Gravity analysis of the determinants of Ukrainian exports: the role of regional trade arrangements

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Evghenia Sleptsova

Centre for Russian and East European Studies, University of Birmingham[1]

Introduction

Ukraine has experienced significant changes in geographical structure of its exports, with the EU gaining a dominant share as a trading partner. The trends, however, have not been so straightforward, as trade is on the rise with CIS and Asian economies as well. Applying a traditional tool for analysing regional trade effects, the gravity model, we are trying to decompose the effects of various RTAs, at the same time controlling for trade protectionism measures. The latter exercise is more accurate in one-equation setting employed here, as it allows decomposing regional effects in a way that would be difficult to explore in a multi-country gravity model. We do this in order to clarify the conflicting findings in the literature about over- or under-performance of Ukraine trade with western or eastern trade blocs and to point out aspects in external trade policy of Ukraine, which require early attention of policy makers.

In section I we provide background information on trade, economic growth and exchange rate trends in Ukraine and their possible interaction. In section II we present the theoretical approach, followed by model and data description in sections III and IV. Section V includes discussion of the results, which are further summed up in Policy discussion and conclusions section.

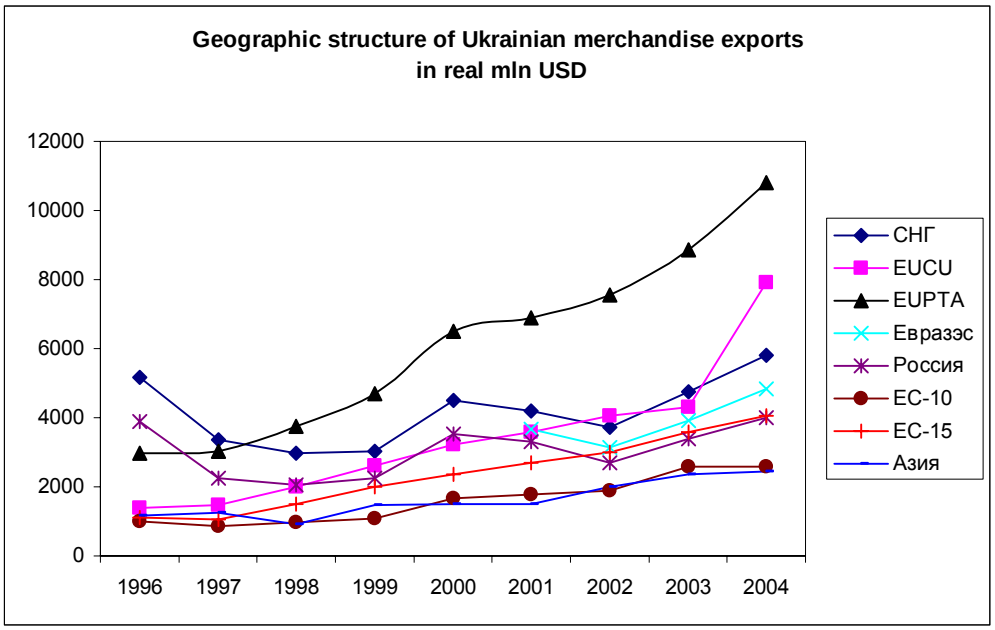
I. Background information

After the 2004 enlargement of the EU, the European Union became the top importer of Ukrainian products, followed by CIS (where Russia accounts for over 70 percent).

[1] Draft version, not to be cited.

The figure below plots the trends in Ukrainian exports by destination markets, laid out in a perspective pursued in our analysis, i.e. by Western vector, broken down as: EU-15, EU-10, EU CU (EU Customs Union, which included 16 countries until 2004, and another 10 henceforth), countries that have preferential trade agreement with the EU, and Eastern vector: CIS (Commonwealth of Independent States, 12 former Soviet republics), Russia (to demonstrate the high correlation, and that CIS data is mainly comprised of Russia) and Eurasec (Eurasian Economic Union, which includes Russia, Kazakhstan, Belarus, Tajikistan and Kyrgyzstan). Again, its high correlation with Russian data shows that Russia dominates as a partner in this Union.

Figure 1.

