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The role of free trade agreements and the agricultural share of the GDP in the EU's external agricultural trade

Die Rolle von Freihandelsabkommen und des Anteils der Landwirtschaft am BIP im Agraraußenhandel der EU

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Summary

In this paper, I explore the role played by free trade agreements (FTAs) and the agricultural share of GDP (VAAGRI) in the EU's external agricultural trade. I examined bilateral trade flows in 20 agricultural sectors between 243 countries over the period of 2000–2016, obtained from the International Trade and Production Database (ITPD-E), as well as the importer's and exporter's VAAGRI and an FTA dummy. The estimation provided by applying the gravity model of international trade shows that a larger proportion of the EU's external trade in grains and fruits occurs with exporting countries which have a higher VAAGRI and that the amount of trade is not significantly larger in most agricultural sectors if an FTA exists between trading partners.

Keywords: gravity model, agricultural trade, free trade agreement, EU, applied economics

Zusammenfassung

Diese Studie untersucht, welchen Einfluss Freihandelsabkommen (FTAs) und der Anteil der Landwirtschaft am BIP (VAAGRI) auf den EU-Außenhandel in Agrarprodukten haben. Es wurden bilaterale Handelsströme zwischen 243 Ländern in 20 Agrarsektoren von 2000 bis 2016 aus dem ITPD-E-Datensatz als abhängige, sowie der VAAGRI der Länder und ein FTA-Dummy als unabhängige Variablen verwendet. Die Gravity-Schätzung zeigt, dass ein größerer Teil des EU-Außenhandels mit Getreide und Obst mit Exportländern abgewickelt wird, die einen höheren VAAGRI haben, und dass der Handel in den meisten Agrarsektoren nicht signifikant größer ist, wenn zwischen den Handelspartnern ein Freihandelsabkommen besteht.

Schlagworte: Gravitationsmodell, Agrarhandel, Freihandelsabkommen, EU, angewandte Ökonomie

1 Introduction

Today, conducting fact-based trade policy analyses is more necessary than ever, as trade openings are subject to intense public scrutiny. Unlike in the second half of the 20th century, when welfare creation was the main goal of liberalizing trade, issues like climate change, social rights and the rule of law are currently considered at least as important. This affects the agricultural sector, historically the most heavily protected sector worldwide (Hirsch and Oberhofer, 2020).

The literature on the effects of trade policy on countries' economies is vast (e.g. Head and Mayer, 2021; Oberhofer and Pfaffermayr, 2021; Caliendo and Parro, 2014; Heid et al., 2021), some especially focussing on the European agricultural sector (Sinabell et al., 2020; Timini and Viani, 2020; Baryshpolets and Devadoss, 2021). No gravity model analyses of potential effects on the agricultural sector are available for the EU's FTAs with Canada, Japan, Singapore or Vietnam. While the University of Manchester (2009) or Burrell et al. (2011) provide extensive assessments of the potential FTA with the Mercosur[1] countries, the discussed treaty has been altered substantially in the meantime. The treaty text finalized in 2019 has been analysed regarding its effects on agriculture in Mercosur countries (e.g. Cabrera et al., 2021) and in the EU (London School of Economics Consulting, 2020; Breuss, 2020; Carrico et al., 2020; Sinabell et al., 2020; Timini and Viani, 2020). While previous work addresses the role of VAAGRI in the economic development of countries (e.g. Bein and Ciftcioglu, 2017; Olowu et al., 2019), at the time of writing its relation to agricultural trade of countries has not been researched yet. I address the question of how the existence of an FTA and the VAAGRI are related to countries' bilateral trade flows in agricultural sectors. These trade flows were analysed using a gravity model of trade and ordinary least squares (OLS) regressions. The existence of an FTA between two countries and the VAAGRI for those countries were included as the main explanatory variables. While the geographical focus was placed on the EU's external agricultural trade, an estimation of global agricultural trade was made to compare and contrast the results for both samples. The construction of a dataset including recent data on all the necessary variables fulfils a secondary aim, because, to the author's knowledge, such a dataset did not previously exist.

