

Appendix A-G

A. Explanation of the modes of supply	p.2
B. Country coverage in the WIOD and TSD	p.3
• Includes sector coverage in the TSD	
C. STRI Level and STRI Heterogeneity (score and answer)	p.4
D. Derivation of the input-output framework	p.6
E. Corresponding tables with the figures in section 3.....	p.11
• Includes sector coverage in the WIOD	
F. Derivation of the theoretical gravity system.....	p.17
G. Summary statistics and regression tables linked to section 4...	p.19

Appendix A:

The four modes of supply¹

1. Cross-border supply of services: when a service supplier resident in one country provides a service in another country without either supplier or consumer moving to the physical location.
2. Consumption abroad: when a consumer resident in one country moves to the location of a supplier to consume a service.
3. Commercial presence: when a service provider moves to the location of consumers to sell services locally through the establishment of a foreign affiliate or branch.
4. Presence of natural persons: when an individual (temporarily) moves to the country of the consumers to provide a service.

¹ Definitions by Francois et al. (2010).

Appendix B:

Country coverage in the WIOD and TSD

Table A.1
Country and Services Trade Restrictiveness Index (STRI) Coverage

Country	TSD & STRI	WIOD 2016	Country	TSD & STRI	WIOD 2016
Australia	Yes	Yes	Japan	Yes	Yes
Austria	Yes	Yes	Korea	Yes	Yes
Belgium	Yes	Yes	Latvia	Yes	Yes
Brazil	Yes	Yes	Luxembourg	Yes	Yes
Canada	Yes	Yes	Mexico	Yes	Yes
Chile	Yes	Yes	Netherlands	Yes	Yes
China	No	Yes	New Zealand	Yes	Yes
Colombia	Yes	Yes	Norway	Yes	Yes
Cyprus	No	Yes	Poland	Yes	Yes
Czech Republic	Yes	Yes	Portugal	Yes	Yes
Denmark	Yes	Yes	Russian Federation	Yes	Yes
Estonia	Yes	Yes	Slovakia	Yes	Yes
Finland	Yes	Yes	Slovenia	Yes	Yes
France	Yes	Yes	South Africa	Yes	Yes
Germany	Yes	Yes	Spain	Yes	Yes
Greece	Yes	Yes	Sweden	Yes	Yes
Hungary	Yes	Yes	Switzerland	Yes	Yes
Iceland	Yes	Yes	Taiwan	No	Yes
India	Yes	Yes	Turkey	Yes	Yes
Indonesia	Yes	Yes	United Kingdom	Yes	Yes
Ireland	Yes	Yes	United States	Yes	Yes
Israel	Yes	Yes	Rest of world	No	Yes
Italy	Yes	Yes	Total	42	45

Notes:

- All 45 countries (including a model of the Rest of the world) is included in the input-output analysis in section 3, and all 42 countries with a corresponding STRI index is included in the gravity regressions in section 4.
- The *proportionality assumption*² is not applied when creating import matrices for goods and services in the WIOD tables, which represent an advantageous feature of the tables because they better reflect the actual trade in intermediates and final goods and services.³ The construction of the tables, however, allows countries' import shares to differ across but not within end-use categories.
- The construction of the WIOD tables depends on the *fixed product sales assumption* which implies that for any given industry all firms use the same goods and services to produce the same output.
- The TSD provides a consolidated and reconciled version of data from the OECD, Eurostat, IMF and the UN.
- The TSD is of relative high quality compared to other sources of bilateral trade in services since it has been cross checked across the multiple sources and corrected for inconsistencies and measurement errors (Francois et al., 2013).

² The proportionality assumption implies that the share of imports of any given product consumed directly as intermediate consumption or final demand (except exports) is the same for all use categories (i.e., industry and category of final demand) (Koopman et al., 2015).

³ Dietzenbacher et al. (2013) show that import proportions differ widely across use categories, and within each category they differ by country of origin. They argue that the non-proportional approach is important empirically because some industries shares of imported intermediate goods tend to have increased substantially more than the imports of final goods.

Appendix C:

STRI Level and STRI Heterogeneity

Table C.1
STRI Level index in 2014

STRI	Mean	Standard deviation	Min	Max
Road freight transport	0.1527	0.0661	0.0397	0.3863
Commercial banking	0.1926	0.1146	0.0792	0.5446
Construction	0.2012	0.0828	0.0705	0.4027
Computer	0.2012	0.0770	0.0940	0.4154
Insurance	0.2034	0.1215	0.0528	0.6314
Telecom	0.2263	0.1306	0.0797	0.5882
Maritime transport	0.2399	0.0889	0.0859	0.4330
Courier	0.2595	0.1657	0.0884	0.8609
Legal	0.3630	0.2496	0.0857	1.0000
Air transport	0.4248	0.1195	0.1337	0.6737

Table C.2
STRI Heterogeneity score index in 2014

STRI Heterogeneity score	Mean	Standard deviation	Min	Max
Computer services	0.2498	0.0726	0.0518	0.5643
Construction	0.2447	0.0769	0.0653	0.4786
Legal services	0.3896	0.1743	0	0.8724
Telecommunications	0.3009	0.1256	0.0879	0.6327
Air transport	0.23	0.1438	0.0239	0.5476
Maritime freight transport	0.3018	0.0889	0.0903	0.6433
Road freight transport	0.1831	0.0831	0.0217	0.574
Courier services	0.2311	0.0861	0.0686	0.6111
Commercial banking	0.2379	0.1064	0.0619	0.557
Insurance	0.2347	0.1179	0.0409	0.649

Table C.3
STRI Heterogeneity answer index in 2014

Heterogeneity answer	Mean	Standard deviation	Min	Max
Computer services	0.3114	0.072	0.7784	0.5488
Construction	0.2746	0.0722	0.0847	0.4883
Legal services	0.3108	0.0593	0.1143	0.4746
Telecommunications	0.2811	0.0993	0.0991	0.5929
Air transport	0.1995	0.1085	0.0395	0.5115
Maritime freight transport	0.2874	0.0753	0.1189	0.5338
Road freight transport	0.1872	0.0635	0.0325	0.4259
Courier services	0.2589	0.0733	0.0884	0.4609
Commercial banking	0.2657	0.0999	0.1159	0.6039
Insurance	0.2372	0.1229	0.0635	0.667

Note for Tables C1-C3:

- i. The reported statistics are based on the countries and sectors in the data used in section 4 of the analysis. See Appendix B for a complete country overview.

The construction of the STRI Level and STRI Heterogeneity (score and answer)

The construction of the STRI Level is based on a list of standardised questions or measures on each country's laws and regulations covering the five policy areas, in which binary scores are given where answers are simply yes or no, while numerical answers are broken down on thresholds to which binary scores are applied (Geloso et al., 2015; Nordås, 2016).

The STRI Heterogeneity reflects the (weighted) share of measures for which two countries have different regulations in a sector. Here, a matrix where each cell contains the *answer* to a specific policy measure *m* by country *s* and *r*, which is equal to zero if their answers are the same and one otherwise. A weighted average of these scores are calculated (same weight to each measure) and each country and sector are assigned a heterogeneity index. Alternatively, the heterogeneity index is based on *scores* assigned to each measure, which are calculated similarly except that if the country pair in a cell has the same *score* on measure *m*, the cell is also scored zero and one otherwise.

Note that the indices cover restrictions that apply on a most-favoured-nation (MFN) basis, thus excluding preferential regulations.

