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World Trade Flows Characterization: Unit Values, Trade Types and Price Ranges

Charlotte Emlinger & Sophie Piton

Highlights

- We harmonize Trade Unit Values, CEPII's database providing a world trade matrix of unit values for more than 230 countries and 5 100 products over the period 2000-2012.
- We associate each flow with a trade type (one-way trade, intra-industry trade in similar products or in differentiated products) and a price range (low, middle or high range).
- We show that world trade is still mainly inter-industry and concerns more and more middle-market products.

RESEARCH AND EXPERTISE
ON THE WORLD ECONOMY

Abstract

We provide a systematic decomposition of world trade using a new database built on an harmonized version of Trade Unit Values, CEPII's database providing a world trade matrix of unit values for more than 230 countries and 5 100 products over the period 2000-2012. The decomposition allows to associate each flow with a trade type (one-way trade, intra-industry trade in similar products or in differentiated products) and a price range (low, middle or high range). We show that world trade is still mainly inter-industry and concerns more and more middle-market products.

Keywords

Unit Values, Trade Prices, Trade Types, Price Ranges.

JEL

F1, F6.

Working Paper

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RESEARCH AND EXPERTISE ON THE WORLD ECONOMY

World Trade Flows Characterization: Unit Values, Trade Types and Price Ranges

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Contents

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Introduction

Subramanian and Kessler (2013) pointed out criss-crossing globalization as one of the seven salient features of trade integration in the 21st century. The emergence of horizontal intra-industry trade and the specialization of countries in various price ranges of identical products challenged traditional trade theories. However, empirical analyses of such phenomena are limited by the available information on export and import prices at a disaggregated level. They pertain to unit values since prices are not directly observable in trade statistics.

This paper presents a new database: the Trade Flows Characterization dataset. Trade characteristics are computed using an harmonized version of CEPII's Trade Unit Values (TUV) database. Using TUV database allows to have reliable and consistent trade unit values as compared to other databases (particularly COMTRADE which unit values can derive from estimations based on world means). The harmonization procedure allows to increase the number of unit values documented. Harmonization takes advantage of mirror flows of the TUV database: it compares import unit values (relying on importers' declarations) and export unit values (relying on exporters' declarations) and compute a single value for each flow. The resulting database, the harmonized TUV database, provides more reliable data, for a large coverage of countries, products and years. We use this harmonized Trade Unit Values database to compute price ranges and trade types. The final Trade Flows Characterization dataset provides, for each flow, its trade type (one-way trade, intra-industry trade in similar products or in differentiated products) and price range (low, middle or high range), and covers 240 countries and 5,111 products over the period 2000-2012.

The paper is divided into three sections. Section 1 presents the Trade Unit database and its harmonization methodology. Section 2 describes the computation of price ranges and trade types that are used to construct the Trade Characterization database. Section 3 presents an overview of world trade using Trade Characterization, highlighting the dominant role of inter-industry trade and the increasing share of trade happening in the middle range of prices.

1. Data: an harmonized version of the Trade Unit Values database

1.1. The Trade Unit Values database (TUV)

The Trade Unit Values database developed by CEPII relies on Tariff lines data, provided by the United Nations Statistical Division. These data provide raw information on trade values and quantities as reported by the declaring countries, for 173 reporters and 255 partner countries. Each country declares both imports (CIF) and exports (FOB). Raw declarations do not allow for international comparative analyses: quantity units, thresholds and levels of aggregation vary according to the reporter.

Data are processed in order to provide reliable and comparable unit values across countries. First, all quantity units are converted into weights, using conversion factors computed from UN COMTRADE mirror flows (quantities declared in different units by the exporter and the importer provide empirical conversion). Second, extreme unit values are detected using the cross-sectional and the time dimensions of the data. Third, unit values are computed as the ratio of values on quantities. Finally, unit values (in US dollars per ton) are aggregated at the HS6-digit level. We end up with a worldwide unit values database, covering the 2000-2012 period, 182 reporters, 253 partners, and more than 5,000 product categories. This Trade Unit Values database, freely available on CEPII

webpage, provides both CIF unit values, relying on importers' declarations, and FOB unit values, relying on exporters' declarations.[1]

1.2. Harmonization of the Trade Unit Values database (TUV)

We harmonize the Trade Unit Values database following BACI methodology[2]. Harmonization takes advantage of the double information for each flow we have in the Trade Unit Values database, comparing import unit values (relying on importers' declarations) and export unit values (relying on exporters' declarations) for the same flow (i.e. mirror flows).

