Global Trade Analysis Project
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This paper is from the
GTAP Annual Conference on Global Economic Analysis
https://www.gtap.agecon.purdue.edu/events/conferences/default.asp

There Goes Gravity: How eBay Reduces Trade Costs*

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April 2012

Preliminary Draft - Do not cite or circulate

Abstract

The effect of distance on cross-border flows, a standard proxy for trade costs, is 60 percent smaller on the eBay online platform than offline. The relative decline is not explained by the correlation of distance with other traditional trade cost variables, such as common legal systems and language, colonial links, transport costs, and trade agreements, but rather by a reduction of information frictions online. This loss of gravity is particularly important for remote countries with larger information asymmetries associated, for example, with higher levels of corruption, suggesting an important role for technology to help overcome market and government failures while bringing the global economy towards frictionless trade.

JEL CODES: F13, F16
Key Words: Trade costs, gravity, online trade, eBay.

*We are grateful to Richard Baldwin, Christine Barthelemy, Mathieu Crozet, Peter Egger, Phil Evans, Simon Evenett, Lionel Fontagné, Gordon Hanson, Torfinn Harding, Beata Javorcik, Thierry Mayer, Hanne Melin, Marc Melitz, Peter Neary, Tony Venables, and seminar participants at Oxford University, the Villars PEGGED workshop, the WTO's Geneva Trade and Development Workshop, the University of Neuchatel, the Paris Trade Seminar, and the RIEF meeting at Bocconi University for their constructive comments and suggestions. We also thank Daniel Bocian, Steve Bunnel, and Sarka Pribylova at eBay for their time, patience and efforts with our data requests, and eBay for funding. All errors are the sole responsibility of the authors.

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1 Introduction

In the 1990s many commentators believed that with advances in transport and communication technologies, geographic distance between countries would soon no longer hinder international transactions (e.g. Cairncross 1997). But despite some anecdotal evidence in support of the "death of distance" hypothesis (e.g. Friedman 2005), there is a large number of academic papers suggesting that distance is "thriving", not "dying". For example, Disdier and Head (2008), using a meta-analysis based on 1,000 gravity equations , found that the estimated coefficient on distance has been slightly on the rise since 1950. While Chaney (2011) argues that the need for direct interactions between trading partners, as first highlighted by Rauch (1999), explains why distance still matters for trade. Similarly, Allen (2011) suggests information frictions account for 93 percent of the distance effect. But why isn't technology substituting for direct interactions?

In this paper we examine the role of technology in reducing trade costs using data on eBay trade flows. Founded in 1995, eBay is the world's largest online marketplace, connecting millions of buyers and sellers globally on a daily basis. By allowing sellers to upload their products online and simply wait for buyers, it has drastically reduced the search and matching costs highlighted by Rauch (1999) and Chaney (2011) as important impediments to trade. Sellers no longer need to make multiple phone calls, write emails, attend trade fairs and networking events. While buyers still incur search costs, these are brought down to a simple internet search uncorrelated with how remote markets are. As argued by Hortaçsu et al. (2009), the main benefit of the Internet as a trade facilitator is to reduce search costs, and it is reasonable to think of these marketplaces as "frictionless" in this regard.

Hortaçsu et al. (2009), using a sample of within-US eBay transactions, showed that the coefficient on distance on trade was much smaller online than offline. But as highlighted by the authors, several caveats make the comparison with offline trade imperfect. One is that the products traded on eBay are mainly household durables, and thus extrapolations to other categories of goods are not possible. The other is that the demographic characteristics of the users are online-specific and not representative of the offline world. Another caveat is that international search costs are very different from those within the US. Horta csu et al.

(2009) do provide international evidence using MercadoLibre, another online market, though the latter only covers 12 Latin American countries.

Our dataset allows us to to overcome these critiques and compare the impact of distance on trade flows on eBay and offline considering the same set of countries and goods. It covers all eBay transactions, disaggregated into 40 product categories, between 62 countries (92% of world trade) during 2004-2009. To create the best-possible counterfactuals, we first drop the years 2008 and 2009, the crisis years of the Great Trade Collapse.[1] We also drop from our eBay data all transactions that were concluded via auctions (60 percent of eBay traded value), as well as those sold by consumers. We thus focus on firm exports through set-price mechanisms, which is closer to the standard practice offline. We then match eBay product categories to product descriptions in the 6-digit level HS classification. Since it was impossible to match some eBay categories to HS codes, we dropped those goods from our eBay aggregate.[2]

Prima-facie evidence from our sample suggests that the absence of search costs on the eBay platform does reduce the importance of distance. Figure 1 illustrates the relationship between trade flows and distance on eBay in the left panel and offline in the right panel. The slope is flatter for eBay trade flows. This confirms the prediction of Chaney (2011), namely that in a world where direct interaction between potential suppliers and buyers is not necessary, the role of distance in explaining trade flows is smaller. However, even if the importance of distance is 60 percent smaller on eBay, suggesting search costs are drastically reduced, it still matters significantly. Hortacsu et al. (2009) attributed the remaining effect to trust, arguing that people trust their neighbors more than people further away. Blum and Goldfarb (2006) show gravity holds in the case of website visits and argue this is because distance proxies for taste.

To identify as precisely as possible the effect of distance we thus use a gravity framework and control for other standard gravity trade costs such as the absence of a common language, a common legal system, a border, colonial links, or a free-trade agreement. We also control for

[1] Abstracting from that period allows us to get rid of some undesired complications, but in the robustness section we include those years as well.

[2] Both our eBay data and offline image include used goods, but in the robustness section we separate new and used goods to see whether this is driving results.

bilateral shipping costs, which are included in our eBay dataset. While the effect of distance declines online after introducing these other trade-cost variables, the relative importance of distance online and offline is unchanged, with distance mattering 63 percent less online than offline.

We perform a number of robustness checks. First, we show that using OLS or a Poisson pseudo-maximum likelihood model yields similar results. Then we show the results hold when using more liberal counterfactuals, using all eBay flows and all comtrade flows. Results also hold when looking at only new goods, or only used goods, or even when looking at auction transactions. Interestingly the distance coefficient online is larger for old goods and auction transactions than for new goods and set-price transactions, suggesting that information frictions may indeed be behind the decline in the distance coefficient. We also run our gravity model by eBay category and show that distance matters more offline for all bar one category (collectables).

In order to understand what is driving the world-flattening brought about by eBay we interact the distance coefficient both online and offline with the level of corruption and information at the country level. We find that the reduction in the marginal effect of distance on bilateral trade flows is the largest in countries with high levels of corruption and low levels of popularity as measured by google search results. This suggests that distance captures distance captures both trust and information frictions.

