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The Dynamics of Trade Margins: Evidence from the European Integration[†]

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Abstract

We analyze the exports trade margins dynamics for ten transition countries, both at the industry and product level, during the period of accession to the EU. We find that trade along both margins was driven by only about 1% of almost 5000 (HS 6-digit) products. Moreover, the largest intensive and extensive margin gains were mostly concentrated around the same subset of sectors. Last, we find a positive correlation between productivity growth and the extensive margin across the transition economies.

JEL classification: F13, F14, O47

Keywords: economic integration, international trade, intensive and extensive margins, productivity growth, transition economies

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1. Introduction

Exports growth following trade liberalization reforms can occur through two channels: countries selling more of the goods they were previously exporting—the intensive margin—or exporting previously non-traded goods—the extensive margin. Which margin plays a more prevalent role during trade liberalization events? The literature does not provide a conclusive answer. While, for example, Kehoe and Ruhl (2013), Hummels and Klenow (2005) and Dalton (2014) highlight the importance of the extensive margin, Helpman et al. (2008) and Besedeš and Prusa (2011) conclude that the intensive margin is instead the dominant force.

Previous studies have underscored the relevance of the imports trade margins following trade liberalization reforms. For example, Mukerji (2009) quantifies the welfare-enhancing role of new goods imports after India’s 1990s trade liberalization. Similarly, Mukerji (2013) finds that new goods imports grow faster in technology-lagging countries than in advanced ones.

We aim to contribute to the literature by documenting the patterns of the *exports* margins during a large-scale episode of trade liberalization: the accession of ten transition economies of Central and Eastern Europe into the European Union (EU).¹ Moreover, we analyze sectoral-level patterns to determine whether liberalized access to new markets encouraged exports of goods from new industries or intensified already existing exports. This aspect has received little attention in the literature. Our analysis focuses on the 1995–2008 period, an era that includes the signing of free trade agreements (FTAs) during the countries’ candidacy years, as well as their EU accession. This period is long enough to include potentially lagged effects of such trade reforms, but stops prior to the Global Financial Crisis to avoid any distorting implications.

As trade with the EU was liberalized, did the goods accounting for the bulk of exports of these countries expand or contract? Did trade barriers removal encourage new products exports? Did these countries specialize or broaden their exports industry distribution? Was export growth due to the intensive or extensive margin? We answer these questions quantitatively using highly disaggregated export data. We also investigate which margin measures are correlated with productivity growth. Our study complements works like Fabrizio et al. (2007), which examine the export performance of eight transition economies, but focus on total exports rather than export margins.

2. Data

For each country, we collect product-level (nominal) data on exports to the EU15² for the 1995–2008 period from the UN Comtrade database, using the 6-digit Harmonized System classification.³ For the industry-level analysis, each product is assigned to one of 16 industries according to the

¹The ten countries are: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

²EU15 refers to the EU members prior to the 2004 expansion. In what follows, “exports” and “total exports” imply exports to the EU15, unless otherwise noted.

³For Bulgaria, data are only available starting in 1996.

International Standard Industrial Classification (ISIC) Revision 3. Our study covers 4924 products.⁴ Table 1 shows the product distribution across industries.

Table 1. Industry Distribution of All Goods

ISIC Code	Industry Name	Number of Products	ISIC Code	Industry Name	Number of Products
A-B	Agriculture	305	24	Chemicals	862
C	Mining	108	25	Rubber, plastic	116
15-16	Food	413	26	Other non-metalic minerals	158
17-18	Textiles	770	27-28	Basic and fabricated metals	594
19	Leather	67	29	Machinery	517
20	Wood	64	30-33	Electric equipment	454
21-22	Paper	151	34-35	Transport equipment	136
23	Coke, petrol, fuel	20	36-37	Manufacturing nec	189

3. Top-Traded Goods

3.1. Frequency of Top-Traded Goods

For each country, we order goods by their export values in descending order and label those that collectively account for 50% of total exports as “top-traded” (TT) goods. Table 2 shows the number of TT goods in 1995 and 2008, and the changes experienced during that period. An interesting fact is the small number of goods in this category. On average, 55 goods (or 1.2% of all goods) accounted for half of the exports in 1995, and that number decreased to 38 (0.8% of all goods) in 2008. The decline in the number of TT goods was the trend for most countries, except for Latvia, Romania, Estonia and Bulgaria.

Table 2. Frequency of TT Goods in 1995 and 2008

Country	Number of TT goods in 1995	Number of TT goods in 2008	Change 1995-2008	Percent Change
Bulgaria	42	53	11	26.2
Czech Rep.	140	52	-88	-62.9
Estonia	25	32	7	28.0
Hungary	93	34	-59	-63.4
Latvia	5	17	12	240.0
Lithuania	20	12	-8	-40.0
Poland	68	63	-5	-7.4
Romania	44	58	14	31.8
Slovakia	53	17	-36	-67.9
Slovenia	63	46	-17	-27.0
Average	55	38	-17	-30.6

3.2. Changes in the Industry Distribution of Top-Traded Goods and Exports

In 1995 industries A to 27—mainly primary goods and manufactures with relatively low value-added—accounted for about three quarters of all TT goods. In 2008, instead, industries 29 to 34—corresponding to Machinery, Transportation Equipment, and Electric Equipment—accounted

⁴Some products had to be dropped since there was no corresponding industry assigned to them.

for more than half of the TT goods, reflecting a shift in the nature of the transition economies' most heavily-traded goods.

