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# **The Impact of BREXIT on the Foreign Direct Investment in the United Kingdom**

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# THE IMPACT OF BREXIT ON THE FOREIGN DIRECT INVESTMENT IN THE UNITED KINGDOM<sup>1</sup>

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**Abstract:** The main objective of this study is to measure the impact of the British exist from the European Union on foreign direct investment (FDI) projects. Unlike previous studies, the research does not take into account the bilateral FDI flows. Instead, the analysis focus on FDI projects and new jobs and safeguarded jobs related to FDI projects. Using Poisson models on panel data over 2012 to 2015 and for regions from the entire world, the results indicate that the Brexit significantly and negatively affects the new jobs created in FDI projects. This expectation generates problems on labour markets. England policies should create a more flexible labour market and a stronger orientation towards other countries outside the Europe.

**Keywords:** foreign direct investment, FDI, Brexit, labour market

**JEL classification:** C51, C53, F21

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## 1. Introduction

Foreign direct investment (FDI) represents investments made by companies from other countries in a host country for various purposes: expansion of current establishments, acquisition of local firms or creation of new subsidiaries. England is the biggest FDI recipient from Europe, with a stock value of about £1 trillion, almost half of it being from the other EU countries, according to the report UK Trade and Investment (UKTI 2015). At a global level, the UK is the third FDI recipient, after the US and China. England encouraged FDI for increasing output, productivity and salaries. The FDI advantages are direct (foreign companies are more productive and ensure higher wages) and indirect (new managerial practices and technologies brought by foreign companies can be adopted by local firms; competitive pressure brings improvements in performance).

In this paper I ask if the Brexit will negatively affect the FDI that the United Kingdom might attract. This is the research question for which an answer will be provided using Poisson panel data models. At first glance, if the UK leaves the EU, the FDI will decrease. Consequently, the GDP will also decrease. Dhingra et al. (2016) identified three reasons for which FDI will fall in case the UK will leave the EU: (1) As a country in the Single Market, the UK becomes a good export platform for many multinational companies, because of the lower costs from tariff and non-tariff barriers for exporting to the rest states from EU. (2) Multinational companies are endowed with complex supply chains and they have many coordination costs between local branches and headquarters. If the UK leaves EU, it is difficult to manage these entities. (3) There is a high degree of uncertainty regarding the next trade arrangements between the EU and the UK, which may decrease FDI.

The previous empirical evidences showed that the UK gained considerable FDI from EU countries due to its membership. In this context, the empirical results confirmed the theoretical expectations regarding a FDI decrease after the UK leaves the EU. For assessing the percent of decrease in FDI inflows or stocks, on the one hand, most of the previous authors used gravity models or panel data models, but only few of them used an approach based on Poisson models based on panel data. On the other hand, the past studies tried to explain the bilateral flows, some

of them anticipating the decrease in FDI after a Brexit. As a novelty for the research in this field, the dependent variable is not represented by bilateral inflows of FDI which has already being explained (Campos and Coricelli, 2015; Dhingra et al., 2016). The endogenous variables are represented by the number of FDI projects, number of new jobs and number of safeguarded jobs ensured by FDI in the UK. As economists anticipated (Campos and Coricelli, 2015; Driffield and Karoglou, 2016; Ebell and Warren, 2016), the UK will face problems on labour markets because of its exit from the EU. However, a quantification of the impact on jobs related to FDI projects has not been made yet in literature.

Having a measure of the impact of Brexit on FDI projects, some policy recommendations can be made for reducing the expected deficit of competitiveness in England. Our results are in accordance with the expectations, the anticipated problems on labour markets being reflected in a lower GDP growth.

The paper is organized as follows. After this introduction, a literature review is made with the most relevant studies according to the research direction regarding the impact of Brexit on FDI in the UK. The next sections present the methodology, data and results. The last part concludes.

## **2. Literature Review**

The studies in the literature related to the contribution of the EU to FDI in the UK follow two directions, each of them having consistent results: (1) The positive effects of membership on FDI inflows and stocks after the UK entered EU (Pain and Pickering 1997, Barrell and Pain 1998, Straathof et al. 2008, Campos and Coricelli 2015, Ebell and Warren 2016, Dhingra et al. 2016, Crafts 2016). (2) The negative impact of Brexit on FDI inflows and, consequently, on GDP rate that will decrease in case the UK leaves the EU (Mansfield 2014, Irwin 2015, Campos and Coricelli 2015, Barret et al. 2015, Dhingra et al. 2016, Ebell and Warren 2016, Kierzenkowski et al. 2016, Featherstone 2016).

