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**Trade Dynamics and Trade Costs: First Evidence from the
Exporter and Importer Dynamics Database for Germany**

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Abstract: This note uses the newly available *Exporter and Importer Dynamics Database for Germany* to investigate the links between trade dynamics and trade costs. It shows results for the dynamics of Germany's goods trade as a whole, and for trade with two of the most important partner countries, namely France and China. Furthermore, it reports results from the first empirical study that searches for links between measures of trade dynamics (entry, exit and survival rates, and share of entrants, in total exports and imports) in destination countries of exports and countries of origin of imports on the one hand and characteristics of these countries (distance to Germany, difficulty of foreign trade, and market size) on the other hand.

JEL classification: F14

Keywords: Exports, imports, transaction level data, Germany

* The transaction level data on German exports and imports used to prepare the *Exporter and Importer Dynamics Database for Germany* are strictly confidential and can only be used inside the research data center of the German Federal Statistical Office. I thank Melanie Scheller for preparing the data base and checking the results for violation of privacy. The aggregate data from the exporter and importer dynamics data base are available from the author on request; the data for exporters are included in version 2.0 of the World Bank's Exporter Dynamics Database, too. To facilitate replication the Stata do-files used to compute the results reported in this paper are available from the author on request.

1. Motivation

Over the past twenty years researchers from all over the world used either census-type firm level data collected by the statistical offices or other large surveys of firms to investigate which firms trade (how much) and how trade is related to various dimensions of firm performance.¹ More recently, empirical trade economists went one step further and investigated which firms trade how much of which goods with customers or suppliers from which countries. The data used in these studies are based on records of (legal) cross-border transaction regularly collected by the customs (or other institutions). The unit of observation in these data is a single transaction between economic agents located in two countries, e.g. the export of X kilogram of good A with a value of Y Euro from Germany to China. The record of the transaction usually includes a firm identifier (tax registration number) of the exporting (or importing) firm. Using this identifier information at the transaction level can be aggregated at the level of the trading firm to generate year-firm-product-value-weight-destination (or –origin) data. Wagner (2016a) provides a survey of 147 empirical studies for 39 countries, plus 8 studies for multiple countries, that use such transaction level data on exports or imports.

To facilitate research based on internationally comparable data of this type researchers from the World Bank's Trade and Integration Team, Development Research Group, prepared the *Exporter Dynamics Database* (Cebeci et al. 2012). This database includes measures of exporter dynamics based on firm-level customs information from 38 developing and seven developed countries, primarily for the period between 2003 and 2010. The measures are available at the country-year, country-year-product, and country-year-destination level. They can be downloaded

¹ This literature was started by Bernard and Jensen (1995) and grew exponentially over time; for surveys, see Wagner (2007, 2012).

free of charge from <http://econ.worldbank.org/exporter-dynamics-database>. Cebeci et al (2012) use these data to document several new stylized facts about exporter behavior across countries.

One shortcoming of the Exporter Dynamics Database in the version described in Cebeci et al. (2012) is the absence of information on several of the most important countries in world exports, including Germany, the third largest exporter (and importer) of goods (World Trade Organization 2012, p. 30). To overcome this shortcoming Wagner (2016b) prepared this information for Germany for the years 2009 to 2012. This information is now part of version 2.0 of the World Bank's Exporter Dynamic Database. Furthermore, Wagner (2016b) provides for the first time strictly comparable statistics for imports.

This note uses the newly available *Exporter and Importer Dynamics Database for Germany* to investigate the links between trade dynamics and trade costs. Section 2 provides details regarding the transaction level data for German exports and imports of goods used to prepare the data base. Section 3 documents selected results from the *Exporter and Importer Dynamics Database for Germany* for the dynamics of goods trade as a whole, and for trade with two of the most important partner countries, namely France and China. Section 4 reports results from an econometric investigation of the links between trade dynamics and trade costs. Section 5 concludes.

2. Transaction level data on German exports and imports of goods²

In Germany information on the goods traded internationally and on the countries with which these goods are traded³ is available from the statistic on foreign trade

² This section is taken from Wagner (2016b)

(*Außenhandelsstatistik*). This statistic is based on two sources. One source is the reports by German firms on transactions with firms from countries that are members of the European Union (EU); these reports are used to compile the so-called *Intrahandelsstatistik* on intra-EU trade. The other source is transaction-level data collected by the customs on trade with countries outside the EU (the so-called *Extrahandelsstatistik*).⁴ The raw data that are used to build the statistic on foreign trade are transaction level data, i.e. they relate to one transaction of a German firm with a firm located outside Germany at a time. Published data from this statistic report exports or imports aggregated at the level of goods traded and by country of destination or origin.

The data used in this paper are based on the raw data at the transaction level. The unit of observation in these data is a single transaction between economic agents located in two countries, e.g. the export of X kilogram of good A with a value of Y Euro from Germany to China. For a given year, the sum over all export or import transactions is identical to the figures published by the Federal Statistical Office for total exports or imports of Germany.⁵

The record of the transaction usually⁶ includes a firm identifier (tax registration number) of the exporting (or importing) firm. Using this identifier information at the

³ Note that in Germany information on international trade in services is compiled by the German Central Bank (*Deutsche Bundesbank*) to build the balance of services trade (*Dienstleistungsbilanz*).

