Competitive Pressure in Transition:
A Role for Trade and Competition Policies?

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Motivation

- Explore the role of policy intervention in the shaping of competitive markets:

    ○ *Disentangle trade and antitrust regimes' respective impact.*
    ○ *Study their interplay.*

▷ Overall outcome influenced by a wide-ranging policy mix (litigation, standard-setting, IPR protection, privatization, etc.).

▷ Multi-faceted policy instruments defy thorough quantification.

- Cases of exceptional policy reorientation and recourse to alternative proxies can still shed some light.

Presentation Outline

- Transition Countries with EU Aspirations

- Measures of Policy Intervention

- Evolution of Trade and Antitrust Regimes

- Empirical Framework

- Data Description

- Results

- Concluding Remarks

Transition Countries with EU Aspirations

- Transition countries – a natural experiment in the context of preparations for accession to the European Union:

  - *Common planned economy background*

  - *Shared blueprint for legislative and institutional reforms*

  - *Policy turnarounds implemented gradually*

  - *Asymmetry in reform choices and enactment timing*

- Scope for pooled and country-specific empirical investigations to verify the studied relationships' robustness.

Measures of Policy Intervention

- Trade regime

  ○ Most-favored-nation (MFN) applied tariff − sets the ceiling for duties levied on imports from WTO partners.

  ○ Trade-weighted tariff − an average of MFN and preferential rates in force, weighted by bilateral imports' share in total imports (*weighting bias*).

  ▷ *Possible higher rates applied to imports from non-WTO partners are not reflected in either of the proxies.*

  ▷ *Ignore the impact of non-tariff barriers (e.g. quotas, sanitary and conformity assessment requirements).*

  ▷ *Fairly disaggregated (4-digit NACE) reflection of inter-industry heterogeneity in protection levels.*

Measures of Policy Intervention

- Antitrust regime

  - Incidence of final instance decisions − number of cases (state aid excluded) scaled by the total number of domestic firms in the year 2000.

  - EBRD index − ranking of antitrust regimes on the basis of legislation, institutional framework, enforcement actions and efforts to reduce barriers to entry.

  ▷ *Presumption that stricter enforcement is associated with a higher incidence of decisions.*

  ▷ *EBRD index should capture qualitative aspects, but comes with a vague methodology description and limited variation over time.*

  ▷ *Inability to capture the industry dimension − reflect an overall signaling effect.*

Trade Policy Reorientation

Liberalization with a Regional Focus

Trade Agreements	BG	CZ	EE	HU	PL	SK	SI
WTO	1/12/1996	1/1/1995	13/11/1999	1/1/1995	1/7/1995	1/1/1995	30/07/1995
EU	31/12/1993	1/3/1992	1/1/1995	1/3/1992	1/3/1992	1/3/1992	1/1/1997
EFTA	1/7/1993	1/7/1992	1/6/1996	1/10/1993	15/11/1993	1/7/1992	1/6/1995
CEFTA	1/1/1999	1/3/1993	—	1/3/1993	1/3/1993	1/3/1993	1/1/1996
No. FTAs pre-1998	3	5	3	0	1	5	5
No. FTAs post-1998	6	3	5	6	6	3	4

Source: WTO

- Notwithstanding the broadly similar liberalization patterns, there are significant differences within and across narrowly defined industries.

- Important to account for barriers to import competition at a high level of sectoral disaggregation and reflect preferential market access under FTAs.

Breakdown of Manufacturing Imports

Share of Preferential and Non-MFN Inflows in 2000

Partner	BG	CZ	EE	HU	PL	SK	SI
				Value Terms			
Total Pref.	82.56	83.94	75.38	72.79	79.72	86.80	87.24
EU	66.66	68.41	64.05	62.95	68.28	60.46	69.95
EFTA	2.05	1.94	2.26	1.53	2.34	1.79	2.14
CEFTA	8.93	12.79	3.68[a]	7.67	7.71	24.06	8.98
Non-WTO	7.41	4.44	12.01	6.29	6.07	5.03	4.09
CHN	1.63	2.37	3.62	3.25	3.18	1.60	1.39
RUS	2.30	1.34	7.10	1.96	1.64	2.00	1.49
				Quantity Terms			
Total Pref.	57.51	83.95	57.42	72.44	80.56	87.52	92.63
EU	33.31	64.44	44.71	43.09	56.89	40.5	55.27
EFTA	0.68	1.19	1.02	0.74	2.1	0.6	1.52
CEFTA	15.14	17.8	2.42[a]	28.07	18.17	46.04	19.68
Non-WTO	25.37	5.95	33.65	17.63	15.39	10.43	3.38
CHN	2.58	4.17	0.73	0.96	1.3	0.73	0.31
RUS	3.59	0.83	29.01	7.41	7.01	4.52	1.42

