



Gravity analysis of the determinants of Ukrainian exports:

The role of Regional Trade
Agreements

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Structure of the presentation

- Purpose and motivation of the analysis
- Theoretical approach, the model and hypotheses tested
- Results
- Discussion of the results
- Conclusions

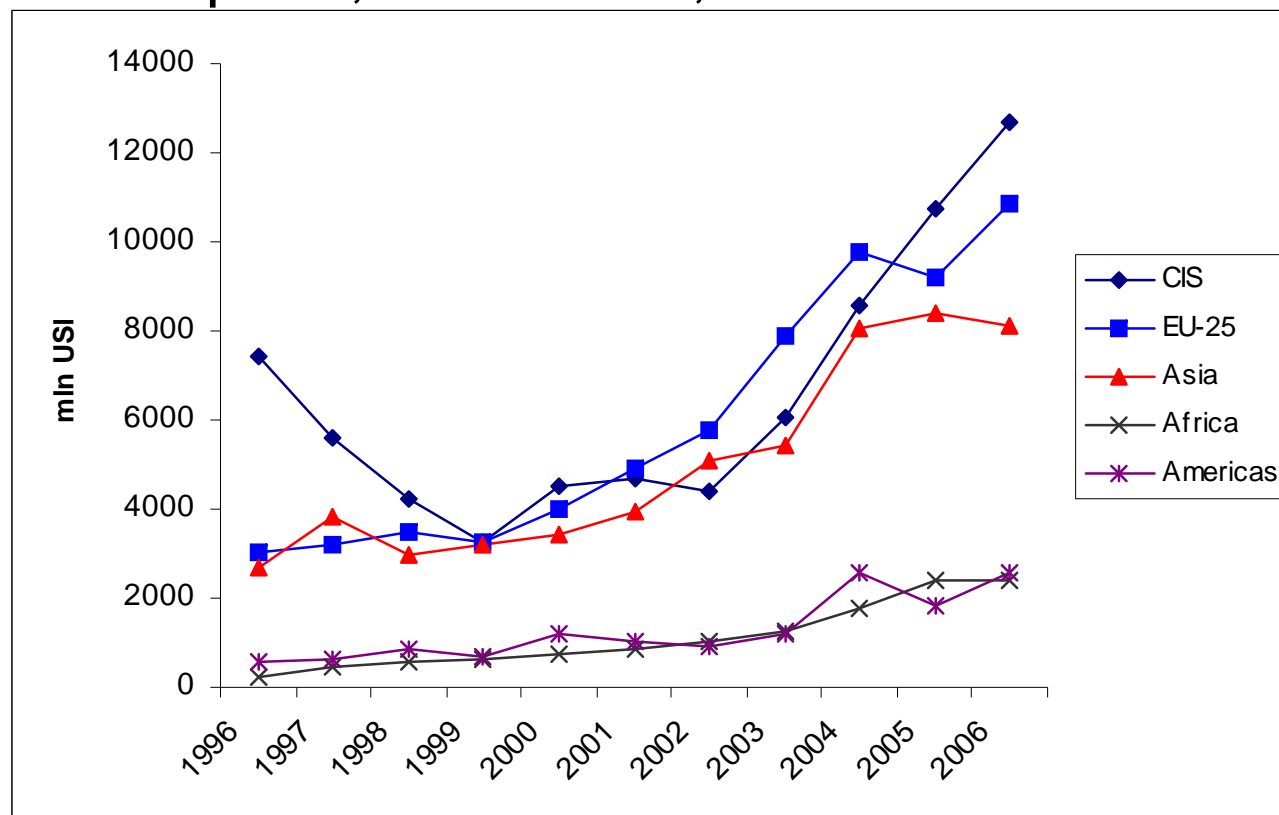


Purpose and motivation of the analysis

- In order to explore the issue of trade reorientation of Ukraine it is important to see
 - How internal or external trade blocs affect the country's export performance, and
 - Whether belonging to the trade bloc improves export performance and whether being excluded from a trade bloc can exert a trade diverting effect
- Gravity model – a traditional tool for seeking answers to such questions

What data says


Ukrainian exports, 1996-2006, mln USD



Source: Ukrainian State Statistics Agency

Geographic distribution of Ukrainian exports, 1996-2006, percent of total

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CIS	51	39	33	28	31	29	24	26	26	31	33
EU-25	21	22	28	28	28	30	32	34	30	27	28
Asia	19	27	24	27	24	24	28	23	25	24	21
Americas	4	5	7	6	8	6	5	5	8	5	7
Others	5	7	9	10	10	10	10	11	11	12	11
Total	100	100	100	100	100	100	100	100	100	100	100