Appendix D: Derivation of the input-output framework

The methodology follows the framework in Koopman et al. (2014) and Timmer et al. (2013) closely.⁴ There are G countries and N sectors, each country-sector produces one good or service that are absorbed at home or abroad either as a final product or an intermediate input in production.⁵ We further label country-sectors as sources and destinations, where s and r denote the source and destination country, and i and j the source and destination sector. We assume market clearing in the model and equation (D.1) gives the market clearing condition for a specific product. Here, the value of output in sector i in country s is $X_s(i)$, the value of products exported from sector i in country s for final use in any country r is $Y_{sr}(i)$, and the value of goods from sector i in country s for intermediate use by sector j in any country r is $M_{sr}(i, j)$. Note that the use of a product can be bought at home ($s=r$) or abroad ($s \neq r$).

$$(D.1) \quad X_s(i) = \sum_r Y_{sr}(i) + \sum_r \sum_j M_{sr}(i, j)$$

Then we rewrite the market clearing condition for each GN product in (D.1) to compact form as $X = AX + Y$, and rearrange terms so that we arrive at the fundamental input-output condition: (D.2) $X = (I - A)^{-1}Y = BY$. Here, X is as a $GN \times 1$ vector of production that consists of output levels in each country-sector, Y is a $GN \times 1$ vector that gives world *final* demand for output in each country-sector. The latter is the sum of both domestic and foreign demand for each country-sector's final products, that is, $Y_s(i) = \sum_r Y_{sr}(i)$. A denotes the $GN \times GN$ global intermediate input coefficients matrix, where each element $a_{sr}(i, j) = M_{sr}(i, j)/X_r(j)$ reflects sector i 's output (in country s) used as an intermediate input in sector j 's production (in country r) as a share of total output in the latter sector (in country r). Hence, A describes how the products of each country-sector are produced using a combination of both domestic and foreign intermediate inputs.⁶ The $(I - A)^{-1}$ term or B is the Leontief inverse matrix (Leontief, 1936) with dimension $GN \times GN$, which gives total gross output (both direct and indirect) required in country s to produce a one-unit increase of final demand in country r . When multiplying the Leontief inverse matrix with the vector of final demand as in (D.2), we obtain the necessary production in country s to satisfy demand for final products absorbed in any country r . Equation (D.2) represents the *Inter Country Input-Output* (ICIO) model which can be rewritten as (D.2') in matrix notation.

⁴ Note that Koopman et al. (2014) do not use their framework to identify sources of value-added at the country-sector level, but that their value-added matrix algebra allows such decomposition.

⁵ A country-sector denotes a particular sector in a country. Final demand consists of household and government consumption and investments.

⁶ I is a $GN \times GN$ identity matrix with ones on the diagonal and zero elsewhere.

$$(D.2') \quad \begin{bmatrix} X_1 \\ X_2 \\ \vdots \\ X_G \end{bmatrix} = \begin{bmatrix} I - A_{11} & -A_{12} & \dots & -A_{1G} \\ -A_{21} & I - A_{22} & \dots & -A_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ -A_{G1} & -A_{G2} & \dots & I - A_{GG} \end{bmatrix}^{-1} \begin{bmatrix} \sum_r^G Y_{1r} \\ \sum_r^G Y_{2r} \\ \vdots \\ \sum_r^G Y_{Gr} \end{bmatrix}$$

$$= \begin{bmatrix} B_{11} & B_{12} & \dots & B_{1G} \\ B_{21} & B_{22} & \dots & B_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ B_{G1} & B_{G2} & \dots & B_{GG} \end{bmatrix} \begin{bmatrix} Y_1 \\ Y_2 \\ \vdots \\ Y_G \end{bmatrix}$$

We further rewrite equation (D.2') by breaking up each country's gross output according to where it is ultimately absorbed by rearranging all countries' final demand into a matrix format by source and destination. That is, the *gross output decomposition matrix* in equation (D.3). Domestic production is absorbed at home if $s \neq r$ and absorbed abroad if $s = r$. With G countries and N sectors, the gross output decomposition matrix and the final demand matrix are both $GN \times G$ matrices. Similarly, X and Y are both GN vectors. However, equation (D.2)-(D.12) omits sector notification in order to simplify notation. In expression (D.2), $X_s = \sum_s^G X_{sr}$ is a $N \times 1$ gross output vector that gives gross output produced in s and absorbed in r , and $Y_{sr} = \sum_s^G Y_{sr}$ is a $N \times 1$ final demand vector which gives country r 's demand for final goods produced in country s .

$$(D.3) \quad \begin{bmatrix} X_{11} & X_{12} & \dots & X_{1G} \\ X_{21} & X_{22} & \dots & X_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ X_{G1} & X_{G2} & \dots & X_{GG} \end{bmatrix} = \begin{bmatrix} B_{11} & B_{12} & \dots & B_{1G} \\ B_{21} & B_{22} & \dots & B_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ B_{G1} & B_{G2} & \dots & B_{GG} \end{bmatrix} \begin{bmatrix} Y_{11} & Y_{12} & \dots & Y_{1G} \\ Y_{21} & Y_{22} & \dots & Y_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ Y_{G1} & Y_{G2} & \dots & Y_{GG} \end{bmatrix}$$

We further define V_s as a $1 \times N$ value-added coefficient row vector where each coefficient gives the ratio of direct domestic value-added in total output of country s .⁷ This is equal to one minus the intermediate input share from all countries (including domestically produced intermediates).⁸ We obtain the value-added share by source (VB) matrix in (D.4) by multiplying V , defined as a $G \times GN$ diagonal matrix of the domestic value-added for all countries, with the Leontief inverse matrix (B) .⁹

$$(D.4) \quad VB = \begin{bmatrix} V_1 B_{11} & V_1 B_{12} & \dots & V_1 B_{1G} \\ V_2 B_{21} & V_2 B_{22} & \dots & V_2 B_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ V_G B_{G1} & V_G B_{G2} & \dots & V_G B_{GG} \end{bmatrix}$$

⁷ With G countries and N sectors V_s becomes a $1 \times GN$ vector.

⁸Formally, we define $V_s = u(I - \sum_r^G A_{rs})$.

⁹ $V = \begin{bmatrix} V_1 & 0 & \dots & 0 \\ 0 & V_2 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & V_G \end{bmatrix}$.

The VB matrix measures value-added share by source of production and reflects the underlying production structure embedded in the ICIO model. The diagonal elements sum to domestic value-added share in production, and the off-diagonal column elements sum to foreign value-added share in the same goods and services. The sum of each row equals unity since production is either domestic or foreign.