TUV harmonization raises two concerns. First, as import unit values are reported including all trade costs (except tariffs and domestic taxes after the border) while exports are reported FOB (Free On Board), we cannot directly compare exporters' and importers' declarations. We thus use CIF (Cost of Insurance and Freight) rates estimates of BACI to compute FOB import unit values. Second, as all country reports do not have the same accuracy, a criteria to average the FOB-FOB mirror numbers is needed. We use the reliability of each country provided by BACI to weight and reconcile each mirror trade flow.[3]

The final database provides FOB unit values over the period 2000-2012, for 236 exporters, 237 importers and more than 5,000 product categories. The interest of using this harmonized version of the Trade Unit Values database to compute price ranges and trade types indices is twofold. First, using TUV database improves the quality and offers more reliable and consistent unit values than the UN COMTRADE database, the latter suffering from biases in the computation of unit values. Indeed, the treatment of countries' reports by UN Statistical Division in case of missing information regarding quantities reduces the variance of unit values observed: missing weights are estimated using the mean unit value recorded for the same reporter and product category or, when it is not possible, using a standard unit value computed at the world level[4]. In this latter case, all countries are assumed to share the same price for a given HS6-digit product category, that leads to smaller unit values variance for this product. As a consequence, in BACI database (which results from the harmonization of the UN COMTRADE database), 63% of world trade corresponds to unit values in the median quartile, whereas it is 57% in the harmonized version of TUV.

Second, the harmonization of TUV increases the quantity of unit values documented and increases the coverage of our database, benefiting from the double information for each flow we have in TUV as stated previously. This harmonization compensates for one of TUV's main setback, which is that using raw data decreases the number of documented unit values: TUV databaset only covers 79% of the flows existing in the UN COMTRADE database on average[5].

To test for the reliability of unit values computed using the harmonized version of TUV, we replicate the econometric analysis proposed by Fontagné et al. (2008) and estimate the effect of geographical distance and GDP per capita of both source and destination countries on these unit values,

[1] See Berthou and Emlinger (2011) for more details concerning the Trade Unit Value database methodology.
[2] See Gaulier and Zignago (2010) for more details concerning BACI harmonization methodology.
[3] In BACI, the reliability of countries' report is evaluated by computing an indicator of the reporting distance among partners (the absolute value of the natural log of the ratio of mirror flows). This indicator is then decomposed using a (weighted) variance analysis. The relative reliability of country reporting is then cleaned from the effects of its geographical and sectoral specialization.
[4] see Reister and Muryawan (2009).
[5] The TUV's coverage is higher for recent years (88% in 2012), as weights are better reported.

controlling for product fixed effects. Results in Figure 1 show that unit values are positively related to geographical distance and GDP per capita (column 2). We make the same estimations on unit values computed using BACI (column 1) and compare with the exact same sample but using unit values computed using the harmonized version of TUV (column 3). Coefficients and R-squared are similar. Overall, these results show that, although the dispersion of trade prices is larger in the Trade Unit Values database, the power of explanation of the empirical model that we estimate is not reduced. This result implies that the larger dispersion in the Trade Unit Values database is well explained by economic aggregates. This econometric analysis confirms that our processing improves the reliability of unit values as a proxy for trade price.

Table 1 – Econometric analysis.

	BACI	TUV	TUV
Distance	0.09***	0.10***	0.09***
	(0.00)	(0.00)	(0.00)
Exporter: GDP per capita	0.21***	0.26***	0.26***
	(0.00)	(0.00)	(0.00)
Importer: GDP per capita	0.10***	0.12***	0.12***
	(0.00)	(0.00)	(0.00)
Number of observations	70319827	77829835	70319827
R^2	0.65	0.67	0.67

Source: authors' calculations.

2. Characterizing trade flows: trade types and price ranges

We use the harmonized TUV database to disentangle the flows of trade in goods into three trade types (one-way trade, horizontal intra-industry trade or vertical intra-industry trade) and into three price ranges (low range products, middle range products or high range products). Whereas trade types can serve as indicators of economic similarity by quantifying the extent to which bilateral imports and exports are matched within sectors, price ladders inform on the specialization of countries along the price ranges. Trade types and price ranges are two distinct and strictly independent notions, despite their common use of unit values.