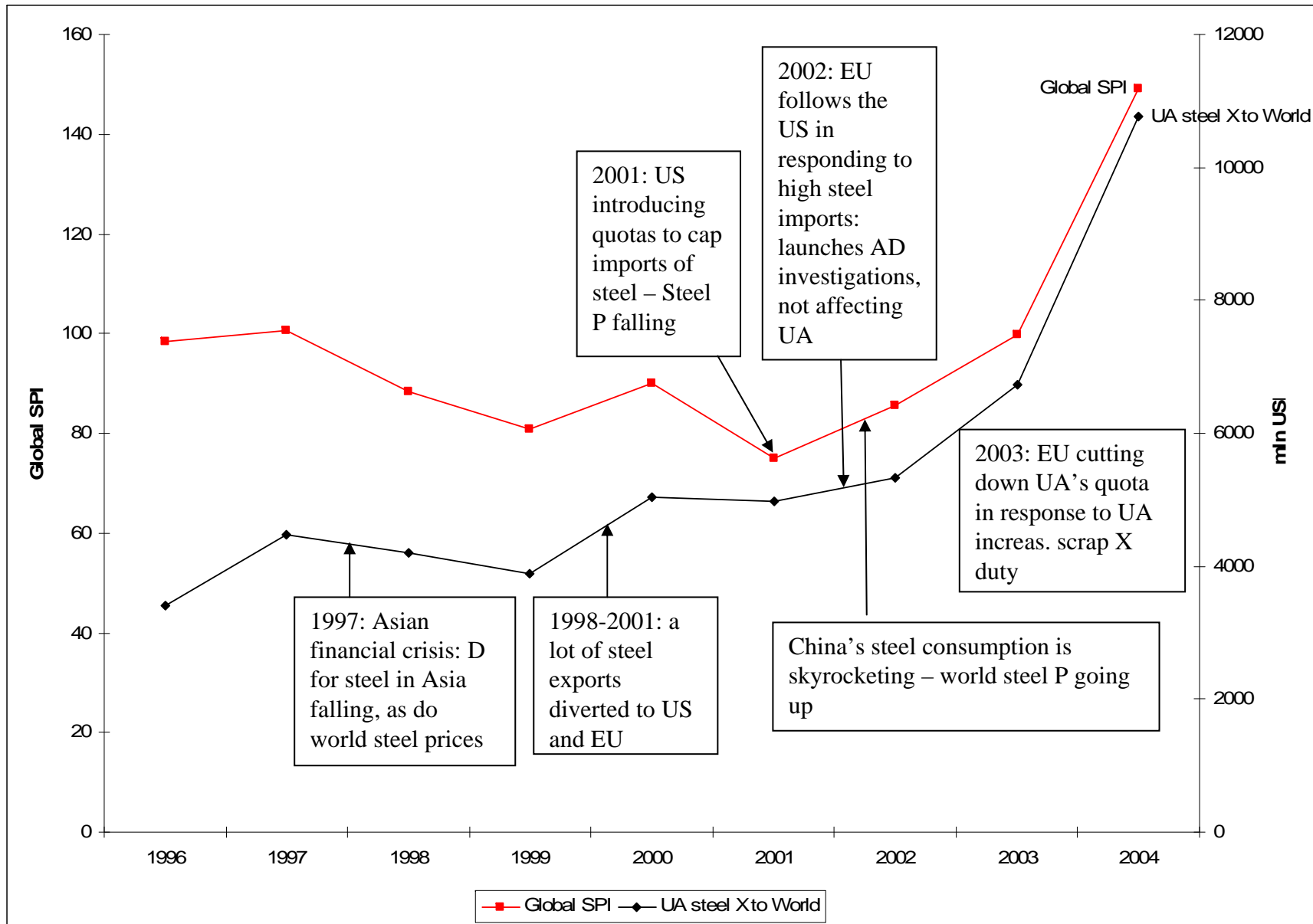


Commodity composition needs to be taken into account: one dominating commodity can cause a bias

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Food and agricultural produce	22.2	13.4	11.8	13.1	10.9	12.4	15	7.7	13.9	14.1
Mineral products	9.7	9.9	10.0	10.7	10.2	11.5	13.1	15.8	13.9	14.1
Chemicals	14.2	13.1	12.5	10.9	12.1	10.5	9.1	9.8	9.7	10.2
Base metals and articles thereof	32.7	41.1	41.8	41.7	43.7	40.8	38.8	35.9	39.3	40.2
Vehicles and transport equipment, Machinery and equipment	14	13.4	13.5	11.3	12.2	13.7	13.4	14	15.2	12.9
Other	7.2	9.3	10.5	12.3	10.1	11.1	10.7	10.6	9.7	8.4
Total	100	100	100	100	100	100	100	100	100	100

Source: Ukrainian State Statistics Agency

Figure 3. Global steel market developments, steel prices, and Ukrainian exports of steel to the World



Source: Steel prices: www.cruspi.com , UA's steel exports – UN Comtrade Database, author's research



Theoretical approach and the model

- Trade blocs proliferating – need to explore the effects of trade blocs on trade flows of either members or those left out (not welfare effects). Vinerian customs theory (Viner, 1950)
- Gravity model becomes a popular tool for this, answering the following questions:
 - Do neighbours trade more with each other → form RTAs?
 - After accounting for neighbour effect – do RTAs increase trade further?
 - Does an RTA result in trade diversion for non-members?
 - Our case: do different commodities behave differently?
- Originally criticised for not being theoretically grounded (rather empirical), but later on derived from trade theories as well (Deardorff, 1998, Evenett and Keller, 2002)