The reminder of the paper is organized as follows. In section 2 we provide some descriptive statistics regarding international trade flows on eBay. Section 3 presents our empirical strategy and section 4 the results. Section 5 presents the trade gains from world flattening. Section 6 concludes.

2 International trade on eBay: Descriptive statistics

The sample covers all eBay trade flows between 62 developing and developed countries over the period 2004-2009. These 62 countries, identified in Figure 2 , represent around 92 percent of offline world trade in 2008. Total cross-border flows were on average USD 6 billion per year

over the period, representing only 0.06 percent of world trade. The correlation between the logs of total offline and total eBay trade is 0.71, suggesting trade patterns are geographically similar online and offline. Still, since we want to compare online and offline trade flows as precisely as possible, we focus on the period 2004-2007 to abstract from special experiences during the Great Trade Collapse of 2008-2009.[3] To improve the matching between online and offline flows we only look at eBay flows sold by businesses, and get rid of all imports purchased via auctions, which are prevalent on eBay but quite uncommon offline.[4]

Our dataset also allows us to match goods traded online and offline. It covers all eBay transactions disaggregated into 40 product categories that we match with product codes at the 6-digit level of the HS classification (our matching table is available upon request). Since it is impossible to match some eBay categories to HS codes, we dropped those goods from our eBay aggregate. This allows us to have an offline eBay-image with the same goods, similarly distributed across categories, as our eBay trade flow (Figure 3). It is also important to note that the selected HS categories all fall into the "final good" category of the WTO's Trade Policy Review classification, and are all classified as "consumer goods" in the BEC classification, which clearly corresponds to the type of goods traded online. All HS 6-digit lines also fall in the differentiated goods category in the Rauch SITC-based classification(1999).

The matching of goods traded online and offline is crucial because it allows us to control for the potential differences in trade costs associated with differences in the composition of goods traded online and offline.[5] Tickets to sport-events traded online for example are likely to be very sensitive to distance whereas exports of rare-earth which are only produced in a few countries, but consumed all over the world are likely to be not very sensitive to distance. If the tickets tend to be traded online and rare-earth offline (which is very likely), then differences in the marginal impact of distance on traded flows will be totally explained by the nature of these two goods, and not by information and communication technology.

[3]For example goods shifting, trade finance problems, or new protectionist pressures.

[4]The share of sales undertaken by consumers is 66 percent and the share of sales through auctions is 65 percent. Once we exclude both we are left with 15 percent of total eBay's cross border flows.

[5]See Berthelon and Freund (2008) or Carrère et al. (2009) for a discussion of the impact of the composition of trade on the role of distance.

Our eBay data also includes data on average bilateral ad-valorem shipping costs. While we do not have an equivalent for offline flows, in the case of US imports we do have data on freight and insurance costs from the online platform provided by USITC. When plotting these costs against distance (see Figure 4)we find that for both online and offline flows, shipping costs are uncorrelated with distance, even though shipping costs seem to be much higher online.[6] This suggests that the introduction of observable shipping costs in the gravity equation, which are often omitted due to lack of data, is not going to explain the importance of distance in the gravity equation. But this is a testable hypothesis at least in the online sample.

Offline trade data and trade cost variables come from the usual sources and are described in the Data Appendix.

3 The empirical model

Our starting point is the gravity model which suggests that bilateral trade between two countries is proportional to their economic mass and the multilateral resistance indices of the importer and the exporter,[7] and inversely proportional to trade costs between the two countries, often approximated by their geographic distance (see Anderson and Van Wincoop (2003) for an elegant derivation):

$$(1) \quad m_{ij} = \frac{y_i y_j}{y_w} \left(\frac{t_{ij}}{P_i \Pi_j} \right)^{\epsilon}$$

where m_{ij} are imports of country i from country j, y_i is total income in importing country i, y_j is total income in exporting country j, y_w is total world income, t_{ij} are trade costs between country i and country j, ϵ is the trade cost elasticity of bilateral imports,[8] and P_i and Π_j are the multilateral resistance terms in the importing (inward) and exporting (outward) country,

[6] Using data on all country pairs online gives a similar picture.

[7] The multilateral resistance terms are weighted-average of price indices in the importer and exporter's trading partners.

[8] Given by 1 - σ in Anderson and Van Wincoop (2003) where σ is the elasticity of substitution between different import sources in the importing country.

respectively.[9]

We follow the literature and model bilateral trade costs (t_{ij}) as a function of geographic distance and other trade cost variables:

$$t_{ij} = D_{ij}^{\alpha_D} T_{ij}^{\alpha_T} \tau_{ij} e^{NB_{ij}\alpha_{NB}} e^{NC_{ij}\alpha_{NC}} e^{NCL_{ij}\alpha_{NCL}} e^{NCLS_{ij}\alpha_{NCLS}} e^{NFTA_{ij}\alpha_{NFTA}} e^{IQ_{ij}\alpha_{IQ}} \quad (2)$$

where all αs are parameters, D_{ij} is geographic distance between countries i and j, T_{ij} are shipping costs between countries i and j, τ_{ij} are bilateral tariff imposed by country i on exports from j, NB_{ij} is a dummy variable taking the value 1 when countries i and j do not share a border, NC_{ij} is a dummy variable taking the value 1 when countries i and j did not share a colonial link, NCL_{ij} is a dummy variable taking the value 1 when countries i and j do not share a common language, $NCLS_{ij}$ is a dummy variable taking the value 1 when countries i and j do not share a common legal system, and $NFTA_{ij}$ is a dummy variable taking the value 1 when countries i and j are not part of the same Free Trade Agreement.[10]

We then substitute (2) into (1) and take logs on both sides to obtain:

$$\begin{aligned} \ln(m_{ij}) = \quad & \ln(y_i) + \ln(y_j) - \ln(y_w) + \beta_D \ln(D_{ij}) + \beta_T \ln(T_{ij}) + \beta_\tau \ln(\tau_{ij}) + \beta_{NB} NB_{ij} + \\ & \beta_{NC} NC_{ij} + \beta_{NCL} NCL_{ij} + \beta_{NCLS} NCLS_{ij} + \beta_{NFTA} NFTA_{ij} + \\ & \beta_{IQ}(IQ_{ij}) - \epsilon \ln(P_i) - \epsilon \ln(\Pi_i) \end{aligned} \quad (3)$$

where all βs are parameters to be estimated and $\beta_k = \epsilon \alpha_k$, where k is the subscript indicating the different trade cost variables. Because we are interested in understanding the variation of different βs offline and online, and because P_i and Π_i are not observable (and difficult to estimate) we proceed as in much of the empirical literature and control for the multilateral resistance terms (and y_i and y_j) including importer i and exporter j fixed effects.