⁴ Note that firms with a value of exports to and imports from EU-countries that did not exceed 400,000 Euro in the previous year or in the current year do not have to report to the statistic on intra-EU trade. For trade with firms from non-member countries all transactions that exceed 1,000 Euro (or have a weight that exceeds 1,000 kilogram) are registered. For details see Statistisches Bundesamt, Qualitätsbericht Außenhandel, Januar 2011.

⁵ This has been confirmed by Melanie Scheller from the Federal Statistical Office in a mail sent on May 20, 2015.

⁶ Note that this identifier is missing for several transactions for various reasons including traders that do not have a (German) tax identification number; further details were not revealed to me.

transaction level can be aggregated at the level of the trading firm to generate year-firm-product-value-weight-destination (or –origin) data. The Federal Statistical Office prepared this type of data for the reporting year 2009 for the first time; the latest data available at the time of writing this note are for 2012. These data show who trades how much of which good with customers (or suppliers) from which country in a given year.

Products are distinguished according to very detailed classifications. In the data used for this paper, the Harmonized System at 6-digit level (HS6) is used as the product classification system. Although transactions are recorded at a higher level of disaggregation, HS6 is used since this is the most detailed level comparable internationally (see Cebeci et al. 2012, p. 9). Note that due to privacy protection any published results refer to the more aggregate HS2 level.

Following the procedure applied by the World Bank team in preparing the Exporter Dynamics Database transaction that cover goods from HS Chapter 27 (hydrocarbons such as oil, petroleum, natural gas, and coal etc.) were eliminated from the raw data set (see Cebeci et al. 2012, p. 11).

3. Exporter and Importer Dynamics in Germany: A first glance at the evidence

Using the year-firm-product-value-weight-destination (or –origin) data that were linked over the four years from 2009 to 2012 and the original Stata do-files that were used to compute the statistics in the World Bank's Exporter Dynamics Database a series of measures was computed that cover for German exports and imports information on basic characteristics, concentration/diversification, firm dynamics, product dynamics, destination / origin dynamics, and unit prices. For Germany all measures are available for exports and imports at different disaggregation levels, i.e. by year, by year-product (HS2) and by year-destination (or year-origin); furthermore,

information for exports and imports are available by year-3digit-ISC-category. Cebeci et al. (2012, p. 14ff.) give the exact definition of all measures and report in a table which measures are available at which level of disaggregation.

Table 1 reports results for selected measures and the reporting year 2010. This year was chosen because for all but the first measure (the number of trading firms in a year t) information has to be available for the year $t-1$ and / or for the year $t+1$, too.⁷

In the table *trade* refers to either export or import. *Traders* are firms that trade in year t . *Entrants* are firms that do not trade in year $t-1$ but trade in year t . *Exiters* trade in t but not in $t+1$. *Incumbents* trade both in $t-1$ and t . *Survivors* do not trade in $t-1$ but trade in both t and $t+1$. The *Firm Entry Rate* is computed as the number of entrants divided by the number of traders. The *Firm Exit Rate* is defined by the number of exiters divided by the number of traders. The *Firm Survival Rate* is equal to the number of survivors divided by the number of entrants. The *Share of Entrants in Trade* is given by the total trade value of entrants divided by the total trade value in that year.

[Table 1 near here]

For Germany's trade with all countries the firm entry and exit rate is quite large for both exports and imports; the share of new traders in total trade, however, is small. This is in line with evidence reported for exports for Chile by Álvarez and Fuentes (2011), for Hungary by Békés and Muraközy (2012), for Turkey by Cebeci and Fernandes (2015), and for exports and imports in Slovenia by Damijan et al. (2014). Furthermore, entry / exit / survival are highly similar for exports and imports.

⁷ Comparable results for 2011 can be easily computed from the raw data.

Given that strictly comparable figures for all statistics related to exports (but not to imports) are available from the World Bank's Exporter Dynamics Database for many countries, the figures reported in Table 1 for Germany can be used as a benchmark for any comparison with other countries from the EDD to see how different (or similar) Germany is compared to its trading partners.

Evidence in the *Exporter and Importer Dynamics Database for Germany* is not limited to trade in all goods with all countries. The measures reported in Table 1 for Germany's total trade (and all other measures from the World Bank's Exporter Dynamics Database) are available for trade in all goods with each country, and for trade with all countries in each HS2 product (or product from each 3digit-ISC category). To illustrate the usefulness of this more disaggregate information Table 1 reports the respective figures for the trade with two of the most important partner countries, France (that was number 1 in exports and number 3 in imports in 2011), and China (that was number 4 and number 2, respectively). Here, firm entry and exit tends to be more pronounced in trade with the more distant partner China compared to the neighbor country France.

