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Exporter and Importer Dynamics Database for Germany

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1 Introduction

Researchers from the World Bank recently released version 2.0 of the *Exporter Dynamics Database (EDD)*.¹ This database includes exporter characteristics and measures of exporter growth based on firm-level customs information from 70 countries, primarily for the period between 2005 and 2012. The measures are available at the country-year, country-year-product, and country-year-destination level. One shortcoming of the earlier version 1.0 of the Exporter Dynamics Database was the absence of information on several of the most important countries in world exports, including Germany, the third largest exporter (and importer) of goods. This note contributes to the project by providing the evidence for exports of Germany for the years 2009 to 2012 that is now part of the World Bank's EDD. Furthermore, it provides for the first time strictly comparable statistics for imports, thereby introducing the *Importer Dynamics Database* for Germany. The note provides details regarding the EDD and IDD for Germany, and it documents selected results for goods trade as a whole, and for trade with three of the most important partner countries (France, USA, and China).

2 Transaction level data on German exports and imports of goods

In Germany information on the goods traded internationally and on the countries with which these goods are traded² is available from the statistic on foreign

¹ See <http://econ.worldbank.org/exporter-dynamics-database>.

² 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*).

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trade (*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*).³ 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.

This paper uses 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 the USA. 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.⁴

The record of the transaction usually⁵ 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. 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: 9). Note that due to privacy protection any published results refer to the more aggregate HS2 level.

³ 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.

⁴ This has been confirmed by Melanie Scheller from the Federal Statistical Office in a mail sent on May 20, 2015.

⁵ 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.

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: 11).

3 Exporter and importer dynamics database for Germany: a first look

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-ISIC-category. The database has information for 98 measures by year, 113 measures for year-product (and year-3digit-ISIC-category) and 74 measures for year-destination (or year-origin). Cebeci et al. (2012: 14 ff.) give the exact definition of all measures and report in a table which measures are available at which level of disaggregation.

To give an impression on the content of the Exporter and Importer Dynamics Database for Germany Table 1 reports results for selected measures and the reporting years 2010 and 2011. The two years were chosen because some measures refer to changes over time, and information has to be available for the year before (i. e. for 2009 in 2010) and for the following year (i. e. for 2012 in 2011).

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 $t+1$. *Product Entry Rate of Incumbents* is defined as the number of HS6 products not traded in $t-1$ but traded in t by a specific incumbent over the number of all HS6 products traded by the same incumbent in t . The *Share of New Products in Total Trade Value of Incumbents* is defined as the trade value of new HS6 products traded by a specific incumbent over the total trade value of the same incumbent. *Product Exit Rate of Incumbents* is defined as the number of HS6 products traded by a specific

Table 1: Exporter and importer dynamics in Germany: all goods and all countries.

	2010		2011	
	Export	Import	Export	Import
Number of Traders	108,136	124,196	118,473	138,656
Number of Incumbents	81,252	94,884	90,392	103,732
Share of Top 5 % of Traders	0.85	0.84	0.86	0.85
Share of top 10 Largest Traders	0.22	0.14	0.22	0.13
Firm Entry Rate (Number Entrants/Number Traders)	0.25	0.24	0.24	0.25
Firm Exit Rate (Number Exiters/Number Traders)	0.15	0.16	0.16	0.16
Firm Survival Rate (Number Survivors/Number Entrants)	0.70	0.71	0.63	0.63
Share of Entrants in Trade (Total Trade Value of Entrants/ Total Trade Value in that Year)	0.05	0.08	0.05	0.06
Number of HS6 Products per Trader (Median)	3	4	3	4
Product Entry Rate of Incumbents (Median)	0.29	0.41	0.25	0.43
Share of New Products in Total Trade Value of Incumbents (Median)	0.006	0.029	0.005	0.031
Product Exit Rate of Incumbents (Median)	0.17	0.36	0.21	0.37
Number of Countries per Trader (Median)	3	2	3	2
Country Entry Rate of Incumbents (Median)	0.21	0.17	0.17	0.17
Share of New Countries in Total Trade Value of Incumbents (Median)	0.016	0.0007	0.009	0.0007
Country Exit Rate of Incumbents (Median)	0.093	0.083	0.13	0.083

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 $t+1$. Incumbents trade both in $t-1$ and t . Survivors do not trade in $t-1$ but trade in both t and $t+1$. Product Entry Rate of Incumbents is defined as the number of HS6 products not traded in $t-1$ but traded in t by a specific incumbent over the number of all HS6 products traded by the same incumbent in t . The Share of New Products in Total Trade Value of Incumbents is defined as the trade value of new HS6 products traded by a specific incumbent over the total trade value of the same incumbent. Product Exit Rate of Incumbents is defined as the number of HS6 products traded by a specific incumbent in t but not in $t+1$ over the number of all HS6 products traded by the same incumbent. Country Entry and Exit Rate and Share of New Countries in Total Trade Value of Incumbents are defined analogously, where a country is either a country of destination (exports) or a country of origin (imports).

incumbent in t but not in $t+1$ over the number of all HS6 products traded by the same incumbent. *Country Entry and Exit Rate* and *Share of New Countries in Total Trade Value of Incumbents* are defined analogously, where a country is either a country of destination (exports) or a country of origin (imports).

