

Margins of Service Trade

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CompNet Workshop, Banque de France

September 21, 2012

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Motivation

- Increasing role of services and international services trade
In Germany,
 - ... services make up 69% of total value added (2011) and 74% of total employment (2010).
 - ... trade in services rose from 6% of GDP in 1975 to 16% in 2011.
- International trade in services responded more resilient to the onset of the financial crisis than goods trade.
- Still, the driving forces of cross-border service trade are largely unexplored.
- Main purpose of this study is to
 - present stylized facts on German firm-level service trade, and
 - give an overview of how the margins of trade shape German service exports and imports.

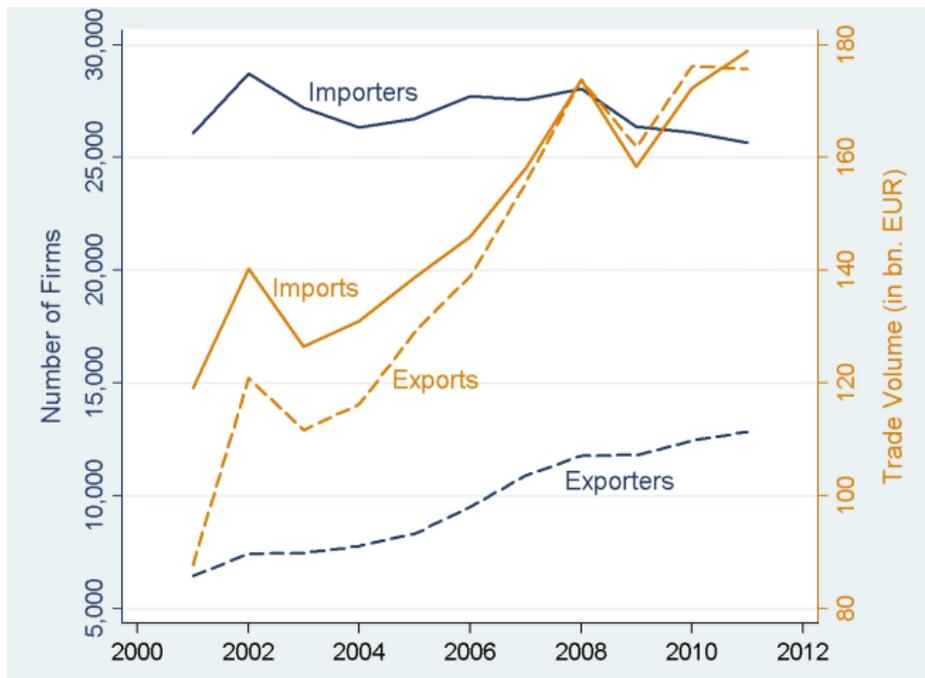
Related Work

- Firm-level evidence on international trade in services (Breinlich/Criscuolo 2011, Ariu/Mion 2010, Conti et al. 2010, Kelle/Kleinert 2010, Walter/Dell'mour 2010)
- Contributions of the intensive and extensive margins in shaping aggregate trade (e.g. Bernard et al. 2009, Eaton et al. 2007, Bricongne et al. 2012)

International Trade in Services Statistics (ITS):

- Service transactions between German residents – firms, banks, individuals, public authorities – and non-residents
- Reporting threshold: 12,500 Euro
- Detailed information on service transactions at the firm-level – traded volumes, service types, trading partners
- Panel 2001-2011, monthly frequency

Data II



Firm-Level Characteristics

Heterogeneity Across Firms

	mean	percentiles				
		1st	25th	50th	75th	99th
<i>Exports</i>						
number of services	1.6	1	1	1	2	9
number of countries	5.5	1	1	2	6	46
avg. sales per firm-service-country	306	1	18	42	130	4032
total sales per firm	14,507	3	97	523	3004	190,694
firm-year-observations	106,674					
<i>Imports</i>						
number of services	2.3	1	1	1	3	13
number of countries	4.5	1	1	2	4	37
avg. sales per firm-service-country	141	1	14	26	64	1693
total sales per firm	5520	4	49	184	818	65,721
firm-year-observations	297,636					

Notes: Sales are reported in thousand Euro.