Information at the level of partner countries in trade (or at the level of goods traded) can be used to search for systematic patterns in the links between measures of exports or imports dynamics on the one hand and characteristics of trade partners (like distance to Germany, GDP as a measure of market size, or indicators of the ease of doing business with a country) or of traded goods (like consumer goods vs. investment goods), and for tests of theoretical hypotheses on these links.

4. Trade dynamics and trade costs in German exports and imports

The evidence on the dynamics of exports and imports reported in Table 1 already revealed that there are differences in these dynamics when different countries of

destination or origin are compared. In this section we will search for systematic patterns in the links between the four measures of exports or imports dynamics introduced in Table 1 on the one hand and characteristics of trade partner countries (to be discussed below).

Here, two groups of trade partner countries are distinguished, namely countries that are members of the European Union (EU) and Non-EU countries, because tariffs and any non-tariff barriers to trade do not play a role in intra-EU trade.

All computations are performed for the years 2010 and 2011 separately. These years were chosen because for all but the first measure (the number of trading firms in a year t) information has to be available for the year $t-1$ and / or for the year $t+1$, too, and the transaction level information for Germany is available for the reporting years 2009 to 2012 only. Looking at these two years serves as a robustness of the results, because the overall dynamics of trade were rather different in 2009/2010 (the time of the great trade recovery following the great trade collapse of the great recession in 2008/2009) compared to 2010/2011 – total exports grew by 18.5 percent and total imports grew by 19.9 percent in 2009/2010, while the respective growth rates were 11.4 percent and 13.2 percent, and therefore much smaller, in 2010/2011 (see Statistisches Bundesamt 2012, p. 414).

4.1 Data on trade partner characteristics

In our search for systematic patterns in the links between the nine measures of exports or imports dynamics introduced in Table 1 on the one hand and characteristics of trade partner countries on the other hand we will focus on trade costs and market size.

Variable trade costs are either due to tariffs and non-tariff barriers or due to the costs of transporting goods across space. While tariffs and non-tariff barriers are

product-specific and, therefore, cannot be measured adequately for trade with a country as a whole, transportation costs are proxied by geographic distance (following the large gravity literature). Data on distance between Germany and the destination countries of exports or the countries of origin of imports are taken from the CEPII's *GeoDist* database (Mayer and Zignago 2011). The "distw" – measure is used that calculates the distance between two countries based on bilateral distances between the biggest cities of those two countries, those inter-city distances being weighted by the share of the city in the overall country's population (see Mayer and Zignago (2011, p. 11) for details and the download-link).

Ease of trading across borders in a country is proxied by an index that is taken from the World Bank's *Doing Business* project. It measures the time and cost (excluding tariffs) associated with exporting and importing a standardized cargo of goods by sea transport (including document preparation, customs clearance and inspections). The index measures the distance of a country to a best-practice frontier on a scale from 0 to 100, where 0 represents the lowest performance and 100 the frontier. The data used can be downloaded free of charge at <http://www.doingbusiness.org/data/exploretopics/trading-across-borders/frontier>.

Market size is proxied by the Gross Domestic Product of the country of destination or origin, measured in Millions of US-Dollar in current prices. Information is taken from the World Bank World Development Indicators database (see <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>).

Descriptive statistics and correlations for the three country characteristics are reported for the various sub-samples (EU and non-EU countries in 2010 and 2011 by destination countries of exports and countries of origin for imports) in the appendix. Note that for all sub-samples of countries the correlation tends to be low between any two country characteristics with values never exceeding 0.28.

4.2 Trade dynamics and trade costs in German exports and imports: Regression results

To search for systematic patterns in the links between the four measures of exports or imports dynamics introduced in Table 1 on the one hand and the three characteristics of the trade partner countries (distance to Germany, ease of trading with a country, and size of partner country) discussed in the last section regression models are estimated for each measure of trade dynamics as the dependent variable and the three country characteristics (plus a constant) as the independent variables. All empirical models are estimated for exports and imports to/from EU- and non-EU-countries in 2010 and 2011 separately. Results for the 32 regressions are reported in Table 2 (for 2010) and Table 3 (for 2011). Note that not all country characteristics are available for all trade partner countries. Furthermore, results from the *Exporter and Importer Dynamics Database for Germany* are confidential for some combinations of measures and countries. Therefore, results are reported for the dynamics of trade with 25 EU member countries and a maximum of 145 non-EU countries, where the sample size is different in regressions using information on non-EU countries.

[Table 2 and Table 3 near here]

A comparison of the results reported for 2010 in Table 2 and 2011 in Table 3 shows an identical big picture. Results are highly similar although the macroeconomic situation in both years was rather different. As stated above, total exports grew by 18.5 percent and total imports grew by 19.9 percent in 2009/2010, while the respective growth rates were 11.4 percent and 13.2 percent, and therefore much smaller, in 2010/2011. Given this robustness of results over time we look at the results for 2010 here that are reported in Table 2.

These results reveal a number of differences and similarities in the links between trade dynamics and country characteristics in the four sub-samples. The big picture can be summarized by pointing out the following findings.

F1: For EU-trade, the index for the ease of trading across borders in a country of destination or origin is never statistically significantly related with any measure of export or import dynamics. This comes as no surprise because practices like customs clearance and inspection do not matter at all for intra-EU trade.