The big picture tends to be rather similar over time (although the overall dynamics of trade were rather different in 2009/2010 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 in 2011/2012). Furthermore, many measures are highly similar for exports and imports (including the share of top 5 percent of traders, the measures of dynamics in trade participation, and the number of products and countries trades with per trader), while others differ considerably (the share of top 10 largest traders is much larger in exports than in imports; both the product entry rate and the product exit rate of incumbents is much smaller in exports than in imports).

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. The same holds for product entry and exit rates and the share of new products in total trade value of incumbents, and for the corresponding measures for countries trades with. This illustrates that the dynamics of both exports and imports are dominated by the intensive margin (the change in trade by incumbents) and that the extensive margins (firm entry/exit, product entry/exit, country entry/exit) play a minor role only.⁶

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 included in Table 1 (and the 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 Tables 2–4 report the measures for the trade with the three most important partner countries, France (that was number 1 in exports and number 3 in imports in 2011), USA (number 2 and number 4) and China (number 4 and number 2).

The top 5 percent of traders play a dominant role in exports and imports with all three trade partners. Firm entry and exit tends to be more pronounced in trade with the more distant partners USA and China compared to the neighbor country France. However, the share of new traders in total trade is small in all three countries, and the same holds for product entry and exit rates and the

⁶ Evidence on the minor role of firm entry and exit for the dynamics of trade in the short run is in line with results reported for the manufacturing sector of Germany in Wagner (2013, 2014).

Table 2: Exporter and importer dynamics in Germany: trade with France (all goods).

	2010		2011	
	Export	Import	Export	Import
Number of Traders	29,633	22,643	30,550	22,981
Number of Incumbents	24,048	17,040	24,815	17,386
Share of Top 5 % of Traders	0.80	0.85	0.81	0.85
Share of top 10 Largest Traders	0.28	0.35	0.29	0.32
Firm Entry Rate (Number Entrants/Number Traders)	0.19	0.25	0.19	0.24
Firm Exit Rate (Number Exiters/Number Traders)	0.18	0.23	0.16	0.23
Firm Survival Rate (Number Survivors/Number Entrants)	0.70	0.59	0.67	0.61
Share of Entrants in Trade (Total Trade Value of Entrants/ Total Trade Value in that Year)	0.05	0.05	0.05	0.05
Number of HS6 Products per Trader (Median)	2	2	2	2
Product Entry Rate of Incumbents (Median)	0	0.2	0	0.2
Share of New Products in Total Trade Value of Incumbents (Median)	0	0.004	0	0.003
Product Exit Rate of Incumbents (Median)	0	0.2	0	0.2

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 $t+1$. Incumbents trade both in $t-1$ and t . Survivors do not trade in $t-1$ but trade in both t and $t+1$. Product Entry Rate of Incumbents is defined as the number of HS6 products not traded in $t-1$ but traded in t by a specific incumbent over the number of all HS6 products traded by the same incumbent in t . The Share of New Products in Total Trade Value of Incumbents is defined as the trade value of new HS6 products traded by a specific incumbent over the total trade value of the same incumbent. Product Exit Rate of Incumbents is defined as the number of HS6 products traded by a specific incumbent in t but not in $t+1$ over the number of all HS6 products traded by the same incumbent.

share of new products in total trade value of incumbents. Identical to the case of trade with all countries (documented in Table 1) the dynamics of both exports and imports are dominated by the intensive margin (the change in trade by incumbents) and the extensive margins (firm entry/exit, product entry/exit) play a minor role only.

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.

Table 3: Exporter and importer dynamics in Germany: trade with USA (all goods).