2.1. Disentangling Intra-Industry Trade

The new databases computed (see Section 2.3) offer two measures of the share of intra-industry trade in world trade: the Grubel-Lloyd index (GL) and the Fontagné and Freudenberg index (FF).

2.1.1. The Grubel-Lloyd index (GL)

The standard empirical approach for the study of intra-industry trade builds on the Grubel-Lloyd index (GL) which measures the *degree of overlap* between exports and imports for a given trade flow:

$$GL_{i,j,k,t} = 1 - \frac{|X_{i,j,k,t} - M_{i,j,k,t}|}{X_{i,j,k,t} + M_{i,j,k,t}}$$

where M stands for imports, X exports, i the exporter and j the importer, k the product and t the year. This index ranges between 0 and 1, and takes the value 1 when the flow is entirely intra-industry (i.e. when exports and imports flows overlap entirely).

However, Fontagné and Freudenberg (1997) showed that the Grubel-Lloyd index presents numerous shortcomings stemming from its very construction[6] that cannot be addressed and suggest an alternative measure[7].

2.1.2. The Fontagné and Freudenberg index (FF)

Fontagné and Freudenberg (1997) suggest an index associating each pair of trade flows (import and export flows) with one trade type only[8]. This index gives also further information on the nature of products traded: whether the import and export flows concern similar or differentiated products. Therefore, the Fontagné and Freudenberg index (FF) breaks down total trade into three types: one-way trade (OWT); horizontal intra-industry trade (TWH), *i.e.* intra-industry trade in similar products ; vertical intra-industry trade (TWV), *i.e.* intra-industry trade in differentiated products.

The methodology proceeds in two stages: defining trade overlap (*i.e.* if the flow is one-way or two-way), and characterizing the product (*i.e.* if export and import flows concern different varieties of products or different ranges, depending on their relative unit values).

Trade overlap To disentangle the nature of the flow, *i.e.* whether it is one way or two-way, Fontagné and Freudenberg (1997) use the degree of trade overlap like the Grubel Lloyd index. However, they define a threshold (lower than 1) for the degree of overlap over which the pair of flows is considered entirely intra-industry.

Fontagné and Freudenberg (1997) suggest that trade at a country-partner-product-year level is considered to be two-way (TWT) or intra-industry when the value of the minority flow (the smallest value between the export and import flow) represents at least 10% of the majority flow, i.e. if they fulfill the following condition where X stands for the value of exports and M the value of imports:

$$\frac{min(X_{i,j,k,t}, M_{i,j,k,t})}{max(X_{i,j,k,t}, M_{i,j,k,t})} > 10\%$$

where i represents the country, j the partner, k the product and t the year. If the ratio is below this 10% threshold, the flow in considered one-way (OWT).

Product similarity Given that even inside an item of the Harmonized System nomenclature products can differ (in quality for example), two products are considered similar if their unit values are close enough. Products of a pair of flows (import and export for a country-partner-product-year) are considered to be similar (or horizontally differentiated, TWH) if their relative unit values differ by less than 15%[9], i.e. if they fulfill the following condition, where UV stands for unit value

[6] The most important issue raised with the GL index is that the interpretation of the nature of the *majority flow* (the biggest flow between exports and imports) can be twofold since the flow can be both inter-industry and intra-industry. See Fontagné and Freudenberg (1997) for a discussion on the index.

[7] See Fontagné and Freudenberg (1997) for a detailed discussion on the comparison of both indices.

[8] While the GL index represents the share of the overlapping trade for a pair of trade flows (import and export flows) and is continuous with its values ranging from 0 to 1, the FF index associates each pair of trade flow with a unique trade type, and is thus a discrete variable taking a different value for each type of flow.

[9] see Fontagné and Freudenberg (1997) for a discussion on the thresholds used to calculate product similarity and price ranges.

and subscripts X and M refer to exports and imports:

$$\frac{1}{1.15} < \frac{UV^X_{i,j,k,t}}{UV^M_{i,j,k,t}} < 1.15$$

When this is not the case, products are considered to be vertically differentiated (TWV).

Fontagné and Freudenberg (1997) methodology, summarized in Table 2, characterizes each pair of flow (exports and imports) with a one of the three types.

Table 2 – Characterizing trade types at the product level.

