m p s o n , J. V a n   R e e n e n : The Cost and Benefits of Leaving the EU: Trade Effects, in: Economic Policy, Vol. 92, No. 32, 2017, pp. 651-705.

and Germany on a sectoral basis.[13] The vehicle sector will take an especially hard blow as the European (German) exporter will be subject not only to tariffs of 8.47% (8.48%) but also to a NTB tariff equivalent of 10.8% (11.09%). Furthermore, sectors such as the pharmaceutical industry that face only marginal WTO tariffs will be subject to a NTB tariff equivalent of 10.8% for an average EU exporter and 8.5% for an average German exporter. This high NTB is partly due to the comprehensive EU regulation framework REACH for chemicals, which, after Brexit, may not be binding anymore for UK companies. The resulting difference in requirements for registration, authorization, labelling or packaging would increase costs.[14] In total, EU exporters would face NTB costs equivalent to 25.8 billion euro, which is 8.8% of their exports to the UK. British firms would face costs of 14.6 billion euro (7.9% of their exports to the EU). Wyman and Chance estimate the total cost of tariffs and NTB in the case of a hard Brexit to be around 27 billion pounds for British companies and 31 billion pounds for European companies.[15]

Nevertheless, for many NTB there is a strong incentive for the negotiating parties to come up with an intermediate solution – the UK articulated strong concessions in terms of unilaterally accepting EU regulations. Therefore, there are good reasons to assume that in the medium term, NTB between the EU and the UK will be lower than they are between the EU and the US. Dhingra et al. provide an optimistic case – in which 75% of potentially reducible NTB tariff equivalents costs drop out; and a pessimistic case – in which only 25% of potentially reducible NTB tariff equivalents costs drop out.[16] Thus, depending on the scenario, the tariff and NTB costs for European companies lie in the range of Wyman and Chance.[17]

Having an aggregated estimation of Brexit costs, the reaction of market participants in terms of trade reluctance can be approximated in a simple model incorporating trade elasticities. Unfortunately, trade elasticities differ significantly depending on the estimation method.[18] Caliendo and Parro estimate sectoral trade elasticities using data from 1993, the year before the introduction of NAF-

Table 2
Second order effects: Exports in percent of pre-Brexit exports, respectively

Exporting country	Effect incorporating NAFTA elasticities and 25% NTB	Effect incorporating country specific elasticities and 25% NTB	Effect incorporating NAFTA elasticities and 75% NTB	Effect incorporating country specific elasticities and 75% NTB
Begium	88.7	54.9	77.7	40.2
Greece	88.0	64.8	76.8	46.8
Lithuania	90.9	78.6	81.2	66.1
Portugal	84.9	57.0	77.9	44.7
Belgium	88.2	70.0	79.4	58.4
Spain	92.5	53.9	85.6	39.4
Luxembourg	89.4	80.9	78.3	70.1
Romania	93.2	57.8	88.4	41.7
Czech Republic	91.9	67.8	84.2	55.8
France	91.1	68.5	82.1	49.1
Hungary	89.9	72.7	81.5	57.9
Slowenia	89.6	76.3	81.6	65.2
Denmark	93.7	76.9	86.2	61.2
Croatia	88.6	77.6	71.9	54.6
Malta	87.9	77.7	67.4	50.6
Slovakia	91.5	53.1	84.2	43.3
Germany	89.9	57.2	80.6	42.9
Italy	92.3	67.5	84.7	52.6
Netherlands	89.6	76.6	76.6	59.8
Finland	91.2	87.8	81.7	76.1
Estonia	90.6	87.9	76.5	73.7
Cyprus	95.9	55.7	90.9	36.9
Austria	90.4	72.4	81.8	57.6
Sweden	92.1	76.4	83.9	65.7
Ireland	90.3	75.3	76.5	50.5
Latvia	85.6	82.9	61.0	57.2
Poland	90.4	70.8	81.5	54.3
EU	90.4	65.4	80.6	49.6
UK to EU-27	90.6	70.1	80.5	53.0

13 WTO; S. Dhingra et al., own calculations.
14 BDI, BDA, vbw: Der Brexit kommt – Was ist zu tun? 111 Orientierungsfragen für die Praxis inklusive Hintergrundinformationen und Szenarien zu den Auswirkungen des Brexit, Leitfaden |Mittelstandspolitik |Brexit, 2018.
15 C. Wyman, C. Chance: The "Red Tape" Cost of Brexit, 2018.
16 S. Dhingra et al., op. cit.
17 C. Wyman, op. cit.
18 See J. Eaton, S. Kortum: Technology, Geography, and Trade, in: Econometrica, Vol. 70, 2002, pp. 1741-1779.

