Data Observer

Joachim Wagner*

Transaction Data for Germany's Exports and Imports of Goods

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1 Transaction data for Germany's trade in goods¹

Information on Germany's international trade in goods is available from the statistic on foreign trade (*Außenhandelsstatistik*). This statistic is based on two sources. The first source consists of 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 statistic on intra-EU trade (*Intrahandelsstatistik*). The second source consists of transaction-level data collected by the customs on trade with firms in countries outside the EU (the so-called *Extrahandelsstatistik*).² 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.

For the years from 2009 onwards the German Federal Statistical Office prepared data based on the raw data from the statistic on foreign trade that can be accessed by researchers inside the research data center of the Office. The unit of observation in these data is a 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. In exports, the data cover 24,885,099 transactions in 2009 and

¹ This description of the transaction data for German exports and imports is based on my survey of papers that use these data, see Wagner (2018).

² 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.

***Corresponding author: Joachim Wagner**, Institut für Volkswirtschaftslehre, Leuphana Universität Lüneburg Fakultät Wirtschaft, Lüneburg, Germany, E-mail: wagner@leuphana.de.
<https://orcid.org/0000-0001-6058-4536>

35,120,715 transactions in 2014. In imports, the data cover 9,839,271 transactions in 2009 and 13, 428,004 transactions in 2014.

The data cover trade with all countries (243 different countries in exports and 239 different countries in imports). 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.

The record of the transaction usually³ includes the tax registration number of the exporting (or importing) firm that serves as a firm identifier. Over the years 2009 to 2014 the data include information on export activities of 212,742 different firms and information on import activities of 251,646 different firms. Using this firm 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 firm identifier is used to link information on export and import transactions of a firm, too.

In short, the data do not only show “who trades and how much”, but also “who trades how much of which goods of which value and which weight with which countries”. Note that this information is available not only for firms from manufacturing industries, but for firms from all parts of the economy, that trade goods internationally.⁴

The firm identifier that is included with the data can be used to link information at the firm level with the transaction data. Sources of this information include surveys performed by the statistical offices. For example, for firms from manufacturing industries the monthly report submitted to the statistical offices includes information on the number of employees and on total turnover that can be used to compute turnover productivity of the firm and to investigate the links between productivity and various margins of exports and imports. Panel data based on the monthly report data can be used to generate a proxy for the age of the firm and to investigate the links between firm age and margins of trade. For a representative sample of manufacturing firms covered by the cost structure survey we have information on the number of employees active in research and development (R&D) in a firm and on spending for R&D that can be used to investigate the link between innovation activities and trade margins. From the same source the rate of turnover profitability of a firm can be computed and the links between profits and margins of foreign trade can be investigated.

³ Note that this identifier is missing for 0.67 percent of all export transactions and 1.2 percent of all import transactions for various reasons including that traders do not have a (German) tax identification number. Further details were not revealed to me.

⁴ Note that exports and imports of services are not covered by the statistic on foreign trade.

Besides data from surveys performed by the statistical offices firm level data from other sources, including data from commercial data providers, can be linked to the transaction level data. Furthermore, information on the characteristics of destination countries of exports or countries of origin of imports (like distance to Germany, or gross domestic product) can be matched with the transaction data. Evidently, linking transaction level data on exports and imports with information from other data sources enhances the potential of the transaction level data for economic analyses by an order of magnitude.

In the transaction level data products are distinguished according to very detailed classifications. In the data used for the studies surveyed in this paper, the Harmonized System at 6-digit level (HS6) is used as the product classification system. The data cover 5,370 different goods in exports and 5,389 different goods in imports.

The Federal Statistical Office prepared this type of data for the reporting year 2009 for the first time; the most recent data available at the time of writing this paper are for 2014. Using the firm identifier panel data can be constructed. Table 1 summarizes important characteristics of the transaction data for German exports and imports.

Table 1: Important characteristics of the transaction data for German exports and imports.