F2: For EU-trade, the links between the measures of trade dynamics and the other two country characteristics, distance and market size, are rather similar for exports and imports, and rather tight. The high R^2 -values indicate that a large share of the variation of the trade dynamics measures entry rate, exit rate, and survival rate can be explained by the cross-country variation in distance to Germany and country size. This link is much weaker for trade with the much more heterogeneous non-EU countries.

F3: For EU-trade, distance to the destination country of exports or to the country of origin of imports is positively related to both the firm entry rate and the firm exit rate, but negatively related to the firm survival rate. To understand this fact, remember that more recent EU member states tend to have a larger distance to Germany than old member states (among which are many direct neighbor countries). Firms seem to “try out” trade partners in new member states at a larger scale, but less of these new links do survive compared to new partners in old member states. Compare the dynamics of trade with France (EU member since 1952 and distance to Germany of 790 km according to the distance measure used here) in 2010 reported in Table 1 with the dynamics of trade with Romania (EU member since 2007, distance to Germany 1341 km) for the same year. In exports, the entry rate is much larger for Romania (28.77 percent) than for France (18.85 percent), and the same

holds for the exit rate (that is 23.96 percent and 17.53 percent, respectively), while the survival rate in Romania is 64 percent – smaller than in France where it is 69.97 percent. In imports, the entry rate is again much larger for Romania (40.05 percent) than for France (24.74 percent), and the same holds for the exit rate (that is 33.35 percent and 22.94 percent, respectively), while the survival rate in Romania is 52.58 percent – smaller than in France where it is 58.75 percent.⁸

For non-EU exports we find the same pattern of exporter dynamics than for EU-exports with regard to distance to Germany. Here, many dynamic emerging economies (including the BRIC countries Brazil, Russia, India, and China) have a rather larger distance to Germany, and relatively more firms find it attractive to “try out” exporting to these countries, but the chance for survival of these links are lower compared to less distant countries. The comparison of exporter dynamics for France and China reported in Table 1 is a case in point. Note that the pattern for importer dynamics in trade with non-EU countries is different – according to Table 2 distance is not related to measures of importer dynamics at all.

F4: For EU-trade and non-EU trade, the size of the market in the destination country of exports and the size of the market in the country of origin of imports is negatively related to firm entry and exit rates, but positively to firm survival in foreign trade activities. More German exporters and importers are active already in larger markets, so high entry and exit rates are rare compared to smaller markets with less

⁸ Note that it is not appropriate to investigate the size of the effect of distance to Germany on the trade dynamics indicators by ceteris paribus changing the value of distance (e.g., from smallest to largest distance in the sample) – it is simply not possible to change the value of distance without changing the values of the other country characteristics accordingly because another distance means another country with different values for the index of trade costs and GDP. Obviously, the same holds for any attempt to quantify the size of the effect of a ceteris paribus change in the index of trade costs or GDP.

German firms active in exports and imports. Larger markets, however, have more room for newbies in trade and offer more niches that make it easier to survive.

F5: The share of entrants in trade is smaller in larger markets for trade with EU-countries and non-EU countries. This comes as no surprise because it is easier to grasp a larger share of a small market than of a much larger market.

F6: For non-EU exports the index for the ease of trading across borders in a country of destination is negatively related to the firm entry and the firm exit rate, and to the share of entrants in trade. This comes partly as a surprise, because by construction a higher value of the index indicates lower bureaucratic barriers to exports, so more difficult markets tend to attract more new exporters. The firm survival rate, on the other hand, is higher in markets with lower barriers. Note that for non-EU imports, the index for the ease of trading across borders in a country of origin tends to be unrelated to the measures of import dynamics.

To the best of my knowledge, and based on the comprehensive survey of the literature that uses transaction-level data to investigate export and import activities in Wagner (2016a), this is the first empirical study that searches for links between measures of trade dynamics (entry, exit and survival rates, and share of entrants, in total exports and imports), in destination countries of exports and countries of origin of imports on the one hand and characteristics of these countries (distance to Germany, difficulty of foreign trade, and market size) on the other hand. Therefore, further empirical investigations that replicate the approach applied here are needed to learn whether the findings reported for Germany here qualify as stylized facts that hold over space.

5. Concluding remarks

The findings reported in several papers based on the World Bank's *Exporter Dynamics Database (EDD)* that are summarized in Wagner (2016b) illustrate that this data base makes a very useful addition to the box of tools available for empirical trade economists. Data are open access, and it is easy to use the information to investigate a broad range of topics, including the discovery and documentation of new facts like those reported for exporter and importer dynamics in Germany in section 4 in this paper. Furthermore, the data can be used in empirical investigations of hypotheses derived in theoretical models. Here, the great advantage of the EDD data is that they are strictly comparable over a large number of countries, which adds tremendous value to every empirical exercise performed with these data, because "the credibility of a new finding that is based on carefully analyzing two data sets is far more twice that of a result based only on one." (Hamermesh 2000, p. 376)

That said, although the empirical trade literature based on transaction level data (surveyed in Wagner 2016a) grew exponentially over the recent years, and we learned a lot from these papers, there is plenty of scope for future research. First and foremost, we do know much less about imports, its margins, and its role in the dynamics of trade, than about exports. Information on the importer dynamics for Germany introduced in this note is a first step to fill this gap. Here, evidence for more countries is most welcome. It would be great if a project that is comparable to the *World Bank Exporter Dynamics Database* (Cebeci et al. 2012) could be realized for imports, too.