Source: WITS Database. [a] At the time, Estonia had preferential trade agreements with CZ, HU, PL, SI and SK.
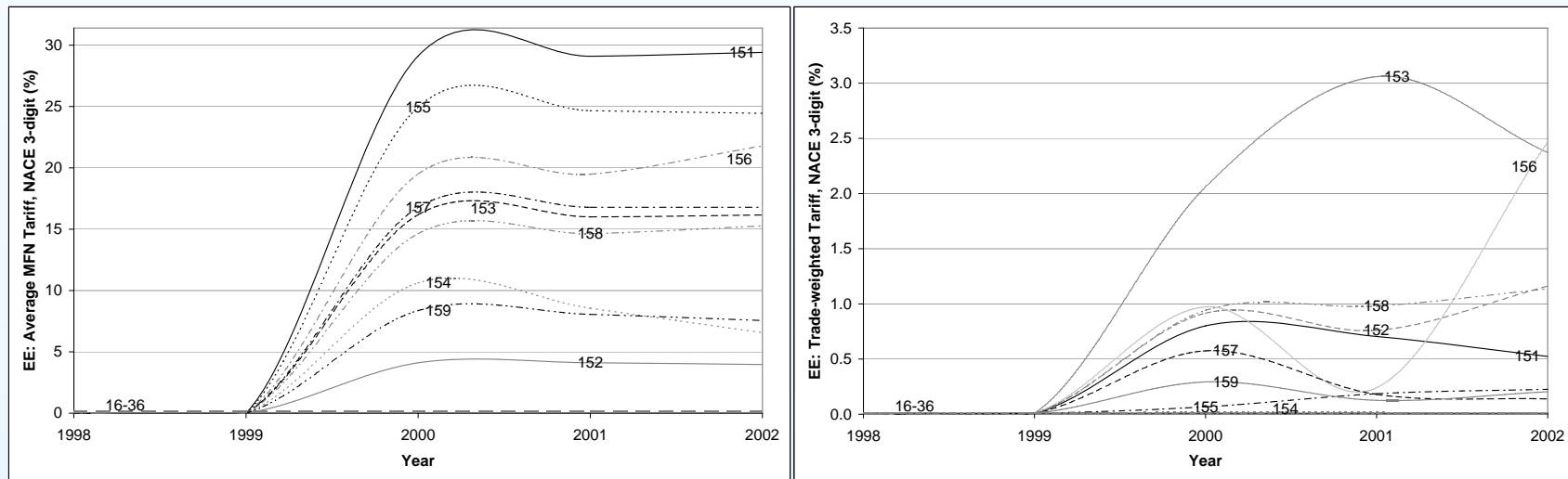
Evolution of Import Tariffs