Table 3 shows the changes in the industry distribution of the frequency of TT goods between 1995 and 2008. On average, all industries from codes A to 27 experienced reductions in their shares of TT goods, except for industries 23 (Coke/Petrol) and 25 (Rubber/Plastics). Textiles registered the largest decrease in TT goods, while Transportation Equipment experienced the largest increase, followed by Electric Equipment and Machinery.

Table 3. Changes in the Industry Distribution of the Frequency of TT Goods, 1995–2008

Code	Industry	BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN	Avg.
A-B	Agriculture	0.004	-0.029	-0.018	-0.024	-0.165	-0.150	-0.044	0.034	0.000	0.000	-0.039
C	Mining	0.000	-0.036	-0.009	0.000	0.059	-0.050	-0.014	0.000	-0.019	0.000	-0.007
15-16	Food	-0.053	-0.009	-0.049	-0.108	0.000	-0.017	0.021	0.017	0.000	0.043	-0.015
17-18	Textiles	0.145	-0.064	-0.129	-0.118	0.000	-0.200	-0.206	-0.271	0.000	-0.159	-0.100
19	Leather	-0.058	-0.014	0.000	-0.022	0.000	-0.050	0.000	0.013	0.059	-0.048	-0.012
20	Wood	0.000	-0.043	-0.035	-0.032	0.094	-0.050	-0.011	0.000	-0.019	-0.079	-0.018
21-22	Paper	-0.024	-0.012	0.031	0.000	0.000	0.000	0.001	0.000	-0.036	-0.068	-0.011
23	Coke, petrol, fuel	-0.005	0.005	-0.049	0.019	0.000	0.083	0.002	-0.005	0.040	0.022	0.011
24	Chemicals	-0.181	-0.066	0.023	-0.057	0.059	0.217	-0.010	-0.034	-0.170	0.033	-0.019
25	Rubber, plastic	0.000	-0.004	-0.009	0.008	0.000	0.083	0.033	0.017	0.040	0.012	0.018
26	Other non-metal. minerals	0.009	-0.071	0.000	-0.011	0.000	0.000	-0.029	-0.045	-0.038	0.006	-0.018
27-28	Basic and fabric. metals	0.012	-0.176	0.014	-0.140	-0.024	0.000	-0.051	-0.056	-0.358	0.096	-0.068
29	Machinery	0.094	0.042	0.063	0.032	0.000	0.000	0.081	0.041	0.002	0.047	0.040
30-33	Electric equipment	0.066	0.256	0.121	0.146	0.000	-0.017	0.068	0.144	0.179	0.013	0.098
34-35	Transport equipment	-0.005	0.219	-0.009	0.310	0.118	0.033	0.153	0.161	0.357	0.095	0.143
36-37	Manufacturing nec	-0.005	0.003	0.054	-0.003	-0.141	0.117	0.006	-0.016	-0.038	-0.014	-0.004

Note: The shaded values denote industries that recorded increases in the number of TT goods between 1995 and 2008.

Table 4. Changes in the Industry Distribution of Export Values of TT Goods, 1995–2008

Code	Industry	BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN	Avg.
A-B	Agriculture	0.010	-0.034	-0.103	-0.037	-0.170	-0.076	-0.027	0.037	0.000	0.000	-0.040
C	Mining	0.000	-0.040	-0.008	0.000	0.051	-0.018	-0.063	0.000	-0.010	0.000	-0.009
15-16	Food	-0.075	-0.021	-0.089	-0.106	0.000	-0.218	-0.005	0.023	0.000	0.026	-0.046
17-18	Textiles	0.096	-0.034	-0.054	-0.092	0.000	-0.119	-0.113	-0.215	0.000	-0.085	-0.062
19	Leather	-0.057	-0.015	0.000	-0.051	0.000	-0.021	0.000	-0.047	0.020	-0.038	-0.021
20	Wood	0.000	-0.052	-0.052	-0.017	-0.055	-0.149	-0.035	0.000	-0.020	-0.057	-0.044
21-22	Paper	-0.013	-0.003	0.024	0.000	0.000	0.000	-0.003	0.000	-0.091	-0.043	-0.013
23	Coke, petrol, fuel	0.002	-0.016	0.041	-0.026	0.000	0.528	0.013	-0.027	0.021	0.024	0.056
24	Chemicals	-0.199	-0.055	0.006	-0.073	0.064	0.049	-0.004	-0.031	-0.159	0.032	-0.037
25	Rubber, plastic	0.000	-0.008	-0.004	0.000	0.000	0.027	0.022	0.029	0.007	0.005	0.008
26	Other non-metal. mineral	0.006	-0.054	0.000	-0.007	0.000	0.000	-0.025	-0.023	-0.068	-0.001	-0.017
27-28	Basic and fabric. metals	0.091	-0.169	0.078	-0.118	0.082	0.000	-0.095	-0.073	-0.309	0.081	-0.043
29	Machinery	0.078	0.018	0.032	-0.014	0.000	0.000	0.040	0.044	-0.010	0.027	0.021
30-33	Electric equipment	0.069	0.254	0.135	0.179	0.000	-0.084	0.152	0.205	0.337	-0.008	0.124
34-35	Transport equipment	-0.010	0.225	-0.021	0.375	0.052	0.020	0.162	0.178	0.316	0.068	0.137
36	Manufacturing nec	0.001	0.004	0.014	-0.011	-0.023	0.063	-0.018	-0.100	-0.034	-0.032	-0.014

Note: The shaded values denote industries that recorded increases in their share of exports of TT goods between 1995 and 2008.