Trade overlap: does the minority flow represent at least 10% of the majority flow?	Product similarity: do export and import unit values differ less than 15%?		
	yes	no	missing unit value
yes	TWH	TWV	TWT
no	OWT		

Source: Fontagné and Freudenberg, 1997.

2.2. Defining price ranges

A price range is assigned to each elementary flow depending on its unit value relatively to a world reference. The three price ranges for each flow at the country-partner-product-year level are defined as followed:

1. *High range* (H), if the product unit value exceeds the world reference by at least 15%:

$$UV > 1.15\alpha$$

2. *Middle range* (M), if the product unit value ranges between +/-15% around the reference:

$$\frac{1}{1.15}\alpha \leq UV \leq 1.15\alpha$$

3. *Low range* (L), if the product unit value is below the reference by at least 15%:

$$UV < \frac{1}{1.15}\alpha$$

We define the reference α as the world median of all unit values weighted by the value of their flow for a given year.

2.3. Trade Characterization database

Three databases on trade characterization are freely available on CEPII website.

The first database *trad_charact_*0012 provides a trade type and price range for each exporter, importer, year and product at the 6-digit level of the nomenclature of products. The 8 variables specified are:

- i the exporter
- j the importer
- $hs6$ the product in HS96 revision
- t the year (from 2000 to 2012)
- GL the Grubel-Lloyd index
- $price\_range$ the price range equal to H (High), M (Medium) or L (Low)
- $trade\_type$ the trade type equal to OWT (One-Way Trade) TWT (Two Way Trade) TWH (Two Way Horizontal trade) or TWV (Two Way Vertical trade)
- uv the unit value coming from the harmonization of TUV

Table 3 below provides a brief description of the number of observations, reporters, partners, products and years in this first database, and precise the share of observations with missing information regarding price ranges (when trade unit values are not available).

Table 3 – Trade Characterization database (hs6 level): descriptive statistics

Year	Observations	Exporters	Importers	Products	Share of missing price range
2000	5 684 071	238	239	5 111	23%
2001	5 900 464	238	239	5 111	26%
2002	6 060 957	238	240	5 111	24%
2003	6 341 009	238	237	5 111	24%
2004	6 637 808	237	237	5 111	18%
2005	6 940 971	234	233	5 109	14%
2006	7 125 713	234	234	5 104	14%
2007	7 307 337	234	234	5 098	15%
2008	7 434 962	234	233	5 079	15%
2009	7 149 881	234	234	5 076	16%
2010	7 333 105	234	233	5 049	15%
2011	7 408 258	235	235	5 029	13%
2012	7 336 378	236	237	5 032	14%

Source: authors' calculations.

The second database $price\_range\_chelem0012$ gives the value of trade in thousands of US dollars for the three different price ranges (High, Medium and Low), for each exporter, importer, year and group of product (industry) following the CHELEM nomenclature. The 9 variables specified are:

- i the exporter
- j the importer
- t the year (from 2000 to 2012)
- $product$ the product category according to the CHELEM classification
- $chain$ the chain of production according to the CHELEM classification
- $stage$ the stage of production according to the CHELEM classification
- H the value of trade in the High price range
- M the value of trade in the Medium price range

- L the value of trade in the Low price range

The third database $type\_chelem0012$ gives the value of trade in thousands of US dollars for the four different trade types (OWT, TWT, TWH, TWV), for each exporter, importer, year and group of product following the CHELEM nomenclature. The 11 variables specified are:

- i the exporter
- j the importer
- t the year (from 2000 to 2012)
- $product$ the product category according to the CHELEM classification
- $chain$ the chain of production according to the CHELEM classification
- $stage$ the stage of production according to the CHELEM classification
- GL the Grubel-Lloyd index
- OWT the value of one-way trade
- TWT the value of two-way trade (with missing unit value)
- TWH the value of two-way horizontal trade
- TWV the value of two-way vertical trade

Table 4 below provides a brief description of the number of observations by year for these two latest databases.