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Table 1: Exporter and Importer Dynamics, Germany, 2010

	2010 Export	Import
<i>Trade with all countries</i>		
Firm Entry Rate (Number Entrants/Number Traders) (Percent)	24.86	23.60
Firm Exit Rate (Number Exiters/Number Traders) (Percent)	14.88	16.28
Firm Survival Rate (Number Survivors/Number Entrants) (Percent)	69.78	71.11
Share of Entrants in Trade (Total Trade Value of Entrants/ Total Trade Value in that Year) (Percent)	5.44	7.91
<i>Trade with France</i>		
Firm Entry Rate (Number Entrants/Number Traders) (Percent)	18.85	24.74
Firm Exit Rate (Number Exiters/Number Traders) (Percent)	17.53	22.94
Firm Survival Rate (Number Survivors/Number Entrants) (Percent)	69.97	58.75
Share of Entrants in Trade (Total Trade Value of Entrants/ Total Trade Value in that Year) (Percent)	5.24	5.37
<i>Trade with China</i>		
Firm Entry Rate (Number Entrants/Number Traders) (Percent)	38.44	33.59
Firm Exit Rate (Number Exiters/Number Traders) (Percent)	21.21	22.46
Firm Survival Rate (Number Survivors/Number Entrants) (Percent)	54.15	61.26
Share of Entrants in Trade (Total Trade Value of Entrants/ Total Trade Value in that Year) (Percent)	4.57	8.43

Note: Trade refers to either export or import. Traders are firms that trade in year t. Entrants are firms that do not trade in year t-1 but trade in year t. Exiters trade in t but not in t+1. Survivors do not trade in t-1 but trade in both t and t+1. Incumbents trade both in t-1 and t.

Table 2: Trade Dynamics and Trade Costs in Germany, 2010 – Regression Results

		<u>Export</u>		<u>Import</u>	
<i>Trade Dynamics Indicator</i>		EU	Non-EU	EU	Non-EU
<i>Firm Entry Rate (Number Entrants / Number Traders)</i>					
Distance	β	0.000049	5.07e-6	0.000068	-2.81e-6
	p	0.003	0.060	0.000	0.478
Trading Across Borders	β	-0.00014	-0.0017	0.00044	-0.00063
	p	0.907	0.000	0.749	0.177
Gross Domestic Product	β	-3.54e-8	-1.97e-8	-5.55e-8	-1.80e-8
	p	0.001	0.011	0.001	0.004
R-squared		0.538	0.232	0.694	0.068
N of cases		25	145	25	138
<i>Firm Exit Rate (Number Exiters / Number Traders)</i>					
Distance	β	0.000047	0.000012	0.000089	4.06e-6
	p	0.000	0.002	0.002	0.395
Trading Across Borders	β	-0.00058	-0.0018	0.0014	-0.0015
	p	0.665	0.000	0.312	0.024
Gross Domestic Product	β	-2.68e-8	-2.79e-8	-6.23e-8	-3.78e-8
	p	0.001	0.015	0.001	0.007
R-squared		0.639	0.228	0.601	0.133
N of cases		25	145	25	141

Firm Survival Rate (Number Entrants / Number Traders)

Distance	β	-0.000062	-7.04e-6	-0.000082	2.21e-6
	p	0.000	0.074	0.000	0.601
Trading Across Borders	β	-0.00042	0.0016	-0.00027	0.00030
	p	0.683	0.000	0.753	0.562
Gross Domestic Product	β	3.39e-8	2.09e-8	4.13e-8	2.59e-8
	p	0.001	0.023	0.006	0.002
R-squared		0.647	0.189	0.697	0.085
N of cases		25	139	25	130

Share of Entrants in Trade (Total Trade Value of Entrants/Total Trade Value in that Year)

Distance	β	8.07e-7	0.000014	7.63e-6	9.38e-6
	p	0.961	0.012	0.801	0.179
Trading Across Borders	β	-0.00014	-0.0020	0.0054	0.00062
	p	0.872	0.005	0.248	0.479
Gross Domestic Product	β	-2.26e-8	-3.00e-8	-3.88e-8	-2.41e-8
	p	0.000	0.022	0.065	0.019
R-squared		0.192	0.119	0.177	0.037
N of cases		25	145	25	137

Note: For a definition of the *Trade Dynamics Indicators* see Table 1. The table reports results from OLS regressions; β is the estimated regression coefficient, p is the prob-value (based on heteroscedasticity-consistent standard errors). *Distance* is the distance of the country of destination (for exports) or country of origin (for imports) to Germany; *Trading Across Borders* is an index for the time and cost (excluding tariffs) associated with trading, where a larger value indicates lower costs; *Gross Domestic Product* refers to the country of destination (for exports) or country of origin (for imports); for details, see text. All regression models include a constant term, too.