The positive impact of the UK integration in the EU is obvious in terms of FDI. Ebell and Warren (2016) considered that being member of the EU is important for inward FDI, two reasons

being provided as arguments: free capital movement facilitates the investment of the other EU countries to the UK and free goods and services trade, which includes labour mobility and passporting and makes the UK an attractive destination country for FDI that come out of EU. In other words, EU membership brings more FDI to the UK not only from the rest of EU countries, but also from the rest of the world.

The elimination of internal tariff barriers after the European Community formation in 1957 and the adoption of a single external tariff stimulated the research regarding FDI attraction in the region. In the case of the UK, the performance in attracting inward FDI significantly grew after the country entered the European Economic Community, because foreign companies made exports from the UK to the other EEC countries without the problem of common external tariff. The advantages of entering EU were also proved by Barrell and Pain (1998) on empirical evidences. The authors found that EU membership had a positive and significant impact on FDI stock from the UK, Spain, Ireland and Sweden.

The Single Market Programme introduction in the late 1980s brought the elimination of lot of internal barriers to cross-border trade and investment. In manufacturing and service sectors, market segmentation was diminished. According to econometric estimations, the Single Market Programme brought a positive and significant effect on the FDI level (on extra-EU in Europe according to Dunning (1997) and on intra-EU by UK and Dutch firms according to Pain and Pickering (1997)).

In the case of the UK, FDI brought benefits regarding enhanced productivity. Bloom et al. (2012) proved that multinational firms boost productivity in the UK through superior technologies and management practices. Moreover, Haskel et al. (2007) identified foreign investment ‘spillovers’ to UK inland firms in the same industry.

FDI had a positive impact on economic growth in the UK. For example, Alfaro et al. (2004) estimated the effect of changes in FDI on economic growth for a sample of 73 countries. In the case of the UK, with a very developed financial sector, FDI growth had a significant positive effect on the real GDP rate. Pain and Young (2004) showed that the UK increased GDP via FDI

with 2.25% just because it is an EU member. The authors used a NIESR macro-model for the UK economy under endogenous monetary and fiscal policies.

There are many studies that assess the economic impact of Brexit, some of them focusing on FDI. Some research is based on econometric models, while other does not use any models in making predictions regarding the effects of Brexit on FDI inflows into UK. However, all of the studies lead to the conclusion that FDI attracted by the UK will decrease because of the decision to leave the EU. In this context, recommendations are made to the UK in order to compensate the loose in competitiveness.

There are still few studies in the literature that focus on the measurement of the positive impact of the EU membership on FDI in the case of the UK. For estimating this impact, three types of methods were used: gravity models, regressions explaining FDI on trade openness, and synthetic cohorts. The approach based on synthetic controls estimated a positive contribution of the EU membership on the FDI with 25% till 30% as Campos and Coricelli (2015) obtained. There are two main advantages of the approach based on regressions that relates FDI with trade openness: the regressions consider total inward FDI flow and not only FDI inside EU and they permit the mapping of the differential impact on trade in the scenarios for other countries. The impact of trade openness on FDI in manufacturing and services was estimated by Ramasamy and Yeung (2010) using a fixed effects panel model for OECD countries over 1980 to 2003. They obtained that trade openness is a stronger determinant of FDI inflows for services compared to manufacturing. An increase in services trade to GDP ratio with one percentage point determined an increase in inward services FDI with 1.98 billion dollars. On the other hand, an increase in manufacturing trade to GDP ratio with one percentage point determined an increase in inward manufacturing FDI with 1.66 billion dollars.

The impact of Brexit on bilateral FDI flows was assessed by Dhingra et al. (2016) using gravity models and a sample of 34 countries from OECD over the past 30 years (1985-2013), where the UK is among these states. The main conclusion of the research showed that the FDI in the UK raised with almost 28% only because it was member of the European Union. When different hypotheses are considered, the positive effect of EU membership ranges from 14% to 38%. Even

if Switzerland will join the European Free Trade Association, the effect of Brexit could not be significantly changed.

