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Wagner, Joachim

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Joachim Wagner

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Intra-good trade in Germany: A first look at the evidence

Joachim Wagner

Leuphana University Lueneburg, Germany, and CESIS, KTH Stockholm, Sweden

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Abstract:

This paper contributes to the literature by using newly released comprehensive transaction level data on all exports and imports to document facts about the amount of *intra-good trade* – the simultaneous export and import of identical goods by one firm - in Germany. Combined data for trade transactions and for characteristics of a representative large sample of trading firms are then used to report differences between firms that export and import different goods only (*inter-good traders*) and firms that engage in the simultaneous export and import of identical goods (*intra-good traders*). We find that the share of intra-good trade in total trade was some 17 percent in Germany in 2012. Intra-good trade matters. This share differs widely between broadly defined groups of goods and between industries. Controlling for detailed industry affiliation intra-good traders differ significantly from inter-good traders – they are larger, more human capital intensive, more productive, have a higher R&D intensity, and are more profitable. The data, however, are not rich enough to reveal the direction of causality between intra-good trade and firm performance and to investigate empirically the reasons why some firms engage in intra-good trade.

Keywords: Intra-product trade, two-way trade, imports, exports, Germany

JEL Classification: F14

* All computations were done at the Research Data Centres of the Federal Statistical Office in Wiesbaden and the Statistical Office of Berlin-Brandenburg in Berlin. The micro data used are strictly confidential but not exclusive; see http://www.forschungsdatenzentrum.de/datenzugang.asp for information on how to access the data. To facilitate replications the Stata do-files used are available from the author on request.

Prof. Dr. Joachim Wagner
Leuphana University Lueneburg
Institute of Economics
PO Box 2440
D-21314 Lueneburg, Germany

e-mail: wagner@leuphana.de
www: http://www.leuphana.de/joachim-wagner.html

1. Introduction

This paper documents for the first time the relevance of a newly described type of international trade – *intra-good trade*, defined as the simultaneous export and import of identical goods by a single firm – for Germany, one of the biggest actors[1] on the world markets for imports and exports.

To put the findings reported in this paper into perspective, remember that more than forty years ago empirical trade economists realized that a large share of international trade between developed countries was made of simultaneous exports and imports of goods from identical industries (like exports of German cars to France and imports of French cars to Germany). This type of international trade was labeled *intra-industry trade* in contrast to *inter-industry trade* that consists of the international exchange of goods from different industries (like the export of German machines to Vietnam in exchange for shoes imported from Vietnam to Germany). The empirical literature on intra-industry trade grew exponentially over time, and it contributed to both a switch of the focus of empirical trade studies from aggregate data for countries to more disaggregate data at the industry level, and to the development of what was called the *new trade theory* where theoretical models deal with international trade in differentiated goods produced in industries under monopolistic completion.[2]

Starting in the 1990s the focus of empirical studies in international trade changed again when empirical trade economists realized that firms – and not countries or industries – are engaged in exports and imports. Beginning with Bernard

[1] According to the WTO's World Trade Statistical Review 2016 Germany was number three among the leading exporters and importers in world merchandise trade in 2015 (see Word Trade Organization (2016), p. 94, Table A6).

[2] See Grubel and Lloyd (1975) and Helpman and Krugman (1985) for canonical books on the empirical and theoretical parts of this literature. Searching for "intra-industry trade" in Google Scholar returned some 29.000 results on August 3, 2016.

and Jensen (1995) studies with data from countries all over the world looked at differences between exporting and non-exporting firms (and later between importing and non-importing firms). One stylized fact uncovered in this literature is that even in narrowly defined industries there are firms that export and firms that do not export; the same holds for imports. Firms engaged in international trade and those that do not differ systematically; among others, traders are more productive (controlling for firm size and industry). These empirical findings inspired the development of what is now called the *new new trade theory* started by Melitz (2003) and surveyed in Melitz and Redding (2014) with a focus on international activities of heterogeneous firms.

The first generation of this literature on the micro-econometrics of international trade used data from surveys of firms that report who exports (and, to a smaller extent, who imports) how much (for surveys of this literature see Wagner (2007, 2012)). A more recent empirical literature is based on transaction level data that are usually based on customs records of international trade activities. These data cover detailed information on which firms trade which goods in which quantity and of what value with firms from which countries (see Wagner (2016) for a survey). Analyses of these transaction data reveal a number of new empirical facts that were hidden under the veils of more aggregate trade data at the firm level. A case in point is evidence on the existence of hitherto undocumented types of trade activities. Damijan, Konings and Polanec (2013) report that in Slovenia on average 70 percent of all exporting firms engage in what they term *pass-on trade* (POT), i.e. the firms import products that are later exported again *by the same firm*. According to this study a large share of manufacturing firms are active in simultaneous two-way trade in identical goods.