Table 3: Trade Dynamics and Trade Costs in Germany, 2011 – Regression Results

		<u>Export</u>		<u>Import</u>	
<i>Trade Dynamics Indicator</i>		EU	Non-EU	EU	Non-EU
<i>Firm Entry Rate (Number Entrants / Number Traders)</i>					
Distance	β	0.000041	2.24e-6	0.000062	2.05e-6
	p	0.004	0.454	0.000	0.667
Trading Across Borders	β	0.00032	-0.0018	-0.00049	-0.00042
	p	0.815	0.000	0.606	0.429
Gross Domestic Product	β	-3.30e-8	-2.00e-8	-4.55e-8	-1.83e-8
	p	0.001	0.006	0.001	0.004
R-squared		0.491	0.254	0.678	0.047
N of cases		25	141	25	137
<i>Firm Exit Rate (Number Exiters / Number Traders)</i>					
Distance	β	0.000054	0.000012	0.000076	-3.97e-6
	p	0.000	0.004	0.000	0.383
Trading Across Borders	β	0.000080	-0.0022	0.0014	-0.0012
	p	0.925	0.000	0.173	0.025
Gross Domestic Product	β	-2.44e-8	-2.62e-8	-4.48e-8	-2.62e-8
	p	0.001	0.012	0.001	0.001
R-squared		0.685	0.247	0.684	0.137
N of cases		25	145	25	135

Firm Survival Rate (Number Entrants / Number Traders)

Distance	β	-0.000058	-2.95e-6	-0.000061	3.01e-6
	p	0.000	0.409	0.001	0.323
Trading Across Borders	β	-0.000038	0.00095	-0.0012	0.00045
	p	0.969	0.001	0.219	0.379
Gross Domestic Product	β	3.11e-8	1.41e-8	4.35e-8	1.57e-08
	p	0.000	0.009	0.001	0.006
R-squared		0.668	0.124	0.682	0.065
N of cases		25	141	25	122

Share of Entrants in Trade (Total Trade Value of Entrants/Total Trade Value in that Year)

Distance	β	0.000027	0.000013	0.000021	0.000011
	p	0.013	0.045	0.030	0.128
Trading Across Borders	β	0.00099	-0.0016	0.0013	-0.0025
	p	0.375	0.003	0.441	0.024
Gross Domestic Product	β	-2.36e-8	-2.38e-8	-1.92e-8	-1.90e-8
	p	0.000	0.017	0.018	0.014
R-squared		0.513	0.111	0.314	0.070
N of cases		25	141	25	136

Note: For a definition of the *Trade Dynamics Indicators* see Table 1. The table reports results from OLS regressions; β is the estimated regression coefficient, p is the prob-value (based on heteroscedasticity-consistent standard errors). *Distance* is the distance of the country of destination (for exports) or country of origin (for imports) to Germany; *Trading Across Borders* is an index for the time and cost (excluding tariffs) associated with trading, where a larger value indicates lower costs; *Gross Domestic Product* refers to the country of destination (for exports) or country of origin (for imports); for details, see text. All regression models include a constant term, too.

Appendix

The appendix tables use the original variable names from the World Bank's *Exporter Dynamics Database* :

- C1 Firm Entry Rate (Number Entrants/Number Traders)
- C2 Firm Exit Rate (Number Exiters/Number Traders)
- C3 Firm Survival Rate (Number Survivors/Number Entrants)
- C4 Share of Entrants in Trade (Total Trade Value of Entrants/ Total Trade Value in that Year)

Country characteristics are listed in the appendix tables with the following names:

distance	Distance to country of destination (exports) or origin (imports); kilometers
db2010, db2011	<i>Trading Across Borders</i> index for trade costs (excluding tariffs)
gdp2010, gdp2011	Gross Domestic Product of country of destination or origin; Millions of US-\$

Appendix tables:

Table A.1a: Exporter Dynamics 2010 – EU: Part 1: Descriptive statistics

Table A.1b: Exporter Dynamics 2010 – EU: Part 2: Correlation matrix

Table A.2a: Exporter Dynamics 2010 – Non-EU: Part 1: Descriptive statistics

Table A.2b: Exporter Dynamics 2010 – Non- EU: Part 2: Correlation matrix

Table A.3a: Importer Dynamics 2010 – EU: Part 1: Descriptive statistics

Table A.3b: Importer Dynamics 2010 – EU: Part 2: Correlation matrix

Table A.4a: Importer Dynamics 2010 – Non-EU: Part 1: Descriptive statistics

Table A.4b: Importer Dynamics 2010 – Non- EU: Part 2: Correlation matrix

Table A.5a: Exporter Dynamics 2011 – EU: Part 1: Descriptive statistics

Table A.5b: Exporter Dynamics 2011 – EU: Part 2: Correlation matrix

Table A.6a: Exporter Dynamics 2011 – Non-EU: Part 1: Descriptive statistics

Table A.6b: Exporter Dynamics 2011 – Non- EU: Part 2: Correlation matrix

Table A.7a: Importer Dynamics 2011 – EU: Part 1: Descriptive statistics

Table A.7b: Importer Dynamics 2011 – EU: Part 2: Correlation matrix

Table A.8a: Importer Dynamics 2011 – Non-EU: Part 1: Descriptive statistics

Table A.8b: Importer Dynamics 2011 – Non- EU: Part 2: Correlation matrix

Table A.1a: Exporter Dynamics 2010 – EU: Part 1: Descriptive statistics

stats	C1	C2	C3	C4
N	25	25	25	25
mean	.2521946	.2279854	.6152155	.095438
sd	.0563276	.0449896	.0572284	.0403259
min	.176476	.1670355	.4870317	.0524169
max	.3740837	.3346321	.7076446	.240425

stats	distance	db2010	gdp2010
N	25	25	25
mean	1054.04	83.4084	538311.4
sd	557.3542	6.197964	767777.6
min	378	73.6	19482
max	2621	93.16	2646995

Table A.1b: Exporter Dynamics 2010 – EU: Part 2: Correlation matrix

	C1	C2	C3	C4	distance	db2010	gdp2010
C1	1.0000						
C2	0.9514	1.0000					
C3	-0.8452	-0.9471	1.0000				
C4	0.4774	0.4393	-0.3804	1.0000			
distance	0.5539	0.6485	-0.6734	0.0762	1.0000		
db2010	-0.1493	-0.1798	0.0854	-0.1279	-0.0323	1.0000	
gdp2010	-0.5580	-0.5561	0.5338	-0.4380	-0.1492	0.2444	1.0000

Table A.2a: Exporter Dynamics 2010 – Non-EU: Part 1: Descriptive statistics

stats	C1	C2	C3	C4
N	145	145	139	145
mean	.5265142	.4222814	.379018	.278019
sd	.1025305	.1427041	.1187875	.2191201
min	.3223041	.16675	0	.0324653
max	1	1	.6254731	1

stats	distance	db2010	gdp2010
N	145	145	145
mean	7041.021	60.60972	328179.6
sd	3575.986	21.77732	1431225
min	543	2.83	150
max	18220	96.62	1.50e+07

Table A.2b: Exporter Dynamics 2010 – Non-EU: Part 2: Correlation matrix

	C1	C2	C3	C4	distance	db2010	gdp2010
C1	1.0000						
C2	0.8983	1.0000					
C3	-0.8199	-0.8953	1.0000				
C4	0.7352	0.7625	-0.7027	1.0000			
distance	0.0785	0.2237	-0.1152	0.1671	1.0000		
db2010	-0.3595	-0.2541	0.2990	-0.1835	0.2474	1.0000	
gdp2010	-0.3326	-0.3186	0.3008	-0.2244	0.0396	0.1835	1.0000

Table A.3a: Importer Dynamics 2010 – EU: Part 1: Descriptive statistics

stats	C1	C2	C3	C4
N	25	25	25	25
mean	.3422472	.3273362	.5310423	.1266966
sd	.0729952	.094072	.0710372	.0938297
min	.2200046	.2056837	.3695652	.0536903
max	.4825175	.5647059	.6572257	.5073377

stats	distance	db2010	gdp2010
N	25	25	25
mean	1054.04	83.4084	538311.4
sd	557.3542	6.197964	767777.6
min	378	73.6	19482
max	2621	93.16	2646995

Table A.3b: Importer Dynamics 2010 – EU: Part 2: Correlation matrix

	C1	C2	C3	C4	distance	db2010	gdp2010
C1	1.0000						
C2	0.9177	1.0000					
C3	-0.9232	-0.9133	1.0000				
C4	0.4408	0.3429	-0.3277	1.0000			
distance	0.6085	0.6021	-0.7123	0.0813	1.0000		
db2010	-0.1221	-0.0470	0.1040	0.2764	-0.0323	1.0000	
gdp2010	-0.6523	-0.5642	0.5364	-0.2375	-0.1492	0.2444	1.0000

Table A.4a: Importer Dynamics 2010 – Non-EU: Part 1: Descriptive statistics

stats	C1	C2	C3	C4
N	138	135	125	137
mean	.5166182	.5709252	.3388243	.2302015
sd	.1334405	.1749992	.1311639	.2490652
min	0	.2246039	0	.0113716
max	1	1	.6666667	1

stats	distance	db2010	gdp2010
N	138	138	138
mean	6866.174	60.27413	344789.9
sd	3402.646	22.13204	1465371
min	543	2.83	150
max	18220	96.62	1.50e+07

Table A.4b: Importer Dynamics 2010 – Non- EU: Part 2: Correlation matrix

	C1	C2	C3	C4	distance	db2010	gdp2010
C1	1.0000						
C2	0.7484	1.0000					
C3	-0.5448	-0.7657	1.0000				
C4	0.5855	0.5511	-0.3961	1.0000			
distance	-0.1072	-0.0996	0.1874	0.1309	1.0000		
db2010	-0.1582	-0.2686	0.1282	0.0572	0.2387	1.0000	
gdp2010	-0.2210	-0.3311	0.2922	-0.1244	0.0549	0.1890	1.0000

