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Barriers to Trade in Financial and Insurance Services:
Evidence from the United Kingdom

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Monetary and Capital Markets

Barriers to Trade in Financial and Insurance Services: Evidence from the United Kingdom

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Abstract

Distance, as a proxy for trade barriers, is found in many studies to matter even for weightless cross-border financial investments and lending, possibly due to the presence of information asymmetries. Its importance is tested in this paper using exports of all five broad categories of the U.K.'s financial and insurance services. No trade barriers are found for the bulk of the U.K.'s exports. Trade barriers are confirmed only for interest-bearing activities – being in line with available results in the literature. The positive effect of EU membership appears to be small. Notwithstanding the uncertainties, it suggests that post-Brexit disruptions of the U.K.'s export of financial and insurance services may be minor.

Contents

I. INTRODUCTION

This paper studies the role of trade barriers in the export of a range of financial and insurance services.[2] It applies a gravity model, where distance is a proxy for trade barriers, to the case of the U.K. The U.K. is the largest net exporter of financial and insurance services in the world and a global leader in cross-border provision of these services, exporting to more than 64 countries across all continents. The U.K.'s financial and insurance services account for close to 30 percent of the U.K.'s export of all services.

Previous studies analyzed international transactions in financial assets, such as equity flows, securities holdings, and retail bank lending, using a gravity equation and found distance— representing barriers to trade—to be an important factor. The seminal paper by Portes and Rey (2005) found that a gravity model explains international equity flows at least as well as trade in goods. They called it a "distance puzzle", since financial services are weightless (do not involve a physical delivery) and suggested that transaction costs may stem from greater information asymmetries for more distant countries. Transaction costs in financial services may indirectly reflect those in trade in goods if trade in financial services is strongly associated with trade in goods.

Aviat and Coeurdacier (2007) explored the complementarity between bilateral trade in goods and bilateral asset holdings in a simultaneous gravity equations framework. Their results suggest that bilateral equity investments are indeed strongly correlated with the underlying patterns of trade in goods. Lane and Milesi-Ferretti (2008) studied the endogeneity between trade in goods and the holding of securities and found transaction costs (distance) to be the common underlying determinant. They explained it by barriers to international trade and information asymmetries. And finally, Heuchemer *et al.* (2009) analyzed cross-border retail bank lending in a gravity framework for the Eurozone and found a significant role of the physical distance. They partly attributed it to regulatory and cultural differences across countries.
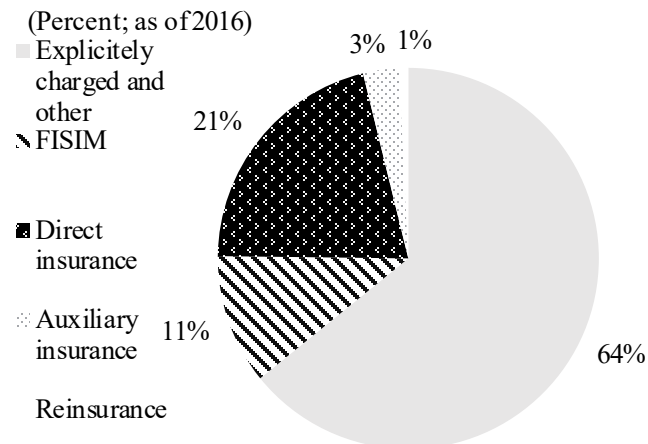
All the cited studies above focused on international transactions in financial assets rather than export of financial and insurance services. However, international trade in financial services encompasses much more than interest revenues from cross-border investments and lending (stemming from financial asset holdings). Cross-border financial services are dominated by OTC derivatives (interest and currency) and spot currency trading. According to the Bank for International Settlements (2020, 2021), Schrimpf and Sushko (2019) and the World Bank (2021), in 2019-20, the total outstanding global equity and cross-border loans together amounted to $135 trillion, while the notional amount of global OTC derivatives reached $607 trillion and spot currency trading was close to $480 trillion a year. Such proportions are also found in the breakdown of export in the case of the U.K.: revenues from interest (financial intermediation services indirectly measured—FISIM) represent only 11 percent of total financial and insurance revenues (see Figure 1). Financial services explicitly charged

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[2] Financial services usually include banking, investing, and insurance activities. This paper follows classifications in International Trade Statistics and National Accounts that treat financial and insurance services separately.

(commissions and fees) represent the largest part, followed by direct insurance. The representativeness of the U.K. for the global trade and the advanced collection of bilateral trade data makes the U.K. a great case to learn from.