[9]The expressions for the inward and outward multilateral resistance terms are $P_i = \left[\sum_j (t_{ij}/\Pi_j)^\epsilon \frac{y_j}{y_w}\right]^{1/\epsilon}$ and $\Pi_j = \left[\sum_i (t_{ij}/P_i)^\epsilon \frac{y_i}{y_w}\right]^{1/\epsilon}$.

[10]Note that we measure the absence of common language, common legal system, colonial links or trade agreements, rather than their presence as in most of the literature. This has no consequences for the estimates, but it allows to interpret these variables as trade costs (like distance) rather than trade-enhancing variables.

A stochastic fixed effect version of equation (3) is our baseline specification to understand the importance of different trade costs offline and online. We estimate them separately for online and offline flows, but also appending the offline and online data so that we can directly test whether coefficients are statistically different online and offline by introducing an online dummy that we interact with each of the trade cost variables. If the interaction of the variables is statistically significant then the coefficients are statistically different online and offline. In both cases we allow for importer and exporter fixed effects to be different online and offline.

Finally, we can also provide estimates of the relative difference between α_ks online and offline, i.e., the contribution of each trade cost variable to the total trade cost online and offline relative to some other variable. This is simply obtained by comparing the ratio of two interaction variables once the data has been appended. Indeed, the interaction variable gives the difference on $\beta_k = \epsilon\alpha_k$ for online and offline flows. Given that online and offline flows share the same ϵ if our matching of products is correct:[11]

$$(4) \quad \beta_k^{\text{online}} - \beta_k^{\text{offline}} = \epsilon \left(\alpha_k^{\text{online}} - \alpha_k^{\text{offline}}\right)$$

Taken then the ratio of two of these interacting variables (i.e., differences in β_ks) we obtain the relative difference on the impact of each trade cost variable on trade costs online and offline:

$$(5) \quad \frac{\left(\beta_k^{\text{online}} - \beta_k^{\text{offline}}\right)}{\left(\beta_{-k}^{\text{online}} - \beta_{-k}^{\text{offline}}\right)} = \frac{\left(\alpha_k^{\text{online}} - \alpha_k^{\text{offline}}\right)}{\left(\alpha_{-k}^{\text{online}} - \alpha_{-k}^{\text{offline}}\right)}$$

. Thus, by comparing the ratio of the interaction variables, we can deduct the which trade costs are most reduced online.

[11] This assumption is tested in section 5.

4 Results

Table 1 provides the results of our baseline estimation of (3). The elasticity of distance is almost three times smaller online than offline. This supports Chaney's (2011) hypothesis that a large part of what drives the distance coefficient in the gravity framework are associated with search costs, which vanish on a platform such as eBay.

Columns (2) and (5) of Table 1 provide the estimates of (3) including the other usual trade costs variables. When we introduce these additional trade costs, the coefficient on distance declines both online and offline. Still it remains around three times smaller online suggesting a flatter world on the eBay platform.

Some interesting patterns emerge regarding the other trade cost variables. Common legal systems, trade agreements, colonial links and borders seem to matter much more offline. On the other hand the absence of a common language seem to matter more online than offline.We test for the statistical significance of these differences by appending the online and offline datasets and estimating the gravity equation including interactions of each trade costs with an eBay dummy which takes the value of one if the flow on the left-hand side is the eBay flow and zero if it is the eBay-image. As argued above we also include importer-eBay and exporter-eBay fixed effects that control for potential self-selection into online and offline trade, as well as differences in prices (i.e., multilateral resistance) online and offline, or any country specific difference between importers and exporters online and offline. As seen in Table 3, we find that the difference in the effect of distance is statistically significant. What's more, we find that the absence of colonial links and common legal systems matter significantly less online. Hence technology reduces the distortions caused by historical legacies. We find no significant difference in the effect of free-trade agreements, borders, or languages.

Columns (3) and (6) add shipping costs to the set of explaining variables. Since these are not available for offline data, they are not usually included in gravity estimates. But since our eBay data includes shipping costs, we include this bilateral ad-valorem average as a control both online and offline where it may also be a valid proxy for shipping costs. Surprisingly, we find no significant effect for shipping costs, and our results are unaffected by this inclusion, which can be explained by the fact that shipping costs are not necessarily

correlated with distance.

Columns (7) and (8) provide the results using a Poisson pseudo-maximum likelihood estimator which was suggested for gravity models by Santos Silva and Tenreyro (2006) to control for the presence of zeros and heteroscedasticity. Again we find that distance matters much more offline. The estimated distance elasticity is of -0.28 on eBay and -0.66 on the eBay image.

We then proceed to estimating gravity equations per eBay category and using the specification of column (2) of Table 1 to check that our result is not driven by a bundle composition effect within the online and offline bundles. Results, summarized in Figure 5, show that, with the exception of collectibles, distance always has a bigger effect offline, being on average 2.5 times bigger.

In Table 2 we include the results of various other robustness checks. As an important part of eBay trade is in used goods (25 percent) or occurs through auctions (65 percent) we replicate Table 1 disaggregating imports into used vs. new goods (this is done on a 2008 cross section because it is the only year for which we have the used versus new good information) and auctions vs. direct sales. We also report results when looking at all trade flows reported on comtrade, i.e. not just the eBay image. Results are consistent across aggregations suggesting that across all types of ebay flows distance matters less. Interestingly, the distance coefficient is smaller for new than for used goods, and for goods sold through auctions than for goods sold through set-price transactions. Thus when information is more difficult to obtain regarding the quality of the goods or the price at which it will be sold (i.e. in the case of used goods and auction transactions) distance seems to matter more, suggesting that the reason the distance coefficient declines for eBay is because it help reduce information asymmetries.[12]

The final two columns of Table 2 verify whether seller reputation matters for the impact of distance on trade flows by comparing the distance coefficient for powersellers and non-powersellers on eBay. Indeed, online platforms adopt mechanisms to overcome the incentives for opportunistic behavior in global markets where buyers and sellers do not

[12]We also run the same specification for C2C flows and perhaps surprisingly found a similar distance elasticity as for B2C flows of around -0.5.