Average Applied Tariff (Industrial Products)
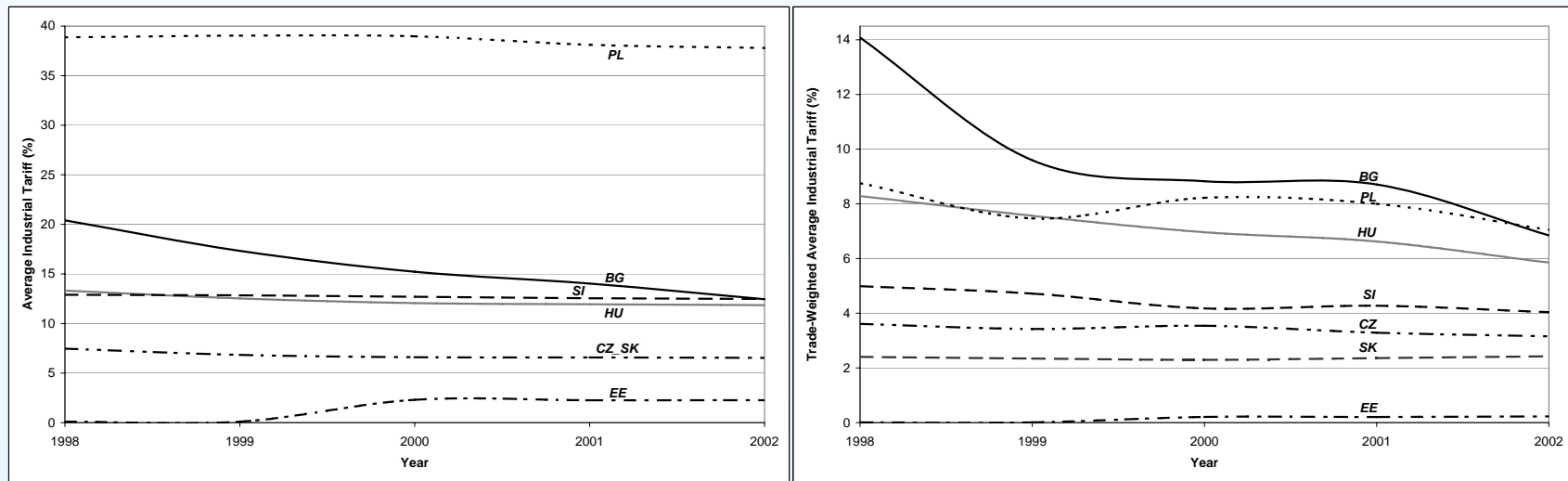
Source: WITS Database

Evolution of Import Tariffs

Average Applied Tariffs (3-digit NACE): Estonia

Source: WITS Database

Competition Policy Implementation

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
BG		★	~						○			~	~
CZ		★	~				○				~	○	~
EE				★		~			○	~	~	○	~
HU	★							○		~		○	~
PL	★	~				○	~	~		~	~	○	~
SI			★							○	~	~	~
SK		★				○		~			~	○	~

Note: ★/○/~ indicate year of initial law adoption/amendment with significant changes/amendment with minor changes, respectively.
Source: Dutz and Vagliasindi (2000) and Competition Authorities' Annual Reports.

▷ A common prevalence of cases not relating to serious distortions of competition in the early enforcement records.

▷ Shortcomings in institutional design, enforcement capacity and expertise have also been documented.

Empirical Framework

Hall (1988):

$$Y_{ijt} = A_{ijt}F(L_{ijt}, M_{ijt}, K_{ijt})$$

The price-cost margin can be estimated from the relationship between fluctuations of inputs (weighted by their factor shares in output) and the corresponding movements in output.

Roeger (1995):

$$C(P_{Lt}, P_{Mt}, P_{Kt}, Y_{it}, A_{it}) = \min_{L,M,K} \{(P_L L_i + P_M M_i + P_K K_i)_t \, | \, A_{it}F(L_{it}, M_{it}, K_{it}) = Y_{it}\}$$

Empirical Framework

$$\left(\frac{dY}{Y}\right)_{ijt} = \mu_{ijt}\left(\alpha_L \frac{dL}{L} + \alpha_M \frac{dM}{M} + \alpha_K \frac{dK}{K}\right)_{ijt} + \left(\frac{dA}{A}\right)_{ijt}$$

FOC:Profit Maximization

$$\left(\frac{\partial Y}{\partial N}\right)_{ijt} = \left[\frac{1}{1 + \left(\frac{Y_{ijt}}{P_{jt}}\frac{\partial P_{jt}}{\partial Y_{ijt}}\right)}\right]\left(\frac{P_N}{P}\right)_{jt} = \mu_{ijt}\left(\frac{P_N}{P}\right)_{jt}, \text{ where } N = L, M, K$$

$$= \frac{P_N}{\lambda} = \frac{P_N}{\partial(C/\partial Y)_{ijt}}$$

FOC:Cost Minimization

$$\left(\frac{dP}{P}\right)_{jt} = \left(\frac{1}{\gamma} - 1\right)\left(\frac{dY}{Y}\right)_{ijt} - \frac{1}{\gamma}\left(\frac{dA}{A}\right)_{ijt} + \frac{\mu_{ijt}}{\gamma_{ijt}}\left(\alpha_{Li}\frac{dP_L}{P_L} + \alpha_{Mi}\frac{dP_M}{P_M} + \alpha_{Ki}\frac{dP_K}{P_M}\right)_{jt}$$