2 Data and methods

The gravity model was chosen as a theoretical framework, because it is intuitive, has a sound theoretical footing, applies a realistic general equilibrium market view and has a flexible structure (Yotov et al., 2016, 69). Today, the model is the workhorse of many quantitative analyses of international trade data. Head and Mayer (2014) offered evidence that the model fit is 60–90% when aggregate or sectoral data are used. To determine the underlying aggregate demand and supply functions, the Constant Elasticity of Substitution (CES) as well as iceberg-type bilateral trade frictions were assumed. Another assumption made is the market clearing condition, which is used in any general equilibrium framework. This implies that factory-gate prices in a specific country will change when a change in global trade costs occurs (Yotov et al., 2016, 69). Based on the literature (Sinabell et al., 2020; Timini and Viani, 2020), I assume that the FTA dummy can be significant in the empirical gravity estimation. The relation between VAAGRI and trade flows lacks such a literature base. However, it is a key indicator in development economics, measuring both the growth of the agricultural sector itself and the country's overall GDP, where developing countries are characterised by a high VAAGRI, while this is less than 7% in developed countries. This renders an influence on trade and thus an inclusion in the estimation plausible.

The panel dataset constructed for this paper includes yearly values for all bilateral trade flows in agricultural sectors, the VAAGRI, standard gravity variables, and a dummy variable indicating the existence of an FTA between bilateral trading partners for all the countries globally. The latter two were taken from the Dynamic Gravity Dataset (DGD) (Gurevich and Herman, 2018, 4), which bases the FTA dummy on the Regional Trade Agreements Information System of the WTO (The World Trade Organization, n.d.). Thus, it takes the value one if a group of customs territories hold an agreement suspending duties and regulations. However, this is frequently subject to exemptions and incremental application provisions for agricultural sectors. Yearly values were used based on the recommendation of Egger et al. (2022). Sectoral trade flows are denoted in current US dollars and were taken from the International Trade and Production Database for Estimation (ITPD-E) of Borchert et al. (2020b), the first comprehensive sector-level gravity database (Borchert et al., 2020a, 7). This dataset includes trade data for 26 agricultural sectors for 243 countries over the span of 16 years (2000–2016), based on the reported import flows obtained from the FAO Statistics Division. Using reported import flows as opposed to reported export flows is considered to provide more reliable results (Sinabell et al., 2020, 20). As Borchert et al. (2020b, 22ff) argue, the ITPD-E is suited for application in a sectoral gravity estimation, as it is based solely on reported administrative data, rendering it appropriate for statistical inference. A downside of using the ITPD-E is that its sectoral coverage is far from perfect. Next, gravity variables were added to the ITPD-E. Lastly, the VAAGRI of countries, measured in current US dollars, was added by using data from The World Bank (2022). The constructed dataset was subsequently extended by adding importer-time and exporter-time fixed effects. These were computed following the recommendations of Vargas (2021).

The final dataset was used to estimate a gravity model using the statistical software R. Wölwer et al. (2018, 35) com-

1 Mercosur is short for "Mercado Común del Sur" of Argentina, Brazil, Paraguay and Uruguay.

pared different estimation methods and agreed with Head and Mayer (2014) that no ideal estimation method for gravity models exists. The OLS estimation proved most suitable for the dataset in this work. It is least demanding with regard to the gravity data, computing power, but still has a sound econometric footing.

For the estimation, the following gravity specification was used:

$$X_{ijt} = \beta_0 + \beta_1 lnDIS_{ij} + \beta_2 lnGDP_{it} + \beta_3 lnGDP_{jt} + \beta_3 VAagri_{it} + \beta_4 VAagri_{jt} + \beta_5 FTA_{ijt} + \beta_6 (VAagri_{it} \cdot FTA_{ijt}) + \beta_7 (VAagri_{jt} \cdot FTA_{ijt}) + \beta_8 \prod_{it} + \beta_9 P_{jt} \quad (1)$$