Origin and setting of the gravity model

- Newton's gravity law:

$$F_{ij} = G \frac{M_i^\alpha M_j^\beta}{D_{ij}^\theta}$$

- The model is usually augmented by incl. other fixed country effects (geographic) and the RTAs of interest
- In log-linear form our model looks like:

$$X_{ijt \text{ aggr}} \text{ or } X_{ijt \text{ non-steel}} = \alpha + \beta_1 \text{LPGDP}_{ijt} + \beta_2 \text{LPGDPCAP}_{ijt} + \beta_3 \text{LDIST}_i + \beta_4 \text{BORDER}_{ij} + \beta_5 \text{LPLAND}_{ij} + \beta_6 \text{LANDLOCK}_j + \beta_7 \text{CIS}_{ij} + \beta_8 \text{EUCU}_{jt} + \beta_9 \text{CEFTA}_{jt} + \beta_{10} \text{CHINA} + \varepsilon_{ijt}$$



Setting of the model cont.

- Single-equation (1 x N countries) gravity model, dependent variable – aggregate and non-steel exports from Ukraine to 170 trade partners, 1996-2004, independent – economic and natural effects + RTAs
- 9 (1996-2004) cross-sectional regressions. (Pooled TS – losing variation over time, panel data – dropping time-invariant observations).
- 4 specifications:
 - Economic and natural effects: effect on aggregate and non-steel exports
 - Adding RTAs (in closest proximity, internal and external): effect on aggregate and non-steel exports



Hypotheses

- *H1*: GDP (*LPGDP*) and GDP per capita (*LPGDPCAP*): “+” and around 1
- *H2*: Distance (*LDIST*): “-” and around 1
- *H3*: Common border (*BORDER*): “+”
- *H4*: Bilateral product of geographical areas (*LPLAND*): “-”
- *H5*: Landlockness (*LANDLOCK*): “-”
- *H6*: *CIS*: “+”
- *H7*: *EU CU*: “-”
- *H8*: *CEFTA*: “+/-”

1. Geographic and economic characteristics, dependent variable – total real exports, 1996-2004

Variable	1996	1997	1998	1999	2000	2001	2002	2003	2004
LPGDP	.63***	.70***	.77***	.80***	.86***	.86***	1.13***	1.12***	1.07***
	4.97	5.35	5.73	6.94	7.54	7.28	6.60	8.59	9.52
LPGDPCAP	-0.22	-0.28	-0.25	-.27**	-.42***	-.37***	-.82***	-.81***	-.55***
	-1.24	-1.61	-1.52	-1.79	-2.94	-2.70	-3.81	-4.53	-3.88
LDIST	-1.12***	-1.04***	-1.02***	-.934***	-1.25***	-1.43***	-1.57***	-1.83***	-1.64***
	-5.86	-5.29	-6.13	-6.18	-7.41	-8.70	-8.91	-8.40	-8.59
BORDER	1.4***	1.37***	1.16***	1.19***	.9***	.89***	0.56	0.27	0.52
	2.93	2.91	2.63	2.52	2.11	2.01	1.16	0.54	1.10
LANDLOCK	0.42	0.33	0.49	0.06	-0.14	-0.52	-.72***	-0.67	-0.59
	0.84	0.64	1.06	0.15	-0.33	-1.25	-1.82	-1.55	-1.24
LPLAND	0.02	0.01	-0.14	-.22***	-0.08	-0.06	-.22**	-.28***	-0.12
	0.16	0.07	-1.29	-2.73	-0.89	-0.49	-1.77	-2.32	-1.07
_cons	-2.37	-5.55	-5.44	-4.61	-6.35***	-6.12***	-7.23***	-3.5	-10.8***
	-0.56	-1.43	-1.45	-1.43	-2.03	-1.89	-1.96	-0.81	-2.92
R2	0.51	0.54	0.56	0.57	0.62	0.61	0.64	0.63	0.67
RMSE	1.61	1.56	1.48	1.42	1.49	1.66	1.64	1.78	1.69

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Economic and geographic factors - comments

1. *GDP (LPGDP)* and *distance (LDIST)* are as expected – around 1 and of expected signs. Coeff. on GDP increasing over time – increasing capacity utilisation?
2. *GDP per capita (LPGDPCAP)* negative. Theoretical explanation – countries with similar levels of income will have similar preferences for analogous, but differentiated products (i.e. IIT) → countries with dissimilar levels of income will tend to trade less with each other. (H-O would predict the opposite, if GDP/cap = capital/labour ratio).
3. *Neighbour effect (BORDER)* – indeed positive and significant. Declining – reorientation away from immediate neighbours, esp. Russia and Belarus. Why disappearing since 2002 – see RTA results: CIS effect declining on aggregate X, CEFTA effect disappearing on non-steel X.
4. Some evidence for *bigger countries (LPLAND)* being more self-sufficient and trading less.