Firm-Level Characteristics

Concentration Within Firms

services	Rank of service						countries	Rank of country					
	1	2	3	4	5	10		1	2	3	4	5	10
<i>Exports</i>													
exact 2	81	19	—	—	—	—	exact 2	78	22	—	—	—	—
exact 3	74	20	6	—	—	—	exact 3	68	23	9	—	—	—
exact 5	66	20	8	3	1	—	exact 5	58	22	11	6	3	—
exact 10	60	21	9	4	2	0.1	exact 10	47	20	11	7	5	1
<i>Imports</i>													
exact 2	78	22	—	—	—	—	exact 2	75	25	—	—	—	—
exact 3	70	22	9	—	—	—	exact 3	66	23	11	—	—	—
exact 5	63	21	10	5	2	—	exact 5	57	22	11	6	4	—
exact 10	54	21	11	6	4	0.3	exact 10	46	20	12	8	5	1

Notes: The table shows the shares (in percent) of exports/imports for the services and countries ranked first, second, third, etc., whereas firms that trade exact 2, 3, 5 or 10 services or with 2, 3, etc., markets are considered. Averages over individual firms' shares are presented.

Cross-Sectional Variation

Country-Level Margins I

- Decomposition of aggregate trade (exports or imports) with country c at time t , x_{ct} , into four different margins following Bernard et al. (2009):
 - number of firms, f_{ct} ,
 - number of services traded, s_{ct} ,
 - trade density, $d_{ct} = o_{ct} / (f_{ct}s_{ct})$, where o_{ct} denotes the number of firm-service observations, and
 - average trade $\bar{x}_{ct} = x_{ct} / o_{ct}$
- Total trade with country c at time t can be written as:

$$x_{ct} = f_{ct}s_{ct}d_{ct}\bar{x}_{ct}$$

- Disentangling the contribution of each margin to the cross-sectional variation of country-level trade by regressing the log of each margin on the log of total exports or imports

Cross-Sectional Variation

Country-Level Margins II

Margin	Exports			Imports		
	Full Sample	EMU	Top Traders	Full Sample	EMU	Top Traders
Firms	0.385 (0.006)	0.483 (0.005)	0.270 (0.004)	0.449 (0.006)	0.524 (0.006)	0.327 (0.004)
Services	0.262 (0.003)	0.271 (0.004)	0.239 (0.003)	0.288 (0.003)	0.276 (0.004)	0.270 (0.003)
Density	-0.248 (0.003)	-0.254 (0.004)	-0.200 (0.003)	-0.269 (0.003)	-0.250 (0.006)	-0.224 (0.004)
Intensive	0.602 (0.007)	0.500 (0.005)	0.691 (0.005)	0.532 (0.006)	0.449 (0.007)	0.627 (0.005)
Obs	2,632	137	2,292	2,628	137	2,385

Notes: Pooled estimates of the contribution of each margin to cross-sectional variation in country-level exports and imports for the years 2001 to 2011. The sub-sample denoted “Top Traders” corresponds to firms in the top percentile. Clustered standard errors in parentheses.

Cross-Sectional Variation

Firm-Level Margins I

- Total exports or imports of firm f at time t , x_{ft} can be written as:

$$x_{ft} = c_{ft}s_{ft}d_{ft}\bar{x}_{ft}, \text{ with}$$

- number of countries, c_{ft} ,
 - number of services traded, s_{ft} ,
 - trade density, $d_{ft} = o_{ft} / (c_{ft}s_{ft})$, where o_{ft} denotes the number of country-service observations, and
 - average trade $\bar{x}_{ft} = x_{ft} / o_{ft}$
- Again, regress the log of each trade margin on the log of total exports or imports

Cross-Sectional Variation

Firm-Level Margins II

Margin	Exports			Imports		
	Full Sample	EMU	Top Traders	Full Sample	EMU	Top Traders
Countries	0.172 (0.001)	0.129 (0.001)	0.264 (0.006)	0.184 (0.001)	0.128 (0.001)	0.263 (0.005)
Services	0.052 (0.001)	0.047 (0.001)	0.107 (0.006)	0.113 (0.001)	0.100 (0.001)	0.162 (0.004)
Density	-0.032 (0.000)	-0.023 (0.000)	-0.067 (0.004)	-0.075 (0.000)	-0.053 (0.000)	-0.101 (0.002)
Intensive	0.808 (0.001)	0.846 (0.001)	0.696 (0.007)	0.779 (0.001)	0.824 (0.001)	0.676 (0.006)
Obs	106,674	71,157	1,074	297,636	172,136	2,983

Notes: Pooled estimates of the contribution of each margin to cross-sectional variation in firm-level exports and imports for the years 2001 to 2011. The sub-sample denoted “Top Traders” corresponds to firms in the top percentile. Clustered standard errors in parentheses.