Where:
X_{ij} = agricultural exports of country i to country j at time t
DIS_{ij} = distance between trading partners
GDP_{it} Gross Domestic Product at time t of i
GDP_{jt} Gross Domestic Product at time t of j
$VAAGRI_{it}$ = agricultural share of GDP of i
$VAAGRI_{jt}$ = agricultural share of GDP of j
FTA_{ijt} = FTA dummy (1 if the trading partners share an FTA at time t, 0 otherwise)
Π_i = Outward Multilateral Resistance of i
P_j = Inward Multilateral Resistance of j

Π_i and P_j were operationalized for the estimation by applying importer- and exporter-time fixed effects (Anderson and Van Wincoop, 2003)[2]. All instances where the trade, distance, GDP, or VAAGRI displayed NA or zero values were removed to enable an OLS estimation (Wölwer et al., 2018, 20). The final dataset contained 898,839 observations. The bilateral trade flows, distance and importer and exporter GDP were specified by logarithmic transformation. Including an interaction term between VAAGRI and the FTA-dummy as an explanatory variable not only allowed for capturing their joint effect, but also increased the significance of the other variables in most of the sectors. Still, including this term meant that the FTA dummy could not be interpreted independently without assuming that the VAAGRI of the importer and exporter was 0%. Therefore, two different estimation specifications were used: Specification A includes the interaction term, and Specification B does not. Specification A was used to interpret the effect of VAAGRI, as including the interaction term led to a higher significance of VAAGRI. This specification is also easily interpreted in conjunction with the interaction term: If no FTA is in place between two trading partners, the interaction term is 0. If one exists, then the value of the interaction term is added to the VAAGRI variable and consequently interpreted. Specification B was used to interpret the effect of FTAs on agricultural trade, because excluding the interaction term allowed for the direct interpretation of the FTA dummy. Two different sets of estimations were compared: The first included all countries in the dataset, the second included only bilateral trade flows between countries where one partner was an EU member and the other was not[3]. This means that the second set includes all EU external trade, but includes neither EU internal trade nor trade between non-EU countries. This comparison was made to gain insights into EU external trade in comparison with world trade.

Regarding both sets of estimations, 20 out of the 26 agricultural sectors in the ITPD-E dataset were included in the analysis. The sector of "Other agricultural products, nec" was omitted, as the included products were too diverse for interpretation, as well as five sectors that had fewer than 11,000 observations in the global set and fewer than 4,000 in the EU external trade set[4].

Overall, this empirical work has a two-by-two architecture: Two different specifications (A and B) are estimated by using two different datasets (EU external trade and global trade).

3 Results

The OLS regression results show that the coefficient for distance is significant for all sectors on the 0.1% level for both specifications and datasets. "Rice(raw)" is an exception, as this coefficient is significant at the 1% level in the EU external trade set. The exporter and importer GDPs are not significant for most of the sectoral observations in both estimation sets. This can be due to cultural reasons, dietary preferences and social norms, as these greatly affect the range and value of the traded agricultural products.

Table 1 shows the results for Specification A with respect to the EU external trade estimation[5]. The most significant role of VAAGRI in EU external trade is found for trade in grains and fruits: A one percentage point (pp) increase in the VAAGRI of the exporter is associated with larger trade flows for fresh fruit (+63.07%[6]), soybeans (+9.28%), wheat (+4.98% and +4.87% if an FTA is in place between the trading countries), oilseeds (+5.93% and +6.05% with FTA) and other cereals (+2.24% and +2.38% with FTA). In these five sectors, a large, significant and positive correlation was observed between the exporter VAAGRI and trade. Three

2 Country population was insignificant for most sectors when included as an explanatory variable. Thus, it was omitted for all of the sectors, enabling consistent estimations and interpretations.

3 For the whole analysis, 28 EU countries were used, i.e. including the UK.

4 The five sectors omitted due to too few observations were "Live Cattle", "Live Swine", "Cereal products", "Prepared vegetables" and "Raw and refined sugar and sugar crops".

5 The other three tables can be found in the online appendix.

6 This and the following semi-elasticities were calculated to interpret the coefficients. As the VAAGRI variable indicates the estimation in a log-level model, the coefficient needs to be transformed as follows: $\%\Delta y = 100 * (e\beta - 1)$.