Overall, the value of POT exports was close to 13 percent of the aggregate value of manufacturing exports in Slovenia in 2008 (Damijan et al. 2013, p. 87).[3]

This paper is closely related to the study by Damijan, Konings and Polanec (2013) but takes a somewhat broader view by looking at the role of *intra-good trade*, defined as the simultaneous export and import of the same narrowly defined product (according to the HS6-digit classification of products) within a reporting year by one single firm in Germany. Intra-good trade, therefore, is not limited to pass-on trade (were by definition firms pass-on previously imported goods to exports) but includes imports that are sold on the national (i.e. German) market and exports from Germany that are later imported to Germany again. In short, intra-good trade in identical products is defined in close analogy to intra-industry trade in products from identical industries.

This paper contributes to the literature by using newly released comprehensive transaction level data on all exports and imports to document facts about the amount of intra-good trade in Germany, the third largest exporter and importer in world merchandise trade. Combined data for trade transactions and for characteristics of a large sample of trading firms are then used to report differences between firms that export and import different goods only (*inter-good traders*) and firms that engage in the simultaneous export and import of identical goods (*intra-good traders*).

[3] Evidence on another newly discovered type of international trade is reported by Bernard, Van Beveren and Vandenbussche (2010) who document that a large majority of Belgian firms export products they do not produce – they are engaged in Carry-Along Trade (CAT). These CAT exports are concentrated in the largest and most productive firms. Empirical evidence for CAT is also reported by Abreha, Smeets and Warzynski (2013) for Denmark and by Lo Turco and Maggioni (2013) for Turkey.

To anticipate the most important findings, the share of intra-good trade in total trade was some 17 percent in Germany in 2012. Intra-good trade matters. This share differs widely between broadly defined groups of goods and between industries. Controlling for detailed industry affiliation intra-good traders differ significantly from inter-good traders – they are larger, more human capital intensive, more productive, have a higher R&D intensity, and are more profitable.

The rest of the paper is organized as follows. Section 2 presents descriptive evidence on intra-good trade in Germany. Section 3 looks at the differences between intra-good traders and inter-good traders. Section 4 discusses explanations for intra-good trade. Section 5 concludes.

2. Intra-good trade in Germany: Descriptive evidence

We start the empirical investigation with a look at the share of intra-good trade in total trade for the economy as a whole, in 21 broadly defined sections of goods, and in some 80 industries. The transaction level data used are described in section 2.1, results are reported in section 2.2.

2.1 Data

In Germany information on the goods traded internationally and on the countries with which these goods are traded is available from the statistic on foreign 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).[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 usually[6] 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. Furthermore, the firm identifier is used to link information on export and import transactions of a firm.

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 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.

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[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.

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. Note that due to privacy protection any published results refer to the more aggregate HS2 level.

2.2 Intra-good trade in Germany in 2012

The empirical analysis uses data for 2012, the most recent year available at the time of writing this paper. The share of intra-good trade in total trade is defined as the sum of intra-good exports and intra-good imports over the sum of total exports and total imports, either in the economy as a whole or in parts of it (defined below).

Table 1 reports this share of intra-good trade in trade with all goods, or in total trade, and in trade of 21 broadly defined groups of goods (defined as HS2-sections in the Harmonized System). The overall share of intra-good trade is 17.32 percent, and this documents that intra-good trade is far from rare in German trade. Intra-good trade matters.

While the share of intra-good trade differs widely between groups of goods – from 7 percent in “footwear, headgear, umbrellas” to 50 percent in “works of art, collectors’ pieces and antiques” – it is of an order of magnitude that is non-negligible in all sections. Intra-good trade matters for all kind of goods.

[Table 1 near here]

The share of intra-good trade in the two-digit level industries in reported in Table 2. This share differs widely between industries. Not surprisingly, intermediaries from wholesale and retail trade (industries 45 - 47) are active in intra-good trade, but

we find evidence for intra-good trade in firms from all manufacturing industries (see industries 10 to 32), too. Intra-good trade matters in large parts of the economy.[7]

[Table 2 near here]

This birds-eye view on intra-good trade in Germany in 2012 reveals that this type of trade matters - for the economy as a whole, for all kind of goods, and for firms in nearly all industries.