Then we define $\hat{V}_s$ as a diagonal matrix with direct value-added coefficients along the diagonal, and with G countries and N sectors, we obtain the $GN \times GN$ diagonal value-added coefficient matrix as in equation (D.5).¹⁰

$$(D.5) \quad \hat{V} = \begin{bmatrix} \hat{V}_1 & 0 & \dots & 0 \\ 0 & \hat{V}_2 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & \hat{V}_G \end{bmatrix}$$

We obtain the $GN \times G$ *value-added production matrix* ($\hat{V}BY$) in equation (D.6) by multiplying (D.5) with the right hand side of equation (D.3).

$$(D.6) \quad \begin{bmatrix} \hat{V}_1 & 0 & \dots & 0 \\ 0 & \hat{V}_2 & \dots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & \hat{V}_G \end{bmatrix} \begin{bmatrix} X_{11} & X_{12} & \dots & X_{1G} \\ X_{21} & X_{22} & \dots & X_{2G} \\ \vdots & \vdots & \ddots & \vdots \\ X_{G1} & X_{G2} & \dots & X_{GG} \end{bmatrix} \\ = \begin{bmatrix} \hat{V}_1 \sum_r B_{1r} Y_{r1} & \hat{V}_1 \sum_r B_{1r} Y_{r2} & \dots & \hat{V}_1 \sum_r B_{1r} Y_{rG} \\ \hat{V}_2 \sum_r B_{2r} Y_{r1} & \hat{V}_2 \sum_r B_{2r} Y_{r2} & \dots & \hat{V}_2 \sum_r B_{2r} Y_{rG} \\ \vdots & \vdots & \ddots & \vdots \\ \hat{V}_G \sum_r B_{Gr} Y_{r1} & \hat{V}_G \sum_r B_{Gr} Y_{r2} & \dots & \hat{V}_G \sum_r B_{Gr} Y_{rG} \end{bmatrix}$$

The $\hat{V}BY$ matrix provides estimates of country-sector sources (domestic or foreign) of direct and indirect value-added used in each country-sector's production of final goods consumed at home or abroad. Diagonal elements reflect countries' value-added production absorbed at home, while off-diagonal elements represent a country's value-added exports. We can further trace backward and forward industrial linkages using the $\hat{V}BY$ matrix (Wang, Wi and Zhu, 2013). For instance, we account for a given country-sector's *use* of domestic value-added by the sector itself as well as in *all* downstream country-sectors when summing across a given row. If we sum the elements in a given column, we take into account the distribution of value-added from *all* country-sectors to final goods produced by a *particular* country-sector. Hence, we trace forward industrial linkages across all *downstream* country-sectors from a producer's

¹⁰ Note that $\hat{V}_s$ and V_s have different dimensions.

perspective when summing across a row, whilst we trace backward industrial linkages across *upstream* country-sector from a user's perspective when summing along a column (Wang et al., 2013).

Total value-added exports from country s to the world is defined in Koopman et al. (2014) as equation (D.7), which we decompose into three components in equation (D.8) according to where and how the value-added is absorbed ultimately. See section 3.3 for further explanations.

$$(D.7) \quad VT_{S*} = \sum_{r \neq s}^G V X_{sr} = V_s \sum_{r \neq s}^G \sum_{g=1}^G B_{sg} Y_{gr}$$

$$(D.8) \quad VT_{S*} = V_s \sum_{r \neq s}^G B_{ss} Y_{sr} + V_s \sum_{r \neq s}^G B_{sr} Y_{rr} + V_s \sum_{r \neq s}^G \sum_{t \neq s, r}^G B_{sr} Y_{rt}$$

$$(D.9) \quad E_{S*} = \sum_{r \neq s}^G E_{sr} \sum_{r \neq s}^G (A_{sr} X_r + Y_{sr})$$

Equation (D.9) reflects a country's gross exports to the world and includes exports of intermediates and final goods. Koopman et al. (2014) further decompose gross exports in equation (D.9) into nine components that identify foreign and domestic sources of value-added as well as double-counted trade, equation (D.10) gives the decomposition formula.

$$(D.10) \quad uE_{S*} = \left\{ V_s \sum_{r \neq s}^G B_{ss} Y_{sr} + V_s \sum_{r \neq s}^G B_{sr} Y_{rr} + V_s \sum_{r \neq s}^G \sum_{t \neq s, r}^G B_{sr} Y_{rt} \right\} \\ + \left\{ V_s \sum_{r \neq s}^G B_{sr} Y_{rs} + V_s \sum_{r \neq s}^G B_{sr} A_{rs} (I - A_{ss})^{-1} Y_{ss} \right\} \\ + V_s \sum_{r \neq s}^G B_{sr} A_{rs} (I - A_{ss})^{-1} E_{S*} \\ \left\{ \sum_{t \neq s}^G \sum_{r \neq s}^G V_t B_{ts} Y_{sr} + \sum_{t \neq s}^G \sum_{r \neq s}^G V_t B_{ts} A_{sr} (I - A_{rr})^{-1} Y_{rr} \right\} \\ + \sum_{t \neq s}^G V_t B_{ts} A_{sr} \sum_{r \neq s}^G (I - A_{rr})^{-1} E_{r*}$$

The three first terms are value-added exports as defined in equation (D.9). The fourth and the fifth terms, in the second bracketed expression, include the source country's value-added in both its final and intermediate goods imports, which are first exported but eventually returned and consumed at home, both of which are parts of the source country's GDP but represent a double-counted portion in official gross export statistics. These six terms together reflect the domestic content of gross exports. However, term four and five are not included in value-

added exports because they are not consumed abroad. The seventh and eight term in the third bracketed expression represent foreign value-added (GDP) in the source country's gross exports, including foreign GDP embodied in both final and intermediate goods. There are two pure double-counted terms, the sixth and ninth terms sum up to the double-counted portions of the two-way intermediate trade from all bilateral routes (third partners). Note that equation (D.10) does not hold at the country-sector level, therefore it is not emphasized in the analysis.

Koopman et al. (2014) define backward vertical specialisation in country s (VS_s) as equation (D.11) and forward vertical specialisation ($VS1_s$) as equation (D.12).

$$(D.11) \quad VS_s = \sum_{t \neq s}^G \sum_{r \neq s}^G V_t B_{ts} Y_{sr} + \sum_{t \neq s}^G \sum_{r \neq s}^G V_t B_{ts} A_{sr} (I - A_{rr})^{-1} Y_{rr} + \sum_{t \neq s}^G V_t B_{ts} A_{sr} \sum_{r \neq s}^G (I - A_{rr})^{-1} E_{r*}$$

$$(D.12) \quad VS1_s = V_s \sum_{r \neq s}^G B_{sr} E_{r*} = V_s \sum_{r \neq s}^G \sum_{t \neq s, r}^G B_{sr} Y_{rt} + V_s \sum_{r \neq s}^G \sum_{t \neq s, r}^G B_{sr} A_{rt} X_t + V_s \sum_{r \neq s}^G B_{sr} Y_{rs} + V_s \sum_{r \neq s}^G B_{sr} A_{rs} X_s$$

VS measures the share of foreign inputs in either a country's total gross exports or a country-sector's gross exports. The first and second components are foreign value-added in exports of final products and intermediates, respectively, and the third term reflects double-counted intermediate exports produced abroad. Koopman et al. (2014) generalise VS measure in Hummels et al. (2001) to fit a multi-country setting with *unrestricted* intermediate goods trade.¹¹ Furthermore, Koopman et al. (2014) define VS1 as the share of a given country's exports of intermediates used as inputs by foreign countries to produce final exports to third countries. Note that equation (D.12) does not hold at the country-sector level, therefore it is not emphasized in the analysis.

¹¹The generalisation by Koopman et al. (2014) is done by allocating double-counted intermediates in gross exports to domestic or foreign value according to where they were initially produced, whilst Hummels et al. (2001) simple assume that trade in intermediates cannot go in both directions (i.e., set these two components to zero).