Table 1: Results for the OLS estimation with an interaction term (Specification A) for the EU external trade set

	Wheat		*Fresh vegetables*		*Other cereals*		*Soybeans*		*Fresh fruit*		*Animal feed ingredients*		*Other oilseeds*	
Intercept	213.40	.	98.76		5.00		-99.16		-148.30		-35.13		-85.76	
Distance (log)	-1.61	***	-1.97	***	-1.85	***	-2.04	***	-2.50	***	-2.07	***	-1.56	***
Importer GDP (log)	-18.66	.	-7.24		-1.24		6.47		7.46		2.74		4.10	
Exporter GDP (log)	2.03	*	0.16		1.33	*	2.19	***	5.28	***	1.18	.	3.01	***
Importer VAAGRI	2.21		0.08		2.16		0.63		-1.10		-0.74		-0.63	
Exporter VAAGRI	1.79	*	0.26		1.17	.	2.33	***	4.16	***	1.11		1.94	*
FTA dummy	-0.63		0.50	*	-0.05		-0.55		0.39	.	-2.53	***	-1.18	***
FTA dummy x Importer VAAGRI	0.13	*	0.05	*	-0.09		0.25	*	-0.02		0.21	***	0.07	**
FTA dummy x Importer VAAGRI	-0.12	*	-0.03		0.13	***	-0.07		-0.02		0.08	.	0.11	***
Num. obs.	7223		24805		9106		4372		28771		9274		20895	

	Meats. livestock products and live animals		*Prepared fruits and fruit juices*		*Corn*		*Nuts*		*Cocoa and cocoa products*		*Eggs*		*Tobacco*	
Intercept	70.91		-3.87		3588.00		843.69		-10.18		-635.10		23.36	
Distance (log)	-2.44	***	-1.42	***	-1.41	***	-1.49	***	-0.81	*	-1.67	***	-0.61	***
Importer GDP (log)	-2.90		-3.93		-300.40		12.19		0.76		51.20		1.09	
Exporter GDP (log)	-2.43		3.64		1.86	.	-67.81		0.00		2.34	*	-2.68	**
Importer VAAGRI	0.65		0.39		69.21		-5.85		0.12		-12.01		0.06	
Exporter VAAGRI	0.36	.	-0.07		0.88		-62.42		0.34		1.33		0.52	***
FTA dummy	-0.12		-0.18		0.45		0.52	.	-5.71	.	-2.28	*	-0.05	
FTA dummy x Importer VAAGRI	-0.01		-0.08		-0.11	**	-0.05	.	0.59	**	0.02		0.12	**
FTA dummy x Importer VAAGRI	0.06	**	0.02		0.02		-0.04		-0.12		0.32	***	-0.11	***
Num. obs.	26 254		13 635		8 263		16 268		5 007		5 687		13 939	

	Spices		*Other sweeteners*		*Beverages*		*Cotton*		*Rice*		*Pulses and legumes*	
Intercept	54.06		-9.58		102.20		-22.89		-153.20		-44.05	
Distance (log)	-1.37	***	-1.21	***	-2.22	***	-1.61	***	-0.75	**	-1.31	***
Importer GDP (log)	-9.13		4.92		-7.45		-3.44		21.95		10.78	
Exporter GDP (log)	2.01		-2.23	*	-2.27	.	4.29		-1.85		-3.16	
Importer VAAGRI	2.18		-1.31		1.57		0.96		-5.43		-2.54	
Exporter VAAGRI	0.12		-0.53	.	0.65	***	3.86		-1.65		0.38	
FTA dummy	-0.10		0.58	*	-0.65	***	-0.70	***	-1.20	.	-0.35	**
FTA dummy x Importer VAAGRI	0.12	***	-0.18	***	-0.08	**	0.12		0.18		0.17	***
FTA dummy x Importer VAAGRI	-0.02		-0.05		0.11	***	-0.21	**	-0.05		-0.07	
Num. obs.	26 097		9 847		27 584		11 051		4 187		16 651	

Note: Importer- and exporter-time fixed effects were estimated as well (as elaborated in the section on the estimation), but this table only depicts the focal variables. The "Meat" category also includes livestock products and live animals. Significance is depicted using stars and dots: . means $p < 0.1$, * means $p < 0.05$, ** means $p < 0.01$, *** means $p < 0.001$.
Source: Own compilation, 2023.

more sectors (beverages, meats, tobacco) show a significant positive correlation which is tiny (+ 0.92%, +0.43% and + 0.68%, respectively). And only one sector shows a significant negative correlation, which is close to zero (Other sweeteners: -0.41%). The remaining 11 sectors show no significant estimate for the VAAGRI of the exporter.