necessarily meet repeatedly by adopting mechanism that reveal the past behavior of traders. eBay powerseller status is one of these mechanisms. It certifies that the seller has received 98% positive feedback, has been active for more than 90 days, has completed at least 100 transactions or transactions worth at least $3000 during the past year, and complies with eBay policies.[13] Seller reputation is in principle much more important than buyer reputation on eBay as all transactions are of the "cash-in-advance" type where the buyer first pays, and needs to then wait for the seller to send the right goods, with the correct characteristics on time. The last two columns of Table 2 look at whether the impact of distance on trade flows is different for powersellers than non-powersellers. If the distance coefficient partly captures trust in the distant seller, and if the powerseller mechanism were to be effective, then we would expect a stronger distance coefficient for transactions undertaken by non-powersellers. However, we find that distance affects similarly both types of sellers. However, powerseller status does seem to explain the difference in the coefficient for common legal systems as the coefficient is much larger for non-powersellers than for powersellers. Thus, the powerseller status help reduce the importance of having a common legal system, but it does not seem to be the mechanism through which the importance of distance is reduced online.

In order to further understand the mechanisms through which eBay reduces the impact of distance on bilateral trade flows, we explore the extent to which the distance coefficient changes as the level of corruption or country information as measured by google search results of the buyer and the seller increases. To do this we introduce four interaction variables in the specification of column (2) in Table 1. First, we interact distance with the level of corruption in the importer and the exporter country. Then, we interact distance with the level of country information in the exporter and importer country as measured by google results for searches for the country name. Results are reported in columns (3) to (6) and (9) to (12) of Table **??**.

The marginal effects of distance as as function of corruption or country information in the importing and exporting country are reported in Figure 7. They confirm the results of Table **??**. The higher the level of corruption in the importing or the exporting country, the larger

[13]See eBay's website for more details here: http://pages.ebay.com/sellerinformation/sellingresources/

the difference of the distance coefficient between online and offline flows. Similarly, the lower the degree of country information the larger the difference of the distance coefficient between online and offline flows. Thus the reduction in the distance coefficient is largest when the importer and/or the exporter are located in countries with high levels of corruption and for which there is little information available.

The difference in the effect of distance could be due to a selection of 'international' buyers rather than a'technology' effect. While the appended model including importer-eBay and exporter-eBay fixed effects partly corrects for these selection effects, these buyer and seller characteristics might also affect the impact of trade costs if for example online buyers tend to be richer and rich individuals prefer purchasing goods from far away countries. Ideally, we would like to observe individual characteristics of buyers online and offline, but we do not have access to that data. Thus, we check for this possibility by examining whether distance matters less online no matter the level of internet penetration, or income inequality in the buyer country. The idea is that if a buyer is located in a country with little internet penetration or high income inequality, the likelihood for self-selection of buyers driving our results is stronger. Results reported in Table **??**

5 Who benefits from world flattening?

In this section we estimate the trade gains that would result if all trade occurred on eBay. More precisely, we predict the increase in imports that would results from a reduction of the distance elasticity from -1.12 to -0.41. This is done by first computing the changes in bilateral imports and then aggregating across trading partners and taking the percentage change. Results are summarized in Figure 8 where the changes in aggregate imports are plotted against an indicator of remoteness which is measured as the GDP-weigthed average of the geographic distance to all trading partners. It is quite clear from Figure 8 that the change in imports is positively associated with remoteness, suggesting not surprisingly that countries that are more likely to benefit from the flattening of the world in eBay are more remote countries. Indeed, the percentage increase in imports is three times larger for the

most remote countries than for the least remote countries. More importantly, there is on average a twofold increase in trade associated with such a decline in the impact of distance on trade flows.

6 Concluding Remarks

On eBay, the world is flatter, but still not completely flat. More interestingly eBay reduces the effect of distance on trade flows most where it is most needed: in remote countries with bad institutions. Thus, the reduction in trade costs brought by online market platforms such as eBay are promising is promising in terms of the potential for technology to help sellers and consumers in poor countries integrate into the global economy.

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Data Appendix

Below we discuss variable construction and data sources for all variables used in the empirical sections. The appendix Table provides descriptive statistics for each variable.

- Distance (D): Distance between two countries based on bilateral distances between the largest cities of those two countries, those inter-city distances being weighted by the share of the city in the overall country's population. Source: CEPII Distances database.

- Transport or shipping cost (T): Ad-valorem shipping costs as a share of product price. Source: eBay.

- No Border (NB): dummy variable indicating whether the two partners share a border. Takes the value 1 when the two partners do not share a border. Source: CEPII Distances database.

- No Colony (NC): dummy variable indicating whether the two countries have ever had a colonial link. It takes the value 1 when the two trading partners do not share a colonial link. Source: CEPII Distances database.

- No Common Language (NCL): dummy variable indicating whether the two countries share a common official language. It takes the value 1 when the two trading partners do not share a common language. Source: CEPII Distances database.

- No Common Legal System ($NCLS$): dummy variable indicating whether the two countries have the same legal origin. It takes the value 1 when the two partners do not share a legal origin. Source: CEPII Gravity database.

- No FTA ($NFTA$): dummy variable indicating whether the two countries have a free-trade agreement declared at the WTO. It takes the value 1 when the two partners do not have a free-trade agreement. Source: WTO.

- Corruption (C): Negative of control-of-corruption which captures perceptions of the extent to which public power is exercised for private gain, including both petty and

grand forms of corruption, as well as "capture" of the state by elites and private interests. Source: Kaufmann et al. (2010).