Table 4 shows a similar story for TT goods' export values, with Coke and Petrol, Machinery, Electric Equipment, and Transportation Equipment increasing their shares, and the remaining industries experiencing reductions in their relative importance.

4. Least-Traded Goods

We follow the methodology in Kehoe and Ruhl (2013), hereinafter KR, and label those goods with initially very low trade volumes—or not traded at all—as “least-traded” (LT) goods. Specifically, we rank goods in ascending order according to their average export value during 1995–1997.⁵ The goods that account for the bottom 10% of total exports are labeled as LT or “new” goods.

4.1. Frequency of Least-Traded Goods

Table 5 reveals that in 1995 the vast majority of goods were exported in very small values, or not at all. In fact, 4448 goods composed the average LT basket, implying that about 90% of all goods were essentially not traded. A notable exception is the Czech Republic with a much lower fraction (78%). However, the relative importance of LT goods in total exports grew disproportionately, going from representing 10% of exports in 1995 to accounting, on average, for more than one third of total exports in 2008, with Slovakia and Latvia leading the group.

Moreover, we find that although LT goods experienced sizable increases in the overall exports shares, this was due to very few goods. On average, only 31 goods (0.7% of all LT goods) accounted for 50% of LT goods exports. In what follows, we call this subset the “top” LT, or TLT, goods.

Table 5. Frequency of LT and TLT Goods

Country	Number of goods in LT basket	LT goods fraction of Total Exports in 2008	Number of TLT goods in 2008
Bulgaria	4519	0.338	52
Czech Rep.	3844	0.191	24
Estonia	4531	0.296	39
Hungary	4235	0.285	11
Latvia	4785	0.497	24
Lithuania	4703	0.378	22
Poland	4339	0.332	56
Romania	4563	0.450	47
Slovakia	4549	0.527	3
Slovenia	4410	0.263	33
Average	4448	0.356	31

4.2. Industry Distribution of Top Least-Traded Goods and Exports

In addition to being concentrated on a small number of products, we find that the distribution of TLT goods and their exports were clustered on only a handful of industries. As shown in Table 6, Basic and Fabricated Metals, Machinery, and Electric and Transport Equipment accounted on average for nearly 70% of all TLT goods in 2008. As Table 7 reveals, the sectoral concentration of TLT goods’ exports was even more pronounced. Over 55% of TLT exports were concentrated in the Electric and Transport Equipment sectors. This pattern was quite robust across countries, except for Lithuania, which specialized in the Food and Chemicals sectors.

⁵We average values over those 3 years to avoid any potential distortions derived from an anomalous initial year.

Table 6. Industry Distribution of TLT Goods in 2008

Code	Industry	BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN	Avg.
A-B	Agriculture	0.096	0.000	0.026	0.000	0.167	0.136	0.018	0.021	0.000	0.061	0.052
C	Mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-16	Food	0.019	0.042	0.051	0.000	0.000	0.273	0.125	0.021	0.000	0.030	0.056
17-18	Textiles	0.154	0.000	0.000	0.000	0.000	0.045	0.000	0.043	0.000	0.030	0.027
19	Leather	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	Wood	0.019	0.000	0.000	0.000	0.042	0.000	0.000	0.021	0.000	0.030	0.011
21-22	Paper	0.019	0.000	0.103	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.016
23	Coke, petrol, fuel	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030	0.003
24	Chemicals	0.058	0.042	0.026	0.091	0.042	0.227	0.107	0.021	0.000	0.091	0.070
25	Rubber, plastic	0.038	0.000	0.051	0.091	0.000	0.045	0.054	0.064	0.000	0.030	0.037
26	Other non-metal. minerals	0.019	0.000	0.026	0.000	0.000	0.000	0.036	0.000	0.000	0.030	0.011
27-28	Basic & fabric. metals	0.173	0.042	0.154	0.000	0.250	0.045	0.071	0.085	0.000	0.152	0.097
29	Machinery	0.115	0.250	0.179	0.182	0.000	0.091	0.179	0.128	0.000	0.121	0.125
30-33	Electric equipment	0.192	0.417	0.256	0.455	0.167	0.045	0.161	0.362	0.333	0.182	0.257
34-35	Transport equipment	0.038	0.208	0.103	0.182	0.292	0.091	0.214	0.213	0.667	0.182	0.219
36	Manufacturing nec	0.058	0.000	0.026	0.000	0.042	0.000	0.000	0.021	0.000	0.030	0.018

Note: The shaded values denote industries that in 2008 accounted for 10% or more of the TLT goods.