Appendix E: Corresponding tables to figures in section 3 and sector overview in the WIOD 2016

**Table E.1. Sector overview in the WIOD 2016,
Gross and value-added exports and vertical specialization (VS) by sector**

Sector description	ISIC Rev. 4	WIOD sector	Gross exports		Value-added exports		Vertical specialisation (VS)	
			2000	2014	2000	2014	2000	2014
Crop and animal production, hunting and related service activities	A01	c1	48.94	164.01	480.58	825.41	0.13	0.19
Forestry and logging	A02	c2	22.47	198.14	347.46	294.80	0.06	0.09
Fishing and aquaculture	A03	c3	1179.05	5410.34	1053.40	3460.59	0.13	0.17
Mining and quarrying	B	c4	37784.10	90073.77	34904.71	79962.75	0.03	0.08
Total primary sector excluding Mining and quarrying		c1-c3	1250.46	5772.49	1881.44	4580.81	0.13	0.17
Manufacture of food products, beverages and tobacco products	C10-C12	c5	2920.93	6781.39	1103.19	2994.13	0.14	0.20
Manufacture of textiles, wearing apparel and leather products	C13-C15	c6	278.98	378.78	223.18	336.03	0.18	0.20
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	C16	c7	376.07	405.68	226.95	281.45	0.20	0.22
Manufacture of paper and paper products	C17	c8	1432.39	1018.70	648.70	383.93	0.19	0.21
Printing and reproduction of recorded media	C18	c9	21.07	24.07	148.47	168.95	0.22	0.19
Manufacture of coke and refined petroleum products	C19	c10	2352.39	7015.35	692.27	1220.05	0.27	0.24
Manufacture of chemicals and chemical products	C20	c11	2073.12	5605.12	666.77	895.98	0.27	0.24
Manufacture of basic pharmaceutical products and pharmaceutical preparations	C21	c12	392.75	1382.98	104.76	216.69	0.27	0.24
Manufacture of rubber and plastic products	C22	c13	330.98	670.64	186.96	406.10	0.26	0.30
Manufacture of other non-metallic mineral products	C23	c14	310.48	559.11	228.63	525.70	0.19	0.21
Manufacture of basic metals	C24	c15	4521.14	8341.86	1988.18	2043.71	0.34	0.42
Manufacture of fabricated metal products, except machinery and equipment	C25	c16	590.13	2020.11	633.77	2174.70	0.22	0.25
Manufacture of computer, electronic and optical products	C26	c17	1562.77	3281.50	897.63	1734.05	0.26	0.25
Manufacture of electrical equipment	C27	c18	686.99	1998.58	360.22	1010.89	0.28	0.31
Manufacture of machinery and equipment n.e.c.	C28	c19	1647.34	6667.78	717.06	3440.88	0.29	0.31
Manufacture of motor vehicles, trailers and semi-trailers	C29	c20	561.31	965.81	251.85	394.42	0.29	0.33
Manufacture of other transport equipment	C30	c21	1623.03	2723.26	904.13	1218.02	0.30	0.31
Manufacture of furniture; other manufacturing	C31_C32	c22	564.31	785.24	381.99	517.87	0.18	0.22
Repair and installation of machinery and equipment	C33	c23	198.88	1053.72	329.31	1601.09	0.29	0.26
Total manufacturing sector		c5-c23	22445.07	51679.68	10694.02	21564.61	0.26	0.28
Electricity, gas, steam and air conditioning supply	D35	c24	579.36	779.59	1017.77	2530.26	0.06	0.06
Water collection, treatment and supply	E36	c25	0.15	0.42	7.64	20.20	0.10	0.14
Sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services	E37-E39	c26	162.01	892.42	459.43	800.71	0.12	0.20

Notes:

- Exports in million current US dollars.
- The aggregated sectors *primary*, *manufacturing* and *service* are defined according to ISIC Rev. 4 Divisions 1-3, 5-23, 27-56, respectively. Note that Mining and quarrying (Division 4) is excluded in the primary sector.
- In section 3.4 we divide services sectors into broader categories: Construction (27), Wholesale and retail trade (including repair of motor vehicles and motorcycles) (28-30), Water transportation (32), Transportation and storage (31, 33-35), Accommodation and food service activities (36), Information and communication (37-40), Financial and insurance activities (41-43), Real estate activities (44) and Professional, scientific and technical activities (45-49).
- WIOD sector 5 (ISIC Rev. Division C10-C12) includes Processing and preserving of fish, which is likely to reduce the value of exports in WIOD sector 3 (ISIC Rev.4 Division A03).

Table E.1. (cont.)

Description	ISIC Rev. 4	WIOD sector	Gross exports		Value-added exports		Vertical specialisation (VS)	
			2000	2014	2000	2014	2000	2014
Construction	F	c27	125.11	307.51	311.28	865.48	0.19	0.20
Wholesale and retail trade and repair of motor vehicles and motorcycles	G45	c28	4.39	31.62	496.94	1132.85	0.18	0.20
Wholesale trade, except of motor vehicles and motorcycles	G46	c29	42.97	199.86	1657.01	3582.43	0.12	0.17
Retail trade, except of motor vehicles and motorcycles	G47	c30	199.71	717.16	1187.90	2970.48	0.11	0.13
Land transport and transport via pipelines	H49	c31	1471.18	2287.56	1498.11	2636.70	0.13	0.17
Water transport	H50	c32	7828.08	15622.04	3006.45	7324.92	0.24	0.32
Air transport	H51	c33	444.10	1456.35	362.03	667.19	0.20	0.38
Warehousing and support activities for transportation	H52	c34	514.83	1749.23	630.45	2103.92	0.22	0.29
Postal and courier activities	H53	c35	68.29	328.02	291.16	432.20	0.08	0.13
Accommodation and food service activities	we	c36	10.03	48.27	160.67	427.75	0.10	0.13
Publishing activities	J58	c37	30.13	146.23	231.96	618.13	0.12	0.13
Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities	J59_J60	c38	41.00	97.70	65.04	266.50	0.14	0.18
Telecommunications	J61	c39	287.91	1019.86	343.19	1125.06	0.15	0.14
Computer programming, consultancy and related activities; information service activities	J62_J63	c40	258.61	1728.14	338.10	1890.29	0.11	0.12
Financial service activities, except insurance and pension funding	K64	c41	301.46	1866.75	866.27	4135.85	0.05	0.06
Insurance, reinsurance and pension funding, except compulsory social security	K65	c42	110.67	343.51	79.14	652.98	0.09	0.05
Activities auxiliary to financial services and insurance activities	K66	c43	87.93	613.57	277.71	575.34	0.03	0.17
Real estate activities	L68	c44	2.87	49.21	769.65	2285.18	0.07	0.08
Legal and accounting activities; activities of head offices; management consultancy activities	M69_M70	c45	119.07	1476.49	340.12	1889.17	0.08	0.09
Architectural and engineering activities; technical testing and analysis	M71	c46	738.24	2715.75	401.49	2021.60	0.16	0.17
Scientific research and development	M72	c47	80.85	146.60	63.28	117.57	0.10	0.09
Advertising and market research	M73	c48	59.75	722.78	122.32	402.05	0.22	0.27
Other professional, scientific and technical activities; veterinary activities	M74_M75	c49	353.57	1346.00	215.71	852.13	0.18	0.18
Administrative and support service activities	N	c50	480.69	3007.65	1005.78	4360.25	0.15	0.18
Public administration and defence; compulsory social security	O84	c51	112.16	161.89	1526.58	984.85	0.08	0.09
Education	P85	c52	0.79	127.87	122.21	239.71	0.04	0.05
Human health and social work activities	Q	c53	127.64	427.39	141.11	533.37	0.06	0.06
Other service activities	R_S	c54	46.57	187.28	194.94	563.91	0.10	0.13
Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	T	c55	0.00	0.00	0.00	0.00	0.00	0.00
Activities of extraterritorial organizations and bodies	U	c56	0.00	0.00	0.00	0.00	0.00	0.00
Total service sector (excluding utilities)		c27-c56	13948.59	38932.28	16706.63	45657.89	0.20	0.23