Empirical Framework

$$\left(\frac{dY}{Y}\right)_{ijt} = \mu_{ijt}\left(\alpha_L\frac{dL}{L} + \alpha_M\frac{dM}{M} + \alpha_K\frac{dK}{K}\right)_{ijt} + \left(\frac{dA}{A}\right)_{ijt}$$

FOC:Profit Maximization

$$\frac{\partial Y}{\partial N}\frac{N}{Y} = \mu\frac{P_N}{P}\frac{N}{Y} = \mu\alpha_N$$

$$\left(\frac{\partial Y}{\partial N}\right)_{ijt} = \left[\frac{1}{1+\left(\frac{Y_{ijt}}{P_{jt}}\frac{\partial P_{jt}}{\partial Y_{ijt}}\right)}\right]\left(\frac{P_N}{P}\right)_{jt} = \mu_{ijt}\left(\frac{P_N}{P}\right)_{jt}, \text{ where } N = L, M, K$$

$$= \frac{P_N}{\lambda} = \frac{P_N}{\partial(C/\partial Y)_{ijt}}$$

FOC:Cost Minimization

$$\frac{P_N}{C_i}\frac{\partial C_i}{\partial P_N} = \frac{P_N N}{C_i} = \frac{P_N N}{\frac{\partial C_i}{\partial Y}\gamma Y} = \frac{\partial Y}{\partial N}\frac{N}{\gamma Y} = \frac{\mu}{\gamma}\alpha_N$$

$$\left(\frac{dP}{P}\right)_{jt} = \left(\frac{1}{\gamma}-1\right)\left(\frac{dY}{Y}\right)_{ijt} - \frac{1}{\gamma}\left(\frac{dA}{A}\right)_{ijt} + \frac{\mu_{ijt}}{\gamma_{ijt}}\left(\alpha_{Li}\frac{dP_L}{P_L} + \alpha_{Mi}\frac{dP_M}{P_M} + \alpha_{Ki}\frac{dP_K}{P_M}\right)_{jt}$$

Empirical Framework

$$\left(\frac{dY}{Y}\right)_{ijt} = \mu_{ijt}\left(\alpha_L\frac{dL}{L} + \alpha_M\frac{dM}{M} + \alpha_K\frac{dK}{K}\right)_{ijt} + \left(\frac{dA}{A}\right)_{ijt}$$

FOC:Profit Maximization

$$\frac{\partial Y}{\partial N}\frac{N}{Y} = \mu\frac{P_N}{P}\frac{N}{Y} = \mu\alpha_N$$

$$\left(\frac{\partial Y}{\partial N}\right)_{ijt} = \left[\frac{1}{1 + \left(\frac{Y_{ijt}}{P_{jt}}\frac{\partial P_{jt}}{\partial Y_{ijt}}\right)}\right]\left(\frac{P_N}{P}\right)_{jt} = \mu_{ijt}\left(\frac{P_N}{P}\right)_{jt}, \text{ where } N = L, M, K$$

$$= \frac{P_N}{\lambda} = \frac{P_N}{\partial(C/\partial Y)_{ijt}}$$

FOC:Cost Minimization

$$\frac{P_N}{C_i}\frac{\partial C_i}{\partial P_N} = \frac{P_N N}{C_i} = \frac{P_N N}{\frac{\partial C_i}{\partial Y}\gamma Y} = \frac{\partial Y}{\partial N}\frac{N}{\gamma Y} = \frac{\mu}{\gamma}\alpha_N$$

$$\left(\frac{dP}{P}\right)_{jt} = \left(\frac{1}{\gamma} - 1\right)\left(\frac{dY}{Y}\right)_{ijt} - \frac{1}{\gamma}\left(\frac{dA}{A}\right)_{ijt} + \frac{\mu_{ijt}}{\gamma_{ijt}}\left(\alpha_{Li}\frac{dP_L}{P_L} + \alpha_{Mi}\frac{dP_M}{P_M} + \alpha_{Ki}\frac{dP_K}{P_M}\right)_{jt}$$

Empirical Framework

- Eliminating the technological change term by substitution:

$$\underbrace{(dy_i + dp - dk_i - dp_K)_{jt}}_{dq} = \frac{\mu_{ijt}}{\gamma_{ijt}} \underbrace{[\alpha_{Li}(dl_i + dp_L - dk_i - dp_K) + \alpha_{Mi}(dm_i + dp_M - dk_i - dp_K)]_{jt}}_{dx}$$