Table 7. Industry Distribution of Export Values of TLT Goods in 2008

Code	Industry	BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN	Avg.
A-B	Agriculture	0.100	0.000	0.026	0.000	0.266	0.061	0.007	0.057	0.000	0.040	0.056
C	Mining	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-16	Food	0.022	0.030	0.035	0.000	0.000	0.226	0.096	0.050	0.000	0.041	0.050
17-18	Textiles	0.110	0.000	0.000	0.000	0.000	0.016	0.000	0.018	0.000	0.027	0.017
19	Leather	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	Wood	0.010	0.000	0.000	0.000	0.048	0.000	0.000	0.010	0.000	0.015	0.008
21-22	Paper	0.009	0.000	0.126	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.016
23	Coke, petrol, fuel	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.092	0.009
24	Chemicals	0.034	0.064	0.029	0.028	0.128	0.462	0.103	0.011	0.000	0.036	0.090
25	Rubber, plastic	0.019	0.000	0.026	0.034	0.000	0.070	0.021	0.038	0.000	0.020	0.023
26	Other non-metal. minerals	0.011	0.000	0.011	0.000	0.000	0.000	0.027	0.000	0.000	0.010	0.006
27-28	Basic & fabric. metals	0.209	0.010	0.148	0.000	0.202	0.028	0.041	0.050	0.000	0.119	0.081
29	Machinery	0.111	0.086	0.175	0.068	0.000	0.061	0.121	0.148	0.000	0.079	0.085
30-33	Electric equipment	0.289	0.362	0.324	0.712	0.088	0.042	0.147	0.333	0.661	0.081	0.304
34-35	Transport equipment	0.048	0.448	0.091	0.158	0.239	0.033	0.416	0.276	0.339	0.427	0.247
36	Manufacturing nec	0.028	0.000	0.010	0.000	0.029	0.000	0.000	0.008	0.000	0.014	0.009

Note: The shaded values denote industries that in 2008 accounted for 10% or more of TLT goods exports.

5. TT and LT Goods Transitions

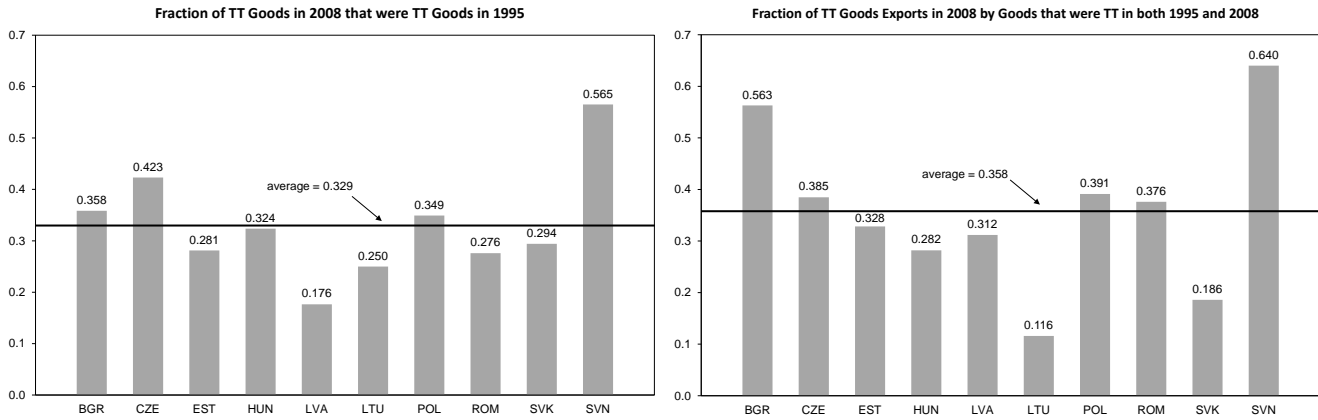
5.1. Persistence of Top-Traded Goods

Previously we documented that the TT goods basket was composed of a small number of products. However, there was significant turnover within that category. Figure 1 displays the fraction of TT goods in 1995 that remained as such in 2008. On average, less than a third of TT goods in 2008 were also TT in 1995, and those goods accounted for nearly 36% of TT goods exports in 2008. Slovenia displayed the highest persistence in goods remaining as TT (56.5%), and Latvia the lowest (17.6%).