The main contribution of this paper consists of broadening the analysis beyond the usual interest-bearing asset holdings by analyzing the export of all types of traded financial and insurance services. Besides loans, deposits, and securities (measured by FISIM), the analysis in this paper includes trading in exchanges and derivatives (commissions and fees), insurance and reinsurance (premiums), and auxiliary insurance services.

Figure 1: The U.K.'s Export of Financial and Insurance Services

(Percent; as of 2016)

- Explicitly charged and other
- FISIM
- Direct insurance
- Auxiliary insurance
- Reinsurance

3% 1%
21%
11%
64%

Source: Office of National Statistics, the United Kingdom

The gravity equation explains the U.K.'s export of five types of financial and insurance services by commonly considered variables, including the market size, distance, and a range of political and cultural similarities. The U.K.'s export values are reported by a large number of countries and there is a reminder for each subregion. To maximally utilize the information contained in the collected data, the gravity equation is estimated using a censored normal regression model, accounting for censoring of observations at different thresholds. Lane and Milesi-Ferretti (2008) also applied a Tobit-type model to cross-border equity holdings, where a large number of observations were censored at zero. A robustness analysis considers how results change when reducing the sample only to countries that are explicitly identified in the U.K.'s export statistics and estimating through least squares.

The main finding is that trade barriers are not significant for most types of U.K.'s financial and insurance exports. Transaction costs seem to matter only for interest-bearing activities (FISIM), which confirms previous findings in the literature that transaction costs due to asymmetric information (distance) are significant for cross-border bank lending and equity investments. However, trade barriers (distance) are not significant for the largest part of the U.K.'s financial services export, that is, the commissions-and-fees-based (explicitly charged) financial services. This may not necessarily come as a surprise since most of the financial services that involve commissions and fees (trading currencies, derivatives, stocks, and issuance and trading of bonds) are performed in the U.K. (the City) on behalf of clients in other countries. Consequently, there are no significant barriers to trade involved as clients from different countries meet at the London market.

Trade barriers are found to be also insignificant for all three types of exported insurance. Perhaps, the usually very detailed nature of contracts for direct insurance (life and non-life), that guide the processes of settling claims (auxiliary insurance) leaves little room for cross-border asymmetric information or hidden transaction costs for the U.K.'s insurance exports.

In addition, the re-insurance market is, by definition, global, driven by diversification risks and hence there one may expect little cross-border transaction costs.

There are three other findings worth mentioning. First, the benefit of the U.K.'s passporting rights to the EU (the ability to serve EU clients from the U.K.-based firms without further authorization by other EU member countries) turns out to be significant, albeit small. It represents an additional boost in the range of one to two percent of the U.K.'s export of financial services to the EU but no effect for all types of insurance export. Second, a country's use of English as an official language boosts U.K.'s export of all financial and insurance services to that country. And third, countries' scores in the rule of law measure appear to be positively correlated with the U.K.'s export of financial services. However, the results are statistically insignificant for the U.K.'s export of insurance services, which is likely due to the very detailed, standardized character of typical insurance contracts, making them independent from the quality of local laws.

Section II details the methodology, including the specification of the gravity equation and estimation technique, while Section III describes the data used in the estimation and some stylized fatcs. Sections IV and V contain results and Section VI concludes.

II. METHODOLOGY

The analysis of export of financial and insurance services uses the standard gravity equation specification, as is common in the literature. The gravity equation (market size and distance) was employed in the studies of determinants of bilateral trade (Tinbergen, 1962 and Pöyhönen, 1963) even before it received theoretical foundations by Anderson (1979). The bilateral trade flows are typically explained by size, distance, and some measures for relative similarity of countries' size and development, sharing common border, and other cultural (e.g., common language) and political similarities (see Baltagi *et al.*, 2003). The actual choices of variables representing the size and similarity usually vary depending on what kind of cross-border flows are being investigated.

Therefore, the specification of the gravity equation for the U.K.'s export of financial and insurance services includes distance and market size and variables representing cultural and political similarities:

$$\ln(EX_i) = \alpha + \beta \ln(POP_i) + \gamma \ln(GDPPC_i) + \delta \ln(DIST_i) + \theta \ln(ROL_i) + \cdots$$
$$\dots + \rho EOL_i + \varphi EU_i + \omega AA_i + \mu EPA_i + \varepsilon_i$$

where the dependent variable EX_i denotes the export of financial or insurance services from the U.K. to the trading partner i. *Log(1+EX$_i$)* is computed in order not to eliminate occasional observations with zero export. This transformation affects only the size of the intercept.