Time-Series Variation

Level Decomposition

- Change in total exports or imports from period $t - 1$ to t can be written as (Bernard et al. 2009):

$$\begin{aligned}\Delta x_t = & \sum_{f \in N_t} x_{ft} - \sum_{f \in E_{t-1}} x_{ft-1} \quad (\text{firm entry and exit}) \\ & + \sum_{c \in B_{ft}} x_{fct} - \sum_{c \in R_{ft-1}} x_{fct-1} \quad (\text{born and retired trading partners}) \\ & + \sum_{s \in A_{ft}} x_{fst} - \sum_{s \in D_{ft-1}} x_{fst-1} \quad (\text{added and dropped services}) \\ & + \sum_{s \in G_{ft}} \Delta x_{fst} + \sum_{s \in S_{ft}} \Delta x_{fst} \quad (\text{growing and shrinking trade})\end{aligned}$$

- Short-run and long-run changes

Time-Series Variation

Exports – Short-Run

	2001- 2002	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	2008- 2009	2009- 2010	2010- 2011
<i>Firm Entry and Exit</i>										
Entry	12.2	-50.8	94.1	34.3	52.9	32.8	31.0	-27.2	20.1	-395.2
Exit	-8.3	22.7	-47.6	-15.0	-18.8	-16.4	-12.6	20.9	-14.7	349.8
Net Entry	3.9	-28.2	46.5	19.4	34.1	16.4	18.4	-6.3	5.4	-45.5
<i>Trade Relationship</i>										
Born	8.9	-29.5	82.1	25.6	38.5	23.6	24.0	-33.4	29.0	-923.7
Retired	-6.4	20.7	-43.9	-16.1	-25.9	-17.1	-15.0	26.5	-21.1	613.5
Net Country	2.5	-8.8	38.2	9.5	12.6	6.5	9.0	-6.9	7.9	-310.2
<i>Service-Switching</i>										
Added	9.2	-29.7	70.1	35.1	37.2	17.5	32.7	-51.5	22.3	-729.1
Dropped	-6.9	23.4	-60.6	-14.5	-35.5	-19.7	-25.1	29.6	-26.0	646.7
Net Service	2.3	-6.3	9.5	20.6	1.7	-2.1	7.6	-21.9	-3.8	-82.4
<i>Intensive Margin</i>										
Increase	154.6	-251.5	571.1	246.7	313.6	220.0	228.0	-260.1	300.9	-6884.5
Decrease	-63.3	394.8	-565.3	-196.2	-262.0	-140.8	-163.1	395.2	-210.5	7422.5
Net Intensive	91.3	143.3	5.7	50.5	51.6	79.2	64.9	135.1	90.4	538.0
Total Change (in bn. €)	33.1	-9.2	4.6	12.7	9.9	16.6	18.3	-12.0	14.3	-0.5

Notes: Percentage contributions of each margin to changes in total exports for each noted period. The last row gives the total change in export volume in billions of Euro.