5.2. From Least-Traded to Top-Traded

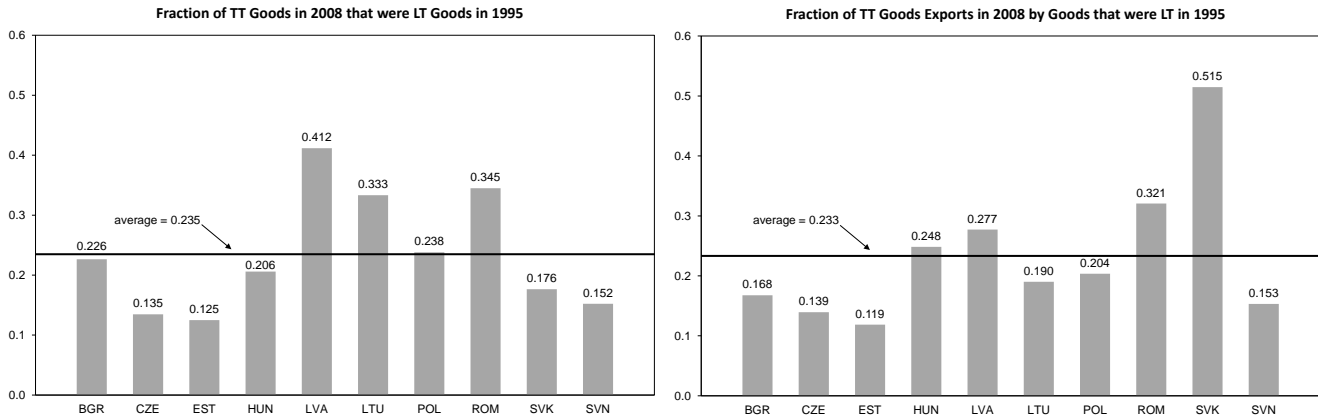
We also find that a significant fraction of the LT goods in 1995 became top-traded in 2008. As shown in Figure 2, almost a quarter of TT goods in 2008 were LT goods in 1995, with Latvia—which

Figure 1



had the lowest persistence of TT goods—leading the group, followed by Romania and Lithuania. Moreover, these goods accounted for 23% of TT goods exports in 2008.

Figure 2



5.3. Industry Distribution of TT and TLT Goods and Exports

Tables 8 and 9 show the industry distributions of TT and TLT goods and of their exports in 2008. For both the number of goods and the export values we find a high degree of correlation between the two distributions. The correlation between the distributions of TT and TLT goods exceeded 0.5 for all countries, and averaged 0.76. For export values, the correlation also exceeded 0.5 for all countries (except Lithuania) and averaged 0.78. This indicates that, while there were significant increases in new goods exports, they belonged—for the most part—to the same industries that accounted for the majority of overall exports.

At the country level, the sectoral overlapping of TT and TLT goods was also consistently noticeable. All countries (except for Latvia and Lithuania) showed high export concentrations of both TT and TLT goods in the Metals, Machinery, Electric, and Transportation Equipment sectors. Latvia and Lithuania diverged from the group, with main exports of agricultural and chemical products, respectively.

Table 8. Industry Distribution of TT and TLT Goods in 2008

Industry	BGR		CZE		EST		HUN		LVA		LTU		POL		ROM		SVK		SVN	
	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT
A-B	0.075	0.096	0.000	0.000	0.063	0.026	0.029	0.000	0.235	0.167	0.000	0.136	0.000	0.018	0.034	0.021	0.000	0.000	0.000	0.061
C	0.000	0.000	0.000	0.000	0.031	0.000	0.000	0.000	0.059	0.000	0.000	0.000	0.016	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-16	0.019	0.019	0.019	0.042	0.031	0.051	0.000	0.000	0.000	0.000	0.083	0.273	0.079	0.125	0.017	0.021	0.000	0.000	0.043	0.030
17-18	0.264	0.154	0.000	0.000	0.031	0.000	0.000	0.000	0.000	0.000	0.045	0.000	0.000	0.138	0.043	0.000	0.000	0.000	0.000	0.030
19	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.113	0.000	0.059	0.000	0.000	0.000	0.000
20	0.000	0.019	0.000	0.000	0.125	0.000	0.000	0.000	0.294	0.042	0.000	0.000	0.048	0.000	0.000	0.021	0.000	0.000	0.000	0.030
21-22	0.000	0.019	0.038	0.000	0.031	0.103	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.036	0.000	0.000	0.059	0.000	0.043	0.000
23	0.019	0.000	0.019	0.000	0.031	0.000	0.029	0.000	0.000	0.000	0.083	0.000	0.032	0.000	0.017	0.000	0.059	0.000	0.022	0.030
24	0.057	0.058	0.019	0.042	0.063	0.026	0.029	0.091	0.059	0.042	0.417	0.227	0.063	0.107	0.034	0.021	0.000	0.000	0.065	0.091
25	0.000	0.038	0.038	0.000	0.031	0.051	0.029	0.091	0.000	0.000	0.083	0.045	0.048	0.054	0.017	0.064	0.059	0.000	0.043	0.030
26	0.057	0.019	0.000	0.000	0.000	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.022	0.030
27-28	0.226	0.173	0.038	0.042	0.094	0.154	0.000	0.000	0.176	0.250	0.000	0.045	0.111	0.071	0.103	0.085	0.000	0.000	0.239	0.152
29	0.094	0.115	0.135	0.250	0.063	0.179	0.118	0.182	0.000	0.000	0.000	0.091	0.095	0.179	0.086	0.128	0.059	0.000	0.174	0.121
30-33	0.113	0.192	0.385	0.417	0.281	0.256	0.382	0.455	0.000	0.167	0.083	0.045	0.127	0.161	0.190	0.362	0.235	0.333	0.109	0.182
34-35	0.019	0.038	0.269	0.208	0.031	0.103	0.353	0.182	0.118	0.292	0.083	0.091	0.286	0.214	0.207	0.213	0.471	0.667	0.174	0.182
36	0.019	0.058	0.038	0.000	0.094	0.026	0.029	0.000	0.059	0.042	0.167	0.000	0.079	0.000	0.052	0.021	0.000	0.000	0.065	0.030
Correlation	0.832		0.946		0.651		0.892		0.516		0.514		0.807		0.791		0.976		0.830	

Note: The shaded values denote industries that in 2008 accounted for 10% or more of the goods.