3. Characteristics of intra-good traders

Given the relevance of intra-good trade for foreign trade in Germany it is important to learn more about which firms engage in this type of trade, and why they do so. This section focuses on the first question. From the literature on the microeconemetrics of international trade we know that firms that engage in both exports and imports – the so-called two-way traders – are different from firms that only export and that only import (and from firms that do not engage in foreign trade at all). Vogel and Wagner (2010) show that in Germany two-way traders are more productive than non-traders, only-importers and only-exporters. Some of these two-way traders are intra-good traders that simultaneously export and import identical goods, while others are inter-good traders that trade different goods in exports and imports only. This section

[7] It may come as a surprise that firms from services industries are active as traders of goods, and that in some services industries the share of intra-good trade is rather high (e.g., industry 65 – Insurance etc., or industry 79 – Travel agency etc.). Exports and imports of goods in these industries, however, are tiny compared to trade in manufacturing industries (details are available on request), and for confidentiality reasons we are not able to document what kind of goods are exported and imported simultaneously by firms from these or other services industries.

reports results from a comparison of intra-good traders and inter-good traders in Germany.

3.1 Data and definition of variables

The empirical investigation uses a tailor-made data set that combines high quality firm-level data from three official sources.

The first source of data is the statistic on foreign trade that is described in section 2 above and that is used to identify two-way traders that are either inter-good traders or intra-good traders.

The second source of data is the cost structure survey for enterprises in the manufacturing sector. This survey is carried out annually as a representative random sample survey in about 15,000 firms. The sample is stratified according to the number of employees and the industries; all firms with 500 and more employees are covered by the cost structure survey (see Fritsch et al. 2004). Note that a new sample of firms is drawn every four or five years.

These data were matched with the enterprise register system (*Unternehmensregister-System*). The enterprise register system is used as the third source of data. With these linked three data sets it is possible to investigate differences in the following characteristics of inter-good and intra-good traders from manufacturing industries:

Number of employees in a firm, a measure for the size of the firm.

Human capital intensity, measured by the average wage per employee.[8]

[8] Direct information on the qualification of the employees in a firm is not available in the data used in this study, but Wagner (2012b) demonstrates that the average wage is indeed a good proxy variable for the qualification of the workforce in German manufacturing firms.

Labor productivity, measured by value added per employee.[9]

R&D intensity, measured by the percentage share of employees that are active in R&D in all employees in a firm.

Rate of profit, computed as (total turnover - total costs) / total turnover * 100.

Industry: Dummy variables for 4-digit industries are included in the empirical models to control for industry specific differences (found to be important in section 2).

Note that due to fact that the cost structure survey covers firms from manufacturing industries only the empirical investigation on differences between intra-good traders and inter-good traders is limited to manufacturing firms, while the descriptive evidence reported in section 2 above was based on trade transactions from firms from the German economy as a whole.

3.2 Empirical results

Table 3 reports differences between 4,714 intra-good traders and 1,124 inter-good traders that participated in the cost-structure survey of 2012.[10] Compared to two-way traders that are inter-good traders, intra-good traders are larger, more human capital intensive, more productive, more engaged in R&D activities, and more profitable. These differences do not only exist at the mean of the firm characteristics, they are observed over the whole distribution of any characteristic (as shown by the values for the percentiles of the distribution), too.

[9] Note that the data used has no information on the capital stock of the firms, so more elaborate measures of productivity like total factor productivity cannot be computed.

[10] The fact that more than four in five two-way traders in the sample are intra-good traders should not be considered as representative for firms from manufacturing industries in Germany. As said in section 3.1., by construction the cost structure survey oversamples very large firms and the high share of intra-good traders in the sample of two-way traders investigated here can be explained by the fact that firm size is positively linked with participation in intra-good trade (as detailed below).