These estimates are consistent with the results obtained by Campos and Coricelli (2015), who computed an impact of the EU membership from 25% to 30% on FDI flows when a gravity model is used. On the other hand, a gravity model was also used by Straathof et al. (2008) who concluded that EU membership brings an increase in inward FDI stocks with 14% in relation with non-EU states and with 28% when partners are other EU members.

The long run effects of leaving EU were assessed by Ebell and Warren (2016) for the next 15 years. According to these authors, the growth rate will be between 1.5% and 3.7% by 2030. According to gravity models estimations of Ebell and Warren (2016) FDI will decrease after the UK exit from the EU with 12% till 28%.

Another common conclusion for all these studies is the fact that the uncertainty of anticipations is very high and the proper quantification of FDI decrease is marked of many uncertainties coming from a dynamic and unstable international context. Using an alternative method, a Markov regime-switching structural VAR, Driffield and Karoglou (2016) tried to measure the impact of Brexit on inward FDI in the UK. The authors concluded that there is a high degree of uncertainty regarding the future evolution of England economy. Considering the negative effects of Brexit on inward FDI, Driffield and Karoglou (2016) proposed several policy measures: the creation of a more flexible labour market, ensuring more trade with those locations that imply low costs (for example, Asian countries), and a lower employment protection. Contrary to these empirical assessments, the Open Europe model considered that the British exit from EU will not have such a large impact of FDI as it is so much assumed. In order to counter this affirmation, Harvey and Hubbard (2016) brought several arguments: the Open Europe model is limited by a fixed exchange rate, when, in fact, capital inflows and exchange rates will adjust. Moreover, the short-run transitional costs are not captured.

However, there are fewer studies that assess the economic effects of Brexit on the FDI of the rest of the EU states. The effects of Brexit on the Irish economy were studied by Barrett et al. (2015)

who showed that less FDI in the UK will negatively affect the economic growth in Ireland. Moreover, the attraction of new FDI projects from UK in Ireland might be quite small. On the other hand, Purdue and Huang (2015) considered that Brexit will negatively affect the FDI into Ireland in energy market, while the financial service sector might take advantage. After Brexit, Ebell and Warren (2016) estimated a decrease in FDI flows from Norway to England with 9.7% and from Switzerland to England with 17.1%. The quantified impacts are similar with those proposed by Treasury analysis (10% for Norway and 15%-20% for Switzerland).

The adjustment costs for large European companies investing in the UK could be considerable. After Brexit, the competition will be higher and England might come with improvements in business environment and taxation. The lion share of FDI in England from EU comes from few countries among them Germany, France, Ireland and Spain. Compared to professional and financial services, more FDI from the EU are attracted in energy, wholesale and retail trade, manufacturing and transportation sectors. The UK registered a success in attracting FDI jobs and projects. If the UK leaves the EU, the other countries will face risks and opportunities to other states. Brexit decreases the UK's competitiveness. The business environment in the other EU countries will influence the way in which the UK will attract external headquarters for multinational companies. It is a real challenge for the UK to restore its competitiveness. A solution might be to undercut taxation and social regulation, but maybe not on environmental legislation. The UK could act like Ireland creating many risks to EU by the obligations and constrains.

After the exit from the EU, the UK has several options related to its foreign relations with the EU countries and the rest of the world: (1) the Swiss model (an EFTA (European Free Trade Association) member, but not an EEA (Agreement on the European Economic Area) member) – following EFTA conditions and terms, the UK has to sign bilateral treaties with the EU, (2) the Norwegian model - following EEA conditions and terms, (3) the Turkish model – following conditions and terms of the EUCU (EU Customs Union), and (4) Bilateral agreements following WTO auspices.



The type of policy that will be chosen to minimize the negative effects of British exit from EU on inward FDI flows depends on the anticipated magnitude of the effect. As the above literature review specified, the methods are varied and they conduct to different results. Given the specific type of data used in research, count data, the most suitable method is the Poisson panel data regression models that will be presented below.