Table 9. Industry Distribution of Export Values of TT and TLT Goods in 2008

Industry	BGR		CZE		EST		HUN		LVA		LTU		POL		ROM		SVK		SVN	
	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT	TT	TLT
A-B	0.067	0.100	0.000	0.000	0.047	0.026	0.016	0.000	0.250	0.266	0.000	0.061	0.000	0.007	0.037	0.057	0.000	0.000	0.000	0.040
C	0.000	0.000	0.000	0.000	0.020	0.000	0.000	0.000	0.051	0.000	0.000	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000
15-16	0.011	0.022	0.008	0.030	0.013	0.035	0.000	0.000	0.000	0.000	0.032	0.226	0.040	0.096	0.023	0.050	0.000	0.000	0.026	0.041
17-18	0.175	0.110	0.000	0.000	0.040	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.000	0.000	0.099	0.018	0.000	0.000	0.000	0.027
19	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.096	0.000	0.020	0.000	0.000	0.000
20	0.000	0.010	0.000	0.000	0.091	0.000	0.000	0.000	0.377	0.048	0.000	0.000	0.022	0.000	0.000	0.010	0.000	0.000	0.000	0.015
21-22	0.000	0.009	0.030	0.000	0.024	0.126	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.021	0.000	0.000	0.018	0.000	0.022	0.000
23	0.067	0.000	0.009	0.000	0.100	0.000	0.028	0.000	0.000	0.000	0.528	0.000	0.053	0.000	0.021	0.000	0.064	0.000	0.024	0.092
24	0.032	0.034	0.012	0.064	0.033	0.029	0.018	0.028	0.064	0.128	0.266	0.462	0.032	0.103	0.017	0.011	0.000	0.000	0.051	0.036
25	0.000	0.019	0.028	0.000	0.014	0.026	0.014	0.034	0.000	0.000	0.027	0.070	0.030	0.021	0.029	0.038	0.025	0.000	0.034	0.020
26	0.031	0.011	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.000	0.000	0.000	0.008	0.010
27-28	0.406	0.209	0.040	0.010	0.112	0.148	0.000	0.000	0.170	0.202	0.000	0.028	0.096	0.041	0.074	0.050	0.000	0.000	0.189	0.119
29	0.078	0.111	0.094	0.086	0.032	0.175	0.043	0.068	0.000	0.000	0.000	0.061	0.046	0.121	0.070	0.148	0.021	0.000	0.141	0.079
30-33	0.089	0.289	0.408	0.362	0.399	0.324	0.447	0.712	0.000	0.288	0.023	0.042	0.199	0.147	0.249	0.333	0.421	0.661	0.074	0.081
34-35	0.009	0.048	0.328	0.448	0.014	0.091	0.413	0.158	0.052	0.289	0.040	0.033	0.365	0.416	0.210	0.276	0.431	0.339	0.360	0.427
36	0.010	0.028	0.043	0.000	0.062	0.010	0.022	0.000	0.036	0.029	0.084	0.000	0.092	0.000	0.074	0.008	0.000	0.000	0.072	0.014
Correlation	0.660		0.958		0.742		0.843		0.501		0.282		0.890		0.876		0.935		0.920	

Note: The shaded values denote industries that in 2008 accounted for 10% or more of the exports.

6. Export Growth Contributions of the Intensive and Extensive Margins

By analyzing the patterns of TT and LT goods, we documented the evolution of two sets of goods that can be thought as proxies for the intensive and extensive margins. This, however, does not allow us to determine the relative contributions to export growth of the two margins. Since exports of the transition countries to the EU15 grew rapidly (both nominally and, in most cases, as a fraction of GDP, see Table 10), our objective is to understand whether this growth was mainly due to the intensive or extensive margins. To do so, we follow the decomposition developed by KR:

$$\log(1 + \gamma) = \log(1 + \gamma_{IM}) + \log(1 + \gamma_{EM}) \quad \Leftrightarrow \quad 1 = \frac{\log(1 + \gamma_{IM})}{\log(1 + \gamma)} + \frac{\log(1 + \gamma_{EM})}{\log(1 + \gamma)} \quad (1)$$

where γ_{IM} is the intensive margin growth rate (the growth in exports of the goods traded above the LT threshold⁶ in both periods under consideration), γ is the growth rate of (total) exports, and γ_{EM} is the extensive margin growth rate, calculated as a residual. Thus, the two terms on the right-hand side of (1) measure the shares of the intensive and extensive margins, respectively.

Table 10. Growth Rate of Exports to EU15, 1995–2008
(percent)

⁶The LT threshold is the export value of the last product to be included in the construction of the least-traded goods basket in the base year.