Unit of observation	Export or import transaction
Information included	Value (€), weight (kg), good (HS6 classification), country of destination (export), country of origin (import)
Years covered	2009–2014
Number of observations	Exports: 24,885,099 (2009); 35,120,715 (2014) Imports: 9,839,271 (2009); 13,428,004 (2014)
Number of countries	243 different countries in exports, 239 different countries in imports
No. of firms	212,742 different firms in exports; 251,646 different firms in imports
No. of goods	5,370 different goods in exports; 5,389 different goods in imports

2 A bird’s eye view on studies based on transaction data for german exports and imports of goods

Since 2012 the transaction data for German exports and imports of goods that were prepared by the Federal Statistical Office have been used in a number of

empirical studies to shed light on various aspects of trade activities of firms, to uncover new facts and to test hypotheses from theoretical models.⁵

A recent literature survey by Wagner (2018) summarizes most of these studies under nine topics: the role of “superstars” in trade; the average number of goods traded and countries traded with; the dynamics of trade in the short run; new insights on the links between firm characteristics (productivity, credit constraints, firm age, innovation, foreign ownership, and profitability) and extensive margins of trade; quality of traded goods; evidence on hitherto undocumented types of foreign trade activities; the “lumpiness” of trade; the role of distance and time zone difference for firm-level trade; and econometric tests of implications of models of multi-product, multi-destination exporters.⁶

3 Whatever next?

Empirical studies demonstrate that transaction level data for exports and imports of goods are highly useful. The research potential of these data can be increased considerably if transaction level data are linked with information on the countries of destination of exports or on the countries of origin of imports, and with information on firm characteristics that are not recorded by the customs, including data from regular surveys by the statistical offices (for, e. g., productivity, firm age, innovations, and profitability) or data from other external sources (on, e. g., credit rating scores or foreign ownership status of firms).

Transaction data can be easily linked with data for country characteristics because the countries of destination and origin of goods are identified directly in the data. Linking transaction data with data on firm characteristics is easy, too, when the firm identifier in the transaction data can be used directly and when the firm level data to be linked are either collected by official statistics or are publicly available (including data from commercial sources), because this means that the data linkage is legally possible. Linked data of this kind have been used in many studies.

If the firm identifier in the transaction data is not identical with the firm identifier in the firm level data to be matched the situation is more difficult.

⁵ Similar data for other countries have been used in a large number of studies; see Wagner (2016) for a comprehensive survey of the international literature.

⁶ Many of these papers are reprinted in Wagner (2019).

However, sometimes the enterprise register system can provide a solution here because it includes the turnover tax registration number (that is in the transaction data) and other firm identifiers (like the registration number in the “Handelsregister”) that might be in the data to be linked to the transaction data. If the linkage is legally possible, it is technically feasible here, too, as is illustrated by the case of linking transaction data and credit rating scores.

We face a different situation if the data to be linked to the transaction data are neither provided by the statistical offices nor publicly available. Irrespective of the existence or not of an identical firm identifier in these data (or of the availability of some kind of workaround), as a rule matching is not legal then, and, therefore, impossible. This is the case when confidential data from different data producing agencies should be matched, e. g. data from the federal employment agency (“Bundesagentur für Arbeit”) for firms and transaction data for exports and imports of these firms from the statistical office. The only way out here is to ask all firms for their written consent to match information across the boundaries of the data producing agencies – which means that such matching is next to impossible in practice.

But things are changing here slowly. According to the latest revision of the federal statistics law (“Bundesstatistikgesetz” BStatG) it is now legally possible to match firm level data from the statistical offices with firm level information gathered by the central bank (“Bundesbank”) – see § 13a BStatG. In the future, hopefully, this might lead to the possibility to match data on international transactions of goods from the statistic on foreign trade with data on international transactions of services collected by the Bundesbank. Furthermore, transaction data from the statistic on foreign trade could be matched with information on foreign direct investments (FDI) by firms collected by the Bundesbank to investigate the links between trade in goods, trade in services, and FDI.

4 Access to transaction level data for Germany’s exports and imports of goods

The micro data on export and import transactions are strictly confidential but not exclusive; see <http://www.forschungsdatenzentrum.de/datenzugang.asp> for information on the general conditions governing access to micro data from official statistics. For detailed information on how to access the transaction level data for exports and imports please contact Melanie Scheller at Destatis (Melanie.Scheller@destatis.de).

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