### 3. Methodology

The fixed-effects Poisson regression based on panel data was described in detail by Cameron and Trivedi (1998). If  $y_{it}$  is the dependent variable which varies across spatial units ( $i=1, \dots, n$ ) and over time ( $t=1, \dots, T_i$ ). This variable has a Poisson distribution of parameter  $\mu_{it}$  that depends on more exogenous variables in vector  $x_{it}$ , being given the log-linear function:

$$\ln \mu_{it} = \delta_i + \beta x_{it} \quad (1)$$

with  $y_{it}$ - dependent variable,  $\mu_{it}$ - parameter of Poisson distribution,  $\delta_i$ - fixed effect,  $\beta$ - parameter (slope), and  $x_{it}$ - vector of exogenous variables.

The conventional Poisson regression based on maximum likelihood is the common way to estimate the parameters of this model. The procedure supposes to consider dummy variables for all cross-sections (excluding one) in order to directly estimate the fixed effects. Another method is to use conditional maximum likelihood. The restriction is related to the total  $\sum_t y_{it}$  for each cross-section. In the case of the Poisson model, this supposes a conditional likelihood which is proportional to  $\prod_i \prod_t \left( \frac{e^{\beta x_{it}}}{\sum_s e^{\beta x_{is}}} \right)^{y_{it}}$ . This is the likelihood function for multinomial logit regression based on grouped data.

The conditioning, in fact, deleted the  $\delta_i$  parameters from the likelihood function. Because of the incidental parameters, Allison and Waterman (2002) showed that including dummy variables will generate inconsistent estimates for  $\beta$  for logistic regression models. However, in case of conditional estimation this problem is eliminated. Considering Poisson regression model, the two estimation methods (conditional and unconditional maximization likelihood) provide the same

values for  $\beta$  estimation and also for the corresponding covariance matrix. The selection of a certain method is determined by the computational advantages.

The fixed-effects Poisson regressions permit unrestricted heterogeneity over cross-sections, but, in the case of a certain cross-section, the restriction regarding the equality between average of each count and its variance is still kept:

$$E(y_{it}) = var(y_{it}) = \mu_{it} \quad (2)$$

A possible disadvantage of this type of model might be given by the fact that other types of heterogeneity might not be taken into account. In this study, we estimated random-effects Poisson models and fixed-effects poisson models with robust standard errors (quasi-maximum likelihood). This last specification provides consistent estimates under quite weak hypotheses: only conditional mean should be correctly specified, but standard errors are adjusted to account to overcome the under or over variance.

In a random effects model, the parameter of heterogeneity is analyzed as a random variable with a unit average. In the case of a fixed effects model, the parameter of heterogeneity is only considered as a parameter that should be estimated for each cross-section. Actually, the fixed effects model is utilized to make inferences knowing the effects in the sample. The random effects model is used to formulate conclusions about the entire population. The main difference between the two types of models is that fixed effects one gives parameters estimates for time varying characteristics. The rest of the parameters are seen as part of the individual term as Hsiao (2003) explained.

The Poisson model was used by Campos and Coricelli (2015) in a gravity approach to estimate the impact of Brexit on bilateral FDI flows, obtaining a decrease in FDI with 38%. This estimate is higher than in the case when OLS and Heckman models are used. Contrary to previous studies in the literature, in this paper other data will be used. Instead of bilateral FDI flows, we utilize the number of FDI projects and the number of jobs related to these projects (new and safeguarded projects).

#### 4. Data

Currently, the UK has the highest number of FDI projects in Europe. In the period 2014 to 2015, the UK registered 1 988 FDI projects, which means an increase with 12% compared to the previous period. In the context of global FDI flows decrease with 11%, the UK grew during 2014 to 2015 with 50% with respect to the previous year. Around 85 000 new jobs were created in the UK by FDI projects in 2014 to 2015, this country being a leader in Europe at jobs creation. FDI also helped in maintain the existing jobs in the UK. A number of 23 000 jobs were safeguarded in 2015 due to FDI projects. The foreign investors' confidence in the UK economy is the biggest ever, but the Brexit might change this confidence.