[Table 3 near here]

Descriptive results reported in Table 2 show that the share of intra-good trade differs widely between industries, and that this holds for industries from manufacturing, too. The same can be expected to be the case for firm characteristics looked at above. The next step in the investigation of differences between intra-good traders and inter-good traders is a comparison of both groups of firms that takes care of the industry affiliation of the firms. To do so so-called intra-good trader premia are computed that are based on a regression of a variable measuring a firm-characteristic on a dummy-variable indicating whether a firm is an intra-good trader or not (i.e. an inter-good trader) plus a complete set of dummy variables controlling for the detailed industry affiliation of the firm at the 4-digit classification level. If the firm characteristic is measured in logs, the regression coefficient ß of the intra-good trader dummy variable can be transformed by 100 (exp(ß)–1) to give an estimate of the percentage differential between intra-good traders and inter-good traders controlling for the industry affiliation.[11] If the firm characteristic is measured as a percentage variable, ß is the estimated differential between the two groups of firms in percentage points (again controlling for the industry affiliation of the firm).

Results are reported in Table 4, were the first three premia are in percent and the last two in percentage points. All premia are highly statistically significant and large from an economic point of view, showing that intra-good traders are larger, more human capital intensive, more productive, more engaged in R&D activities, and more profitable compared to inter-good traders from the same detailed industry.

[11] This is the standard approach to compute differences between groups of firms that are involved in trade activities in different ways; see Wagner (2007) for the case of productivity differences between exporting and non-exporting firms.

[Table 4 near here]

These results, however, do not show a causal effect of intra-good trade on the dimensions of firm performance. They indicate correlations (controlling for industry affiliation), not more. When it comes to the discussion of the direction of causality between firm performance and participation in international trade in any form, one has to test for the presence of self-selection of firms with certain characteristics into this activity on the one hand and for the effect of this activity on firms on the other hand. Both might be the case. To test this, however, is far from easy, and demanding with regard to the data needed (see Wagner 2007). Among others, longitudinal data for a larger number of years are needed to see whether, in our case, firms that become intra-good traders were better than firms that continue to act as inter-good traders in the years before they start to trade the same good simultaneously in exports and imports, and to investigate the consequences of starting (or stopping) to act as an intra-good trader on firm performance. However, the transaction level data used here are available for just the four years from 2009 to 2012. Therefore, such an investigation is not possible (and will not be possible for Germany over the next couple of years).

A related point is the potential role of unobserved firm characteristics which might be correlated with the variables included in the empirical models and which might lead to biased estimates of the intra-good trader premia. Using panel data (instead of cross-section data for 2012 only) and including fixed firm effects to control for time-invariant unobserved firm characteristics offers no solution here. First of all, the data are available for four years only. Furthermore, a new sample was drawn for the cost structure survey in 2012, so panel data are available for 2009 to 2011 only. If the empirical models were estimated based on panel data for the three years 2009 to

2011 the coefficients that measure the intra-good trader permia were identified by the data for firms that change their intra-good trader status (at least once) over this period only. This is a small and in some sense special sub-group of firms, so we cannot expect to learn much from the results of these estimations.

To sum up, descriptive statistics and estimates of premium regressions indicate that intra-good traders are larger, more human capital intensive, more productive, more engaged in R&D activities, and more profitable compared to inter-good traders, while the data are not rich enough to investigate the direction of causality between firm performance and engagement in intra-good trade.

4. Why do some firms engage in intra-good trade?

After documenting differences between intra-good traders and inter-good traders in German manufacturing industries in the last section this section deals with the question why some two-way traders engage in intra-good trade and others do not. Unfortunately, at least to the best of my knowledge, there is no formal model that shows when it is profitable for a firm to become an intra-good trader. However, Damijan et al. (2013, p. 101ff.) discuss plausible reasons for firms to engage in pass-on trade (partly by referring to the small literature on carry-on trade) that are plausible reasons for firms to engage in intra-good trade, too.

One scenario is that a firm Z in country X that is part of a (horizontally integrated) multinational enterprise where plants in different countries produce the same narrowly defined product imports a product from a related firm in country B, sells this product in part in country X and exports it in part to another country C, maybe together with its own product made in country X, or exports goods produced in X to yet another country D. In this scenario, the intra-good trader Z serves as an intermediary in the multinational network.

Another scenario is that a firm W in country Y engages in price arbitrage by importing a good from country E and exporting it at a higher price (that covers all extra costs of importing and exporting activities) to country F, maybe together with its own product made in country X and maybe after rebranding the imported good to make it look like a product “made in X”.