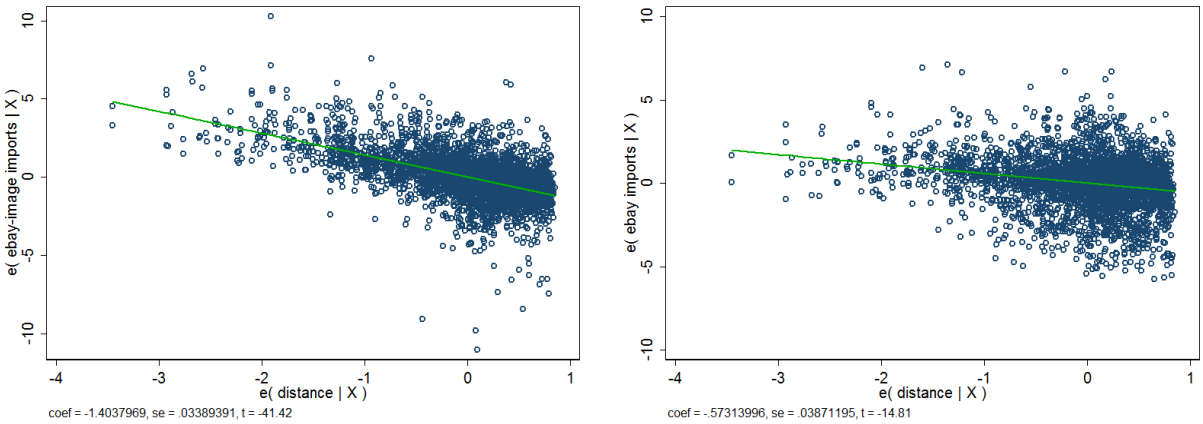
- Google coverage (G): Log of the number of results of a Google search for the country name in English . Source: Google.
- Trademark Intensity (VERO) ($VERO$): Share of companies who complain about parallel imports on eBay. Source: eBay.
- Trademark Intensity (WIPO) ($WIPO$): Log of the number of registered brands per keyword search, where the keyword is the eBay category. Source: WIPO Global Brands Database.
- eBay imports: Total eBay imports in current US dollars. Source: eBay.
- eBay-image imports: Total bilateral imports in HS codes corresponding to eBay categories in current US dollars. Source: Comtrade
- Offline imports: Total bilateral imports in current US dollars. Source: Comtrade
- Powerseller status (PS): Dummy indicating whether the exporters had a power seller status on eBay. Source: eBay.
- Internet penetration (@): Number of internet users over population. Source: World Bank World Development Indicators.

Appendix Table
Descriptive statistics

Variable	# obs.	Mean	Std. Dev.	Min.	Max
eBay imports (USD)	3778	1591471	1.49E+07	0	5.58E+08
Offline eBay-image (thousand USD)	3778	468276.7	3308454	0	1.55E+08
Offline total (thousand USD)	3778	2564305	1.13E+07	0	2.94E+08
Buyer corruption	3778	-0.6753435	1.020868	-2.364348	1.05309
Seller Corruption	3778	-0.6751916	1.021127	-2.364348	1.05309
Distance	3778	8.237772	1.037524	5.080959	9.880192
Transport cost	3745	2.742466	0.5765142	-0.1231111	11.20244
No Border	3778	0.9542086	0.2090601	0	1
No Common Language	3778	0.9391212	0.2391395	0	1
No Colony	3778	0.9703547	0.1696293	0	1
No FTA	3778	0.5865537	0.4920236	0	1
No Common Legal System	3778	0.761514	0.4262141	0	1

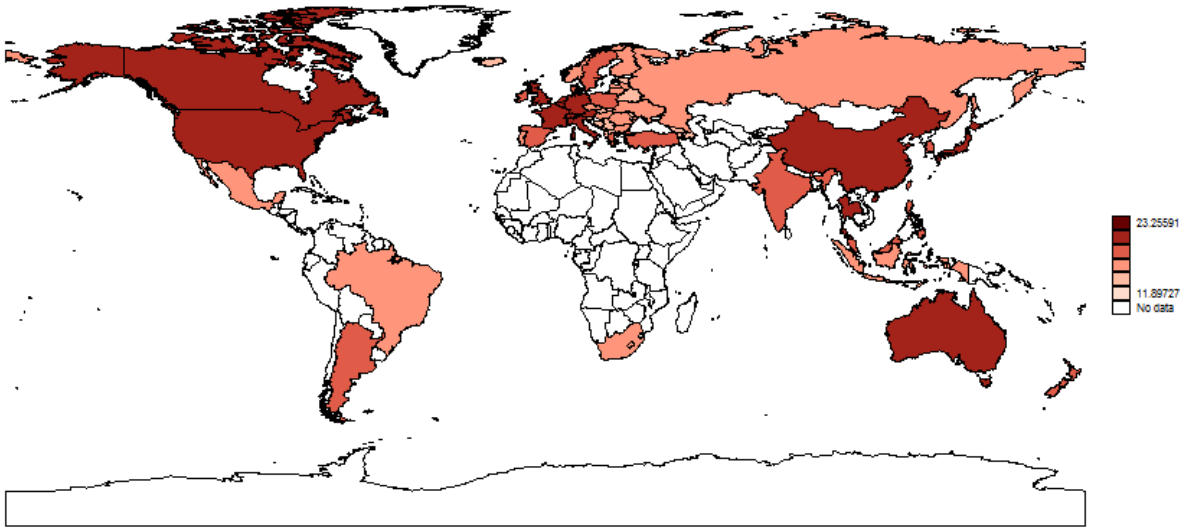
Source: See Data Appendix for a description of variable construction, data sources and symbols used in the rest of the paper.

Figure 1
The importance of distance with and without search costs



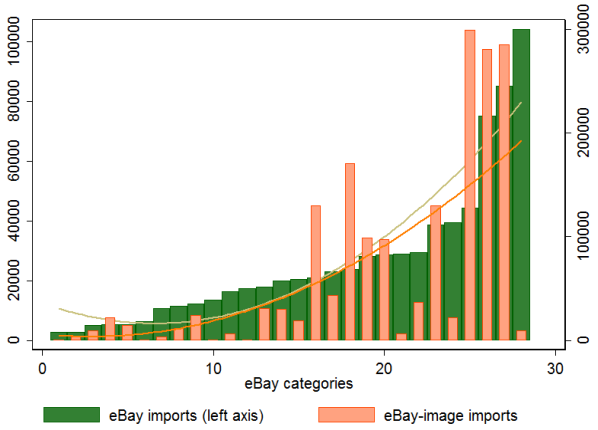
Note: Offline bilateral trade data is from UN Comtrade for 62 countries which represent more than 92 percent of world trade and is restricted to the set of goods which are traded on the eBay platform. eBay bilateral trade data is from eBay for the same set of countries. Distance is from CEPII and is measured as the bilateral distance between the capitals of the two trading partners weighted by the share of the capital's population in the total population of the country.