The explanatory variables are as follows:

- The *size of the market* is measured by population (POP_i) and income per capita at PPP ($GDPPC_i$) in the trading partner i (used by Kimura and Lee, 2006). The expectation is that a larger market attracts more trade.

- The *trading costs* (general barriers to trade and information asymmetries, including hidden costs) are proxied by the distance ($DIST_i$), which is measured in kilometers from London to the capital cities of the U.K.'s trading partners (as in Heuchemer *et al.*, 2009). The common finding is that a larger distance entails costs that reduce trade.

- *Cultural* similarities are proxied by the use of English as a common official language in trading partner countries. The EOL_i is a dummy variable that equals one if trading partner country i uses English as an official language and zero otherwise. The choice of English as an official language is advantageous since it encompasses a combination of factors, namely the ease of communication between nations that share common language and common law (former British colonies typically continue to use common law and English as an official language), which increases their bilateral trade, see Rauch (1999).

- *Political* similarities are represented by the rule of law score (ROL_i). Anderson and Marcouiller (1999) showed that hidden transaction costs in the form of contract enforcement reduce trade. The ROL_i is a governance indicator compiled by the World Bank and a weaker score would be expected to reduce trade due to lower institutional quality and confidence (used by Heuchemer *et al.*, 2009).[3]

- Further to the *political* similarities, various agreed partnerships may benefit the U.K.'s export of financial and insurance services. Similar to Aviat and Coeurdacier (2007), I consider the role of major trade partnerships, namely, the EU_i membership, AA_i – the association agreement, and EPA_i —the economic partnership. Partnership dummies take the value 1 if the trading partner is in that particular partnership and zero otherwise. In the case of the EU, it is expected to primarily measure the effects of passporting rights, which make provision of cross-border financial services easier within the EU. The effects from AA and EPA are likely less direct, intermediated through enhanced cooperation through cross-border trade and finance.

The error term ε is assumed to be independent and identically distributed, according to $N[0, \sigma^2]$.

The U.K. exports financial and insurance services to large number of countries. However, only 64 countries are explicitly identified, while the rest is reported as a residual by

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[3] The score in the Rule of Law is preferred here to other structural variables since it is available for all countries in the sample and has been previously used in other studies. However, it could be thought of as a proxy for other structural variables that are less available, such as the World Bank's Services Trade Restrictions Index since there is a high correlation between them.

geographical region that is not directly attributable to any particular country. Therefore, the dependent variable contains the actual U.K.' exports for explicitly identified trading partners and observations for each of the rest of countries are the U.K.'s export values reported for the rest of the region to which the country belongs. This makes the dependent variable partly continuous and censored at different values and requires an estimation technique that accounts for this feature.

The underlying, partially continuous, export values are modeled as follows:

$$\ln(EX_i^*) = \alpha + \beta \ln(POP_i) + \gamma \ln(GDPPC_i) + \delta \ln(DIST_i) + \theta \ln(ROL_i) + \cdots$$
$$\cdots + \rho EOL_i + \varphi EU_i + {}+ \omega AA_i + \mu EPA_i + \varepsilon_i$$

$$\ln(EX_i^*) = ln(EX_i) \quad if \quad I = 0$$
$$\ln(EX_i^*) \le \ln(EX_i) \quad if \quad I = -1.$$

When the true export value is not known, only the highest possible value is reported (censored). Each censored observation is therefore considered separately using the censoring indicator I that indicates whether a particular observation is the actual ($I = 0$) or is censored from the left ($I = -1$), meaning that the unobserved underlying value is smaller or equal to the one that is observed. This model is an extension of the censored normal regression model first introduced by Tobin (1958), by allowing for observation-by-observation censoring. It is estimated using a censored normal regression estimator.

III.   DATA DESCRIPTION

The export statistics by geography are collected by the U.K.'s Office for National Statistics (ONS). They consist of the value (revenue) of the U.K.'s export to many specific countries and a reminder for each geographical region. The reporting system does not allow one to break down the remainder, according to the written responses by ONS staff, since it is calculated as a residual in each region.