Unfortunately, the data at hand are not rich enough to document the empirical validity of these scenarios. We have no information whether the firms in our sample are part of a multinational enterprise that produces the goods that are simultaneously exported and imported by intra-good traders or not. There is no information on international intra-firm trade transactions. And we have no information on the extent to which imported goods are in fact “passed on” to customers in another country (with or without rebranding). Hopefully, this information will become available in the future.

5. Concluding remarks

Evidence reported for Germany, the third largest exporter and importer in world merchandise trade, shows that (in line with results on pass-on trade reported for Slovenia by Damijan et al. (2013)) intra-good trade matters, and that intra-good traders differ systematically from inter-good traders. Any evidence on the direction and strength of causal links between intra-good trade and firm performance, however, is lacking due to the fact that the data at hand are not rich enough to uncover such links. The same holds for empirical evidence on the reasons why some firms engage in intra-good trade and others do not.

A promising road for future research is the replication of the empirical investigation with data for other countries that will help to uncover what can be considered as stylized facts with regard to the role of intra-good trade in international trade. If it turns out that intra-good trade matters to a relevant order of magnitude in

other countries, too, this might inspire the development of theoretical models (like in the case of intra-industry trade and of heterogeneous firms in the past) that can help to guide econometric analyses on why some firms engage in intra-good trade.

References

Abreha, Kaleb Girma, Valérie Smeets, and Frédéric Warzynsky (2013): Coping with the Crisis: Recent Evolution in Danish Firms' International Trade Involvement, 2000-2010. *Aarhus University Economics Working Papers* 2013-15.

Bernard, Andrew B. and J. Bradford Jensen (1995): Exporters, Jobs and Wages in U.S. Manufacturing, 1976-1987. *Brookings Papers on Economic Activity, Microeconomics* 67-119.

Bernard, Andrew B., Ilke Van Beveren, and Hylke Vandenbussche (2010): Multi-product exporters, carry-along trade and the margins of trade. National Bank of Belgium NBB Working Paper Series No. 203.

Damijan, Joze P., Jozef Konings, and Saso Polanec (2013): Pass-on trade: why do firms simultaneously engage in two-way trade in the same varieties? *Review of World Economics/Weltwirtschaftliches Archiv* 149 (1), 85-111.

Fritsch, Michael, Bernd Görzig, Ottmar Hennchen, and Andreas Stephan (2004): Cost Structure Surveys for Germany. *Schmollers Jahrbuch / Journal of Applied Social Science Studies* 124 (4), 557-566.

Grubel, Herbert G. and Peter J. Lloyd (1975): Intra-Industry Trade – The Theory and Measurement of International Trade in Differentiated Products. London: MacMillan.

Helpman, Elhanan and Paul R. Krugman (1985): Market Structure and Foreign Trade. Increasing Returns, Imperfect Competition, and the International Economy. Cambridge, MA and London, England: MIT Press.

Lo Turco, Alessia and Daniela Maggioni (2013): CAT exports in Turkish manufacturing. *Mimeo.* Universitá Politecnica della Marche, Department of Economics and Social Sciences, Ancona.

Melitz, Marc J. (2003): The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica* 71 (6), 1695-1725.

Melitz, Marc J. and Stephen J. Redding (2014): Heterogeneous Firms and Trade. In: Gita Gopinath, Elhanan Helpman and Kenneth Rogoff *(Eds.), Handbook of International Economics,* Vol.4, 1-54.

Vogel, Alexander and Joachim Wagner (2010): Higher Productivity in Importing German Manufacturing Firms: Self-selection, Learning from Importing, or Both? *Review of World Economics* 145 (4), 641-665.

Wagner, Joachim (2007): Exports and Productivity: A Survey of the Evidence from Firm-level Data. *The World Economy* 30 (1), 60-82.

Wagner, Joachim (2012a): International Trade and Firm Performance: A Survey of Empirical Studies since 2006. *Review of World Economics* 148 (2), 235-267.

Wagner, Joachim (2012b): Average wage, qualification of the workforce and export performance in German enterprises: evidence from *KombiFiD* data. *Journal of Labour Market Research* 45 (2), 161-170.

Wagner, Joachim (2016): A survey of empirical studies using transaction level data on exports and imports. *Review of World Economics* 152 (1), 215-225.

World Trade Organization (2016): World Trade Statistical Review 2016. Download: https://www.wto.org/english/res_e/statis_e/wts2016_e/wts16_toc_e.htm.