The effect of the VAAGRI of both importer and exporter is much less pronounced for global trade than for EU external trade. This might be due to several factors, e.g. since global trade includes all importers and exporters in terms of their VAAGRI (from 0.03% of the GDP in Singapore in 2018 to 79.04% of the GDP in Liberia in 2002), the diversity of trade flows and the aggregation balance out the role of this variable. Overall, the results for these countries show that a higher VAAGRI is associated with more trade in some sectors, and this effect is much more pronounced for EU external trade. This means that the EU imports more goods from countries where agriculture plays a larger role in the economy[7].

7 This also means that more of the EU's agricultural exports come from

In Specification B for EU external trade, a positive and significant[8] relation between the existence of an FTA and bilateral trade flows is seen for three out of the 20 analysed sectors: Sweeteners other than sugar (+57.76%), fresh vegetables (+32.63%) and oilseeds (+24.64%)[9]. On the other hand, four sectors show a negative and significant relation: Cotton (-50.78%), beverages, including coffee and tea (-40.67%), pulses and legumes (-23.93%) and prepared fruits and fruit juices (- 20.76%). Overall, out of 20 analysed sectors, only three display a positive, significant correlation between the existence of an FTA and trade flows, while 17 displayed either insignificant or even negative correlations. Regarding the global trade in agricultural goods, 17 out of the 20 analysed sectors reveal a positive and significant relation between the existence of an FTA and bilateral trade flows: Fresh vegetables (+131.94%), fresh fruit (+116.12%), cocoa and cocoa-products (+79.50%), wheat (+43.65%), rice (+41.65%), prepared fruits and fruit juices (+39.72%), corn (+32.46%), spices (+29.97%), cotton (+23.70%), other cereals (+23.61%), oilseeds (+22.27%), pulses and legumes (+22.23%), other sweeteners (+20.12%), nuts (+19.33%), other meats and livestock products (+18.55%), eggs (+13.75%) and tobacco (+7.94%). A significant negative correlation with FTAs is only seen for soybean trade (-37.10%). The results of the global dataset analysis confirm the aggregate, long-term trade-creating effect of FTAs. Along the same lines, the authors of the ITPD-E dataset have found that, among the 170 industries included in their dataset, all but seven sectors highlight the positive relation between FTAs and trade.

4 Discussion and conclusions

More of the EU's external trade in grains and fruits is with exporting countries which have a higher VAAGRI, i.e. where agriculture plays a larger role in the economy. When using global data, 17 out of 20 sectors revealed a positive and significant correlation between FTAs and trade, thus confirming the trade-creating effect of FTAs. With regard to the EU's external trade, the results are different: A significant positive relation could only be demonstrated in three sectors. While FTAs generally provide an incentive for countries to increase trade, the analysis of trade flows between the EU and its external trading partners in the agricultural sector indicates that there are more sectors with higher trade volumes with countries lacking an FTA with the EU. Thus, trade is not significantly larger in most agricultural sectors if an FTA exists (except for three positively correlated sectors). This places the role of FTAs in the EU's external trade relations into perspective and suggests that efficiency gains could be made in the EU's agricultural sector by negotiating new FTAs, because the EU makes more external agricultural trade with countries without an FTA. This paper's findings need to be interpreted considering that while FTAs are meant to liberalize all trade flows between countries, they frequently include exceptions and provisions for incremental application.