This paper uses annual data for 2016. It constitutes the most complete data set and is sufficiently old vintage to be considered final. More recent data are too preliminary and incomplete to be considered reliable. Trade data is generally subject to several rounds of annual revisions as preliminary data are being updated with delayed reporting and reconciled with other statistical submissions.[4]

Financial services are broken down by type of revenues into explicitly charged and FISIM. Explicitly charged financial services typically include commissions and fees related to issuance, trading, and clearing, while the FISIM is received from interest-bearing activities such as cross-border loans and investments. Revenues from insurance services include premia for direct insurance (life and non-life), reinsurance, and payments for auxiliary

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[4] The data is reported by the U.K. exporters and it would be important to cross check it with import statistics in the U.K. trade partners once such data becomes available.

insurance services, such as risk assessment, claim statements, survey of claims, and loss statements.

Table 1: The Export of U.K.'s Services in 2016, by Region

	Financial services export	Insurance services export	Total services export	Financial and insurance as a share of regional services export
Europe	27,950	4,185	130,480	24.6%
Americas	16,432	10,331	76,592	34.9%
Asia	7,033	1,824	43,256	20.5%
Australasia & Oceania	980	1,357	7,082	33.0%
Africa	948	214	8,213	14.1%
Total	56,535	18,653	265,693	28.3%

Source: Office for National Statistics, the United Kingdom
Note: £ millions unless otherwise noted

Table 1 shows the geographical distribution of export of financial and insurance services. The largest market is Europe and the Americas, accounting for 50 and 30 percent of total export of financial and insurance services, respectively. However, relative to the total export of U.K. services, financial and insurance services export is nearly equally distributed across all continents.

Table 2: The U.K.'s Export of Financial and Insurance Services in 2016

	£ millions	Share of export to explicitly identified countries [1]	Share in total UK services' export
Financial services	**56,535**	**87.5%**	**21.3%**
Explicitly charged and other financial services	48,246	89.5%	18.2%
Financial intermediation services indirectly measured (FISIM)	8,289	85.4%	3.1%
Insurance services	**18,653**	**87.8%**	**7.0%**
Direct insurance	15,776	90.8%	5.9%
Reinsurance	581	90.2%	0.2%
Auxiliary insurance services	2,296	77.5%	0.9%

Source: Office for National Statistics, the United Kingdom

[1] There are 64 explicitly identified countries to which the U.K. exports financial and insurance services.

Table 2 shows that the U.K.'s export of financial and insurance services accounts for 28.3 percent of the total U.K.'s services exports. Financial services explicitly charged make up the largest share. The U.K. financial sector exports to more than 64 countries. Although the 64 explicitly identified countries represent the bulk, smaller export markets represent still sizable 12 and 13 percent of all exported insurance and financial services, respectively.

The sample includes 183 export destination countries across all continents, for which the IMF and the World Bank collect data. It includes all 64 countries that the U.K. explicitly reports exporting to and most of the remaining countries in each region. It represents a great variety of countries in terms of income per capita, population, distance, and quality of the rule of law (Table 3). In the sample, a third of countries use English as an official language; 14 percent of countries are members of the EU, 11 percent have signed an association agreement, and 17 percent entered in a formal economic partnership.

Table 3: Descriptive Statistics for Explanatory Variables

	Mean	Std. Dev.	Min	Max
Market size				
Population (mln)	38.4	145.9	0.01	1,382.7
GDP per capita at PPP	19,441.7	20,310.1	832.2	111,756.6
General barriers to trade				
Distance (Km from London to capital cities)	6,285.6	3,865.2	317.5	18,820.6
Political similarities				
Rule of Law (WGI, World Bank)	(0.03)	0.95	(2.24)	2.04
EU membership 1/	14.0%			
AA (Association Agreement) 1/	10.9%			
EPA (Economic Partnership Agreement) 1/	17.5%			
Cultural similarities				
Share of countries in the sample that use English as an official language	31.7%			

Source: Office for National Statistics, the United Kingdom; the World Bank; European Commission; and author's calculations.
Note: 1/ Percent of countries; Number of countries: 183.

IV. RESULTS

The estimation results contain two specifications: (1) the basic specification that includes only income per capita, population, and general trade barriers—proxied by distance; and (2) the full specification as described in Section II., that is, including also measures of political and cultural similarities.

A. Financial Services

The U.K.'s export of financial services is proportionally positively related to the size of the export market. In case of the export destination country population, the U.K.'s export elasticity is unitary, meaning that a percentage growth in a country's population increases the U.K.s' export of financial services to that country by one percent. The elasticity to income per capita is even bigger, close to three. These results are stable across both specifications (basic and full) and types of exported financial services (Table 4).