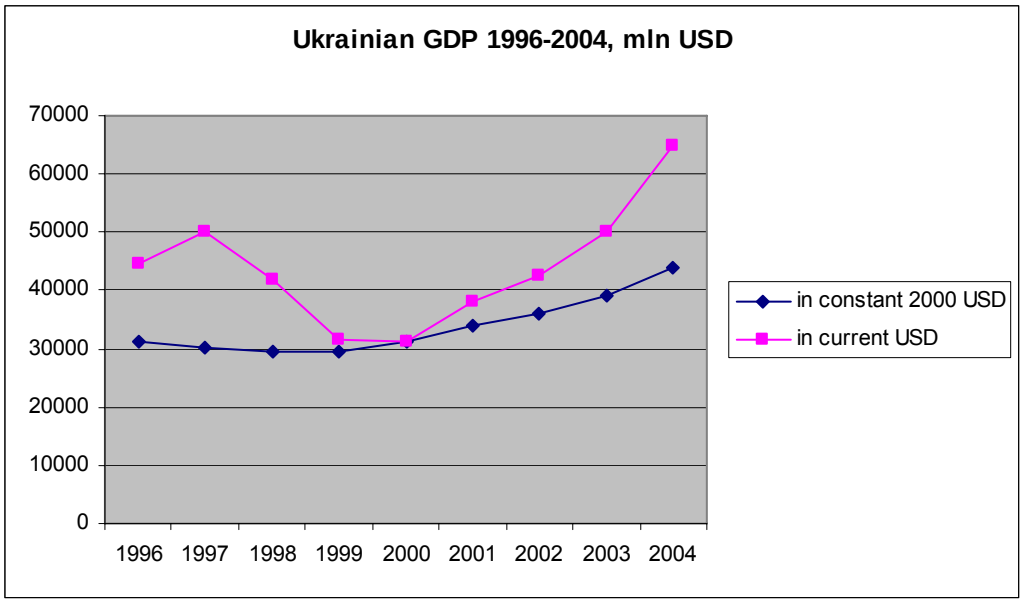


Source: IMF DOTS, own calculations.

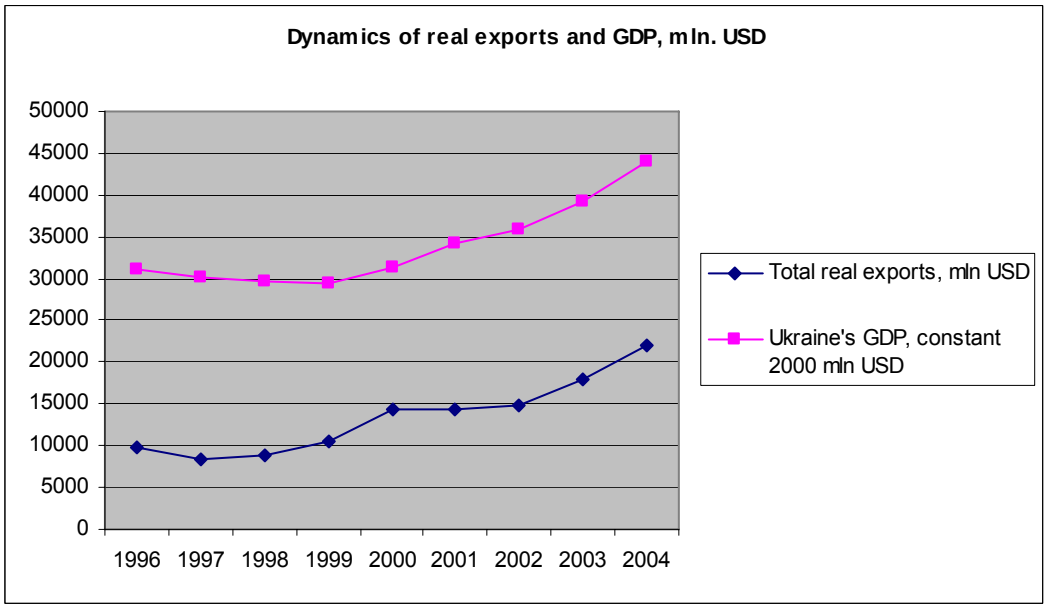
As can be seen, between 2000 and 2002 exports to Russia and CIS have experienced a decline, mainly as a delayed effect of Russian 1998 financial crisis, which led to a severe devaluation of Ukrainian local currency (hryvnya), but even more so of Russian rouble, and caused partial redirection of Ukrainian exports towards countries offering better terms of trade. Thus, exports to the EU-15, EU-10 and to the countries that have PTAs with the EU continued to grow.