Table E.2
Decomposition of value-added by origin and double-counted elements in gross exports

	2000	2014
(1) Domestic VA in direct final goods	17.07	12.03
(2) Domestic VA in intermediates absorbed by direct importer	57.30	58.10
(3) Indirect VA exports to third countries	11.85	12.32
Value-added exports (1)-(3)	86.22	82.45
(4) Returned domestic VA in final goods	0.22	0.21
(5) Returned domestic VA in intermediate goods	0.20	0.29
(6) Pure double-counting in returned intermediates	0.22	0.25
Domestic VA embodied in gross exports (1)-(5)	86.64	82.96
(7) Foreign VA in final goods	3.85	3.57
(8) Foreign VA in intermediate goods	5.22	7.30
(9) Pure double-counting in foreign intermediates	4.05	5.91
Pure double-counted terms (6)+(9)	4.27	6.16
Foreign VA used in production of exports absorbed abroad (7)+(8)	9.08	10.87
Sum (1)-(9)	100.0	100.0

% share in gross exports.

Table E.3
Participation in global value chains

Year	Total GVC participation	Forward participation (VS1)	Backward participation (VS)
2000	50.33	37.20	13.13
2001	50.65	36.23	14.41
2002	50.59	36.37	14.22
2003	52.20	37.56	14.65
2004	53.48	38.91	14.57
2005	55.21	41.30	13.90
2006	57.75	43.93	13.82
2007	58.47	42.40	16.07
2008	62.02	47.95	14.07
2009	56.53	40.96	15.57
2010	60.78	44.28	16.51
2011	64.40	48.78	15.61
2012	64.86	49.38	15.47
2013	62.08	45.92	16.16
2014	62.07	45.29	16.78

% share in gross exports.

Table E.4
Exports of the primary, manufacturing and service sectors

Year	Primaries including Mineral and quarrying			Primary sector			Manufacturing sector			Service sector		
	Gross exports	Value- added exports	Intermedi- ate exports	Gross exports	Value- added exports	Intermedi- ate exports	Gross exports	Value- added exports	Intermedi- ate exports	Gross exports	Value- added exports	Intermedi- ate exports
2000	39034.56	36786.15	35714.70	1250.46	1881.44	388.05	22445.07	10694.02	14719.52	13948.59	16706.63	9132.10
2001	37268.22	34225.77	33161.39	1024.05	1641.44	343.72	23202.62	11003.44	14517.76	14729.62	17662.24	9641.24
2002	36553.94	33259.13	33483.01	1086.73	1664.09	301.83	23803.69	11444.81	15094.64	15633.38	18887.63	10216.39
2003	41799.20	37753.61	38190.74	1256.79	1617.41	217.08	27276.81	13071.58	17817.53	17356.87	21043.53	12533.15
2004	53006.16	49108.18	48299.24	1481.51	1930.36	146.17	30983.74	14257.41	21189.75	20185.94	23602.03	14453.82
2005	69859.92	65975.62	65101.48	1955.50	2392.32	487.96	35858.01	15694.64	24701.51	23345.56	26889.08	15982.34
2006	82043.49	77510.54	76554.50	2444.83	2676.94	486.22	42248.54	17938.10	29585.57	24810.47	29887.39	17067.84
2007	86065.66	79194.60	78543.13	2798.39	2746.01	1050.52	52342.20	21247.02	37144.16	29206.82	37039.29	21032.09
2008	117758.45	108340.93	110385.68	3114.62	2914.59	1228.82	57565.73	23986.51	39599.01	33170.52	42463.68	23718.48
2009	74878.61	65492.40	70009.15	3318.53	3019.39	1058.72	44881.84	19008.98	29334.80	26807.67	36436.53	19700.21
2010	86127.96	75096.68	80332.56	4276.87	3982.21	1857.61	47366.36	20338.83	31900.67	31165.56	38641.73	23119.67
2011	109833.57	100328.76	106043.55	4124.86	3788.53	1878.53	55062.06	21888.59	37757.05	33648.15	41604.51	24523.10
2012	113017.53	101485.09	106073.88	4019.70	3088.76	1072.27	51344.83	20825.63	35355.29	35390.24	42789.50	26144.44
2013	107648.06	94772.74	104292.80	5596.06	4165.00	2769.93	51505.42	21488.07	34932.11	38639.24	45663.98	29863.22
2014	95846.26	84543.56	92259.58	5772.49	4580.81	3136.05	51679.68	21564.61	34711.40	38932.28	45657.89	30231.85

Notes:

- i. Exports in million current US dollars.
- ii. The aggregated sectors *primary*, *manufacturing* and *service* are defined according to ISIC Rev. 4 Divisions 1-3, 5-23, 27-56, respectively.
- iii. Note that Mining and quarrying (Division 4) is excluded in the Primary sector.
- iv. Since the information in WIOD is based on industries and not tasks, and many manufacturing firms produce significant in-house services, the latter activities are not classified under services categories in the data used to construct WIOD tables but as industry output. As a result, estimates of the services content of manufactured goods (based on industries) may underestimate the true underlying value-added from services based tasks (OECD, 2015).
- v. It should be kept in mind that *mining support service activities* are explicitly included within the Mining and quarrying sector, thus, tasks that should ideally be classified as services output are instead reflected in the Mining sector's (OECD, 2015). As a result, estimates of services contribution in the Norwegian economy may be underestimated.

Figure E.1
Exports of Primary sector goods including the Mining and quarrying sector