The general trade barriers appear significant in the basic specification (columns 1, 3, and 5 in Table 4) across the types of financial services. Nevertheless, after controlling for the usual political and cultural similarities (column 2, 4, and 6), general trade barriers (distance) continue to be significant only in the case of FISIM, that is, for the interest-bearing activities. This confirms previous findings of significant trade barriers in the case of cross-border lending (Heuchemer *et al.*, 2009) and equity flows (Lane and Milesi-Ferretti, 2008). Both, cross-border bank lending and equity investments are arguably activities that are most affected by transaction costs stemming from asymmetric information (in screening and loan recovery).

In the case of the financial services explicitly charged—the bulk of exported financial services by the U.K., general trade barriers do not seem to be significant after accounting for the common language, partnership agreements, and the rule of law (column 2, 4, and 6). This is a significant new finding since previous studies did not investigate this export segment despite its importance. It suggests that cross-border provision of explicitly charged services, i.e., commissions and fees from the issuance of debt instruments, trading and clearing assets and derivatives, are not hampered by barriers to trade, beyond usually considered political and cultural similarities.

However, cultural and political similarities do indeed matter:

- Using English as an official language in a country increases the U.K.'s export of financial services to that country by one percent, on average. It is equally important for the U.K.'s export of all types of financial services.

- A better score in the World Bank WGI's rule of law in a country tends to increase the U.K.'s export of all types of financial services to that country by up to 2.4 percent.[5]

- Formal associations and economic partnerships agreements also help boost export of explicitly charged financial services. An economic partnership agreement increases the U.K.'s export of these services by 1.7 percent, while the association agreement yields additional 1.1 percent boost to U.K.'s export. The UK's EU membership

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[5] The effect is calculated as a maximum boost of U.K.'s exports from the improvement in a country's rule of law score. The rule of law indicator ranges in our sample from negative 2.24 to positive 2.04. The difference (a move from the worst to the best) multiplied by the estimated coefficient 0.57 (Table 4, column 2) yields the highest percentage increase in the U.K. export to that country due to the improved rule of law score (that is 2.4 percent).

(including benefits of passporting rights) brings close to one percent of additional U.K.'s export of explicitly charged financial services to the EU. The relatively small size of the EU membership effect is perhaps due to the attractiveness of the UK market (trading and clearing currencies and derivatives—and associated netting benefits, see Benos *et al.*, 2019, and Choi *et al.*, 2021) for EU countries regardless of the UK's EU membership. In case of FISIM export, these trade agreements do not seem to yield any significant export boost.

According to the models' fit, the full specification explains better the export of financial services than the basic specification and is thus the preferred model.

Although not directly comparable, most estimated elasticities fall in the ballpark of those in the literature. The estimated elasticity of export of financial services to distance of – 0.4 falls within the range of available estimates (from – 0.9 to – 0.3), using equity flows, services exports, cross-border loans in Portes and Rey (2005), Kimura and Lee (2006), Heuchemer *et al.* (2009), respectively. Similarly, the near unitary elasticity of the export in financial services to population has been found also in Kimura and Lee (2006) using overall services export. The nearly unitary effect of common language on export of financial services is on the upper side of the range of 0.4 to 0.9 found in Kimura and Lee (2006) and Lane and Milesi-Ferretti (2008) for services exports and equity flows, respectively.

Nevertheless, the effect of GDP per capita at PPP between 2.3 and 3 is higher than the range of 0.8 to 1.3 found in the literature on equity flows, cross-border lending, and export of services, using various, different measures of market size (market capitalization, GDP, or trade). It may be reconciled by the greater size of equity flows, asset holdings, and cross-border lending (hence lower elasticity to income) relative to the interest revenue flows (hence higher elasticity to income).