Since one of the main explanatory variables in gravity-type models is GDP, the trend in real exports is compared below to the trend in real GDP (in constant 2000 US dollars), as is the growth rate.

Figure 3.



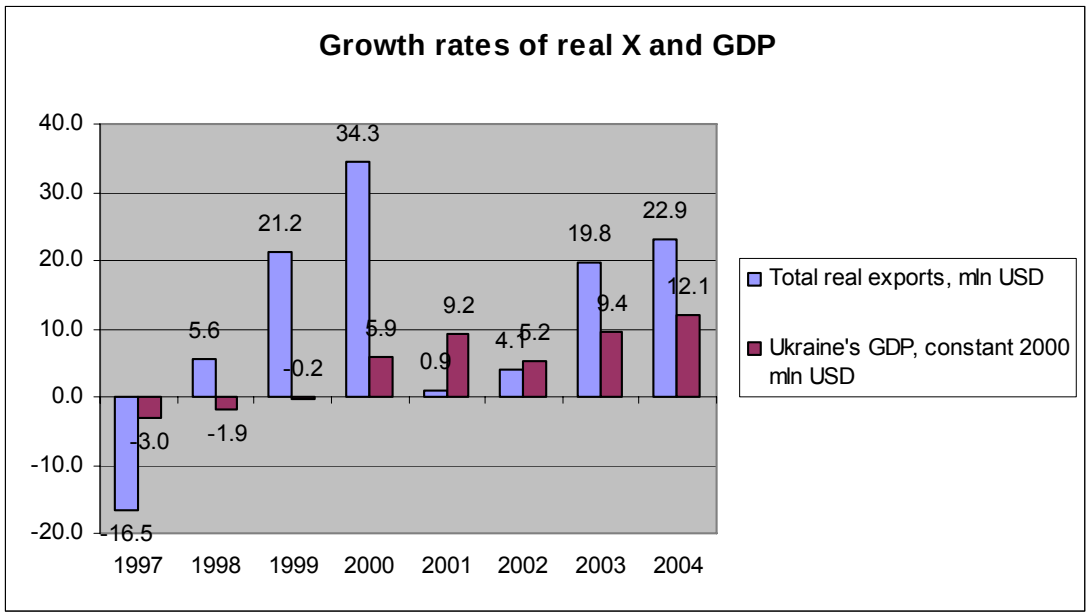
Source: World Development Indicators for GDP data, IMF DOTS for exports



Source: World Development Indicators for GDP data, IMF DOTS for exports

The link is not so straightforward when the growth rates are considered (Figure 4 below). Some lagged effect can be observed, but it is not clear whether the reduction in negative GDP growth rates from 1997 to 2000 positively affected exports, or on the contrary – whether growth of exports led to GDP growth.

Figure 4.



Source: World Development Indicators for GDP data, IMF DOTS for exports, own calculations

An important element in the evolution of Ukrainian exports was the fluctuation of the real exchange rate of Ukrainian hryvnya (UAH). Figure 5 below shows the dynamics of real effective exchange rates of UAH and of Russian ruble for the sake of comparison. As can be seen, Ukrainian hryvnya's evolution mirrors that of Russian ruble: both currencies were appreciating up to 1998, which should have imposed a downward pressure on exports, in 1998 Russia defaulted on all its foreign debt obligations invoking a sharp depreciation of Russian ruble; since Russia was the main economic partner for most CIS members, including Ukraine, maintaining stability of their local currencies was not only unfeasible for their foreign exchange reserves, but would make exporting to Russia impossible – therefore Ukraine allowed hryvnya to float and depreciate in line with Russian ruble. However, still heavier depreciation of Russian ruble relative to Ukrainian hryvnya had a dampening effect on Ukrainian exports to Russia, as was shown in the Figure 5. Therefore, although this test is not covered in our model, growth rates of aggregate Ukrainian exports seem to follow the dynamics of the exchange rate – increasing sharply when local currency depreciates (1998-2000), and slowing down when the currency appreciates (2001-2002). At the same time, since 2002 the National Bank of Ukraine has been following a policy of fixed exchange rate, which, as theories promoting stable exchange rates would predict, seems to have had a positive effect on the growth of exports.