2. Geographic and economic characteristics, dependent variable – total NON-STEEL real exports, 1996-2004

Variable	1996	1997	1998	1999	2000	2001	2002	2003	2004
LPGDP	.46***	.50***	.53***	.62***	.71***	.64***	1.27***	1.13***	.93***
	3.16	2.90	2.88	3.41	5.28	3.92	4.24	5.42	6.95
LPGDPCAP	-0.121	-0.11	0.22	-0.17	-0.10	0.14	-.76***	-.57***	-.29**
	-0.60	-0.46	0.89	-0.68	-0.58	0.61	-2.24	-2.10	-1.81
LDIST	-1.33***	-1.67***	-1.27***	-1.5***	-1.47***	-1.75***	-2.08***	-1.6***	-1.74***
	-5.60	-6.68	-5.59	-6.83	-7.67	-7.03	-7.83	-8.09	-8.35
BORDER	1.44***	1.1***	1.38***	0.79	1.02***	1.28***	0.68	1.18***	.87**
	2.82	2.19	2.53	1.53	2.19	2.15	1.04	2.41	1.82
LANDLOCK	0.46	0.23	1.17***	0.24	0.62	0.03	-0.18	-0.07	-0.14
	0.80	0.41	2.01	0.57	1.30	0.04	-0.27	-0.14	-0.27
LPLAND	0.09	0.07	-0.01	-0.06	-0.02	0.12	-0.21	-0.22	-0.04
	0.90	0.52	-0.09	-0.42	-0.16	0.77	-0.94	-1.31	-0.29
_cons	3.51	4.56	-2.91	1.66	-4.92	-6.3	-12.9***	-12***	-9.87***
	0.68	0.91	-0.61	0.40	-1.28	-1.34	-2.12	-2.65	-2.46
R2	0.42	0.48	0.44	0.49	0.57	0.43	0.45	0.58	0.63
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Economic and geographic factors – non-steel X

1. *GDP* – the same effect.
2. *Distance* – stronger negative effect for non-steel products (1.12 – 1.83, here 1.33 – 2.08). Steel transported by sea, distance less important; non-steel – contain perishable (agricultural) goods and dangerous to transport chemicals.
3. *GDP per capita* – significant in less periods. → The higher the level of income of Ukraine's trading partners, the less steel-containing products Ukraine will sell there (US&EU?). Bergstrand (1989): traded commodities tend to be labour-intensive or necessities if importers' per capita income enters with a negative sign.
4. *Neighbour* effect – stronger → higher competitiveness on CIS / CEFTA markets (similarity in tastes, CIS – quality requirements and standards similar)
5. *Geographic size (LPLAND)* – insignificant at all for non-steel exports, i.e. bigger countries tend to be more self-sufficient in steel

3. Adding RTAs, dependent variable – total real exports, 1996-2004

Variable	1996	1997	1998	1999	2000	2001	2002	2003	2004
LPGDP	.64***	.73***	.79***	.81***	.88***	.9***	1.16***	1.17***	1.12***
	5.02	5.30	5.47	6.78	7.46	7.21	6.53	8.54	9.28
LPGDPCAP	-0.14	-0.21	-0.17	-0.21	-0.36***	-.32***	-.79***	-.75***	-.50***
	-0.84	-1.21	-1.05	-1.37	-2.43	-2.35	-3.47	-4.10	-3.55
LDIST	-.96***	-.94***	-.92***	-.8***	-1.14***	-1.35***	-1.53***	-1.87***	-1.68***
	-4.49	-4.20	-4.84	-4.80	-6.03	-7.35	-7.82	-7.99	-7.29
BORDER	0.75	0.72	0.28	0.31	-0.14	-0.16	-0.02	-0.37	0.10
	1.52	1.22	0.56	0.55	-0.24	-0.26	-0.03	-0.63	0.15
LANDLOCK	-0.49	-0.31	-0.24	-0.51	-.68**	-.99***	-1***	-.93***	-.92**
	-1.12	-0.62	-0.62	-1.43	-1.63	-2.39	-2.46	-2.10	-1.86
LPLAND	-0.02	-0.03	-0.16	-.242***	-0.09	-0.08	-.24***	-.30***	-0.14
	-0.20	-0.30	-1.43	-3.06	-1.01	-0.65	-1.87	-2.51	-1.31
EUCU	0.08	-0.27	-0.23	-0.21	-0.44	-0.69	-0.59	-1.1***	-0.73
	0.18	-0.61	-0.51	-0.45	-1.03	-1.50	-1.30	-2.54	-1.54
CIS	2.82***	2.37***	2.52***	2.45***	2.32***	2.24***	1.66***	1.57***	1.83***
	5.89	3.73	4.77	5.07	4.20	4.34	3.45	3.01	3.71
CEFTA	0.93	0.47	0.91	0.85	1.05	0.87	0.08	-0.10	-0.20
	1.35	0.64	1.47	1.19	1.47	1.24	0.13	-0.17	-0.29
CHINA	2.49***	2.18***	2.14***	2.13***	1.02***	.68**	-0.01	0.53	-0.32
	6.16	5.61	5.38	5.61	2.98	1.72	-0.02	1.06	-0.83
_cons	-4.48	-7.94***	-7.74***	-6.76***	-9.31***	-9.22***	-9.59***	-6.02	-12.4***
	-1.03	-2.00	-1.96	-2.09	-2.92	-2.67	-2.43	-1.26	-3.13
R2	0.59	0.59	0.62	0.63	0.66	0.64	0.65	0.65	0.69
RMSE	1.48	1.46	1.38	1.31	1.41	1.59	1.62	1.75	1.62