Table 4 – Trade Characterization database (CHELEM nomenclature): number of observations

	Price range	Type
2000	364 396	467 434
2001	371 577	485 847
2002	393 905	499 228
2003	416 436	519 380
2004	465 710	536 792
2005	504 189	557 623
2006	515 507	568 090
2007	526 747	586 554
2008	534 550	597 537
2009	525 058	589 904
2010	535 485	598 148
2011	538 807	598 697
2012	524 354	588 608

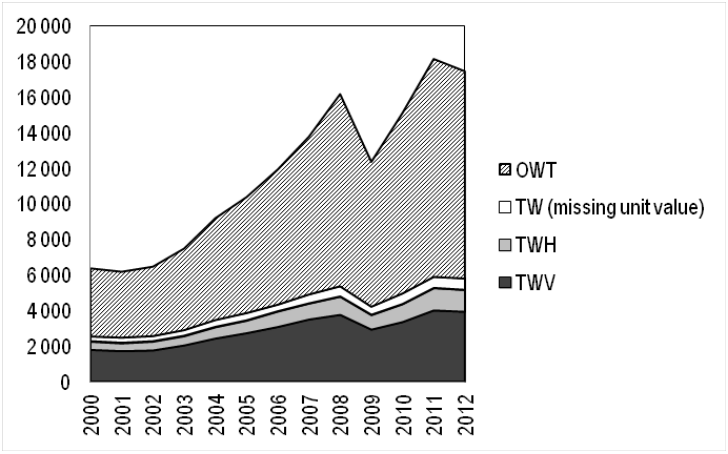
Source: authors' calculations.

3. Trade Types and Price Ranges: an overview of world trade, 2000-2012

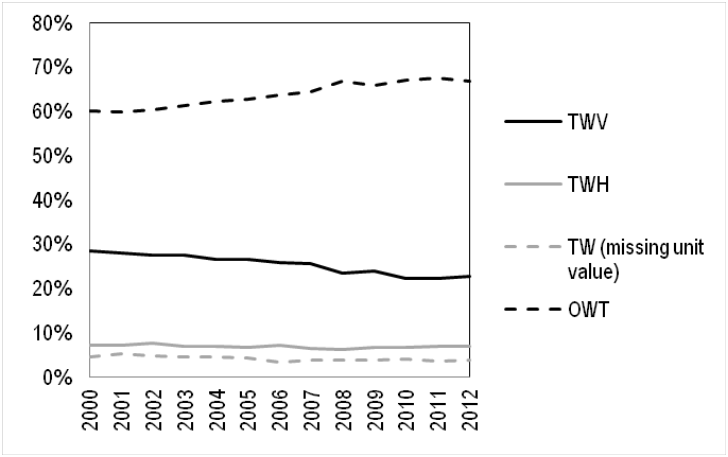
The evolution of each trade type over the period 2000-2012 (see Figure 1) highlights the dominant role of inter-industry trade which still represents about 67% of total world trade. This share increased since 2000, in line with the increasing role of emerging countries in international trade flows. This increase has also been associated with a decline in the share of two-way trade in vertically differentiated products.

Figure 1 – World trade decomposition per trade type, 2000-2012.

(a) in billions of USD



(b) in %



Source: authors' calculations.

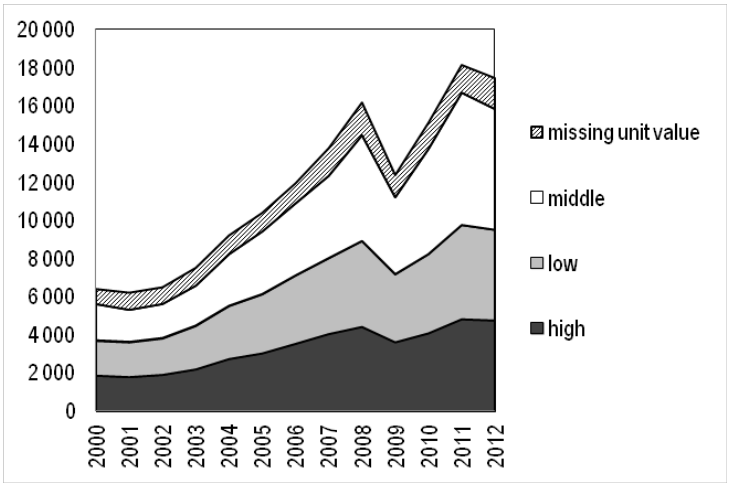
In 2012, countries trading similar products were generally close, economically or geographically (see Table 1 in Appendix): trade between Canada and the United States is composed of 70% of two-way trade, Germany and France of 85%. Symetrically, countries trading on an inter-industry basis are remote trading partners or characterized by large differences in factor endowments (United States-China's trade is composed of 82% of one-way trade). Reexports from Honk Kong certainly have a role in explaining the country's rank in both one-way and two-way trade.