According to Irwin (2015), Ireland will be among the most exposed countries to Brexit effects, because it shares strong investment. On the other hand, because of the changes in FDI, McGrath (2016) forecasted a decrease in Ireland's growth rate after Brexit. Beside proximity, Ireland is quite aligned with the UK in terms of trade policy objectives. The UK's absence from the EU will be also felt in Germany because in many cases UK was a counter-weight to France which permitted German politicians to be a decisive voter in a lot of policy debates. However, Germany is less exposed to risks compared to Ireland. A significant exposure will be met in case of Spain which tries to recover after the recent economic crisis. The lowest risk is expected for France, the exposure being indirect. In policy debates regarding market liberalization, regulation or trade policies, Italy has different positions compared to the UK. After Brexit, the Italian influence outside Europe might be negatively affected. Italy might have problems from the economic and political contagion generated by Brexit. The concept of leaving EU might encourage other members to act like the UK.

The data used in this research refer to the following variables: Dependent variables are : number of FDI projects, number of new jobs and number of safeguarded jobs from FDI projects. The independent variables are: GDP per capita in PPP in constant 2011 international \$, exports and imports of goods and services as % of GDP, manufacturing value added as % of GD, total unemployment rate as % of total labour force.

The number of FDI projects and the number of new and safeguarded jobs from FDI projects refer to the projects made in the UK by several regions (cross-sections): US, Canada, rest of Americas, Switzerland, China, Japan, India, Australia, rest of APAC (Asian-Pacific countries), Ireland, France, Spain, Germany and Italy. There are several EU members among these cross-sections (Ireland, France, Spain, Germany and Italy), which represent the countries with the most FDI projects in the UK. The data are provided by UKTI Inward Investment Report from 2012/2013, 2013/2014 and 2014/2015. The values for independent variables are provided by the World Bank database. According to matrix correlation, there is a very strong relationship between imports and exports (Pearson coefficient of correlation of 0.98). One of the variables is discarded in order to avoid co-linearity.

## 5. Results

We consider the first case when the number of FDI projects represents the dependent variable. A dummy variable is included in the model to account for the EU membership. The logarithm transformation is applied for the rest of the explanatory variables.

The random effects follow a Gamma distribution. Even if the overall model (RE1 model) is valid according to chi-square test, the EU membership seems not to be significant for FDI projects in the UK. If only the unemployment rate is considered as exogenous variable (RE2 model), the impact of EU membership on FDI projects is still insignificant. However, these results might be constraint by the low data volume because of their availability.

**Table 1: Random effects Poisson regressions for explaining number of FDI projects in the UK**

Explanatory variable	RE1 model		RE2 model	
	Coefficients	p-values	Coefficients	p-values
Logarithm of GDP per capita	0.4493	0.053		
Logarithm of exports	-0.5077	0.142		
Logarithm of manufacturing share	-0.6385	0.309		
Logarithm of unemployment rate	-0.6891	0.020	-0.6263	0.033
EU member	0.1286	0.786	-0.087	0.843
Constant	4.7871	0.138	5.964	0.000

Source: author's computations

Indeed, the high number of FDI projects was initiated by the US, which has the position of outlier in this sample, but it is more relevant for the economic impact to know the values of these projects that might be concretized in a number of new jobs. We also have to take into account the dimension of the US formed by many countries and its economic potential compared to several EU countries in the sample.

Some conditional fixed-effects Poisson regressions with robust standard errors are considered under the hypothesis that there is a correlation between countries in the EU unlike the rest of the states in the sample. Indeed, the EU members are encouraged more to make FDI in another EU country.

**Table 2: Conditional fixed-effects Poisson regressions with robust standard errors allowing intra-group correlation for explaining number of FDI projects in the UK**

Explanatory variable	FE1 model		FE2 model	
	Coefficients	p-values		
Logarithm of GDP per capita	1.1896	0.015		
Logarithm of exports	0.5565	0.005		
Logarithm of manufacturing share	-2.9390	0.000		
Logarithm of unemployment rate	-0.5182	0.014	-1.023	0.000

Source: author's computations

Considering these estimations, GDP per capita and exports in foreign states encouraged the FDI in the UK from EU countries. On the other hand, manufacturing share and unemployment rate in the origin countries had a negative impact on FDI in the UK. The results are consistent with the economic theory. Countries with high unemployment are more open to attract FDI in the own countries than to other states. However, even if the manufacturing share increases, the FDI are not stimulated towards the UK, the countries being more eager to export the manufacturing production.