3. Adding RTAs, dependent variable – total real exports, 1996-2004

Variable	1996	1997	1998	1999	2000	2001	2002	2003	2004
LPGDP	.64***	.73***	.79***	.81***	.88***	.9***	1.16***	1.17***	1.12***
	5.02	5.30	5.47	6.78	7.46	7.21	6.53	8.54	9.28
LPGDPCAP	-0.14	-0.21	-0.17	-0.21	-0.36***	-.32***	-.79***	-.75***	-.50***
	-0.84	-1.21	-1.05	-1.37	-2.43	-2.35	-3.47	-4.10	-3.55
LDIST	-.96***	-.94***	-.92***	-.8***	-1.14***	-1.35***	-1.53***	-1.87***	-1.68***
	-4.49	-4.20	-4.84	-4.80	-6.03	-7.35	-7.82	-7.99	-7.29
BORDER	0.75	0.72	0.28	0.31	-0.14	-0.16	-0.02	-0.37	0.10
	1.52	1.22	0.56	0.55	-0.24	-0.26	-0.03	-0.63	0.15
LANDLOCK	-0.49	-0.31	-0.24	-0.51	-.68**	-.99***	-1***	-.93***	-.92**
	-1.12	-0.62	-0.62	-1.43	-1.63	-2.39	-2.46	-2.10	-1.86
LPLAND	-0.02	-0.03	-0.16	-.242***	-0.09	-0.08	-.24***	-.30***	-0.14
	-0.20	-0.30	-1.43	-3.06	-1.01	-0.65	-1.87	-2.51	-1.31
EUCU	0.08	-0.27	-0.23	-0.21	-0.44	-0.69	-0.59	-1.1***	-0.73
	0.18	-0.61	-0.51	-0.45	-1.03	-1.50	-1.30	-2.54	-1.54
CIS	2.82***	2.37***	2.52***	2.45***	2.32***	2.24***	1.66***	1.57***	1.83***
	5.89	3.73	4.77	5.07	4.20	4.34	3.45	3.01	3.71
CEFTA	0.93	0.47	0.91	0.85	1.05	0.87	0.08	-0.10	-0.20
	1.35	0.64	1.47	1.19	1.47	1.24	0.13	-0.17	-0.29
CHINA	2.49***	2.18***	2.14***	2.13***	1.02***	.68**	-0.01	0.53	-0.32
	6.16	5.61	5.38	5.61	2.98	1.72	-0.02	1.06	-0.83
_cons	-4.48	-7.94***	-7.74***	-6.76***	-9.31***	-9.22***	-9.59***	-6.02	-12.4***
	-1.03	-2.00	-1.96	-2.09	-2.92	-2.67	-2.43	-1.26	-3.13
R2	0.59	0.59	0.62	0.63	0.66	0.64	0.65	0.65	0.69
RMSE	1.48	1.46	1.38	1.31	1.41	1.59	1.62	1.75	1.63

3. Adding RTAs, dependent variable – total real exports, 1996-2004

Variable	1996	1997	1998	1999	2000	2001	2002	2003	2004
LPGDP	.64***	.73***	.79***	.81***	.88***	.9***	1.16***	1.17***	1.12***
	5.02	5.30	5.47	6.78	7.46	7.21	6.53	8.54	9.28
LPGDPCAP	-0.14	-0.21	-0.17	-0.21	-0.36***	-.32***	-.79***	-.75***	-.50***
	-0.84	-1.21	-1.05	-1.37	-2.43	-2.35	-3.47	-4.10	-3.55
LDIST	-.96***	-.94***	-.92***	-.8***	-1.14***	-1.35***	-1.53***	-1.87***	-1.68***
	-4.49	-4.20	-4.84	-4.80	-6.03	-7.35	-7.82	-7.99	-7.29
BORDER	0.75	0.72	0.28	0.31	-0.14	-0.16	-0.02	-0.37	0.10
	1.52	1.22	0.56	0.55	-0.24	-0.26	-0.03	-0.63	0.15
LANDLOCK	-0.49	-0.31	-0.24	-0.51	-.68**	-.99***	-1***	-.93***	-.92**
	-1.12	-0.62	-0.62	-1.43	-1.63	-2.39	-2.46	-2.10	-1.86
LPLAND	-0.02	-0.03	-0.16	-.242***	-0.09	-0.08	-.24***	-.30***	-0.14
	-0.20	-0.30	-1.43	-3.06	-1.01	-0.65	-1.87	-2.51	-1.31
EUCU	0.08	-0.27	-0.23	-0.21	-0.44	-0.69	-0.59	-1.1***	-0.73
	0.18	-0.61	-0.51	-0.45	-1.03	-1.50	-1.30	-2.54	-1.54
CIS	2.82***	2.37***	2.52***	2.45***	2.32***	2.24***	1.66***	1.57***	1.83***
	5.89	3.73	4.77	5.07	4.20	4.34	3.45	3.01	3.71
CEFTA	0.93	0.47	0.91	0.85	1.05	0.87	0.08	-0.10	-0.20
	1.35	0.64	1.47	1.19	1.47	1.24	0.13	-0.17	-0.29
CHINA	2.49***	2.18***	2.14***	2.13***	1.02***	.68**	-0.01	0.53	-0.32
	6.16	5.61	5.38	5.61	2.98	1.72	-0.02	1.06	-0.83
_cons	-4.48	-7.94***	-7.74***	-6.76***	-9.31***	-9.22***	-9.59***	-6.02	-12.4***
	-1.03	-2.00	-1.96	-2.09	-2.92	-2.67	-2.43	-1.26	-3.13
R2	0.59	0.59	0.62	0.63	0.66	0.64	0.65	0.65	0.69
RMSE	1.48	1.46	1.38	1.31	1.41	1.59	1.62	1.75	1.63