There are some limitations with regard to the final dataset used: First, as with any quantitative analysis of agricultural indicators, the large share of the informal economy as compared to other sectors poses problems. Therefore, this agricultural production often has to be estimated with other indicators, such as inputs or the area under cultivation. To address the research question adequately, only FTAs were included in the analysis. Ideally, separate variables would be used for all types of trade agreements (e.g. partial scope agreements or economic integration agreements), but this would have made the interpretation much more complex. Furthermore, the final dataset does not include intra-national trade flows. The ITPD-E is the first dataset to report these on the sectoral level, but including them would have created collinearity problems with the other explanatory variables. Yet, this does not reduce the quality of the estimation significantly, as Borchert et al. (2020a, 3) proved: They estimated two gravity models with the ITPD-E, one including and one excluding domestic trade, and found that the estimates were nearly identical.

The estimation results presented provide some novel insights into the role played by FTAs and countries' agricultural shares of their GDP in the EU's agricultural trade relations, which may enhance policymaking in this area. This is highly relevant, as agriculture remains the most trade-distorted sector globally, and a large potential for further quantitative and qualitative research in this field remains.

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MS with a higher VAAGRI. Still, the variation among the EU countries' VAAGRIs is insignificantly small as compared to the global variation.

8 at the 10% level

9 While cocoa and cocoa products also had a positive and significant coefficient, this was impossibly high (+ 1308.34%), possibly due to the existence of influential outliers; therefore, this was not included in the interpretation.

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Appendix

Table A: Results for the OLS estimation with an interaction term (Specification A) for the global dataset

	Wheat		*Fresh vegetables*		*Other cereals*		*Soybeans*		*Fresh fruit*		*Animal feed ingredients*		*Other oilseeds*	
Intercept	74.73		-37.60		-165.60		217.20		-20.85		-489.50		132.10	
Distance (log)	-1.60	***	-1.64	***	-1.57	***	-1.32	***	-1.50	***	-1.48	***	-1.29	***
Importer GDP (log)	-1.95		4.83		22.02		-26.92		3.68		66.02		-17.59	
Exporter GDP (log)	-6.03	*	0.42		-0.62		1.26		-1.07		-3.59		1.41	
Importer VAAGRI	1.62		-1.51		-5.20		7.24		-0.54		-17.00		4.91	
Exporter VAAGRI	0.57		0.27	*	-0.29		-0.37		0.56	**	-0.60		0.02	
FTA dummy	0.44	***	0.89	***	0.21	***	-0.39	***	0.74	***	-0.02		0.22	***
FTA dummy x Importer VAAGRI	-0.03	*	-0.05	***	0.04	***	-0.00		0.03	***	-0.02	.	-0.03	***
FTA dummy x Exporter VAAGRI	-0.02	.	0.03	***	-0.04	***	-0.02	.	-0.02	***	-0.04	***	0.02	***
Num. obs.	22393.00		60142.00		25775.00		15387.00		74358.00		23436.00		55592.00	

	Meats, livestock products and live animals		*Prepared fruits and fruit juices*		*Corn*		*Nuts*		*Cocoa and cocoa products*		*Eggs*		*Tobacco*	
Intercept	116.60		646.20	**	89.11		108.50		25.44		-97.14		79.71	
Distance (log)	-1.38	***	-1.10	***	-1.52	***	-1.31	***	-0.59	***	-1.59	***	-0.43	***
Importer GDP (log)	-14.16		-84.73	**	-1.52		-0.06		-5.67	.	12.64		-8.73	
Exporter GDP (log)	0.29		7.24		-0.70		-8.09	*	1.47	.	0.18		-1.12	*
Importer VAAGRI	3.91		18.48	**	0.38		-1.06		0.72		-3.10		2.65	
Exporter VAAGRI	0.17		-1.57	*	-2.18	.	-1.28	***	1.73		-0.06		0.44	***
FTA dummy	0.21	***	0.31	***	0.19	***	0.20	***	0.51	***	0.22	**	0.01	
FTA dummy x Importer VAAGRI	0.01		0.01		0.00		0.00		0.09	***	0.02	***	0.02	**
FTA dummy x Exporter VAAGRI	-0.03	***	0.00		0.03	***	-0.01		-0.03	.	0.02		0.01	
Num. obs.	57478.00		35618.00		26690.00		43092.00		11644.00		17671.00		34665.00	