Figure 5. Log real effective exchange rates (CPI-based)

Source: (Egert et al., 2006)

Given these mixed trends in geographical distribution of Ukrainian exports, and an unclear evidence of their causes, in this paper we will apply a traditional ex-post approach to analysing trade flows – the gravity model, to explore the role of determinants, which have proved in numerous studies to explain most of the variation in trade – GDP and GDP per capita of partners, distance between them, size of the countries, adjacency or lack of common border and common language. These are the conventional variables of the gravity model. The ultimate aim of the analysis, though, is to disentangle the effects of regional trade groupings of immediate concern to Ukraine – the CIS, with its network of bilateral free trade agreements, and the EU, as a big neighbouring bloc granting duty-free access to the insiders and preferential trade partners, and potentially causing a trade diversion effect to the outsiders. Hence, not expecting the model to explain all of the variation in exports, we are focusing on the trade bloc effects, holding for other effects, including exchange rate, constant.

II. Theoretical approach

The main focus of our analysis is the role of regional trade groupings in determining exporting activity of Ukraine, distinguishing between external trade blocs – EU as the most important one, and internal trade blocs, which in case of Ukraine are CIS with its network of bilateral and multilateral free trade agreements, and GUUAM, the political and economic union between Georgia, Ukraine, Uzbekistan (which dropped out in 2005), Azerbaijan and Moldova. With internal trade blocs we expect to find a positive association with Ukraine's exports, while with external blocs, without strong expectations, we are exploring the effect of increasing EU internal market on Ukraine as a non-member, but located in close proximity to the EU. On the one hand, there should be a positive trend due to restoration of more natural levels of trade after the collapse of the Soviet system, but on the other hand the customs theory, proposed by Viner (1950), posits that when enlargement of a customs union takes place, trade may either be created, if accessing countries are more efficient than non-members, or diverted from non-members, if they had been more efficient producers prior to creation of a customs union. And this is what we are trying to see concerning the EU. This effect has mostly been investigated by means of the gravity model, which, although having had experienced certain criticism and improvements in specifications, even in its simple form remains a valid way of highlighting positive or negative effects of belonging to or being a third country for particular trade blocs.

Gravity model has been one of the most proliferate approaches to modelling trade flows, both due to its simplicity and empirical success. It gained its name from Newton's gravity law that states that the gravity between two bodies is proportional to their masses and inversely related to the distance between them. Therefore, in its basic form the model in relation to trade looks like:

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

where F_{ij} is a trade flow between countries i and j (varies in different studies, either the total trade turnover, or imports and/or exports separately), M are the economic sizes of countries i and j (usually measured by GDP or GNP), and D is the distance between them (usually measured from capital to capital) and G is a gravitational constant (as specified in Head (2003)).

In log-linear form the gravity equation takes the form:

$$F_{ij} = G + \alpha M_i + \beta M_j - \theta D_{ij} + \varepsilon_{ij},$$

where all variables are as defined above, α, β, θ are the parameters of interest to the researcher, and ε_{ij} is the normally and independently distributed error term. I.e. a trade flow will be positively and proportionately related to the countries' GDP and negatively related to the distance between them. There are various opinions on whether the GDPs should be specified as a sum or as a product. (Helpman, 1987) and (Helpman and Krugman, 1985) were the fundamental works that provided the theoretical rationale for the idea that bilateral trade depends on the product of GDPs. We are following this approach as well.

The distance represents not only the hampering effect of the geographical distance, but serves as an estimate of a range of trade costs: transportation and customs clearance costs, perishability of goods and hence impossibility of selling certain goods at high distances, transaction costs of searching for trading opportunities in distant territories, "cultural costs", also known as "psychic distance" following Johanson and Vahnle (1992), and, as noted by Krugman, communication costs (Head, 2003). Hence, the distance variable in this specification of the model could incorporate a wide range of factors, which would make it of little use, as it would tell us a lot in general and nothing in particular. Therefore more specific variables have been added to the analysis to disaggregate this effect, the most popular ones – *common language*, as a proxy for cultural or psychic distance, and *common border* as another measure of proximity, *landlockness* as a measure reflecting higher costs of exporting to landlocked countries. We also attempt to control for *tariffs*, to take out this effect from the distance variable. Thus, common language, common border and protectionism controlled for, the distance variable would retain the effects of actual distance and *transport costs* associated with it, *non-tariff barriers* not captured by protectionism measures, and the remaining *transaction costs*. More variables were also added to the effect of size: *land size* and *income per capita*. The hypothesised effect of land area is negative, as large countries tend to be more self-sufficient, while that of income per capita is more controversial, and relates directly to underlying theories of trade. And before explaining this effect some of the theoretical underpinnings of the model need to be briefly outlined.