3. Adding RTAs, dependent variable – total real exports, 1996-2004

Variable	1996	1997	1998	1999	2000	2001	2002	2003	2004
LPGDP	.64***	.73***	.79***	.81***	.88***	.9***	1.16***	1.17***	1.12***
	5.02	5.30	5.47	6.78	7.46	7.21	6.53	8.54	9.28
LPGDPCAP	-0.14	-0.21	-0.17	-0.21	-0.36***	-.32***	-.79***	-.75***	-.50***
	-0.84	-1.21	-1.05	-1.37	-2.43	-2.35	-3.47	-4.10	-3.55
LDIST	-.96***	-.94***	-.92***	-.8***	-1.14***	-1.35***	-1.53***	-1.87***	-1.68***
	-4.49	-4.20	-4.84	-4.80	-6.03	-7.35	-7.82	-7.99	-7.29
BORDER	0.75	0.72	0.28	0.31	-0.14	-0.16	-0.02	-0.37	0.10
	1.52	1.22	0.56	0.55	-0.24	-0.26	-0.03	-0.63	0.15
LANDLOCK	-0.49	-0.31	-0.24	-0.51	-.68**	-.99***	-1***	-.93***	-.92**
	-1.12	-0.62	-0.62	-1.43	-1.63	-2.39	-2.46	-2.10	-1.86
LPLAND	-0.02	-0.03	-0.16	-.242***	-0.09	-0.08	-.24***	-.30***	-0.14
	-0.20	-0.30	-1.43	-3.06	-1.01	-0.65	-1.87	-2.51	-1.31
EUCU	0.08	-0.27	-0.23	-0.21	-0.44	-0.69	-0.59	-1.1***	-0.73
	0.18	-0.61	-0.51	-0.45	-1.03	-1.50	-1.30	-2.54	-1.54
CIS	2.82***	2.37***	2.52***	2.45***	2.32***	2.24***	1.66***	1.57***	1.83***
	5.89	3.73	4.77	5.07	4.20	4.34	3.45	3.01	3.71
CEFTA	0.93	0.47	0.91	0.85	1.05	0.87	0.08	-0.10	-0.20
	1.35	0.64	1.47	1.19	1.47	1.24	0.13	-0.17	-0.29
CHINA	2.49***	2.18***	2.14***	2.13***	1.02***	.68**	-0.01	0.53	-0.32
	6.16	5.61	5.38	5.61	2.98	1.72	-0.02	1.06	-0.83
_cons	-4.48	-7.94***	-7.74***	-6.76***	-9.31***	-9.22***	-9.59***	-6.02	-12.4***
	-1.03	-2.00	-1.96	-2.09	-2.92	-2.67	-2.43	-1.26	-3.13
R2	0.59	0.59	0.62	0.63	0.66	0.64	0.65	0.65	0.69
RMSE	1.48	1.46	1.38	1.31	1.41	1.59	1.62	1.75	1.63



Effect of internal and external RTAs, economic and geographic factors controlled, comments

1. *GDP, GDP per capita and distance* – similar effect
2. *Neighbour* effect disappears – goes to CIS.
3. *Landlockness* becomes strong and significant.
4. Strongest positive effect of *CIS*. Common language, lower cultural and social barriers, similar tastes, standards, integrated production links. Declines until 2003, up again in 2004.
5. *EU CU*: always negative and significant in 2003. (will see why next). Literature: EU customs union has generated substantial increase in intra-regional trade, often *at the expense* of the rest of the world (e.g. Carrere, 2006; Soloaga and Winters, 2001; Frankel Jeffrey et al., 1997). Ukraine – Maryanchuk finds “+” EU effect, but on average trade, not X
6. *CEFTA* – positive and turns negative in 2003, but insignificant.
7. *China*: second strongest effect after CIS, strongly positive, but consistently declining.
Shedding more light by comparing with non-steel...