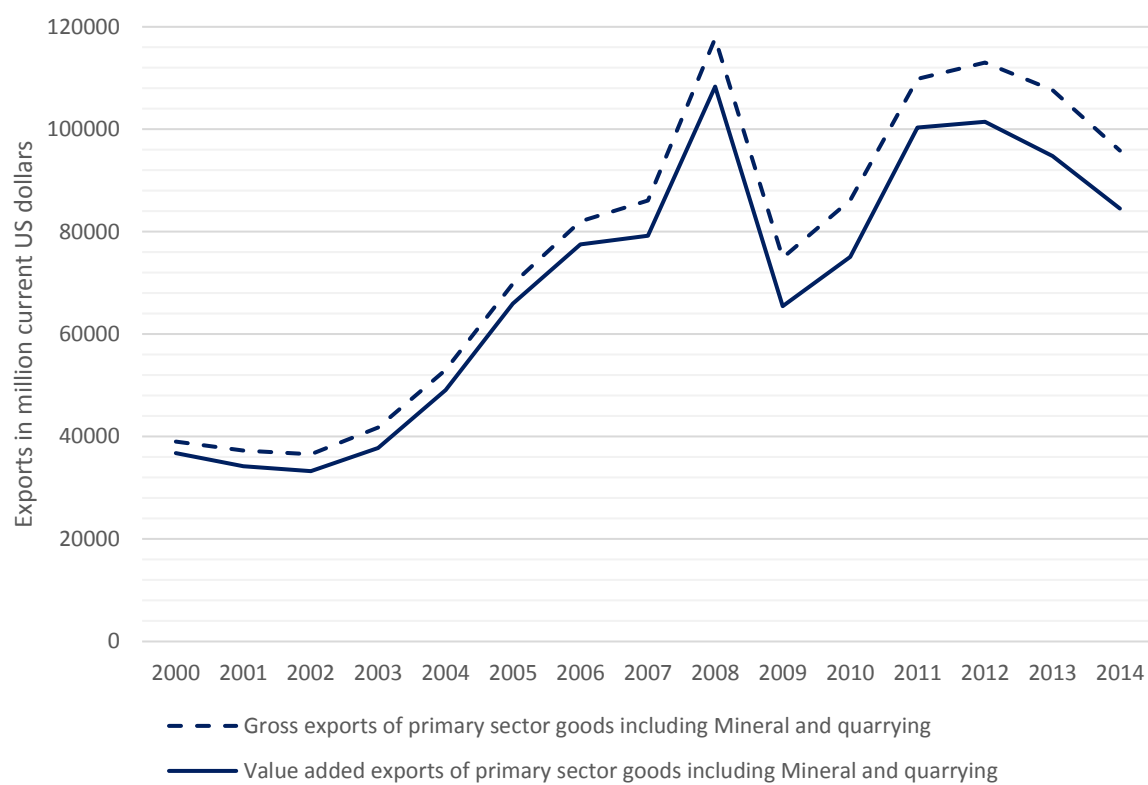


Table E.5
Decomposition of value-added (VA) exports by aggregated sector

	Primary		Manufacturing		Services	
	2000	2014	2000	2014	2000	2014
Total VA exports	1881.44	4580.81	10694.02	21564.61	16706.63	45657.89
Domestic VA in direct final goods	63.06	51.42	34.80	34.91	32.36	22.28
Domestic VA in intermediates absorbed by direct importer	27.60	40.89	49.76	50.33	54.76	64.72
Indirect VA exports to third countries	9.34	7.68	15.44	14.76	12.88	13.00

% share in total value-added exports of aggregate sector.

Table E.6
Value-added share of domestic and foreign services in gross exports

	2000	2014
VA from domestic services in gross exports	22.05	24.43
VA from foreign services in gross exports	6.10	8.51
VA from domestic services in manufacturing gross exports	21.14	18.90
VA from foreign services in manufacturing gross exports	9.73	11.99

% share in total gross exports or manufacturing gross exports.

Notes for Table E.6:

- i. See note (iv) and (v) under Table E.4.

Table E.7
Sector shares in world total value-added and gross exports

	Share in gross exports		Share in value-added exports	
	2000	2014	2000	2014
Primary	0.08	0.11	0.11	0.16
Manufacturing	0.66	0.61	0.41	0.36
Services	0.25	0.27	0.44	0.45

% share in world total gross and value-added exports.

Notes for Table E.7:

- i. Corresponds to Figure 1.1 in section 1 of the study.
- ii. Exports in million current US dollars.
- iii. The aggregated sectors *primary*, *manufacturing* and *service* are defined according to ISIC Rev. 4 Divisions 1-4, 5-23, 27-56, respectively.

Appendix F:

Derivation of the theoretical gravity system by Anderson and van Wincoop (2003)

The Anderson and van Wincoop model assumes that goods are differentiated by place of origin¹², that each country is specialised in the production of one good while the supply of goods is fixed. Market clearance is imposed by the general-equilibrium structure of the model. Consumers have homothetic preferences over all goods that are identical across countries. Preferences are approximated by the constant elasticity of substitution (CES) utility function given in equation (F.1), which consumers in country r maximize subject to the budget constraint in equation (F.2).

$$(F.1) \left(\sum_s \beta_s^{(1-\sigma)/\sigma} c_{sr}^{(\sigma-1)/\sigma} \right)^{(\sigma-1)/\sigma} \quad s.t. \quad (F.2) \sum_s p_{sr} c_{sr} = y_r$$

Where c_{sr} is consumption by consumers in country r of goods from country s ; y_r is nominal income of country r ; $\sigma > 0$ is the elasticity of substitution between all goods and referred to as the trade elasticity; whilst β is a positive distribution parameter. Prices differ between home and abroad due to not directly observable trade costs; p_{sr} is the price consumers in country r pay for goods from country s ; p_s is the supply price given by the exporter in country s (net of trade costs); and t_{sr} is the trade cost of exporting a good from country s to country r ; thus $p_{sr} = p_s t_{sr}$. The exporter carries the trade cost $\{t_{sr}\}$ which is equal to $t_{sr} - 1$ (where $t_{sr} \geq 1$) for each good from country s shipped to country r . These trade costs are passed on to the importer from the exporter. Thus, we can write the nominal value of exports from s to r as $x_{sr} = p_{sr} c_{sr} = p_s t_{sr} c_{sr}$. Note that trade costs are modelled according the structure of iceberg costs, which assumes that only a fraction $\{t_{sr} \in (0,1)\}$ of the good shipped arrives at destination, the rest having melted in transit. Finally, we define total income of country s as $y_s = \sum_r x_{sr}$.

Maximization of (F.1) subject to (F.2) results in the nominal demand consumers in country r have for goods produced in country s as in equation (F.3). P_r is the consumer price index of country r given by equation (F.4). β_s can be interpreted as an inverse measure of quality, for instance, a higher β_s implies a lower demand in country r for goods from country s . Market clearing is imposed by the model's general-equilibrium structure, and as shown in equation

¹² Referred to as the *Armington assumption* (Armington, 1969).

(F.5), it implies that the sum of exports from country s to all destinations, including itself, equals the total value of production in country s , which in aggregate is y_s .

$$(F.3) \quad x_{sr} = \left(\frac{\beta_s p_s t_{sr}}{P_r} \right)^{(1-\sigma)} y_r \quad \text{where (F.4) } P_r = [\sum_s (\beta_s p_s t_{sr})^{1-\sigma}]^{1/(1-\sigma)}$$

$$(F.5) \quad y_s = \sum_r x_{sr} = \sum_r \left(\frac{\beta_s t_{sr} p_s}{P_r} \right)^{1-\sigma} y_r = (\beta_s p_s)^{1-\sigma} \sum_r \left(\frac{t_{sr}}{P_r} \right)^{1-\sigma} y_r \quad \forall_s$$

We obtain equation (F.6) by inserting the demand function in (F.3) into the market clearing condition $y_s = \sum_r x_{sr}$ and solve for $(\beta_s p_s)^{1-\sigma}$.

$$(F.6) \quad (\beta_s p_s)^{1-\sigma} = \frac{y_s}{\sum_r \left(\frac{t_{sr}}{P_r} \right)^{1-\sigma} y_r}$$

We define world nominal income or world GDP as $y^w = \sum_r y_r$, and expand the right hand side of equation (F.6) with $(1/y^w) \times (1/y^w)^{-1}$, which gives:

$$(F.7) \quad x_{sr} = \left(\frac{t_{sr}}{P_r} \right)^{1-\sigma} \frac{y_r y_s}{y^w} \left[\sum_r \left(\frac{t_{ij}}{P_r} \right)^{1-\sigma} \frac{y_r}{y^w} \right]^{-1}$$