Table 4: The U.K.'s Export of Financial Services

	All financial services		Explicitly charged and other financial services		Financial intermediation services indirectly measured (FISIM)	
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Population)	1.080***	1.175***	1.073***	1.173***	0.864***	0.909***
	(0.108)	(0.156)	(0.111)	(0.102)	(0.081)	(0.075)
ln(GDP per capita at PPP)	3.466***	2.960***	3.481***	3.003***	2.764***	2.297***
	(0.287)	(0.538)	(0.293)	(0.436)	(0.218)	(0.327)
ln(Distance from London to capital cities)	-0.361**	-0.271	-0.406**	-0.283	-0.269**	-0.410**
	(0.175)	(0.345)	(0.180)	(0.225)	(0.133)	(0.167)
EU membership		0.822*		0.872*		-0.039
		(0.751)		(0.496)		(0.368)
Association Agreement		1.097*		1.178**		0.677
		(0.556)		(0.577)		(0.425)
Economic Partnership Agreement		1.728**		1.884**		0.625
		(0.851)		(0.875)		(0.614)
English official language		1.132***		1.018**		0.969***
		(0.385)		(0.400)		(0.296)
Rule of Law score (WGI, World Bank)		0.570**		0.573**		0.479**
		(0.271)		(0.281)		(0.209)
Constant	-31.240***	-28.130***	-31.200***	-28.650***	-25.780***	-20.570***
	(3.609)	(5.034)	(3.692)	(5.209)	(2.752)	(3.895)
Sigma	1.357***	1.135***	1.389***	1.179***	1.035***	0.878***
	(0.116)	(0.099)	(0.119)	(0.102)	(0.089)	(0.076)
Pseudo R^2	0.407	0.474	0.397	0.459	0.491	0.553
Observations	183	183	183	183	183	183
o/w left censored	119	119	119	119	119	119

Notes: Standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Dependent variable in logarithm, $\ln(1+y)$. Censored regression.

Source: Author's calculations

B. Insurance and Reinsurance Services

Results for the U.K.'s export of insurance and reinsurance services are shown in Table 5. The full specification outperforms the basic one in terms of fit for all types of insurance services and thus it is the preferred model.

General barriers to the cross-border provision of insurance services, including political and culural, are not significant across all types of insurance services. The distance results are not significant either in the basic specification (columns 7, 9, 11, and 13) or in the full specification (columns 8, 10, 12, and 14). This may be driven by the fact that insurance and reinsurance, including the settlements of claims, are based on very detailed contracts (in case of reinsurance, standardized across countries) that leave very little room for ambiguity that is often the base for hidden transaction costs. In adidtion, since reinsurance primarily serves the purpose of geographical diversification of risk, it would be expected to be affected less by hidden trade barriers (transaction costs).

Similar to the export of financial services, the market size is also important for the U.K.'s export of insurance services. The elasticities of the U.K.'s direct insurance export to an export country's population and income are similar to those of financial services. They are much smaller (about half) in the case of reinsuarce and auxiliary insurance services. The latter findings are rarther intuitive as reinsurance export is driven more by geographical diversification of risks than particular country's income (showing the lowest elasticity to income out of the three types of insurance services), while auxiliary insurance services (the settlement of claims) are derived from both, the direct insurance and reinsurance, hence the elasticity falls between those of the other two.

Cultural similarities, as represented by the use of English as an official language, boost the U.K.'s export of insurance services. The U.K.'s export of direct insurance and auxillary insurance services is higher by close to one percent to countries that list English among official languages, while the reinsurance export benefits by a half of a percentage point.

Political similarities appear to matter much less for insurance services than financial services. The countries' scores in the rule of law do not result as a significant factor across all types of insurance services. This contrasts with the findings for financial services and perhaps, it is again driven by the character of insurance services: namely that they are based on well-specified standardized contracts and in case of reinsurance, internationally enforceable. The EU membership does not seem to matter for the cross-border provision of the U.K.'s insurance services. The association agreements are the only one that significantly increase the U.K.'s export of direct and auxiliary insurance services, but not reinsurance.