Figure 2
Country coverage



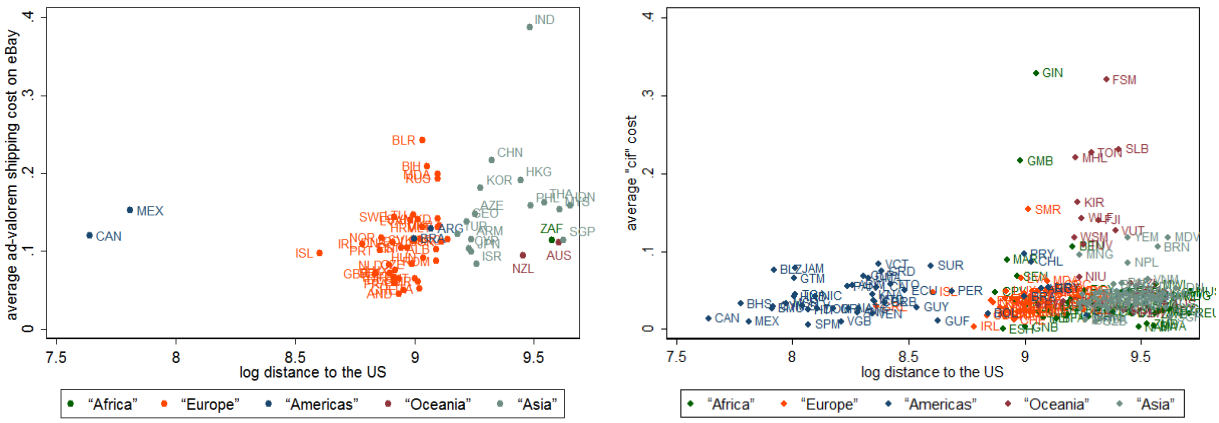
Note: The intensity of the red color signals the value of the log of exports

Figure 3 Distribution across eBay categories



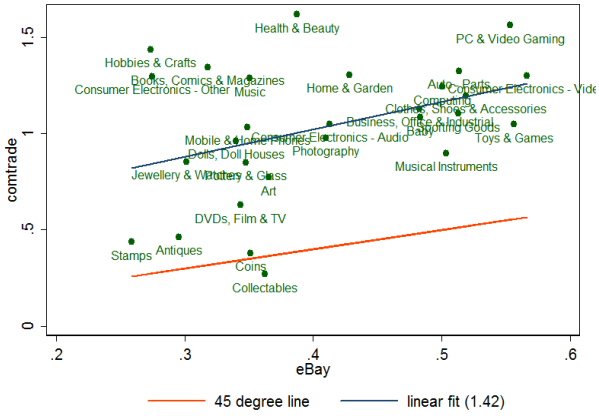
Note: The lines are quadratic fits.