We obtain the Anderson and van Wincoop gravity equation in (F.8) after some rearranging of equation (F.7), where π_s and P_r are the multilateral resistance terms defined in equations (F.9) and (F.10). Equation (F.9) is obtained by expanding the right hand side of equation (F.6) by $(1/y^w) \times (1/y^w)^{-1}$, substituting the resulting expression into the price index in (F.4) and inserting for $\pi_i^{1-\sigma}$.

$$(F.8) \quad x_{sr} = \frac{y_s y_r}{y^w} \left(\frac{t_{sr}}{\pi_s P_r} \right)^{1-\sigma}$$

$$(F.9) \quad \pi_s^{1-\sigma} = \sum_r \left(\frac{t_{sr}}{P_r} \right)^{1-\sigma} \frac{y_r}{y^w}$$

$$(F.10) \quad P_r^{1-\sigma} = \sum_s \left(\frac{t_{sr}}{\pi_s} \right)^{1-\sigma} \frac{y_s}{y^w}$$

The trade cost term in (F.7) is not directly observable and Anderson et al (2003) use equation (F.11) as a proxy for trade costs, where d_{sr} is bilateral distance and B_{sr} equals one if two trade partners share an international border.

$$(F.11) \quad t_{sr} = d_{sr}^\rho e^{\gamma B_{ij}}$$

Appendix G:

Summary statistics and additional regression tables from the gravity analysis in section 4

Table G.1
Summary statistics

	Observations	Mean	Standard deviations	Min	Max
Value of cross-border trade in current million US dollars	42225	47.6708	274.8175	0	12169.84
Log distance	42225	8.1132	1.1487	4.0879	9.883
Contiguity	42225	0.0607	0.2389	0	1
Common language	42225	0.0607	0.2389	0	1
Common legal origin	42225	0.1974	0.398	0	1
Colonial history	42225	0.0401	0.1962	0	1
Same country	42225	0.0178	0.1325	0	1
RTA	42225	0.4519	0.4976	0	1
Heterogeneity score	40990	0.2586	0.1237	0	0.872
Heterogeneity answer	40992	0.2614	0.0964	0.0324	0.667
STRI exporter	41560	0.2359	0.1462	0.0397	1
STRI importer	41567	0.2362	0.1463	0.0397	1
Heterogeneity score * STRI exporter	40892	0.0685	0.0794	0	0.8723
Heterogeneity score * STRI importer	40990	0.0692	0.0833	0	0.8723
Heterogeneity answer * STRI exporter	40992	0.0656	0.0585	0.0035	0.4978
Heterogeneity answer * STRI importer	40992	0.0657	0.059	0.0035	0.4978

Table G.2
Number of observations, missing observations and reported zeroes by sector

Correspondence between EBOPS 2002 & STRI sector		Includes missing values		Excludes missing values	
EBOPS 2002	STRI sector	Zeroes (%)	Missing (%)	Observations	Zeroes (%)
262 ^{bc}	Computer services	27.58	14.91	4396	32.42
249 ^b	Construction	31.57	7.86	4760	34.26
275 ^b	Legal services	38.71	22.22	4018	49.78
247 ^b	Telecommunications	32.71	16.94	4291	39.38
210	Air transport	21.43	20.11	4127	26.82
208	Maritime freight transport	30.68	22.36	4011	39.52
225	Road freight transport	33.26	26.50	3797	45.25
246 ^c	Courier services	51.14	20.89	4087	64.64
260 ^c	Commercial banking	31.38	16.49	4314	37.58
253 ^c	Insurance	33.51	14.36	4424	39.13

- i. Column 3 and 4 report the percentage shares of zeroes and missing values in a balanced panel with 5166 observations in each sector, that is, sectoral bilateral trade is included although the observations are missing. Column 5 and 6 report the number of observations and the percentage share of zeroes when missing values are set to zero. Note that Francois et al (2013) state that unreported exporter:importer:bop:year combinations can safely be assumed as missing in the TRD, while reported zeroes mean that at least one primary source (UN, OECD, Eurostat, IMF) reported a zero flow rather than missing.
- ii. STRI indices are available in both 2014 and 2015.
- iii. Indicates wider coverage than the corresponding STRI sector. In particular, financial services other than insurance and commercial banking are included in the EBOPS 260 but not in the banking STRI, and health insurance and pension funding are included in the insurance STRI but not in the EBOPS 253.

Sector specific regressions

Table G.3 and G.4 provide the sector regressions for those sectors with a STRI heterogeneity index available in two years. The estimates of the sector regressions tend to be more arbitrary, which could be due to few observations according to “gravity standards”. Note that I excluded the coefficients for common language and colony since the other gravity coefficients performed better that way. Additionally, I include an EEA dummy as well as a RTA dummy since the European Economic Areas (EEA) is one of the most integrated agreements on trade in services. As pointed out in Nordås (2016), there are few other regional or preferential trade agreements than the EU and EEA that bind measures below applied Most Favored Nation (MFN) regulation. Therefore, the EEA dummy could capture preferential harmonization that is not captured by the STRI heterogeneity index as the latter only captures MFN regulations, in addition to other benefits and commonalities that come with the membership. The EEA dummy is equal to one for country pairs where both are members of the EEA. The estimates of distance are negative and statistically significant at least at 10 percent levels, common legal origin and same country are positive and statistically significant at least at 5 percent levels for computer, construction and telecommunications. However, the estimates of the RTA, EEA and heterogeneity indices do not perform well since, in general, they have contradictory signs and unreasonable high magnitudes. Table G.5 and G.6 provide estimates for ten services sectors where I have used observation from three years and assumed the STRI heterogeneity index to be constant over the period, to obtain more observations. Nevertheless, the results seem even more arbitrary here, for instance, some of the gravity coefficients have contradictory signs even if they are significant.

Table G.3
PPML sector regressions, STRI Heterogeneity score

	(1) Computer services	(2) Construction	(3) Legal services	(4) Telecommuni- cations
Log distance	-0.285*** (0.0911)	-0.437*** (0.0774)	-0.0996* (0.0518)	-0.815*** (0.0719)
Contiguity	0.0337 (0.145)	0.0879 (0.124)	0.904*** (0.149)	0.158 (0.0978)
Common legal origin	0.319*** (0.123)	0.291*** (0.104)	-0.200 (0.162)	0.603*** (0.0622)
Same country	0.671*** (0.191)	0.692*** (0.263)	-0.0114 (0.248)	0.327** (0.144)
RTA	0.575*** 77.7 (0.216)	0.670** 95.4 (0.332)	1.619*** 404 (0.292)	-1.214*** (0.276)
EEA-intra	0.864** 137.3 (0.341)	-0.269 -23.2 (0.371)	-0.467 (0.392)	1.874*** (0.314)
Heterogeneity score	-2.190*** -88.8 (0.682)	1.336 (0.857)	1.798*** (0.626)	-0.790 (0.760)
Exporter-year and importer-year FEs	Yes	Yes	Yes	Yes
Observations	2,878	3,280	2,622	2,800
Pseudo-R ²	0.796	0.498	0.820	0.846

- (i) The dependent variable is bilateral trade in services by sector in 2008 and 2009.
(ii) Robust standard errors clustered by country pair in parentheses.
(iii) ***, ** and * denote significance at 1, 5 and 10 % levels, respectively.