4. Adding RTAs, dependent variable – total real NON-STEEL exports, 1996-2004

Variable	1996	1997	1998	1999	2000	2001	2002	2003	2004
LPGDP	.42*** 2.86	.50*** 2.72	.54*** 2.70	.62*** 3.25	.72*** 5.00	.64*** 3.75	1.28*** 4.10	1.17*** 5.40	.96*** 6.67
LPGDP	-0.07 -0.34	-0.06 -0.26	0.27 1.09	-0.16 -0.61	-0.04 -0.26	0.20 0.84	-.73*** -2.08	-.54*** -1.89	-0.26 -1.59
LDIST	-1.01*** -3.99	-1.41*** -5.54	-1.02*** -3.88	-1.25*** -5.32	-1.25*** -5.68	-1.46*** -5.08	-1.81*** -5.58	-1.42*** -5.89	-1.57*** -6.10
BORDER	0.80 1.50	0.30 0.44	0.25 0.45	0.02 0.04	-0.15 -0.27	-0.16 -0.23	-0.33 -0.42	0.13 0.21	0.38 0.60
LANDLOCK	-0.50 -0.90	-0.55 -1.01	0.12 0.25	-0.35 -0.88	-0.04 -0.10	-0.80 -1.03	-0.69 -1.00	-0.59 -1.14	-0.67 -1.26
LPLAND	0.06 0.61	0.03 0.22	-0.04 -0.27	-0.08 -0.55	-0.03 -0.26	0.10 0.65	-0.23 -0.99	-0.24 -1.40	-0.06 -0.49
EU CU	1.01*** 1.99	0.51 1.10	0.45 0.80	0.58 1.15	0.11 0.21	0.14 0.24	0.21 0.31	-0.27 -0.50	0.00 0.00
CIS	3.06*** 5.81	2.85*** 4.45	3.36*** 5.35	2.47*** 4.92	2.81*** 5.21	3.53*** 4.21	2.98*** 3.83	2.76*** 4.88	2.59*** 4.79
CEFTA	1.65*** 2.23	1.2 1.43	1.68*** 2.51	1.18*** 2.03	1.54*** 2.32	1.9*** 2.36	1.09 1.40	0.95 1.39	0.27 0.32
CHINA	2.69*** 5.50	2.29*** 3.73	1.8*** 2.85	0.80 1.36	1.14*** 2.67	1.83*** 3.10	0.47 0.64	-0.32 -0.62	0.04 0.11
_cons	2.41 0.45	2.65 0.49	-5.56 -1.07	-0.08 -0.02	-7.76*** -1.95	-9.53*** -1.87	-15.7*** -2.36	-15.5*** -3.20	-12.5*** -2.91
R2	0.50	0.53	0.49	0.52	0.60	0.46	0.46	0.61	0.66
RMSE	1.79	1.88	2.07	1.81	1.73	2.7	3	2.01	1.8

4. Adding RTAs, dependent variable – total real NON-STEEL exports, 1996-2004

Variable	1996	1997	1998	1999	2000	2001	2002	2003	2004
LPGDP	.42***	.50***	.54***	.62***	.72***	.64***	1.28***	1.17***	.96***
	2.86	2.72	2.70	3.25	5.00	3.75	4.10	5.40	6.67
LPGDP	-0.07	-0.06	0.27	-0.16	-0.04	0.20	-.73***	-.54***	-0.26
	-0.34	-0.26	1.09	-0.61	-0.26	0.84	-2.08	-1.89	-1.59
LDIST	-1.01***	-1.41***	-1.02***	-1.25***	-1.25***	-1.46***	-1.81***	-1.42***	-1.57***
	-3.99	-5.54	-3.88	-5.32	-5.68	-5.08	-5.58	-5.89	-6.10
BORDER	0.80	0.30	0.25	0.02	-0.15	-0.16	-0.33	0.13	0.38
	1.50	0.44	0.45	0.04	-0.27	-0.23	-0.42	0.21	0.60
LANDLOCK	-0.50	-0.55	0.12	-0.35	-0.04	-0.80	-0.69	-0.59	-0.67
	-0.90	-1.01	0.25	-0.88	-0.10	-1.03	-1.00	-1.14	-1.26
LPLAND	0.06	0.03	-0.04	-0.08	-0.03	0.10	-0.23	-0.24	-0.06
	0.61	0.22	-0.27	-0.55	-0.26	0.65	-0.99	-1.40	-0.49
EU CU	1.01***	0.51	0.45	0.58	0.11	0.14	0.21	-0.27	0.00
	1.99	1.10	0.80	1.15	0.21	0.24	0.31	-0.50	0.00
CIS	3.06***	2.85***	3.36***	2.47***	2.81***	3.53***	2.98***	2.76***	2.59***
	5.81	4.45	5.35	4.92	5.21	4.21	3.83	4.88	4.79
CEFTA	1.65***	1.2	1.68***	1.18***	1.54***	1.9***	1.09	0.95	0.27
	2.23	1.43	2.51	2.03	2.32	2.36	1.40	1.39	0.32
CHINA	2.69***	2.29***	1.8***	0.80	1.14***	1.83***	0.47	-0.32	0.04
	5.50	3.73	2.85	1.36	2.67	3.10	0.64	-0.62	0.11
_cons	2.41	2.65	-5.56	-0.08	-7.76***	-9.53***	-15.7***	-15.5***	-12.5***
	0.45	0.49	-1.07	-0.02	-1.95	-1.87	-2.36	-3.20	-2.91
R2	0.50	0.53	0.49	0.52	0.60	0.46	0.46	0.61	0.66
RMSE	1.79	1.88	2.07	1.81	1.73	2.7	3	2.01	1.8