- The estimated equation:

$$dq_{ijt} = \beta_1 dx_{ijt} + \beta_2 dx_{ijt} \times IMP_{jt} + \beta_3 dx_{ijt} \times ATR_{ct} + \beta_4 dx_{ijt} \times GRW_{ct} + \tau_i + \epsilon_{ijt}$$

    IMP - MFN tariffs; Trade-weighted tariffs
    ATR - Incidence of final instance decisions; EBRD index
    GRW - Real GDP growth

  ▷ *Assumption that μ and γ remain constant within the period of differentiation; biased estimates in case of significant fluctuations in returns to scale.*

  ▷ *Tradeoff: poor deflators/instrumental variables vs. constant returns to scale assumption. Transformation of book value capital figures into current replacement cost implies recourse to an aggregate price index in both approaches.*

  ▷ *A befitting link to structural models of competitive interaction (quite rich in terms of uncovering hard facts).*

Data Description

- *Firm-level data − Amadeus (25,267 firms, unbalanced panel).*

- *Product-level data on tariffs/trade flows - WITS/COMTRADE databases.*

- *Final instance decisions - national antitrust authorities' annual reports.*

- *Fairly representative of industrial activity (except for SK).*

- ▷ *Aggregate figures for multi-product firms.*

Summary Statistics

	BG	CZ	EE	HU	PL	SI	SK
Turnover	1008.040	12871.830	975.407	7536.222	14676.910	2954.916	14635.760
	(9975.009)	(52379.480)	(3311.844)	(74867.650)	(54669.980)	(19586.770)	(28334.820)
Fixed Assets	483.883	4722.303	269.682	1816.218	4862.251	1346.853	6665.959
	(4455.636)	(32010.090)	(1323.589)	(16085.500)	(20635.850)	(7271.496)	(18099.540)
Material Cost	533.260	10182.330	648.013	5268.212	6748.621	2106.955	12471.000
	(7347.057)	(66478.150)	(2372.941)	(61147.240)	(27036.970)	(16379.920)	(22537.900)
Personnel Cost	144.391	2116.487	137.042	1247.863	1460.415	570.538	1809.094
	(972.647)	(38189.130)	(386.322)	(38835.340)	(2671.714)	(2562.975)	(2530.738)
Employees	73	291	33	146	241	164	522
	(262.714)	(505.658)	(88.305)	(639.656)	(353.180)	(367.666)	(674.152)

Note: Standard deviations in parentheses; values expressed in thousands of dollars.

Results

Pooled Regressions

	(1)	(2)	(3)	(4)
EBRD index	—	—	-0.129	-0.136
			$(0.045)***$	$(0.045)***$
Final decisions	-0.051	-0.053	—	—
	$(0.025)*$	$(0.025)**$		
Antitrust Effect	*-0.040*	*-0.042*	*-0.083*	*-0.088*
MFN tariff	0.192	—	0.192	—
	$(0.064)***$		$(0.063)***$	
Trade-weighted tariff	—	0.104	—	0.112
		$(0.068)*$		$(0.070)*$
Import Barrier Effect	*0.029*	*0.006*	*0.029*	*0.006*
$\triangle GDP$	-0.315	-0.311	-0.362	-0.362
	$(0.098)***$	$(0.097)***$	$(0.103)***$	$(0.103)***$
Cyclical Effect	*0.008*	*0.007*	*0.009*	*0.009*
R^2	0.687	0.687	0.687	0.687
Observations	*62784*	*62784*	*62784*	*62784*

*Note: Robust standard errors in parentheses. */**/*** indicate significance at 10/5/1 percent, respectively.*

Effects reported at sample means of the relevant interaction terms.

▷ *Joint significance.*

▷ *Import barriers do not seem to dominate the importance of competition policy in influencing the pricing behavior of domestic firms.*