Figure 4
Distance and shipping costs offline and online



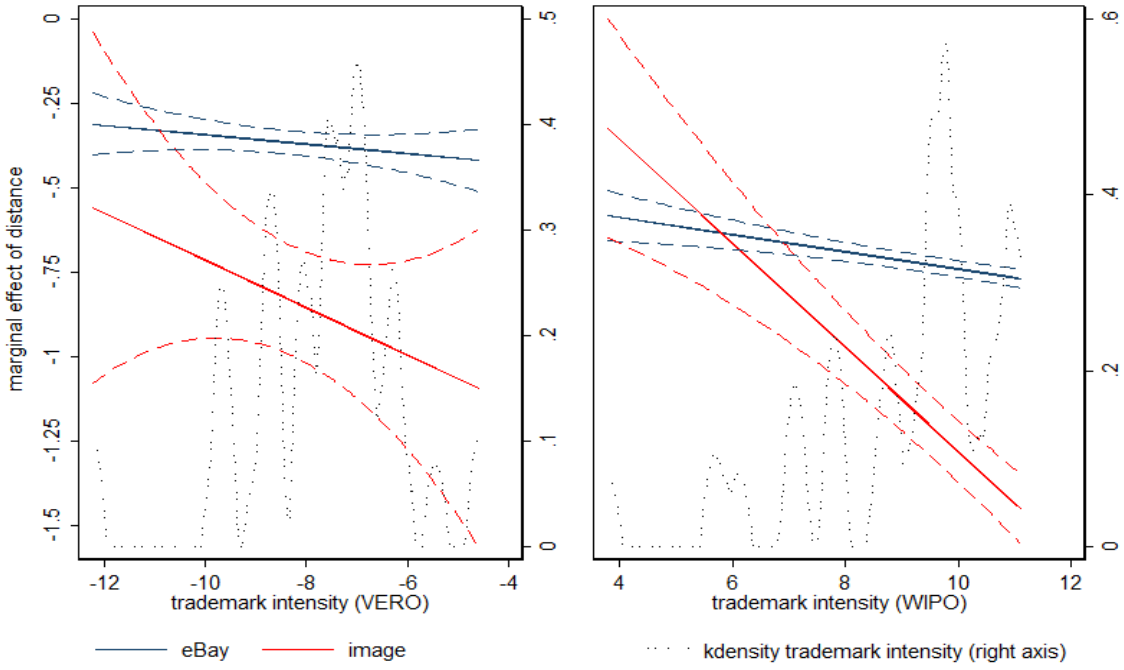
Sources: USITC and eBay

Figure 5
Distance coefficient by eBay category



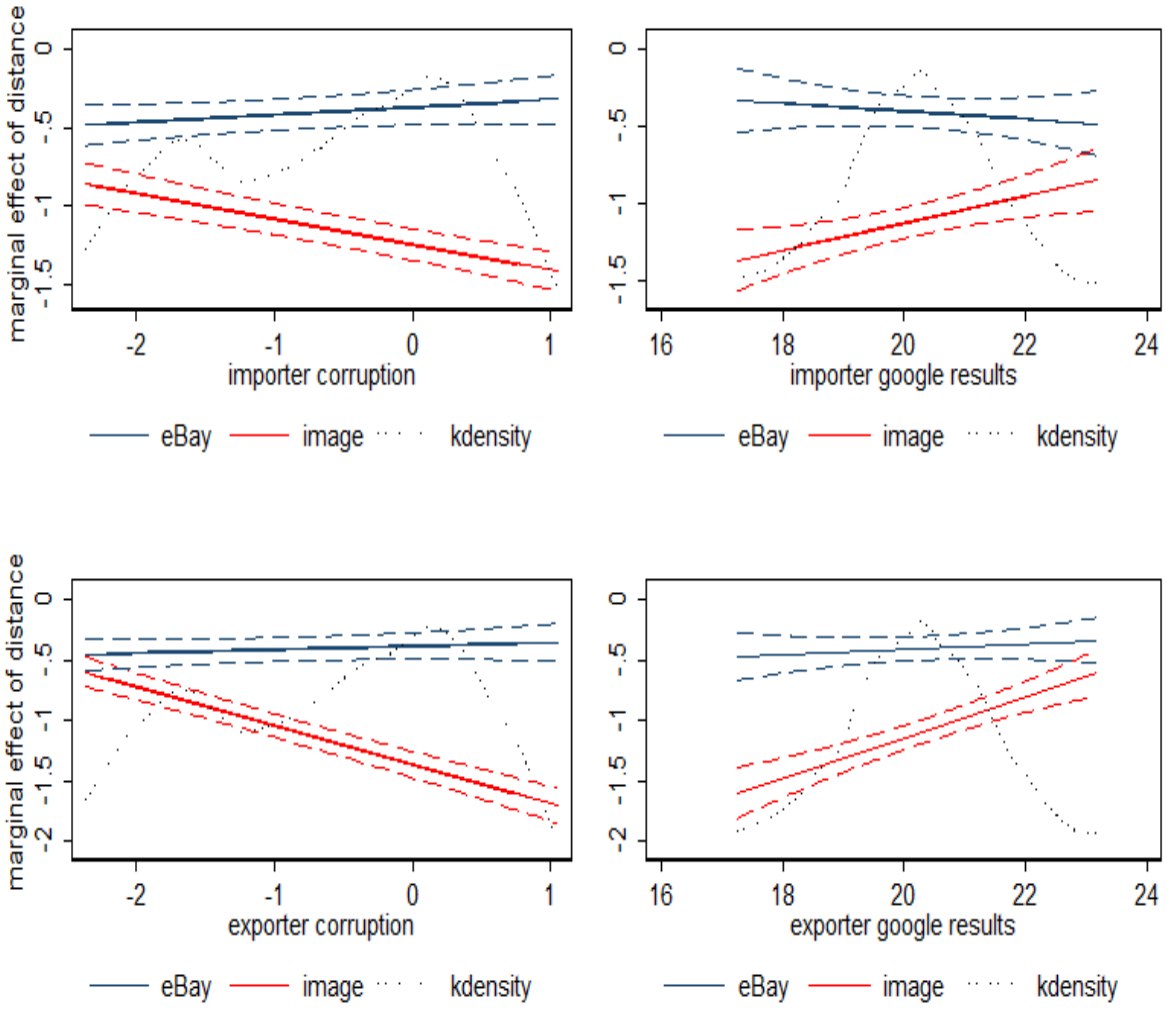
Note: Each distance coefficient is estimated in a separate regression with a specification identical to the one reported in column (2) of Table 1.

Figure 6
Distance coefficients vs. trademark intensity



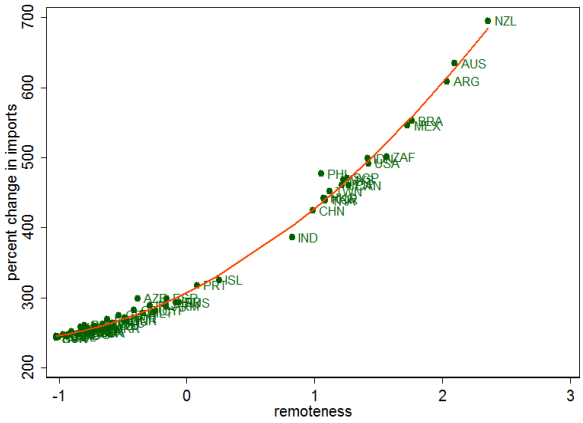
Note: These marginal effects are estimated using a specification similar to the one reported in column (2) of Table 1. The dotted lines give the kernel density estimate of the x axis variable. The dashed lines are the 95 percent confidence interval.

Figure 7
Corruption, google popularity and the distance effect on trade



Note: These marginal effects are estimated ... The dotted lines give the kernel density estimate of the x axis variable. The dashed lines are the 95 percent confidence interval.

Figure 8
Trade gains from world flattening



Note: Remoteness is calculated as the GDP-weigthed average distance to all trading partners. The increase in imports is calculated bilaterally and corresponds to the change that would be observed if offline traders were to face the distance coefficient measured online. It is then aggregated across all trading partners.

Table 1
Trade cost and gravity online and offline

	eBay	eBay	eBay	eBay image	eBay image	eBay image	eBay	eBay image
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Distance	-0.573***	-0.409***	-0.398***	-1.404***	-1.119***	-1.101***	-0.299**	-0.663***
	(0.0834)	(0.0926)	(0.0962)	(0.102)	(0.100)	(0.0986)	(0.126)	(0.0707)
No common legal sys.		-0.266*	-0.191		-0.584***	-0.586***	-0.272**	-0.379***
		(0.138)	(0.121)		(0.0945)	(0.0946)	(0.137)	(0.0864)
No colony		0.188	0.135		-0.408*	-0.410*	-0.287*	0.0301
		(0.228)	(0.221)		(0.222)	(0.219)	(0.170)	(0.121)
No common language		-0.449***	-0.464***		-0.210	-0.215	-0.933***	0.218*
		(0.165)	(0.165)		(0.175)	(0.172)	(0.223)	(0.129)
No border		-0.122	-0.102		-0.353*	-0.318	-0.762***	-0.285**
		(0.179)	(0.171)		(0.206)	(0.200)	(0.195)	(0.112)
No FTA		-0.207	-0.226		-0.314***	-0.286***	-0.359*	-0.429***
		(0.172)	(0.166)		(0.110)	(0.107)	(0.193)	(0.136)
Shipping costs			0.00368			-0.109		
			(0.0888)			(0.0937)		
Observations	3,763	3,763	3,733	3,763	3,763	3,733	3,763	3,763
R-squared	0.864	0.866	0.870	0.849	0.857	0.857		

Source: All regressions are estimated using an importer and exporter fixed effect linear model. The figures in brackets are importer- and exporter-clustered standard errors (importer clustered in the ppml models), and * stands for statistical significance at the 10 percent level, ** for statistical significance at the 5 percent level and *** for statistical significance at the 1 percent level.

Table 2
Testing differences in gravity ocefficients

	Distance	No common legal system	No colony	No common language	No border	No FTA
Gravity coefficient	-1.119***	-0.584***	-0.408*	-0.210	-0.353*	-0.314***
	(0.100)	(0.0945)	(0.222)	(0.175)	(0.206)	(0.110)
Interaction with eBay dummy	0.711***	0.318*	0.596*	-0.239	0.231	0.107
	(0.136)	(0.167)	(0.318)	(0.240)	(0.273)	(0.204)

The dependant variable is log imports. Regression estimated using importer-eBay and exporter-eBay fixed effect linear model. The figures in brackets are importer-eBay- and exporter-eBay-clustered standard errors, and * stands for statistical significance at the 10 percent level, ** for statistical significance at the 5 percent level and *** for statistical significance at the 1 percent level.