4. Adding RTAs, dependent variable – total real NON-STEEL exports, 1996-2004

Variable	1996	1997	1998	1999	2000	2001	2002	2003	2004
LPGDP	.42***	.50***	.54***	.62***	.72***	.64***	1.28***	1.17***	.96***
	2.86	2.72	2.70	3.25	5.00	3.75	4.10	5.40	6.67
LPGDP	-0.07	-0.06	0.27	-0.16	-0.04	0.20	-.73***	-.54***	-0.26
	-0.34	-0.26	1.09	-0.61	-0.26	0.84	-2.08	-1.89	-1.59
LDIST	-1.01***	-1.41***	-1.02***	-1.25***	-1.25***	-1.46***	-1.81***	-1.42***	-1.57***
	-3.99	-5.54	-3.88	-5.32	-5.68	-5.08	-5.58	-5.89	-6.10
BORDER	0.80	0.30	0.25	0.02	-0.15	-0.16	-0.33	0.13	0.38
	1.50	0.44	0.45	0.04	-0.27	-0.23	-0.42	0.21	0.60
LANDLOCK	-0.50	-0.55	0.12	-0.35	-0.04	-0.80	-0.69	-0.59	-0.67
	-0.90	-1.01	0.25	-0.88	-0.10	-1.03	-1.00	-1.14	-1.26
LPLAND	0.06	0.03	-0.04	-0.08	-0.03	0.10	-0.23	-0.24	-0.06
	0.61	0.22	-0.27	-0.55	-0.26	0.65	-0.99	-1.40	-0.49
EU CU	1.01***	0.51	0.45	0.58	0.11	0.14	0.21	-0.27	0.00
	1.99	1.10	0.80	1.15	0.21	0.24	0.31	-0.50	0.00
CIS	3.06***	2.85***	3.36***	2.47***	2.81***	3.53***	2.98***	2.76***	2.59***
	5.81	4.45	5.35	4.92	5.21	4.21	3.83	4.88	4.79
CEFTA	1.65***	1.2	1.68***	1.18***	1.54***	1.9***	1.09	0.95	0.27
	2.23	1.43	2.51	2.03	2.32	2.36	1.40	1.39	0.32
CHINA	2.69***	2.29***	1.8***	0.80	1.14***	1.83***	0.47	-0.32	0.04
	5.50	3.73	2.85	1.36	2.67	3.10	0.64	-0.62	0.11
_cons	2.41	2.65	-5.56	-0.08	-7.76***	-9.53***	-15.7***	-15.5***	-12.5***
	0.45	0.49	-1.07	-0.02	-1.95	-1.87	-2.36	-3.20	-2.91
R2	0.50	0.53	0.49	0.52	0.60	0.46	0.46	0.61	0.66
RMSE	1.79	1.88	2.07	1.81	1.73	2.7	3	2.01	1.8



Effect of internal and external RTAs, economic and geographic factors controlled – NON-STEEL exports

1. *GDP per capita* again less significant with non-steel products. Bias towards lower-income countries in steel trade.
2. *Landlockness* again significant only for steel exports.
3. *CIS*: consistently positive, no declining trend → non-steel products more competitive on CIS markets; declining positive effect on steel due to Russia's increasing self-sufficiency with production of steel pipes. Divergence in coefficients – with steel declining, while with non-steel stays strongly positive → diversification and lower vulnerability to external shocks.
4. *EU CU* – no negative effect, positive in 1996 and insignificantly positive thereafter. → Steel quotas suppressing a potentially positive effect. But, comparing with CEFTA – underperforming (barriers in chemicals, agriculture?).
5. *CEFTA*: strong positive effect 1996-2001 → non-steel products perform better. Why steel under-performs? HU, CZ, SK, PL have their own steel capacities of similar quality. Price increases when transported by land.
 1. Why disappearing since 2001? Biggest decline – mineral fuels. Diversification to other countries. Petroleum – increased X to Singapore, Switzerland, Turkey, Baltic States. Decline in coal/coke exports to CEFTA. (Increased IT, DE, RU).
 2. China: similar trends as with steel exports, i.e. it is not China's growing production of steel responsible for the declining trend – import substituting growth?



Conclusions

- Neighbour effect significantly increases trade, but less than (internal) trade blocs do.
- Distance indeed looks as a biggest natural barrier to trade
- With neighbouring, but external trade blocs trade is suppressed – scope for further reorientation
 - Steel substantially undersells to the EU and CEFTA. With CEFTA – structural reasons, while the EU – policy imposed barriers;
 - Non-steel products: strong positive performance with CEFTA (but loosing ground with refined oil products). EU CU, underperformance could result from either uncompetitiveness, or from barriers in other sensitive sectors (steel, agriculture);
- Significant CEFTA/ insignificant EU CU effect on non-steel exports could be an indirect evidence of trade diversion, but not enough time series to see the dynamics