Sub-samples by Export/Import Intensity

	Import-intensive		Export-oriented		Import-intensive		Export-oriented	
EBRD index	—	—	—	—	-0.129 $(0.062)**$	-0.147 $(0.061)**$	-0.086 (0.07)	-0.085 (0.071)
Final decisions	-0.082 $(0.037)**$	-0.085 $(0.037)**$	-0.034 (0.027)	-0.035 (0.027)	—	—	—	—
Antitrust Effect	*-0.068*	*-0.071*	*-0.024*	*-0.025*	*-0.08*	*-0.091*	*-0.055*	*-0.054*
MFN tariff	0.382 $(0.196)*$	—	0.168 $(0.073)**$	—	0.37 $(0.192)*$	—	0.166 $(0.072)**$	—
Trade-weighted tariff	—	0.460 $(0.118)***$	—	-0.046 (0.135)	—	0.463 $(0.124)***$	—	-0.047 (0.136)
Import Barrier Effect	*0.049*	*0.021*	*0.027*	*-0.003*	*0.047*	*0.021*	*0.027*	*-0.003*
$\triangle GDP$	-0.410 $(0.110)***$	-0.392 $(0.103)***$	-0.383 $(0.140)**$	-0.393 $(0.134)***$	-0.43 $(0.098)***$	-0.426 $(0.092)***$	-0.42 $(0.164)**$	-0.428 $(0.160)**$
Cyclical Effect	*0.011*	*0.011*	*0.009*	*0.009*	*0.012*	*0.011*	*0.01*	*0.01*
R^2	0.689	0.689	0.69	0.69	0.689	0.689	0.69	0.69
Observations	19507	19507	20148	20148	19507	19507	20148	20148
Firms	7976	7976	7907	7907	7976	7976	7907	7907

Note: Robust standard errors in parentheses. */**/*** indicate significance at 10/5/1 percent, respectively.

Effects reported at sample means of the relevant interaction terms. Industries defined as import-intensive (export-oriented) if $\frac{Exports}{Imports} \leq 0.85$ (≥ 1.15) throughout the 5-year period.

▷ *Firms in export-oriented industries are fairly unaffected by either policy instrument.*

Dynamic Effects of Antitrust Enforcement

Lagged Incidence of Final Instance Decisions

	Full Sample		Import-intensive		Export-oriented	
Final decisions$_{(t-1)}$	−0.047	−0.048	−0.107	−0.110	−0.010	−0.010
	(0.016)∗∗∗	(0.016)∗∗∗	(0.031)∗∗∗	(0.031)∗∗∗	(0.021)	(0.021)
Antitrust Effect	*-0.034*	*-0.034*	*-0.080*	*-0.082*	*-0.006*	*-0.006*
MFN tariff	0.193	—	0.380	—	0.166	—
	(0.063)∗∗∗		(0.193)∗		(0.072)∗∗	
Trade-weighted tariff	—	0.101	—	0.449	—	−0.053
		(0.067)∗		(0.117)∗∗∗		(0.130)
Import Barrier Effect	*0.029*	*0.006*	*0.049*	*0.021*	*0.027*	*-0.004*
$\triangle GDP$	−0.240	−0.234	−0.248	−0.226	−0.339	−0.347
	(0.092)∗∗	(0.091)∗∗	(0.091)∗∗	(0.085)∗∗	(0.142)∗∗	(0.135)∗∗
Cyclical Effect	*0.006*	*0.006*	*0.007*	*0.006*	*0.008*	*0.008*
R^2	0.687	0.687	0.690	0.689	0.690	0.690
Observations	62784	62784	19507	19507	20148	20148

*Note: Robust standard errors in parentheses. */**/*** indicate significance at 10/5/1 percent, respectively.*

Effects reported at sample means of the relevant interaction terms.

▷ *Ex post correction suggests that the mere launching of proceedings is not perceived as a viable threat.*