The evolution of each price range over the period 2000-2012 (see Figure 2) highlights the increasing role of middle range products which represent about 36% of total world trade in 2012. This share increased since the mid-2000s.

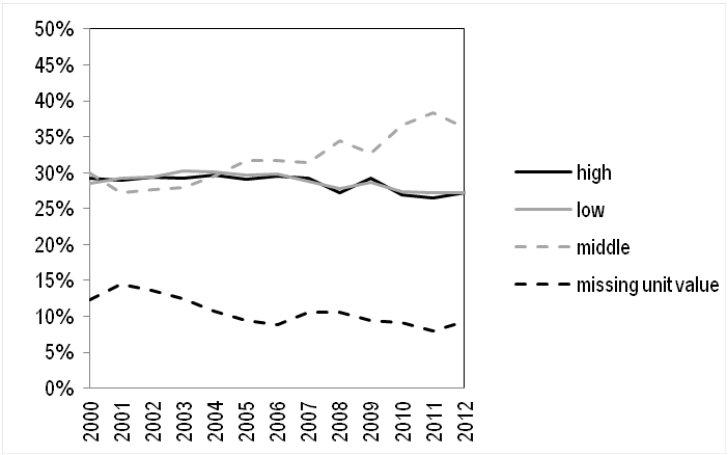
In 2012, countries export products of the middle range to countries from which they are close economically or geographically (German exports to France are composed of about 50% of middle-market products), or because their exports are mainly composed of commodities (Australia's exports

Figure 2 – World trade decomposition per price range, 2000-2012.

(a) in billions of USD



(b) in %



Source: authors' calculations.

to China are composed of 92% of middle-market products, see Table 2 in Appendix). Two leaders stand out: Germany is a world export leader in high range products, and exports such products especially to China (Germany's exports to China are composed of 70% of high-market products); China is a leader in low range products, and exports such products especially to Mexico (79%).

Conclusion

This paper presents a new database aiming at characterizing trade flows at a disaggregated level. The database is built using an harmonized version of the Trade Unit Values (TUV) database provided by CEPII. TUV uses raw data for trade values and quantities at the highest available level of disaggregation (tariff lines). The processing strategy of TUV improves the reliability of unit values as proxies for trade prices, as compared to existing datasets; the harmonization of TUV

increases the number of unit values documented. As a result, the harmonized version of TUV improves empirical works dedicated to the study of price discrimination across markets and the specialization of countries.

The Trade Characterization database disentangles flows of manufactured goods into three trade types (one-way trade, horizontal intra-industry trade or vertical intra-industry trade) and associates a price range (low range products, middle range products or high range products) with each trade flow into two different nomenclatures. The metholodology used to build the indices is presented.

Whereas trade types can serve as indicators of economic similarity by quantifying the extent to which bilateral imports and exports are matched within sectors, price ladders inform on the specialization of countries along the price ranges. Trade types and price ranges are two distinct and striclty independent notions, despite their common use of unit values. The new Trade Characterization (TC) database is provided both at the most disaggregated level (H6-digit level) and in the 71 CHELEM product categories. Stylized facts using these two databases show that world trade is mainly inter-industry and increasingly concerns middle-market products.

References

Berthou, A. and Emlinger, C. (2011). The Trade Unit Values Database. Working Paper 2011-10, CEPII.

Fontagné, L. and Freudenberg, M. (1997). Intra-industry trade: Methodological issues reconsidered. Working Paper 1997-01, CEPII.

Fontagné, L., Gaulier, G., and Zignago, S. (2008). Specialization across varieties and North-South competition. *Economic Policy*, 23:51–91.

Gaulier, G. and Zignago, S. (2010). BACI: International Trade Database at the Product-Level. The 1994-2007 Version. Working Paper 2010-23, CEPII.

Reister, M. and Muryawan, M. (2009). Quantity and weight data in UN comtrade. Background paper, UN Comtrade.

Subramanian, A. and Kessler, M. (2013). The Hyperglobalization of Trade and Its Future. Working Paper Series WP13-7, Peterson Institute for International Economics.

Appendix

Table 1 – Top 10 bilateral flows per trade type in 2012.