Table 3

Robustness checks: trade cost and gravity for different types of eBay flows

	eBay total	comtrade total	New goods	Used goods	Auctions	Non-auctions	Powersellers	Non-Powersellers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Distance	-0.436***	-1.267***	-0.408***	-0.572***	-0.491***	-0.334***	-0.378***	-0.382***
	(0.0655)	(0.0891)	(0.0780)	(0.0858)	(0.0631)	(0.0669)	(0.0681)	(0.0578)
No common legal sys.	-0.134**	-0.539***	0.0294	-0.165*	-0.114**	-0.0568	-0.0580	-0.204***
	(0.0528)	(0.0836)	(0.0808)	(0.0940)	(0.0550)	(0.0727)	(0.0715)	(0.0619)
No colony	-0.328***	-0.421***	0.00409	-0.237	-0.375***	-0.131	-0.297***	-0.338***
	(0.117)	(0.121)	(0.167)	(0.173)	(0.129)	(0.127)	(0.113)	(0.111)
No common language	-0.347***	-0.183	-0.432***	-0.246*	-0.339***	-0.380***	-0.292**	-0.279**
	(0.124)	(0.173)	(0.161)	(0.144)	(0.107)	(0.145)	(0.133)	(0.133)
No border	-0.215*	-0.408**	-0.362***	-0.103	-0.265**	-0.345***	-0.281*	-0.266**
	(0.129)	(0.166)	(0.132)	(0.143)	(0.109)	(0.123)	(0.149)	(0.111)
No FTA	-0.0572	-0.294***	-0.0582	-0.233	-0.0534	-0.127	-0.0360	-0.126*
	(0.0735)	(0.0895)	(0.0952)	(0.145)	(0.0754)	(0.0776)	(0.0839)	(0.0709)
Observations	3,740	3,754	3,740	3,740	3,740	3,740	3,778	3,778
R-squared	0.934	0.829	0.881	0.818	0.920	0.910	0.893	0.862

Source: All regressions are estimated using an importer and exporter fixed effect linear model. The figures in brackets are importer- and exporter-clustered standard errors, and * stands for statistical significance at the 10 percent level, ** for statistical significance at the 5 percent level and *** for statistical significance at the 1 percent level.

Table 4
Product information and distance online and offline

(1)	(2)	(3)	(4)
eBay	eBay	image	image

Note: All regressions are estimated using an importer and exporter fixed effect linear model. The figures in brackets are importer- and exporter-clustered standard errors, and * stands for statistical significance at the 10 percent level, ** for statistical significance at the 5 percent level and *** for statistical significance at the 1 percent level.

Table 5
Disentangling the mechanism: trust or information?

	(1) ebay	(2) ebay	(3) ebay	(4) ebay	(5) ebay	(6) ebay	(7) image	(8) image	(9) image	(10) image	(11) image	(12) image
Distance	-0.269***	-0.356***	-0.387***	-0.373***	-0.855	0.0956	-1.798***	-1.486***	-1.365***	-1.243***	-4.485***	-2.890***
	(0.0880)	(0.0878)	(0.0563)	(0.0569)	(0.562)	(0.614)	(0.0870)	(0.0741)	(0.0556)	(0.0510)	(0.591)	(0.581)
No common legal sys.	-0.297***	-0.250***	-0.277***	-0.285***	-0.261***	-0.271***	-0.539***	-0.555***	-0.458***	-0.519***	-0.547***	-0.565***
	(0.0646)	(0.0643)	(0.0643)	(0.0635)	(0.0643)	(0.0643)	(0.0578)	(0.0575)	(0.0566)	(0.0565)	(0.0567)	(0.0567)
No colony	0.139	0.204	0.182	0.178	0.199	0.175	-0.368**	-0.364**	-0.343**	-0.376**	-0.325**	-0.363**
	(0.159)	(0.165)	(0.161)	(0.161)	(0.162)	(0.161)	(0.164)	(0.168)	(0.163)	(0.165)	(0.165)	(0.166)
No common language	-0.413***	-0.489***	-0.437***	-0.430***	-0.451***	-0.446***	-0.294***	-0.265**	-0.339***	-0.275**	-0.230**	-0.220**
	(0.108)	(0.108)	(0.106)	(0.106)	(0.106)	(0.107)	(0.111)	(0.112)	(0.107)	(0.108)	(0.110)	(0.109)
No border	-0.182	-0.150	-0.129	-0.133	-0.125	-0.117	-0.279*	-0.315**	-0.276**	-0.315**	-0.379**	-0.369**
	(0.145)	(0.147)	(0.144)	(0.144)	(0.146)	(0.146)	(0.143)	(0.148)	(0.138)	(0.144)	(0.148)	(0.149)
No FTA	-0.193**	-0.212**	-0.203**	-0.200**	-0.209**	-0.204**	-0.316***	-0.316***	-0.361***	-0.338***	-0.333***	-0.324***
	(0.0957)	(0.0950)	(0.0947)	(0.0945)	(0.0944)	(0.0943)	(0.0930)	(0.0939)	(0.0915)	(0.0937)	(0.0932)	(0.0938)
Int. sel. internet	-0.00298**						0.0132***					
	(0.00140)						(0.00129)					
Int. buyer internet		-0.00124						0.00710***				
		(0.00135)						(0.00115)				
Int. seller corr.			0.0289						-0.322***			
			(0.0310)						(0.0277)			
Int. buyer corr.				0.0474						-0.163***		
				(0.0303)						(0.0244)		
Int. seller info.					0.0222						0.167***	
					(0.0276)						(0.0289)	
Int. buyer info.						-0.0250						0.0880***
						(0.0303)						(0.0287)
Constant	-1.844***	-1.398**	-1.475**	-1.668**	-1.127**	-1.237**	15.16***	13.47***	14.94***	13.32***	12.02***	11.84***
	(0.699)	(0.707)	(0.677)	(0.684)	(0.564)	(0.564)	(0.607)	(0.575)	(0.569)	(0.532)	(0.475)	(0.471)
Observations	3,641	3,641	3,763	3,763	3,763	3,763	3,641	3,641	3,763	3,763	3,763	3,763
R-squared	0.902	0.902	0.901	0.901	0.901	0.901	0.903	0.901	0.905	0.901	0.902	0.901

Note: All regressions are estimated using an importer and exporter fixed effect linear model. The figures in brackets are importer- and exporter-clustered standard errors, and * stands for statistical significance at the 10 percent level, ** for statistical significance at the 5 percent level and *** for statistical significance at the 1 percent level.