The theoretical backing of the gravity model evolved much later than the model actually gained its big empirical success, and rather as a response to criticism of the model for being atheoretical. The classical (Heckscher-Ohlin-Samuelson) trade theory posits that countries with dissimilar capital-

labour ratios will tend to specialise in the factor they are relatively more endowed with and trade with countries that are relatively more endowed with another factor, and exchange differentiated (or imperfect substitutes) products. The link was made through the GDP per capita variable – as it roughly represents the capital-to-labour ratio – the bigger difference between partners' GDP per capita would be associated with higher trade, i.e. the sign on the difference in per capita incomes is expected to be positive. On the other hand, the opposite hypothesis was put forward by Linder (1961) - countries with similar GDPs per capita will have similar preferences, but for differentiated products, and they will, therefore, trade more with each other, thus suggesting a negative sign on the difference between GDP per capita. Apart from predicting higher volumes of trade, Linder hypothesis also indirectly predicted higher intra-industry trade (in similar goods, but of differentiated quality), and has been extensively tested in the literature in this respect (e.g. (Bergstrand, 1990), (Thursby and Thursby, 1987). The Linder hypothesis proved to hold also with respect to aggregate trade volumes (e.g. (McPherson et al., 2001) studying imports of developing countries). So, there were findings in favour of both hypotheses. A closer link between gravity model and theory can be attributed to new trade theories ((Helpman and Krugman, 1985) and others) inasmuch as it gave role to transportation costs and distance, with the assumptions of increased returns to scale and, as suggested by Linder, differentiated products, which were missing in classical trade theory.

As regional trade agreements were proliferating in the late 1980s and 1990s, gravity model became a very popular tool for exploring the effects that trade groupings had on either members or those left-out, as well as for predicting trade potentials. The main questions usually posed in such studies are: (1) Are regional blocs natural in a way that neighbours tend to trade more and therefore form RTAs? (2) After controlling for the latter effect, are RTAs increasing trade further? (3) Is there a potential for increase in trade after an RTA is formed? (4) Does an RTA result in trade diversion away from non-members, thereby making it logical for them to join the RTA as well? (see (Greenaway and Milner, 2002), for review). **In this study we are attempting to answer the first two questions with regard to Ukraine, and draw conclusions as to the forth question.** Although the language often used in making inferences from the estimated point coefficients on regional trade agreement dummies includes "trade creation / trade diversion effects", these inferences are also rather empirical, as none of the theoretical justifications of the gravity model has so far focused on the Vinerian customs theory as such. So we make these reservations in our analysis as well.

III. The model

We employ an extended version of the outlined above gravity model, including some of the mentioned additional variables.

$$X_{ijt} = \alpha + \beta_1 LPGDP_{ijt} + \beta_2 LPGDPCAP_{ijt} + \beta_3 LDIST_{ij} + \beta_4 LPLAND_{ij} + \beta_5 BORDER_{ij} + \beta_6 LANDLOCK + \beta_7 LANG_{ij} + \beta_8 COMECON_j + \beta_9 EURASEC_j + \beta_{10} EUPTA_{jt} + \beta_{11} EUCU_{jt} + \beta_{12} WTO_{jt} + \beta_{13} LTARIFF_{ji} + \beta_{14} LTRI + \varepsilon_{ijt}$$

where all continuous variables are in natural logarithms, *i* – in our case is Ukraine, *j* – one of its partners, *t* – year from 1996 to 2004, ε_{ijt} - independently and normally distributed with zero variance error term, and

X_{ijt} – exports from Ukraine, *i*, to its partner *j* at time *t*;

$LPGDP_{ijt}$ – log of pair-wise product of GDPs;

$LPGDPCAP_{ijt}$ – log of pair-wise product of GDP per capita;

$LDIST_{ij}$ – log of distance between partners' capitals;

$LPLAND_{ij}$ – log of pair-wise product of land areas;