Table 5: The U.K.'s Export of Insurance and Reinsurance Services

	All insurance services		Direct insurance		Reinsurance		Auxiliary insurance services	
	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
ln(Population)	0.970***	1.051***	1.004***	1.086***	0.503***	0.528***	0.606***	0.662***
	(0.094)	(0.089)	(0.097)	(0.093)	(0.066)	(0.066)	(0.068)	(0.062)
ln(GDP per capita at PPP)	2.500***	2.561***	2.738***	2.738***	1.343***	1.211***	1.610***	1.707***
	(0.243)	(0.375)	(0.253)	(0.389)	(0.167)	(0.268)	(0.177)	(0.265)
ln(Distance from London to capital cities)	0.130	0.077	0.231	0.212	0.069	-0.056	0.043	-0.101
	(0.153)	(0.196)	(0.157)	(0.205)	(0.109)	(0.149)	(0.112)	(0.136)
EU membership		0.359		0.427		-0.246		-0.022
		(0.434)		(0.454)		(0.330)		(0.302)
Association Agreement		1.119**		1.154**		0.443		0.834**
		(0.493)		(0.519)		(0.356)		(0.340)
Economic Partnership Agreement		0.990		0.958		0.544		0.674
		(0.801)		(0.816)		(0.548)		(0.595)
English official language		1.187***		1.157***		0.449*		0.968***
		(0.349)		(0.364)		(0.261)		(0.245)
Rule of Law score (WGI, World Bank)		0.087		0.149		0.219		0.030
		(0.243)		(0.253)		(0.179)		(0.171)
Constant	-25.700***	-26.720***	-29.370***	-30.090***	-14.690***	-12.610***	-16.280***	-16.600***
	(3.072)	(4.480)	(3.197)	(4.662)	(2.127)	(3.223)	(0.073)	(3.148)
Sigma	1.178***	1.034***	1.220***	1.082***	0.856***	0.796***	0.856***	0.720***
	(0.100)	(0.089)	(0.104)	(0.093)	(0.072)	(0.068)	(2.242)	(0.062)
Pseudo R^2	0.397	0.449	0.396	0.446	0.396	0.430	0.419	0.498
Observations	183	183	183	183	183	183	183	183
o/w left censored	119	119	119	119	119	119	119	119

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Dependent variable in logarithm, ln(1+y). Censored regression.

Source: Author's calculations

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V. ROBUSTNESS ANALYSIS

The robustness analysis shows how the results would change if only countries that are explicitly identified in export statistics were used for the estimation of the gravity equation. The sample is much smaller, as it includes only 64 countries. The fully specified model is estimated using ordinary least squares and results are reported in Table 6.

A. Financial Services

The results on the smaller sample shadow those found using the full sample. They confirm the major finding that general trade barriers exist only in the export of FISIM-related financial services. Across all types of financial services, results also remain unchanged for:

- The market size: elasticities on income and population remain broadly unchanged, at one and three, respectively, compared to the full sample regressions; and

- The importance of English as an official language: It boosts the U.K.'s export by about a percentage point.

The major differences are in the significance of political similarities in the case of explicitly charged financial services. The EU dummy and the rule of law score are no longer statistically significant. This is likely due to the missing counterfactual of less developed countries, when focusing only on countries that are explicitly reported. In the restricted sample, nearly half of the countries are members of the EU and most countries are developed countries with very comparable rule of law scores.

B. Insurance and Reinsurance Services

All results for direct insurance and auxiliary insurance services are robust to reducing the sample to only countries that are explicitly identified in export statistics. The only difference is that the use of English as the official language lost its statistical significance for reinsurance services. The relatively weak significance of the dummy variable "English as an official language" in the full sample and the insignificance in the smaller sample for reinsurance may stem from the fact that reinsurance is a cross-border business by nature and less dependent on counterparts speaking English as on official language.

The barriers to trade and the benefit from the EU membership continue to be insignificant across all types of insurance services in the reduced sample. Among the bilateral agreements considered, only the association agreement brings significant boost to the U.K.'s export of direct and auxiliary insurance services. The U.K. exports more direct and auxiliary insurance services to countries that speak English as an official language.

Table 6: The U.K.'s Export of Insurance and Reinsurance Services to Explicitly Identified Countries

	Financial services			Insurance services			
	All	Explicitly charged	FISIM	All	Direct insurance	Reinsurance	Auxiliary insurance
	(15)	(16)	(17)	(18)	(19)	(20)	(21)
ln(Population)	1.162***	1.158***	0.882***	1.044***	1.073***	0.503***	0.659***
	(0.109)	(0.114)	(0.084)	(0.099)	(0.104)	(0.076)	(0.069)
ln(GDP per capita at PPP)	3.069***	3.132***	2.387***	2.682***	2.911***	1.271***	1.745***
	(0.475)	(0.493)	(0.366)	(0.434)	(0.454)	(0.331)	(0.300)
ln(Distance from London to capital cities)	-0.264	-0.274	-0.401**	0.073	0.221	-0.072	-0.118
	(0.238)	(0.247)	(0.183)	(0.217)	(0.227)	(0.166)	(0.150)
EU membership	0.776	0.819	-0.104	0.310	0.361	-0.342	-0.047
	(0.522)	(0.543)	(0.403)	(0.477)	(0.499)	(0.364)	(0.330)
Association Agreement	1.116*	1.203*	0.673	1.248**	1.248**	0.715	0.969**
	(0.615)	(0.639)	(0.474)	(0.562)	(0.588)	(0.429)	(0.389)
Economic Partnership Agreement	2.610*	2.858**	1.684*	1.654	1.850	1.300	0.968
	(1.304)	(1.355)	(1.006)	(1.192)	(1.246)	(0.909)	(0.824)
English official language	1.077**	0.951**	0.912***	1.144***	1.087**	0.396	0.973***
	(0.428)	(0.445)	(0.330)	(0.391)	(0.409)	(0.298)	(0.271)
Rule of Law score (WGI, World Bank)	0.505	0.498	0.413*	0.004	0.043	0.131	-0.014
	(0.303)	(0.314)	(0.233)	(0.277)	(0.289)	(0.211)	(0.191)
Constant	-29.190***	-29.910***	-21.390***	-27.790***	-31.760***	-12.880***	-16.810***
	(5.623)	(5.841)	(4.336)	(5.139)	(5.373)	(3.918)	(3.554)
R^2	0.813	0.803	0.816	0.757	0.764	0.581	0.731
Observations	64	64	64	64	64	64	64