Table G.4
PPML sector regressions, STRI Heterogeneity answer

	(1) Computer services	(2) Construction	(3) Legal services	(4) Telecommuni- cations
Log distance	-0.295*** (0.0895)	-0.471*** (0.0781)	-0.0755 (0.0520)	-0.818*** (0.0724)
Contiguity	-0.0610 (0.130)	0.111 (0.124)	0.924*** (0.154)	0.156 (0.0972)
Common legal origin	0.345*** (0.125)	0.298*** (0.104)	-0.289* (0.175)	0.618*** (0.0637)
Same country	0.722*** (0.190)	0.669*** (0.258)	-0.0348 (0.245)	0.335** (0.145)
RTA	0.761*** (0.230)	0.620* (0.330)	1.557*** (0.289)	-1.225*** (0.278)
EEA-intra	0.682** (0.332)	-0.284 (0.376)	-0.341 (0.403)	1.882*** (0.321)
Heterogeneity answer	-1.214 (0.940)	3.333*** (1.111)	1.233* (0.704)	-0.401 (0.844)
Exporter-year and importer-year FEs	Yes	Yes	Yes	Yes
Observations	2,878	3,280	2,622	2,800
Pseudo-R ²	0.772	0.499	0.813	0.845

- (i) The dependent variable is bilateral trade in services by sector in 2008 and 2009.
(ii) Robust standard errors clustered by country pair in parentheses.
(iii) ***, ** and * denote significance at 1, 5 and 10 % levels, respectively.

Table G.5
PPML sector regressions, STRI Heterogeneity score

	(1) Computer services	(2) Construction	(3) Legal services	(4) Telecommuni- cations	(5) Air transport	(6) Maritime transport	(7) Road transport	(8) Courier	(9) Commercial banking	(10) Insurance
Log distance	-0.327*** (0.0708)	-0.463*** (0.0716)	0.242** (0.101)	-0.866*** (0.0874)	-0.223*** (0.0684)	-0.163* (0.0962)	-0.349*** (0.0805)	-0.342* (0.206)	-0.744*** (0.0822)	0.356*** (0.116)
Contiguity	0.136 (0.118)	0.118 (0.109)	1.255*** (0.161)	0.168* (0.101)	-0.208** (0.103)	0.181 (0.116)	0.392*** (0.121)	0.949** (0.389)	-0.369** (0.160)	0.734*** (0.169)
Common language	-0.458*** (0.132)	-0.0614 (0.152)	-0.519*** (0.181)	0.0181 (0.103)	-0.0353 (0.117)	0.293** (0.136)	-0.162 (0.172)	-1.229*** (0.332)	0.493*** (0.136)	0.620*** (0.151)
Common legal origin	0.577*** (0.0750)	0.305*** (0.0970)	0.376** (0.157)	0.351*** (0.0834)	0.399*** (0.100)	0.0581 (0.0814)	0.284*** (0.0925)	1.124*** (0.225)	0.218** (0.109)	-0.0970 (0.138)
Colony	0.147 (0.134)	0.153 (0.124)	-0.674*** (0.210)	0.165* (0.0955)	0.490*** (0.125)	-0.371*** (0.134)	0.607*** (0.145)	-0.459 (0.434)	0.112 (0.144)	0.257* (0.149)
Same country	0.660*** (0.156)	0.818*** (0.218)	0.181 (0.246)	0.202 (0.143)	0.325* (0.189)	0.701*** (0.170)	0.232 (0.157)	-0.312 (0.391)	0.141 (0.228)	1.791*** (0.260)
RTA	1.046*** (0.187)	0.491*** (0.179)	1.272*** (0.239)	-0.0145 (0.183)	0.637*** (0.223)	-1.584*** (0.591)	-1.844*** (0.319)	-0.409 (0.406)	0.282** (0.135)	2.100*** (0.195)
Heterogeneity score	-1.665*** (0.506)	1.649** (0.780)	2.541*** (0.677)	-1.738** (0.711)	0.0358 (0.606)	1.346** (0.564)	1.648 (1.131)	-4.186* (2.399)	-2.911*** (1.063)	-3.180*** (1.145)
Exporter-year and importer-year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,314	4,668	3,921	4,195	4,086	2,632	3,711	3,845	4,192	4,341
Pseudo-R ²	0.789	0.503	0.685	0.696	0.697	0.819	0.673	0.836	0.905	0.911

- (i) The dependent variable is bilateral trade in services in 2007-2009.
(ii) Robust standard errors clustered by country pair in parentheses.
(iii) ***, ** and * denote significance at 1, 5 and 10 % levels, respectively.

Table G.6
PPML sector regressions, STRI Heterogeneity answer

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Computer services	Construction	Legal services	Telecommuni- cations	Air transport	Maritime transport	Road transoirt	Courier	Commercial banking	Insurance
Log distance	-0.341*** (0.0702)	-0.495*** (0.0715)	0.305*** (0.113)	-0.855*** (0.0863)	-0.245*** (0.0662)	-0.128 (0.101)	-0.375*** (0.0795)	-0.217 (0.211)	-0.730*** (0.0806)	0.283** (0.112)
Contiguity	0.0491 (0.119)	0.141 (0.108)	1.226*** (0.156)	0.157 (0.102)	-0.191* (0.104)	0.217* (0.120)	0.370*** (0.119)	0.944** (0.397)	-0.402** (0.156)	0.694*** (0.163)
Common language	-0.491*** (0.136)	-0.0468 (0.151)	-0.513*** (0.185)	0.00896 (0.102)	-0.0223 (0.119)	0.255* (0.133)	-0.140 (0.173)	-1.056*** (0.308)	0.544*** (0.130)	0.561*** (0.149)
Common legal origin	0.610*** (0.0723)	0.310*** (0.0958)	0.285* (0.153)	0.353*** (0.0827)	0.408*** (0.101)	0.0553 (0.0809)	0.262*** (0.0945)	1.009*** (0.195)	0.235** (0.110)	-0.0782 (0.140)
Colony	0.240* (0.134)	0.177 (0.126)	-0.843*** (0.270)	0.172* (0.0933)	0.462*** (0.123)	-0.338*** (0.130)	0.564*** (0.147)	-0.532 (0.394)	0.136 (0.143)	0.274* (0.153)
Same country	0.676*** (0.152)	0.780*** (0.213)	0.193 (0.251)	0.229 (0.141)	0.343* (0.188)	0.649*** (0.168)	0.207 (0.156)	-0.0761 (0.364)	0.105 (0.233)	1.825*** (0.273)
Heterogeneity answer	-0.756 (0.694)	3.685*** (0.979)	0.115 (1.163)	-2.579*** (0.993)	2.015** (0.905)	1.262 (0.860)	0.361 (1.328)	-9.040*** (1.811)	-2.010* (1.190)	1.561 (1.344)
RTA	1.097*** (0.189)	0.420** (0.178)	1.193*** (0.278)	-0.0722 (0.174)	0.705*** (0.200)	-1.557** (0.615)	-1.911*** (0.309)	-0.873** (0.419)	0.314** (0.135)	2.074*** (0.186)
Exporter-year and importer-year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,314	4,668	3,921	4,195	4,086	2,730	3,711	3,845	4,192	4,341
Pseudo-R ²	0.781	0.505	0.672	0.699	0.703	0.816	0.672	0.844	0.905	0.912

- (iv) The dependent variable is bilateral trade in services in 2007-2009.
(v) Robust standard errors clustered by country pair in parentheses.
(vi) ***, ** and * denote significance at 1, 5 and 10 % levels, respectively.