	BGR	CZE	EST	HUN	LVA	LTU	POL	ROM	SVK	SVN	Avg.
Exports (nominal)	514.0	688.5	605.8	726.6	540.8	925.8	654.0	617.2	1231.3	280.1	678.4
Exports-to-GDP ratio	-4.9	74.3	9.5	113.8	-12.1	52.3	74.2	11.6	215.8	7.2	75.6

Figure 3 plots the margins shares. Two facts become evident. First, for all countries, most of exports growth—nearly three quarters on average—was due to the intensive margin. Second, the extensive margin’s role was not negligible, accounting for the remaining 24% of exports growth. Moreover, there was considerable variation in its relative importance across countries: for Latvia and Lithuania, new goods trade accounted for over a third of total exports growth, while in the Czech Republic and Hungary represented less than 15%.

Figure 3. Shares of Trade Margins in Total Export Growth, 1995–2008

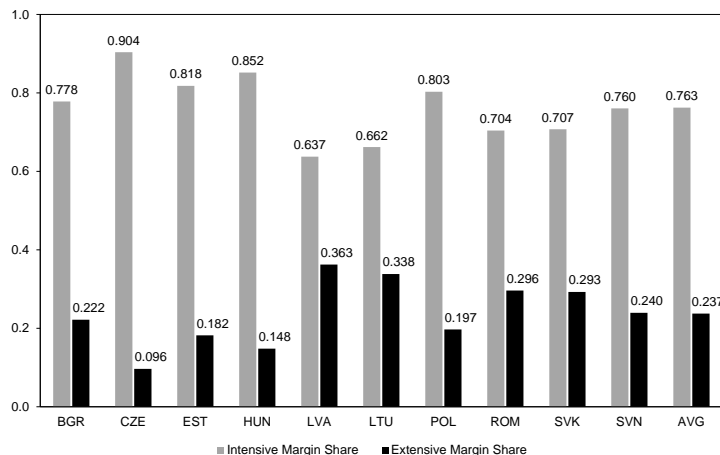


Table 11 shows the evolution of the extensive margin share for all countries during 1995–2008. Although the bulk of exports growth was due to the intensive margin, the importance of the extensive margin increased over time. Moreover, the extensive margin shares displayed increasing patterns during the mid and late 1990s, when these countries signed their FTAs with the EU. After stagnating—and even declining in some cases—the extensive margin share started increasing again after EU accession in 2004.

7. Trade Margins and Productivity Growth

Recent studies, such as Feenstra and Kee (2008), have highlighted the links between the exports extensive margin and productivity gains. To see whether this correlation is also observable for the transition economies, we compare the growth rate of Total Factor Productivity (TFP) between 1995 and 2008 with two measures of new exports growth: the share of LT goods and the share of the extensive margin, both in 2008. TFP data are taken from the European Commission’s Macro-economic Database (AMECO). Figure 4 depicts the results.

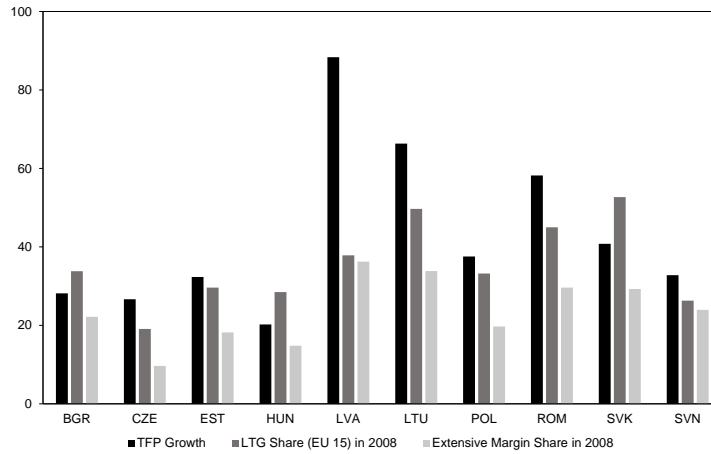
We find that the countries with the highest growth along both measures of the extensive margin (Latvia, Lithuania, Romania, and Slovakia) also experienced the highest productivity growth. On

Table 11. Share of Extensive Margin in Exports Growth Since 1995
(percent)

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Bulgaria	—	6.2	9.2	46.7	22.0	27.3	33.4	24.5	21.4	21.7	20.8	22.1	22.2
Czech Rep.	-27.1	8.3	6.8	9.2	10.1	10.4	7.6	8.6	8.0	9.2	10.0	9.9	9.6
Estonia	8.6	2.7	11.3	12.5	8.0	9.8	13.3	11.9	11.1	12.8	14.7	17.2	18.2
Hungary	-7.1	0.4	2.6	3.8	8.3	13.5	18.1	16.9	20.0	15.5	15.2	15.7	14.8
Latvia	-1.5	2.4	13.4	15.5	19.3	24.5	25.9	19.1	17.7	23.1	26.2	25.1	36.3
Lithuania	1.7	5.8	37.1	41.3	29.5	26.5	26.0	23.9	22.5	27.1	28.9	32.1	33.8
Poland	23.3	28.6	19.4	32.6	43.1	39.2	35.4	30.4	23.9	24.5	23.2	20.7	19.7
Romania	-0.5	9.8	20.9	33.9	37.9	31.5	22.5	19.8	20.2	21.4	22.5	26.4	29.6
Slovakia	-42.9	6.9	7.9	14.8	14.7	16.7	16.0	18.3	24.1	28.0	32.4	30.9	29.3
Slovenia	-10.4	-14.9	39.7	194.7	651.2	398.2	156.7	58.3	37.4	35.5	29.7	23.3	24.0
Average	-6.2	5.6	16.8	40.5	84.4	59.8	35.5	23.2	20.6	21.9	22.4	22.3	23.7

Note: The shaded values denote years during which the extensive margin share grew relative to the previous year.