The overall model (RE3 model) is valid according to chi-square test and the EU membership seems to be significant for new jobs related to FDI projects in the UK. If only the unemployment rate is considered as the exogenous variable (RE3 model), the impact of EU membership on new jobs from FDI projects is still significant.

**Table 3: Random effects Poisson regressions for explaining number of new jobs (RE3 and RE4 model) and safeguarded jobs (RE5 model) from FDI projects in the UK**

Explanatory variable	RE3 model		RE4 model		RE5 model	
	Coefficients	p-values	Coefficients	p-values	Coefficients	p-values
Logarithm of GDP per capita	-4.6128	0.000				
Logarithm of exports	-3.6973	0.000				
Logarithm of manufacturing share	-11.2294	0.000				
Logarithm of unemployment rate	-3.3791	0.000	-3.4699	0.000	9.9634	0.000
EU_member	6.1356	0.000	2.4274	0.002	-2.6036	0.041
Constant	109.1769	0.000	15.0413	0.000	-6.9753	0.000

Source: author's computations

Indeed, EU membership had a positive and significant impact on new jobs created by inward FDI flows in the UK. In case of RE3 model, the number of jobs related to FDI projects increased with around 461% only because the UK was member of the EU during 2012 to 2015. On the other hand, the RE4 model, that considers only the unemployment in the origin countries, estimated a lower impact of EU membership (an increase with only 10.32%). Contrary to expectations, the increases in GDP per capita and manufacturing sector did not encourage countries to create more new jobs in the UK.

On the other hand, the increase in unemployment rate in origin country encourages job protection in the UK. In this case, EU membership had a low and negative impact on safeguarding jobs in England generating a decrease with 0.92%. This result might give us some details regarding the investment behaviour of EU countries that are more interested to create new jobs than to protect the existing ones.

**Table 4: Conditional fixed-effects Poisson regressions with robust standard errors allowing intra-group correlation for explaining number of new jobs (FE3 and FE4 models) and safeguarded jobs (FE5 and FE6 models) from FDI projects in the UK**

Explanatory variable	FE3 model		FE4 model		FE5 model		FE6 model	
	Coefficients	p-values	Coefficients	p-values	Coefficients	p-values	Coefficients	p-values
Logarithm of GDP per capita	-4.6561	0.000			16.5174	0.000		
Logarithm of exports	-3.7312	0.000			-7.6253	0.000		
Logarithm of manufacturing share	-11.2677	0.000			54.1926	0.000		
Logarithm of unemployment rate	-3.3845	0.000	-3.4806	0.000	4.7835	0.000	9.9689	0.000

Source: author's computations

The results of FE3 and FE4 are consistent with those from random effects Poisson regressions, when the economic welfare of the origin countries did not stimulate the creation of new jobs in FDI projects in the UK. So, the EU membership remains the main force of generating new jobs in the UK in FDI projects. Considering these results, the Brexit will put serious problems to England not in terms of FDI projects, but in terms of new jobs created in these projects. Therefore, the UK policies should be focus on labour market to create a flexible market, to reduce unemployment and encourage other non-EU partners to create new jobs in England. The results are somehow in accordance to expectations, because great companies have already left England after Britain's referendum.

In case of safeguarded jobs, a high unemployment rate in the origin country of FDI encouraged the existing jobs protection. In this case, manufacturing share and economic welfare encouraged this behaviour of the foreign investors. However, the increase in exports negatively influenced the number of safeguarded jobs in FDI projects.

## 6. Conclusions

The research hypothesis regarding the negative impact of Brexit on FDI was validated and the main conclusion is that the UK's exit from the EU will have a large impact on the number of

new jobs generated by FDI projects. The number of projects will not be too much affected, but problems on labour market are expected. Therefore, our recommendations are oriented to the creation of a more flexible labour market to overcome the deficiency in competitiveness. The empirical results of this research are a novelty in the literature because an impact assessment was made by taking into account other variables than bilateral FDI flows. Even if economists expect severe problems on the UK labor market a quantification regarding the Brexit effects on jobs from FDI projects was not been made in previous studies.

These results are limited by the number of data. In a future research, we might also consider these regions and bilateral FDI flows with the UK in order to have a better picture of the way in which the relationships between countries are affected after the UK exit from the EU.

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