	2010		2011	
	Export	Import	Export	Import
Number of Traders	26,755	40,574	28,229	48,048
Number of Incumbents	17,671	26,748	20,356	30,442
Share of Top 5 % of Traders	0.88	0.93	0.88	0.94
Share of top 10 Largest Traders	0.39	0.31	0.38	0.31
Firm Entry Rate (Number Entrants/Number Traders)	0.34	0.34	0.28	0.37
Firm Exit Rate (Number Exitors/Number Traders)	0.19	0.25	0.24	0.25
Firm Survival Rate (Number Survivors/Number Entrants)	0.55	0.57	0.50	0.47
Share of Entrants in Trade (Total Trade Value of Entrants/Total Trade Value in that Year)	0.03	0.07	0.04	0.05
Number of HS6 Products per Trader (Median)	2	2	2	2
Product Entry Rate of Incumbents (Median)	0.25	0.5	0.17	0.53
Share of New Products in Total Trade Value of Incumbents (Median)	0.002	0.14	0.0005	0.16
Product Exit Rate of Incumbents (Median)	0	0.5	0.08	0.5

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 . Exitors 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 $t+1$. Product Entry Rate of Incumbents is defined as the number of HS6 products not traded in $t-1$ but traded in t by a specific incumbent over the number of all HS6 products traded by the same incumbent in t . The Share of New Products in Total Trade Value of Incumbents is defined as the trade value of new HS6 products traded by a specific incumbent over the total trade value of the same incumbent. Product Exit Rate of Incumbents is defined as the number of HS6 products traded by a specific incumbent in t but not in $t+1$ over the number of all HS6 products traded by the same incumbent.

4 Selected applications of the world bank exporter dynamics database

Data from the World Bank Exporter Dynamics Database have been used in recent papers to document some stylized facts that hold for a large number of countries and to investigate more specific topics of interest.

Freund and Pierola (2012) use data for 32 countries to investigate the role of the largest exporters for shaping trade patterns. They report that the top 1 percent of exporters – which they call “export superstars” – dominate exports and cover about half of all exports on average in the 32 countries (while the top 10 percent cover 90 percent).

Table 4: Exporter and importer dynamics in Germany: trade with China (all goods).

	2010		2011	
	Export	Import	Export	Import
Number of Traders	18,889	49,079	20,334	57,461
Number of Incumbents	11,628	32,593	13,866	37,652
Share of Top 5 % of Traders	0.88	0.86	0.88	0.87
Share of top 10 Largest Traders	0.41	0.16	0.41	0.13
Firm Entry Rate (Number Entrants/Number Traders)	0.38	0.34	0.32	0.34
Firm Exit Rate (Number Exiters/Number Traders)	0.21	0.22	0.27	0.23
Firm Survival Rate (Number Survivors/Number Entrants)	0.54	0.61	0.50	0.54
Share of Entrants in Trade (Total Trade Value of Entrants/ Total Trade Value in that Year)	0.05	0.08	0.04	0.08
Number of HS6 Products per Trader (Median)	2	3	2	3
Product Entry Rate of Incumbents (Median)	0.29	0.5	0.24	0.5
Share of New Products in Total Trade Value of Incumbents (Median)	0.004	0.09	0.002	0.10
Product Exit Rate of Incumbents (Median)	0	0.48	0.14	0.5

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 $t+1$. Incumbents trade both in $t-1$ and t . Survivors do not trade in $t-1$ but trade in both t and $t+1$. Product Entry Rate of Incumbents is defined as the number of HS6 products not traded in $t-1$ but traded in t by a specific incumbent over the number of all HS6 products traded by the same incumbent in t . The Share of New Products in Total Trade Value of Incumbents is defined as the trade value of new HS6 products traded by a specific incumbent over the total trade value of the same incumbent. Product Exit Rate of Incumbents is defined as the number of HS6 products traded by a specific incumbent in t but not in $t+1$ over the number of all HS6 products traded by the same incumbent.

Cebeci et al. (2012) use data for 38 developing and 7 developed countries to document a number of stylized facts, including the following: Larger or more developed economies have more exporters, larger and more diversified exporters, and lower entry and exit rates into exporting; export expansion along intensive margin (size of exporters) is more important for export growth than entry of new exporters (the extensive margin); export exit and entry rates are highly and strongly positively correlated; there is a high importance of a small number of large multi-product firms that export to many destinations; bilateral exports increase with the size of the destination market and decrease with distance and with bilateral tariffs.

Fernandes et al. (2013) investigate the extent of “export entrepreneurship” (i. e. the advent of new exporting firms, new export products, and new export market destinations) with data from 11 Latin American and Caribbean countries.

They report that countries from this region appear to be no less entrepreneurial in terms of the extensive margins of exports than comparator countries.

Jaud et al. (2015) look at data from 34 developing countries to investigate the implications of financial vulnerability for export diversification. They find a negative and economically large effect.

Fernandes et al. (2015) use data for 42 developing countries across different regions of the world to estimate the effect of pesticide standards on firms' export decisions. The analysis shows that product standards significantly affect foreign market access.

5 Concluding remarks

The papers summarized in Section 5 above illustrate that the *Exporter Dynamics Database (EDD)* 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 stylized facts. 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: 376)

Although the empirical trade literature based on transaction level data (surveyed in Wagner 2016) 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. The *Importer Dynamics Database 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* could be realized for imports, too.

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