	Spices		*Other sweeteners*		*Beverages*		*Cotton*		*Rice*		*Pulses and legumes*	
Intercept	34.29		3.29		6.40		113.60		-174.50		35.37	
Distance (log)	-1.01	***	-0.79	***	-1.01	***	-0.74	***	-1.37	***	-1.14	***
Importer GDP (log)	-4.04		-8.97		1.51		-13.24		22.06		-5.97	
Exporter GDP (log)	-0.57		7.05		-2.12	*	0.04		-1.58		1.78	
Importer VAAGRI	1.36		1.32		-0.17		3.14		-4.70		1.68	
Exporter VAAGRI	0.48	*	0.36		0.48	**	0.05		0.62		-0.19	
FTA dummy	0.23	***	0.24	***	0.02		0.22	***	0.31	**	0.16	***
FTA dummy x Importer VAAGRI	0.03	***	-0.03	***	0.03	***	-0.00		0.02		-0.04	***
FTA dummy x Exporter VAAGRI	-0.02	***	0.01		-0.02	***	-0.00		0.00		0.05	***
Num. obs.	67797.00		24978.00		68340.00		29275.00		14208.00		45837.00	

Note: Importer- and exporter-time fixed effects were estimated as well (as elaborated in the section on the estimation), but this table only depicts the focal variables. The "Meat" category also includes livestock products and live animals. Significance is depicted using stars and dots: . means $p < 0.1$, * means $p < 0.05$, ** means $p < 0.01$, *** means $p < 0.001$.
Source: Own compilation, 2023.

Table B: Results for the OLS estimation without interaction term (Specification B) for the EU external trade set

	Wheat		*Fresh Vegetables*		*Other Cereals*		*Soy Beans*		*Fresh Fruit*		*Animal feed ingredients and pet foods*		*Other Oilseeds*	
Intercept	-298.40	.	-39.88		3.03		18.37		-41.82		-107.20		79.35	
Distance (log)	-1.71	***	-1.95	***	-1.80	***	-1.97	***	-2.34	***	-2.03	***	-1.63	***
Importer GDP (log)	35.97	.	5.31		-1.01		-2.69	.	17.92		11.19		-15.63	
Exporter GDP (log)	1.03		0.53		1.09		1.22	***	-7.05	.	2.08		4.52	
Importer VAagri	-8.81	.	-1.89		0.53		1.06		-4.76		-2.40		4.09	
Exporter VAagri	0.06		0.33		0.78		-0.23		-0.19		-0.53	*	0.05	
FTA dummy	0.26		0.28	*	0.03		0.82		0.12		-0.22		0.22	.
interpretation of…														

	other meats, livestock products and live animals		*prepared fruits and fruit juices*		*Corn*		*Nuts*		*Cocoa and-products*		*Eggs*		*Tobacco*	
Intercept	72.39		-3.07		196.60		117.80		-26.39	**	41.47		26.51	
Distance (log)	-2.44	***	-1.43	***	-1.31	***	-1.47	***	0.09		-1.44	***	-0.63	***
Importer GDP (log)	-2.87		-3.92		3.27		-10.27		0.98	*	-5.11		0.92	
Exporter GDP (log)	-2.58	.	3.58		-16.47		-2.21	*	0.55		0.57		-2.80	**
Importer VAagri	0.64		0.39		0.14		2.90		0.19		1.99		0.11	
Exporter VAagri	0.40	.	-0.07		-6.32		-0.82	***	-0.37		-0.17		0.53	***
FTA dummy	0.14		-0.23	.	-0.36		-0.19		2.65	***	-0.18		-0.16	
interpretation of…														