Figure 4. TFP Growth and New Export Growth, 1995–2008 (percent)



the other hand, Hungary and the Czech Republic, those with the lowest productivity growth, also exhibited the smallest growth along the extensive margin.

Next, we calculate the correlation coefficients between productivity growth and the trade margins. Note that by computing correlations, we do not intend to assign any causality implications, but rather to summarize this large data set. For robustness purposes, besides AMECO data we also use the TFP values estimated by Levenko et al. (2017).

Additionally, we examine the correlations between both trade margins and two labor productivity measures, one that divides value-added by total hours worked, and another that divides by the number of workers. We compute labor productivity using the World Input-Output Database. The advantage of using labor productivity over TFP is that the latter includes the services sector—generally considered to be non-traded—while the former focuses exclusively on the traded sector, more in line with the goods included in the trade margins calculations.

For extensive margin measures we use the LT goods share and the extensive margin share for each country in 2008, as in Figure 4. Additionally, we calculate the correlations with the share of LT manufacturing goods, leaving out primary goods exports, whose prices tend to be more volatile. For the intensive margin, we use non-LT goods export growth for each country between 1995–2008.

The results are summarized in Table 12, which reveals two striking facts. First, the correlations between the various productivity and extensive margin measures were all positive, in some cases close to one. Second, the correlations between productivity and the intensive margin measure showed a mixed picture: negative for the two TFP measures, while positive for the labor productivity measures—though uniformly lower compared to the extensive margin measures. While a more in-depth analysis is needed to establish more definitive results, these preliminary findings point to interesting paths for future research.

Table 12. Correlations: Productivity Growth and Trade Margins, 1995–2008

	Extensive Margin			Intensive Margin
	LT goods share (all goods)	LT goods share (manufacturing only)	Decomposition share	Non-LT goods trade growth
Productivity growth				
TFP (AMECO)	0.563	0.625	0.864	-0.385
TFP (Levenko et al.)	0.380	0.357	0.479	-0.402
Labor productivity (Hours)	0.398	0.371	0.326	0.180
Labor productivity (Workers)	0.507	0.374	0.394	0.235

8. Conclusion

We analyze the dynamics of the exports margins for a group of transition countries that significantly liberalized their trade on their path to EU membership. We find that exports growth along the trade margins was driven by only about 1% of almost 5000 products. Additionally, we find that the largest intensive and extensive margin gains were clustered around the same subset of sectors, and that productivity growth was highly correlated with exports growth along the extensive margin, but not along the intensive margin. By documenting these findings on the transition economies—countries that have received comparatively less attention in the literature—we highlight the importance of the role of the extensive margin of trade.

References

- Besedeš, Tibor, Prusa, Thomas J., 2011. The role of extensive and intensive margins and export growth. *Journal of Development Economics*, Vol. 96, pp. 371–379.
- Dalton, John, 2014. The new goods margin in Japanese-Chinese trade. *Japan and the World Economy*, Vol. 31, pp. 8–13.
- Fabrizio, Stefania, Igan, Deniz, Mody, Ashoka, 2007. The dynamics of product quality and international competitiveness. *International Monetary Fund Working Paper 07/97*.
- Feenstra, Robert C., Kee, Hiau Looi, 2008. Export variety and country productivity: estimating the monopolistic competition model with endogenous productivity. *Journal of International Economics*, Vol. 74, No. 2, pp. 500–518.

- Helpman, Elhanan, Melitz, Marc, Rubinstein, Yona, 2008. Estimating trade flows: trading partners and trading volumes. *Quarterly Journal of Economics*, Vol. 123, No. 2, pp. 441–487.
- Hummels, David, Klenow, Peter J., 2005. The variety and quality of a nation's exports. *American Economic Review*, Vol. 95, No. 3, pp. 704–723.
- Kehoe, Timothy J., Ruhl, Kim J., 2013. How important is the new goods margin in international trade? *Journal of Political Economy*, Vol. 121, No. 2, pp. 358–392.
- Levenko, Natalia, Oja, Kaspar, Staehr, Karsten, 2017. Total Factor Productivity growth in Central and Eastern Europe before, during and after the Global Financial Crisis. *Bank of Estonia Working Paper Series 8/2017*.
- Mukerji, Purba, 2009. Trade liberalization and the extensive margin. *Scottish Journal of Political Economy*, Vol. 56, No. 2, pp. 141–166.
- Mukerji, Purba, 2013. Distance to frontier and new import growth. *Scottish Journal of Political Economy*, Vol. 60, No. 4, pp. 390–411.