▷ *No significant impact on export-oriented industries.*

Threshold Effects

Relaxing the Ranking's Implicit Assumption

	Full Sample		Import-intensive		Export-oriented		Imports ≈ Exports	
EBRD Threshold 1	−0.021	−0.023	−0.033	−0.039	−0.015	−0.015	−0.021	−0.018
	(0.059)	(0.059)	(0.106)	(0.106)	(0.078)	(0.077)	(0.104)	(0.102)
EBRD Threshold 2	−0.047	−0.049	−0.049	−0.056	−0.033	−0.032	−0.066	−0.067
	(0.020)∗∗	(0.020)∗∗	(0.022)∗∗	(0.022)∗∗	(0.027)	(0.027)	(0.034)∗	(0.033)∗
EBRD Threshold 3	−0.167	−0.161	0.000	0.006	0.257	0.313	−0.295	−0.293
	(0.077)∗∗	(0.077)∗∗	(0.113)	(0.111)	(0.073)∗∗∗	(0.084)∗∗∗	(0.156)∗∗	(0.156)∗∗
MFN tariff	0.189	—	0.365	—	0.166	—	0.054	—
	(0.062)∗∗∗		(0.192)∗		(0.073)∗∗		(0.098)	
Trade-weighted tariff	—	0.112	—	0.454	—	−0.038	—	0.034
		(0.07)		(0.121)∗∗∗		(0.141)		(0.119)
Import Barrier Effect	*0.028*	*0.006*	*0.047*	*0.021*	*0.027*	*-0.003*	*0.009*	*0.002*
△GDP	−0.355	−0.353	−0.423	−0.421	−0.412	−0.418	−0.245	−0.245
	(0.111)∗∗∗	(0.112)∗∗∗	(0.107)∗∗∗	(0.103)∗∗∗	(0.172)∗∗	(0.170)∗∗	(0.152)	(0.153)
Cyclical Effect	*0.008*	*0.008*	*0.011*	*0.011*	*0.009*	*0.01*	*0.005*	*0.005*
R^2	0.688	0.688	0.69	0.689	0.69	0.69	0.686	0.687
Observations	62784	62784	19507	19507	20148	20148	23129	23129

Note: Robust standard errors in parentheses. */**/*** indicate significance at 10/5/1 percent, respectively.

▷ *The EBRD index reflects mainly cross-country differences; limited impact of the time dimension.*

Estimates from Country Panels

	BG	CZ	EE	HU	PL	SI	SK
Final decisions	-1.484	-1.008	-0.067	-0.168	-0.243	-0.086	-0.075
	$(0.700)**$	(1.832)	(0.054)	$(0.093)*$	(4.105)	(0.115)	(0.11)
Antitrust Effect	*-0.299*	*-0.179*	*-0.14*	*-0.394*	*-0.037*	*-0.023*	*-0.42*
MFN tariff	0.512	0.307	0.084	0.465	0.221	0.042	1.944
	$(0.195)**$	$(0.156)*$	$(0.032)**$	$(0.137)***$	$(0.127)*$	(0.143)	$(0.514)***$
Import Barrier Effect	*0.109*	*0.019*	*0.001*	*0.055*	*0.08*	*0.005*	*0.147*
$\triangle GDP$	0.252	0.563	-0.103	-0.923	1.908	0.068	1.57
	(0.553)	(1.304)	(0.42)	$(0.353)**$	(2.128)	(0.228)	(0.912)
Cyclical Effect	*-0.004*	*-0.0005*	*-0.001*	*0.04*	*0.0004*	*-0.005*	*-0.028*
R^2	0.538	0.620	0.576	0.635	0.558	0.781	0.548
Final decisions	-1.263	-1.061	-0.069	-0.161	-0.107	-0.093	-0.048
	$(0.807)*$	(1.843)	(0.054)	$(0.091)*$	(4.08)	(0.119)	(0.115)
Antitrust Effect	*-0.255*	*-0.188*	*-0.144*	*-0.378*	*-0.016*	*-0.024*	*-0.269*
Trade-weighted tariff	0.048	0.211	2.952	0.546	0.567	0.017	-0.296
	(0.15)	(0.142)	$(0.659)***$	$(0.049)***$	$(0.195)***$	(0.099)	(0.891)
Import Barrier Effect	*0.005*	*0.006*	*0.005*	*0.03*	*0.038*	*0.0004*	*-0.007*
$\triangle GDP$	0.193	0.602	-0.11	-0.87	1.815	0.058	1.961
	(0.555)	(1.312)	(0.42)	$(0.359)**$	(2.102)	(0.231)	(0.960)
Cyclical Effect	*-0.003*	*-0.001*	*-0.001*	*0.038*	*0.0004*	*-0.004*	*-0.034*
R^2	0.536	0.620	0.575	0.635	0.558	0.781	0.542
Observations	20270	8000	5959	10082	5641	12340	441

Note: Robust standard errors in parentheses. */**/*** indicate significance at 10/5/1 percent, respectively.

Effects reported at sample means of the relevant interaction terms.

Concluding Remarks

- Limited substitutability between import and antitrust regimes.

- Even in small economies, the majority of our sample, trade liberalization alone may not create sufficient conditions for the containment and prevention of market power abuses in the process of economic transformation.

- Internationally competitive firms are less susceptible to indirect threats of strengthened antitrust enforcement.

- The scope for national discretion in competition policy frameworks may have been appropriate in the transition process.