$LANG_{ij}$ – a dummy variable that takes a value of 1 if the two countries share a common language (in our case - Russian) and 0 otherwise;

$BORDER_{ij}$ - a dummy variable that takes a value of 1 if the two countries share a common land border, 0 otherwise;

$COMECON_j$ – a dummy variable that equals 1 if the country used to be a member of the Council for Mutual Economic assistance and 0 otherwise;

$EURASEC_j$ – a dummy variable that equals 1 if a country is a member of Eurasec and 0 otherwise;

$EUPTA_j$ – a dummy of 1 for country *j* benefiting from the preferential trade agreement with the EU at time *t,* 0 – for all other countries;

$EUCU_j$ – a dummy that takes a value of 1 for a country *j* that is a member of the EU customs union at time *t,* 0 otherwise;

WTO_j – a dummy equalling 1 if country *j* was a member of WTO at time *t,* 0 otherwise;

$LTARIFF_j$ – natural log of the tariffs applied by country *j* to country *i* (i.e. to Ukraine), time-invariant at the level existing in 2004 (this was the maximum availability of tariffs we could find, though it may not provide a perfect measure of actual tariffs).

$\beta_{14}LTRI$ – natural log of the Trade Restrictiveness Index (OTRI) composed by Kee *et al.* (2006).

The model is a single-equation gravity model, analysing bilateral trade flows from Ukraine to most of its partners (170) in years 1996-2004[2]. We ran this model in both nominal (current USD) and in real (in constant 2000 USD) terms. We first perform consecutive cross-sectional regressions, and then combine all observations in pooled-time series OLS regressions. When nominal data is used in pooled time series, we control for time effects or possible trend by generating one-period lagged year variables. These time effects turned out insignificant with real data, and are therefore not reported.

Although a gravity model is usually applied in a multi-equation setting, where data is for all countries in the sample to most of their trading partners, in order to consequently extrapolate trade potentials for certain countries (answering question 3 out of the 4 mentioned above), a single-equation approach is valid as well and has been applied for analysing trade of a single country of interest ((Lissovolik and Lissovolik, 2006) for Russia, (Buckwalter, 1998), for Hungary).

As a dependent variable we have chosen exports, and not aggregate trade flows because we are primarily interested in the effects of regional trade groupings on Ukraine's export performance. Besides, such specification has been argued to be a proper one in the literature (e.g. (Matyas, 1997)).

A word of caution needs to be made – the big role of the exchange rate fluctuations in 1998-2000 might be expected to decrease the goodness of fit of our model.

Our hypotheses for β_n coefficients are that Ukrainian exports are:

H1: Positively and proportionately related to the bilateral interaction of the GDPs and GDPs per capita, i.e. the coefficient on the product of GDPs should be around 1;

H2: Negatively and proportionately related to distance, with the coefficient around 1;

H3: Negatively related to the bilateral product of geographical areas – bigger countries tend to be more self-sufficient and thus less dependent on imports;

[2] In total 22 countries were excluded, exports to which were very low. These were mainly poor African countries and island states.

H4: Positively related to common cultural and historical links and inversely related to higher "communication costs" (effects proxied by common language, which should exhibit a positive sign);

H5: Higher with the country that Ukraine shares a common border with;

H6: Lower to landlocked countries.

The above are traditional gravity hypotheses. We further augment our model by focusing on the effects of or possible association with trade arrangements that are of immediate regional concern for Ukraine: (1) bilateral free trade agreements within the *CIS.* The separate CIS dummy is correlated with the language dummy with a coefficient of about 0.95. Besides, using the dummy for free trade agreements between CIS members that were actually ratified would cause a big measurement error, as a lot of FTAs within CIS have never been ratified (e.g. Freinkman et al., 2004), and have in most cases been working anyway, and on the other hand numerous exemptions are applied through yearly protocols. Therefore, given that Ukraine has free trade relations with all CIS members on either ratified or non-ratified basis and at the same time shares fluency or ability to speak Russian language with all of them[3], makes common language dummy still reflect the free trade bloc effect. (Therefore we have to generalise the conclusions from the language dummy onto CIS effects). (2) *Eurasec* – Eurasian Economic Union between Russia, Belarus, Tajikistan and Kyrgyzstan (Uzbekistan joined later than our sample spans) and GUUAM, which includes Georgia, Ukraine, Uzbekistan (which dropped out in 2005), Azerbaijan and Moldova. (3) *Comecon* – the economic and political union that existed in Soviet era between Soviet Union, Central and East European countries, and Cuba, Mongolia and Vietnam. (4) The European Union *customs union, EU preferential trade agreements,* that apart from current EU members includes other countries with which EU has free trade agreements: Balkan and Mediterranean countries and Mercosur bloc (Chile and Mexico throughout our sample period)[4], (5) *NAFTA,* (6) *CEFTA* (in specifications excluding Comecon to avoid correlation) and (7) *WTO* as a multilateral agreement, as well as controlling for *China* as a significant steel importer. The hypotheses in this respect are:

[3] Even in case of Baltic countries, although they were benefiting from free trade regime with the EU, a common language as a proxy of free trade was valid, as for most of the sample period (until 2004) there were bilateral free trade agreements between Ukraine and Estonia, Latvia and Lithuania.

[4] We exclude the countries of Lome / Cotonomou agreement, as they enjoy unilateral autonomous trade preferences, rather than free trade agreements, and besides, these are about 60 poor African and Caribbean countries from our sample, with which Ukraine does not trade much, and adding them would distort the exercise – inclusion of these countries in EU PTA dummy made it insignificant.

H6: *Common language dummy* is expected to have a positive effect on Ukrainian exports;

H7: *Eurasec* and *GUUAM* are also expected to have a positive effect, as preferential agreements;

H8: Former membership in *Comecon* should also have a positive effect due to 'path dependency';

H9: With respect to both *EU CU* and *EU PTA* we are testing the hypothesis of potential trade diversion to Ukraine as a non-member, due to increased self-sufficiency of the EU-centred bloc, i.e. a *negative* effect;

H10: With regard to *CEFTA* and *NAFTA* we are not making specific hypotheses, rather controlling for their effect, although CEFTA is expected to have a positive sign due to formerly being part of Comecon;

H11: *WTO*, as a formation aimed at liberalisation of world-wide trade, not only of that among members, is expected to have a positive effect on exports.

We have also added a number of measures to control for protectionism of Ukraine's partners: actual applied tariffs and Heritage Foundation index of trade restrictiveness. Heritage foundation index, however, also includes tariff measures, causing multicollinearity, and in combination with tariff variable was always insignificant. It is therefore not reported here. The hypothesis is:

H12: *Tariff* or other kinds of *trade protectionism* are expected to be negatively associated with exports.

IV. The data

Data on exports was taken from the IMF Direction of Trade Statistics. Both nominal and real (in constant 2000 USD) GDP data was taken from World Development Indicators database. The GDP deflator applied in WDI to reach real GDP was used to deflate nominal exports from DOTS. Two specifications were run: both in real and nominal (with time effects) terms, which did not affect the results significantly. We therefore stick to real terms in the reported analysis.

Distance was derived from the US Department of Agriculture web-site. Land area – from CIA World Factbook. The status of EU preferential trade agreements was taken from the European Commission DG Trade web-site, with the last update as of July 2005. WTO membership – from WTO web-site.

Applied tariff rates were retrieved from the UNCTAD/WTO Market Access Map[5], which covers not only MFN rates, but also preferences granted to Ukraine on the basis of bilateral or multilateral arrangements (e.g. GSP, and bilateral free trade agreements that Ukraine is part to). Since the data is recent, tariff rates of new EU members prior to accession were taken from WTO World Trade Report 2005. Otherwise this variable is time invariant. A broader measure of trade protectionism was taken from a recent trade restrictiveness index composed by Kee, Nicita and Olarreaga (2006)

We have maximum 170 importers of Ukrainian products in our sample, with some countries excluded due to either negligible imports from Ukraine, or to poor data availability. The maximum number of observations is therefore 170 times 9 (years), which is 1530. Missing observations are dropped by STATA, thereby reducing the number of observations in certain models, which should not, however, create a serious bias in the model.

V. Results

OLS regressions for datasets with many dummy variables, and with robust standard errors to adjust for heteroskedasticity, were performed in STATA 9.1. The data was sorted by year, and one-period lagged year-effects were added to nominal data regressions to control for possible trend, while these proved insignificant with real data.