Table A.5a: Exporter Dynamics 2011 – EU: Part 1: Descriptive statistics

stats	C1	C2	C3	C4
N	25	25	25	25
mean	.2476066	.2189444	.5989827	.0922916
sd	.0537259	.0466937	.0541157	.0356225
min	.1791841	.1538695	.4769327	.0513148
max	.3579631	.3417421	.6956736	.1757306

stats	distance	db2011	gdp2011
N	25	25	25
mean	1054.04	83.9444	579463.4
sd	557.3542	5.774906	824457.7
min	378	74.78	22802
max	2621	92.89	2862502

Table A.5b: Exporter Dynamics 2011 – EU: Part 2: Correlation matrix

	C1	C2	C3	C4	distance	db2011	gdp2011
C1	1.0000						
C2	0.9003	1.0000					
C3	-0.8098	-0.9363	1.0000				
C4	0.9322	0.8401	-0.7108	1.0000			
distance	0.4984	0.7112	-0.6708	0.4928	1.0000		
db2011	-0.1298	-0.1465	0.1615	-0.0150	-0.0576	1.0000	
gdp2011	-0.5629	-0.5293	0.5666	-0.5677	-0.1565	0.2765	1.0000

Table A.6a: Exporter Dynamics 2011 – Non-EU: Part 1: Descriptive statistics

stats	C1	C2	C3	C4
N	141	141	139	141
mean	.479808	.4614725	.3782156	.2299754
sd	.1063682	.130487	.0813079	.1907085
min	.2788976	.2009487	0	.0381533
max	.8333333	.9333333	.5833333	.9985951

stats	distance	db2011	gdp2011
N	141	141	141
mean	6852.071	60.8505	377575.7
sd	3427.823	22.01139	1554688
min	543	4.17	173
max	18220	96.69	1.55e+07

Table A.6b: Exporter Dynamics 2011 – Non- EU: Part 2: Correlation matrix

	C1	C2	C3	C4	distance	db2011	gdp2011
C1	1.0000						
C2	0.8648	1.0000					
C3	-0.6576	-0.6940	1.0000				
C4	0.7039	0.6862	-0.4819	1.0000			
distance	-0.0326	0.0748	0.1125	0.1754	1.0000		
db2011	-0.4090	-0.3788	0.3142	-0.1619	0.2372	1.0000	
gdp2011	-0.3561	-0.3449	0.2956	-0.2140	0.0563	0.1825	1.0000

Table A.7a: Importer Dynamics 2011 – EU: Part 1: Descriptive statistics

stats	C1	C2	C3	C4
N	25	25	25	25
mean	.3333433	.300889	.5308367	.0906181
sd	.0675661	.0714131	.0627217	.0366376
min	.2283289	.1964327	.3956835	.0402354
max	.4760274	.465035	.6460081	.1947787

stats	distance	db2011	gdp2011
N	25	25	25
mean	1054.04	83.9444	579463.4
sd	557.3542	5.774906	824457.7
min	378	74.78	22802
max	2621	92.89	2862502

Table A.7b: Importer Dynamics 2011 – EU: Part 2: Correlation matrix

	C1	C2	C3	C4	distance	db2011	gdp2011
C1	1.0000						
C2	0.9666	1.0000					
C3	-0.9142	-0.9528	1.0000				
C4	0.6179	0.5893	-0.5291	1.0000			
distance	0.6024	0.6650	-0.6208	0.3714	1.0000		
db2011	-0.2247	-0.0674	0.0752	0.0683	-0.0576	1.0000	
gdp2011	-0.6469	-0.5789	0.6241	-0.4239	-0.1565	0.2765	1.0000

Table A.8a: Importer Dynamics 2011 – Non-EU: Part 1: Descriptive statistics

stats	C1	C2	C3	C4
N	137	130	117	136
mean	.5322914	.5204858	.3383829	.268357
sd	.147	.1435482	.109821	.2668722
min	0	.2328287	0	.0079831
max	1	1	.6111111	1

stats	distance	db2011	gdp2011
N	137	137	137
mean	6959.642	61.06752	388448.2
sd	3558.124	22.01865	1576054
min	543	4.17	173
max	18220	96.69	1.55e+07

Table A.8b: Importer Dynamics 2011 – Non- EU: Part 2: Correlation matrix

	C1	C2	C3	C4	distance	db2011	gdp2011
C1	1.0000						
C2	0.8154	1.0000					
C3	-0.2824	-0.5506	1.0000				
C4	0.6753	0.5765	-0.1272	1.0000			
distance	0.0252	-0.1453	0.1856	0.0846	1.0000		
db2011	-0.0862	-0.2634	0.2080	-0.1966	0.2438	1.0000	
gdp2011	-0.2052	-0.3315	0.2318	-0.1441	0.0475	0.1829	1.0000