Time-Series Variation

Imports – Short-Run

	2001- 2002	2002- 2003	2003- 2004	2004- 2005	2005- 2006	2006- 2007	2007- 2008	2008- 2009	2009- 2010	2010- 2011
<i>Firm Entry and Exit</i>										
Entry	18.0	-23.8	64.9	40.8	78.6	26.2	23.2	-13.5	16.4	32.1
Exit	-21.6	18.3	-55.7	-39.5	-35.6	-40.2	-17.3	14.8	-19.0	-35.5
Net Entry	-3.6	-5.6	9.2	1.3	43.0	-14.0	5.9	1.3	-2.6	-3.4
<i>Trade Relationship</i>										
Born	22.7	-28.9	111.7	54.2	60.5	38.9	30.6	-27.7	33.8	63.3
Retired	-19.5	28.7	-87.0	-51.0	-47.1	-30.1	-24.0	29.6	-39.7	-52.1
Net Country	3.2	-0.2	24.7	3.2	13.4	8.9	6.7	1.8	-5.9	11.2
<i>Service-Switching</i>										
Added	29.6	-38.9	129.2	89.1	76.4	52.0	45.2	-50.9	50.6	97.8
Dropped	-27.2	44.0	-105.4	-64.8	-73.6	-40.7	-43.0	37.2	-42.6	-80.4
Net Service	2.5	5.2	23.8	24.2	2.8	11.3	2.2	-13.7	8.0	17.4
<i>Intensive Margin</i>										
Increase	249.4	-205.1	737.8	461.4	475.9	328.9	291.9	-212.9	319.5	650.8
Decrease	-151.4	305.7	-695.6	-390.0	-435.2	-235.0	-206.8	323.5	-219.0	-576.0
Net Intensive	98.0	100.6	42.2	71.4	40.7	93.9	85.2	110.5	100.5	74.8
Total Change (in bn. €)	21.2	-13.8	4.6	7.7	7.2	12.2	15.6	-15.3	14.0	6.5

Notes: Percentage contributions of each margin to changes in total imports for each noted period. The last row gives the total change in export volume in billions of Euro.

Time-Series Variation

Long-Run

	Exports				Imports			
	2002– 2005	2005– 2008	2008– 2011	2002– 2011	2002– 2005	2005– 2008	2008– 2011	2002– 2011
<i>Firm Entry and Exit</i>								
Entry	174.6	42.2	586.8	72.4	-677.4	33.1	148.4	60.5
Exit	-79.0	-18.2	-514.1	-35.1	580.7	-30.8	-233.6	-66.3
Net Entry	95.5	24.0	72.7	37.3	-96.6	2.2	-85.2	-5.7
<i>Trade Relationship</i>								
Born	99.1	21.8	494.2	30.2	-603.3	29.8	167.5	47.9
Retired	-51.7	-13.5	-355.3	-10.0	515.8	-20.8	-148.5	-20.6
Net Country	47.4	8.3	138.9	20.2	-87.5	9.0	19.0	27.3
<i>Service-Switching</i>								
Added	117.0	23.2	419.2	31.3	-771.5	33.7	252.2	61.3
Dropped	-47.0	-18.7	-327.8	-12.4	643.2	-24.6	-171.2	-31.9
Net Service	70.0	4.5	91.3	18.9	-128.3	9.1	81.0	29.3
<i>Intensive Margin</i>								
Increase	436.4	131.1	2365.4	103.0	-2953.0	182.2	1036.8	172.3
Decrease	-549.3	-67.9	-2568.3	-79.4	3365.4	-102.6	-951.5	-123.1
Net Intensive	-112.9	63.2	-202.9	23.6	412.4	79.6	85.2	49.1
Total Change (in bn. €)	8.1	44.8	1.9	54.8	-1.5	34.9	5.2	38.6

Notes: Percentage contributions of each margin to changes in total exports and imports over the noted time interval. The last row gives the total change in export and import volumes in billions of Euro.

Time-Series Variation

Mid-Point Growth

Decomposition of the change in aggregate service exports and imports into margins using mid-point growth rates following Davis and Haltiwanger (1992) and Bricongne et al. (2012)

- Advantage over conventional growth rates: facilitates analysis of created and destroyed flows
- Results confirm previous findings
- Plan: Further decomposition of mid-point growth rates to assess the relative importance of individual trading partners, single services and different firm sizes over time

Summary

- High heterogeneity across service traders
- Strong concentration of service trade
 - ... on a few traders that trade many services and have many trading partners
 - ... within firms on most important services and trading partners
- In general, the intensive margin is the main contributor to the
 - cross-sectional variation (country- and firm-level)
 - time-series variation in the short-run
 - downturn during 2008/2009
- The extensive margins
 - become more important in the long-run
 - alleviate decline in service exports 2008/2009