Partners	value of bilateral trade (billions USD)	share of the bilateral flow in total trade per trade type (%)	share of each trade type in total trade of the bilateral flow (%)
One-way trade (OWT)			
United-States–China	423,52	1,82	81,89
China–Honk-Kong	236,74	1,02	76,15
China–Japan	178,06	0,76	54,99
United-States–Mexico	176,92	0,76	39,34
United-States–Canada	163,66	0,70	29,64
United-States–Japan	129,28	0,55	60,41
China–Germany	119,56	0,51	67,50
China–Australia	114,30	0,49	96,55
China–Russia	84,58	0,36	98,42
China–South Korea	77,99	0,33	37,17
Two-way trade (TW total)			
United-States–Canada	388,51	3,34	70,36
United-States–Mexico	272,84	2,35	60,66
France–Germany	171,75	1,48	85,06
China–Japan	145,76	1,25	45,01
Netherlands–Germany	141,76	1,22	80,30
China–South Korea	131,84	1,13	62,83
United-States–Germany	108,61	0,93	64,85
China–Taiwan	107,65	0,93	64,11
Belg.&Lux.–Germany	96,18	0,83	79,82
Belg.&Lux.–Netherlands	94,79	0,81	69,10
Two-way trade, horizontal (TWH)			
United-States–Canada	*81,14*	*3,33*	*14,69*
China–Honk-Kong	*60,55*	*2,48*	*19,48*
Belg.&Lux.–Netherlands	*41,85*	*1,72*	*30,51*
United-States–Mexico	*37,73*	*1,55*	*8,39*
France–Germany	*37,12*	*1,52*	*18,39*
Netherlands–Germany	*35,26*	*1,45*	*19,97*
India–United Arab Emirates	*23,96*	*0,98*	*33,44*
United Kingdom–Germany	*23,36*	*0,96*	*18,03*
Germany–Austria	*23,14*	*0,95*	*21,55*
Malaysia–Singapore	*22,87*	*0,94*	*35,10*
Two-way trade, vertical (TWV)			
United-States–Canada	*206,03*	*2,61*	*37,31*
United-States–Mexico	*200,52*	*2,54*	*44,58*
China–Japan	*138,03*	*1,75*	*42,63*
France–Germany	*134,39*	*1,70*	*66,56*
China–South Korea	*118,13*	*1,50*	*56,30*
Netherlands–Germany	*106,30*	*1,35*	*60,22*
United-States–Germany	*94,25*	*1,19*	*56,27*
United-States–China	*88,17*	*1,12*	*17,05*
Japan–United-States	*76,62*	*0,97*	*35,80*
Belg.&Lux.–Germany	*73,68*	*0,93*	*61,14*

Source: authors' calculations.

Table 2 – Top 10 bilateral flows per price range in 2012.

Exporter-importer	value of exports (billions USD)	share of the flow in total trade per price range (%)	share of each price range in the total export flow (%)
Low range			
China–United-States	266,86	5,62	66,39
China–Hong Kong	150,20	3,17	60,47
Mexico–United-States	119,35	2,52	44,67
Canada–United-States	83,90	1,77	26,29
United States–Mexico	68,92	1,45	37,75
China–Mexico	44,12	0,93	84,83
China–Japan	40,68	0,86	23,24
United-States–Canada	38,67	0,81	16,60
China–Germany	38,36	0,81	41,21
China–South Korea	36,78	0,78	47,04
Middle range			
China–United-States	115,60	1,82	28,76
Mexico–United-States	93,37	1,47	34,95
Canada–United-States	80,69	1,27	25,28
United-States–Canada	77,14	1,21	33,11
China–Hong Kong	72,90	1,15	29,35
Japan–United-States	71,71	1,13	50,15
Australia–China	65,68	1,03	87,61
South Korea–China	65,48	1,03	49,75
Germany–France	57,19	0,90	47,04
Netherlands–Germany	55,46	0,87	56,80
High range			
Japan–China	88,84	1,87	59,73
China–Japan	86,19	1,81	49,23
Germany–United-States	74,33	1,56	68,79
Germany–China	62,59	1,32	74,49
United-States–Canada	58,37	1,23	25,05
United-States–China	53,37	1,12	46,33
Japan–United-States	48,25	1,02	33,74
United-States–Mexico	45,95	0,97	25,17
South Korea–China	43,00	0,91	32,67
Mexico–United-States	41,76	0,88	15,63

Source: authors' calculations.