Notes: Standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$; Dependent variable in logarithm, $\ln(1+y)$; OLS. Results do not change when using robust standard errors.
Source: Author's calculations

VI. CONCLUSION

This paper brings new and richer insights into trade barriers in financial and insurance services. It analyzes export data for the U.K. — the global leader in cross-border services provision — for all types of financial and insurance services using the gravity equation. It significantly broadens the analysis of trade barriers beyond the cross-border equity investments and bank lending that have been analyzed in the literature so far, which, however, represent only a small fraction of the overall export of financial and insurance services. It brings new insights by providing more granular information on trade barriers in each market segment.

The U.K. is the largest net exporter of combined financial and insurance services. It exports wide range of financial and insurance products to more than 64 countries across the globe. The U.K.'s export (revenue) proportions across all types of financial services closely match the importance of each asset classes globally. These aspects make the U.K. a very representative country for the global trade in financial and insurance services and findings on the U.K. data may be of a broader relevance.

The findings suggest that general barriers to trade are restricted to a one type of financial service, that is, the interest-bearing activities, which in addition represents only a small fraction of trade in financial and insurance services. Therefore, the bulk of trade in financial and insurance services, including trading derivatives, currencies, issuance of debt securities, and all types of insurance services are not subject to barriers to trade. These findings may help to reconcile the apparent contradiction between the "popular view of intense and widespread financial globalization" and findings of barrier to trade in financial services (Aviat and Coeurdacier, 2007).

And finally, the U.K.'s export markets' income, English as the official language, trade agreements, as well as the countries' score in the rule of law are found to matter for the U.K.'s export of financial and insurance services. However, the effects on boosting exports are small, in the range of one to two percentage points.

These findings, based on a cross-section data in the year of the Brexit vote, further suggest that the U.K. benefited little from the EU membership in terms of additional boost in export of financial and insurance services to the EU. This is likely due to benefits the U.K. market offers to EU countries regardless of the U.K.'s EU membership (such as netting benefits due to the large collateral pool for the CCPs).[6] Based on the estimates, Brexit may be expected to reduce the U.K.'s export level of financial services to the EU (about 40 percent of total U.K. export of financial services) by only 0.82 percent (one-off decline) and no impact on insurance exports. This translates in 0.33 percent one-off decline in overall U.K.'s export level of financial and insurance services due to Brexit. It is expected that economic partnerships of the U.K. with third countries, closed under the EU, will continue post Brexit.

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[6] For comparison, the US CCPs received EU equivalence decision in 2016 (those supervised by the US Commodity Futures Trading Commission) and in 2021 (those supervised by US Securities and Exchange Commission).

The U.K. has on-shored most of the equivalence under the EU, except for CCPs, which operate under the Temporary Recognition Regime. If discontinued, it would have an additional one-off effect of 0.2 percent decline of the U.K.'s export level of financial and insurance services.

Since the Brexit vote (2016-2020), the share of the U.K.'s export of financial and insurance services to the EU in total U.K.'s export of financial and insurance services actually increased by one percentage point, from 39 to 40 percent for financial services and from 15 to 16 percent for insurance services. Nevertheless, there continues to be considerable uncertainty around the full impact of Brexit from future regulatory and legal developments, including the EU decision on equivalence for U.K.'s CCPs (only a temporary equivalence has been granted by the EU), and methodological challenges, such as the lack of the time dimension in the analysis and difficulties with establishing an appropriate counterfactual.

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