Table 1: Intra-good trade in HS2-sections of goods, Germany, 2012

HS2-Section	Description	Share of intra-good trade in total trade (percent)
All	All HS2-sections	17.32
1	Live animals; animal products	17.39
2	Vegetable products	27.69
3	Animal or vegetable fats and oils etc.	27.75
4	Prepared foodstuffs; beverages; tobacco	23.09
5	Mineral products	33.15
6	Products of chemical or allied industries	19.34
7	Plastics, rubber and articles thereof	16.45
8	Leather, furskins and articles thereof	17.62
9	Wood, cork and articles thereof	25.06
10	Pulp, paper, paperboard and articles thereof	20.45
11	Textiles and textile articles	10.94
12	Footwear, headgear, umbrellas	6.95
13	Articles of stone, ceramic products, glass	24.14
14	Pearls, precious stones or metals	11.14
15	Base metals and articles of base metals	21.74
16	Machinery, electrical equipment	10.23
17	Vehicles, aircraft, vessels, transport equipment	11.45
18	Optical etc. instruments; clocks; musical instruments	11.09
19	Arms and ammunition	26.18
20	Miscellaneous manufactures articles	29.78
21	Works of art, collectors' pieces and antiques	49.52

Note: Intra-good trade refers to the simultaneous export and import of the same HS6-good by a firm. The share of intra-good trade in total trade is computed as the sum of intra-good export and intra-good import over the sum of total export and total import in a HS2-section. For a detailed description of the HS2 classification by section see the web at: http://unstats.un.org/unsd/tradekb/Knowledgebase/HS-Classification-by-Section.

Table 2: Intra-good trade in industries in Germany, 2012

No.	Industry	Share of intra-good trade in total trade (percent)
01	Crop and animal production, hunting and related service activities	31.87
02	Forestry and logging	17.42
03	Fishing and aquaculture	8.75
05	Mining of coal and lignite	48.13
06	Extraction of crude petroleum and natural gas	##.##
07	Mining of metal ores	--
08	Other mining and quarrying	42.09
09	Mining support service activities	20.97
10	Manufacture of food products	20.50
11	Manufacture of beverages	16.81
12	Manufacture of tobacco products	19.70
13	Manufacture of textiles	24.75
14	Manufacture of wearing apparel	6.90
15	Manufacture of leather and related products	15.76
16	Manufacture of wood and products of wood, except furniture	31.67
17	Manufacture of paper and paper products	27.64
18	Printing and reproduction of recorded media	18.90
19	Manufacture of coke and refined petroleum products	53.98
20	Manufacture of chemicals and chemical products	14.89
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	11.44
22	Manufacture of rubber and plastic products	19.40
23	Manufacture of other non-metallic mineral products	24.95
24	Manufacture of basic metals	21.17
25	Manufacture of fabricated metal products, except machinery and equipment	29.37
26	Manufacture of computer, electronic and optical products	13.00
27	Manufacture of electrical equipment	9.30
28	Manufacture of machinery and equipment n.e.c.	11.09
29	Manufacture of motor vehicles, trailers and semi-trailers	7.10
30	Manufacture of other transport equipment	6.40
31	Manufacture of furniture	38.80
32	Other manufacturing	22.10
33	Repair and installation of machinery and equipment	26.13
35	Electricity, gas, steam and air conditioning supply	84.78
36	Water collection, treatment and supply	9.31

37	Sewerage	21.98
38	Waste collection, treatment and disposal activities; materials recovery	38.11
39	Remediation activities and other waste management services	##.##
41	Construction of buildings	17.61
42	Civil engineering	26.54
43	Specialized construction activities	19.11
45	Wholesale and retail trade and repair of motor vehicles and motorcycles	22.99
46	Wholesale trade, except of motor vehicles and mtorcycles	19.96
47	Retail trade, except of motor vehicles and mtorcycles	17.17
49	Land transport and transport via pipelines	4.20
50	Water transport	6.12
51	Air transport	19.91
52	Warehousing and support activities for transportation	15.08
53	Postal and courier activities	6.07
55	Accommodation	10.91
56	Food and beverage service activities	1.56
58	Publishing activities	21.51
59	Motion picture, video and television programme production, sound recording and music publishing activities	35.73
60	Programming and broadcasting activities	4.97
61	Telecommunications	4.83
62	Computer programming, consultancy and related activities	19.37
63	Information service activities	46.50
64	Financial service activities, except insurance and pension	10.67
65	Insurance, reinsurance and pension funding, except compulsory social security	92.90
66	Activities auxiliary to financial services and insurance activities	20.04
68	Real estate activities	24.62
69	Legal and accounting activities	21.28
70	Activities of head offices; management consultancy activities	13.82
71	Architectural and engineering activities; technical testing and analysis	17.40
72	Scientific research and development	18.60
73	Advertising and market research	23.77
74	Other professional, scientific and technical activities	16.70
75	Veterinary activities	35.87
77	Rental and leasing activities	14.29
78	Employment activities	7.55
79	Travel agency, tour operator and other reservation service and related activities	63.92
80	Security and investigation activities	1.53
81	Services to buildings and landscape activities	41.30