	Spices		*Other sweeteners*		*Beverages, nec*		*Cotton*		*Rice*		*Pulses and legumes*	
Intercept	53.30		-10.38		99.29		-23.50		-154.40		-44.33	
Distance (log)	-1.36	***	-1.21	***	-2.22	***	-1.60	***	-0.76	***	-1.30	***
Importer GDP (log)	-9.11		4.99		-7.36		-3.38		22.03		10.74	
Exporter GDP (log)	2.05		-2.19	*	-2.11	.	4.30		-1.80		-3.13	
Importer VAagri	2.17		-1.33		1.54		0.94		-5.45		-2.53	
Exporter VAagri	0.11		-0.53	.	0.64	***	3.86		-1.62		0.38	
FTA dummy	-0.05		0.46	.	-0.52	***	-0.71	***	-1.12		-0.27	*

Note: Importer- and exporter-time fixed effects were estimated as well (as elaborated in the section on the estimation), but this table only depicts the focal variables. The “Meat” category also includes livestock products and live animals. Significance is depicted using stars and dots: . means $p < 0.1$, * means $p < 0.05$, ** means $p < 0.01$, *** means $p < 0.001$.
Source: Own compilation, 2023.

Table C: Results for the OLS estimation without interaction term (Specification B) for the global dataset

	Wheat		*Fresh Vegetables*		*Other Cereals*		*Soy Beans*		*Fresh Fruit*		*Animal feed ingredients and pet foods*		*Other Oilseeds*	
Intercept	74.29		-36.46		-167.90		216.50		-21.11		-496.71		133.20	
Distance (log)	-1.57	***	-1.63	***	-1.57	***	-1.31	***	-1.51	***	-1.46	***	-1.29	***
Importer GDP (log)	-1.92		4.71		22.30		-26.87		3.74		66.45		-17.75	
Exporter GDP (log)	-6.01	*	0.39		-0.61		1.31		-1.09		-3.27		1.42	
Importer VAAGRI	1.62		-1.47		-5.28		7.20		-0.56		-17.11		4.96	
Exporter VAAGRI	0.57		0.27	*	-0.29		-0.37		0.56	**	-0.57		0.02	
FTA dummy	0.36	***	0.84	***	0.21	***	-0.46	***	0.77	***	-0.15		0.20	***

	other meats, livestock products and live animals		*prepared fruits and fruit juices*		*Corn*		*Nuts*		*Cocoa and-products*		*Eggs*		*Tobacco*	
Intercept	117.70		649.80	**	92.63		108.00		24.29		-97.97		80.51	
Distance (log)	-1.37	***	-1.10	***	-1.53	***	-1.31	***	-0.60	***	-1.58	***	-0.44	***
Importer GDP (log)	-14.29		-85.22	**	-5.95		-0.02		-5.64	.	12.65		-8.85	
Exporter GDP (log)	0.28		7.29		-0.71		-8.07	*	1.52	.	0.24		-1.09	*
Importer VAAGRI	3.95		18.59	**	0.50		-1.07		0.72		-3.09		2.68	
Exporter VAAGRI	0.18		-1.58	*	-2.17	.	-1.28	***	1.81		-0.06		0.44	***
FTA dummy	0.17	***	0.33	***	0.28	***	0.18	***	0.59	***	0.13	.	0.08	.

	Spices		*Other sweeteners*		*Beverages, nec*		*Cotton*		*Rice*		*Pulses and legumes*	
Intercept	35.64		4.99		7.45		113.80		-174.30		36.29	
Distance (log)	-1.01	***	-0.78	***	-1.02	***	-0.73	***	-1.38	***	-1.14	***
Importer GDP (log)	-4.21		-9.44		1.37		-13.26		22.07		-6.08	
Exporter GDP (log)	-0.56		7.18		-2.11	*	0.04		-1.60		1.78	
Importer VAAGRI	1.41		1.48		-0.13		3.14		-4.70		1.70	
Exporter VAAGRI	0.48	*	0.41		0.48	**	0.05		0.62		-0.19	
FTA dummy	0.26	***	0.18	***	0.05		0.21	***	0.35	***	0.20	***

Note: Importer- and exporter-time fixed effects were estimated as well (as elaborated in the section on the estimation), but this table only depicts the focal variables. The "Meat" category also includes livestock products and live animals. Significance is depicted using stars and dots: . means $p < 0.1$, * means $p < 0.05$, ** means $p < 0.01$, *** means $p < 0.001$.
Source: Own compilation, 2023.