TA.[19] Given the European (German) export composition to the UK, these trade elasticities are at around 2.8 (2.6). Although those elasticities fall into the expected range, they might be biased due to North American trade patterns that do not match the EU-UK case. To circumvent this problem, country specific sectoral elasticities are extracted from Imbs and Mejean.[20]

In general, those elasticities turn out to be significantly higher: For the EU27, the weighted country specific elasticity is 5.1, and for Germany 5.9. It should be noted that using price elasticities might overestimate trade effects as this implies that tariff and non-tariff barriers translate directly into higher prices. In reality, especially in competitive markets, these costs may eat up companies' margins rather than be translated into higher prices for consumers. For example, Gasiorek et al. expect a 9.8% rise in prices in the transport (automotive etc.) sector although tariff and NTB add up to 19.3% (assuming US-EU NTB).[21]

Hence, the estimated second order effects in Table 2 for the different scenarios should be considered as a possible range of hard Brexit trade implications. The country specific elasticities-based pessimistic scenario reveals the negative boundary of our estimations with EU27 exports to the UK being reduced to 50% of pre-Brexit trade; German exports down to 43% and Belgian exports at 40% of pre-Brexit trade.

Other countries are less exposed to the newly introduced trade barriers: in Finland, exports to the UK are estimated to fall by "only" 24%. UK exports to the EU27 would presumably drop by 47% to 53% of pre-Brexit trade. All in all, British tariff revenues on EU exports in the most pessimistic scenario would be reduced to only 20% (2.1 billion euro) of the first order effect where trade was assumed to be entirely inelastic. EU revenues from tariffs on British exports would decline to 23.6% (1.2 billion euro). These estimations are in the range of more sophisticated modelling carried out by Dhingra et al. (2017) and Felbermayr et al. (2017).[22]

On the other hand, if we assume the NAFTA elasticities can be applied to the European case and 75% of the reducible cost can be overcome by regulatory standardization, effects reduce to a mere 10% trade reduction on average. Once again, those results are driven by the vehicle sector and the automotive industry. These industries would be significantly less affected than in the worst case scenario. On the country level, Portugal would be hit hardest, Cyprus' the least.

Conclusion

Even just a few months before the UK leaves the EU, the effects on bilateral trade relations remain unclear. Companies and citizens on both sides of the Channel are already preparing for the worst case scenario: a hard Brexit. Our analysis considers several hard Brexit scenarios in which no trade deal is achieved and trade is affected by tariffs and NTBs on both sides. In the short run, Brussels and London can generate tariff revenues of 5.1 and 10.5 billion euro, respectively. The largest tariff burden will be on Britain and Germany and the automotive industry will be most affected. One-fifth of all tariff revenues collected by the UK would be paid by the German automotive industry; the British automotive industry would have to pay one-third of all duties collected by the EU. Additionally, in the short run, NTBs might imply an additional burden of up to 14.6 billion euro for UK companies and up to 25.8 billion euro for EU companies. In the long run, international trade volumes will adjust – in the worst case scenario, trade may be reduced by around 50%.

It follows then that a hard Brexit, especially if it occurs abruptly as a result of a collapse of negotiations, will be associated with considerable costs. This applies in the sense of the above mentioned lose-lose situation for both sides, especially for the United Kingdom and Germany. Due to the strong effects of newly introduced tariffs on trade, the negotiations should not only be aimed at avoiding a hard Brexit but should explicitly seek a customs union. This leaves enough room to maneuver in designing the free trade rules and thus takes into account the Brexiteers' red lines, which relate to the free movement of labour, rather than to customs duties. In this regard, any transition period should maintain the customs union. In the long run, however, NTBs could be an equally important barrier to trade and need to be prevented effectively. All in all, in view of the increasingly urgent preparations and adjustments of companies on both sides, clarity is desperately needed.

19 L. Caliendo, F. Parro: Estimates of the Trade and Welfare Effects of NAFTA, in: Review of Economic Studies, Vol. 82, 2015, pp. 1-44.

20 J. Imbs, I. Mejean: Trade Elasticities, in: Review of International Economics, Vol. 2, No. 25, 2018, pp. 383-402, Online Appendix http://www.isabellemejean.com/publications.html.

21 M. Gasiorek, I. Serwicka, A. Smith: Which Manufacturing Sectors are most vulnerable to Brexit? Briefing Paper No. 16, UK Trade Policy Observatory, University of Sussex, Chatham House, 2016.

22 S. Dhingra et al., op. cit.; G. Felbermayr, J. Gröschl, I. Heiland, M. Braml, M. Steininger: Ökonomische Effekte eines Brexit auf die deutsche und europäische Wirtschaft, ifo Studie No. 85/2017.