82	Office administrative, office support and other business support activities	11.02
84	Public administration and defense; compulsory social security	14.61
85	Education	10.26
86	Human health activities	23.81
87	Residential care activities	48.70
88	Social work activities without accommodation	41.90
90	Creative, arts and entertainment activities	26.19
91	Libraries, archives, museums and other cultural activities	47.93
92	Gambling and betting activities	12.74
93	Sports activities and amusement and recreation activities	23.01
94	Activities of membership organizations	66.15
95	Repair of computers and personal and household goods	26.01
96	Other personal service activities	24.96
97	Activities of households as employers of domestic personnel	--
98	Undifferentiated goods- and services-producing activities of private households for own use	--
99	Activities of extraterritorial organizations and bodies	--
??	Transactions by firms that are not classified as a member of an industry	22.05

Note: The 2-digit industries are defined according to the German classification WZ 2008; missing numbers are not defined. Intra-good trade refers to the simultaneous export and import of the same HS6-good by a firm. The share of intra-good trade in total trade is computed as the sum of intra-good export and intra-good import over the sum of total export and total import in an industry. ##.## indicates confidential values that are not revealed to me. – indicates that no trade is reported in the transaction data.

Table 3: Two-way traders from manufacturing industries with and without intra-good trade, Germany, 2012: Descriptive statistics

	Mean	Standard deviation	p1	p50	p99
Number of employees					
Firms without intra-good trade	90.11	110.78	21	62	525
Firms with intra-good trade	178.65	178.65	22	102	1,169
Human capital intensity					
Firms without intra-good trade	32,276	10,320	12,671	31,828	60,517
Firms with intra-good trade	37,926	11,463	14,549	37,179	68,593
Labor productivity					
Firms without intra-good trade	54,671	31,667	7,734	49,679	160,872
Firms with intra-good trade	68,316	85,360	10,174	59,070	202,418
R&D intensity					
Firms without intra-good trade	1.41	5.14	0.0	0.0	25.81
Firms with intra-good trade	3.26	6.50	0.0	0.0	30.93
Rate of profit					
Firms without intra-good trade	45.81	65.77	-5.84	48.70	88.22
Firms with intra-good trade	51.46	20.48	7.75	51.93	88.67

Note: Two-way traders exported and imported goods in 2012. Intra-good trade refers to the simultaneous export and import of the same HS6-good by the same firm. Results are for a sample of 1124 (4714) firm without (with) intra-good trade. For a definition of the firm characteristics see text. p1, p50 and p99 refer to the percentiles of the distribution of the firm characteristics variables; minima and maxima cannot be reported to due confidentiality issues.

Table 4: Intra-good trader premia, Germany, 2012

	Premium	p-value
Number of employees	74.99	0.000
Human capital intensity	16.94	0.000
Labor productivity	18.53	0.000
R&D intensity	0.90	0.000
Rate of profit	7.14	0.000

Note: Intra-good trader simultaneously exported and imported the same HS6-good in 2012; the reference group is made of firms that imported and exported different HS6-goods. The estimated premia are based on the regression coefficients of the intra-good trader dummy variable in a regression of the firm characteristic on this dummy variable and a complete set of 4-digit industry dummy variables. The first three firm characteristics (number of employees, human capital intensity, and labor productivity) enter the regression models in logs, and the premia are the percentage difference between the two groups. R&D intensity and rate of profit are percentage variables, and the premia are differences in percentage points between the two groups of firms. For a definition of the firm characteristics see text. p-value is the prob-value of the estimated regression coefficient of the intra-good trader dummy variable.

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Institut für Volkswirtschaftslehre
Postfach 2440
D-21314 Lüneburg
Tel.: ++49 4131 677 2321
email: brodt@leuphana.de

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