With both nominal and real data we first ran cross-sectional regressions, and then pooled time-series, first with a set of basic gravity model variables: product of GDPs, product of GDP per capita, distance (specification 1); then adding other common gravity variables: common language, border, landlockness and product of partners' land areas (specification 2). Further analysis focuses on regional dummy variables: we first check for individual regional effects (specifications 3-11), and then combine them in a way that aims at avoiding multicollinearity – EU customs union and EU PTA variables are tested in separate regressions, as PTA includes EU CU members, while Comecon and CEFTA are excluded in regressions that include EU PTA due to overlap (13-14). A word of caution should be made about CIS and former Soviet bloc variables – Eurasec, Comecon and GUUAM – all of them are correlated with common language dummy, we therefore also check for their effects separately, and make a reservation with regard to the magnitude of common language variable – it includes both language, free trade agreements and other "cultural distance" effects.

[5] www.macmap.org

And finally, trade restrictiveness measures are added (11). The idea is that before exploring the role of trade protectionism, regional dummies would capture all the trade barriers or, on the contrary, preferences. When tariff measures are added first (assuming that they reflect real tariff costs), any remaining effects on the regional dummy incorporate non-tariff factors, such as non-tariff barriers, subsidies to local producers that impede imports, unilateral bans, quotas, anti-dumping procedures, or indeed quality incompliance. To account for possible distorting effects of the 1998 financial crisis we also run regressions only on 1998-2004 time period (14-15). We are also looking separately at non-steel exports, taking out iron and steel exports from group 72 in HS1996 classification.

Basic gravity variables

The main findings of the pooled-time series regressions on real exports and GDP data are presented in Tables 1 and 2. Our *H1* and *H2* seem to be confirmed – exports are positively related to partner's GDP and negatively related to the distance with coefficients of around 1, consistently throughout the whole modelling process. That is, a 1% increase in the partners' GDP will be associated with a proportionate increase of 1% in exports.

There is, however, a problem with GDP per capita – unlike in most gravity studies, it is of negative sign. Following a discussion in Frankel (1997, pp. 60-61), two competing hypotheses can be considered when interpreting this negative sign. The Heckscher-Ohlin trade theory would predict a positive sign, as countries with dissimilar endowments, or capital/labour ratios (proxied by GDP per capita), would tend to trade more with each other, implying a positive sign on the difference between per capita incomes. On the other hand, another perspective proposed by Linder, and related to the developed later Krugman's new trade theory, suggests that countries with similar per capita incomes will have similar preferences and similar, but differentiated products, thereby predicting an inverse relationship – the bigger the difference between partners' GDP per capita, the lower will be the trade between them. Therefore our negative sign might just reflect that Ukraine trades more with countries of similar level of income. This would seem plausible, given the high share of CIS countries in total Ukrainian exports. Moreover, as Bergstrand (1989) has suggested, traded commodities tend in an average sense to be more labour-intensive or necessities, if the sign on per capita income of the importing country enters the equation with a negative sign[6].

[6] And this is similar to our specification, as in one-equation setting the product of incomes per capita captures constant Ukrainian GDP per capita, and variable importers' GDP per capita.

At the same time, if we consider the coefficient on GDP per capita in sum with the coefficient on GDP, which becomes lower than one, the relationship of exports to GDP is then less than proportional, implying an underperformance of Ukrainian exports vis-à-vis the expected level based on income growth.

The *distance* coefficient is of expected sign and magnitude, and says that Ukraine will export 142 percent less (specification 1) to a market that is twice as distant as another otherwise similar market, when only economic size is taken in account, and about 104 per cent less, when land area, having no access to the sea, adjacency and language are added (specification 2). A possibility that was noted in the reasoning above, that distance variable can incorporate various trade costs, seems to be plausible – when we include regional trade arrangements the effect of distance declines (specifications 2-11). And that could imply that originally the distance incorporated 'border costs' on top of the actual distance, while with the addition of regional dummies both tariff and non-tariff barriers pertaining to those particular groupings are removed from the distance coefficient.

The hypothesis of *larger countries* being more self-sufficient (*H3*) is also confirmed and is very robust throughout: ceteris paribus, a 10 percent increase in the partner's land area, results in 1.4-1.7 percent less imports from Ukraine, regardless of the region or trade protectionism.

Common border (*H5*) always has a positive effect – in the basic specification (model 2), with the adjacent countries Ukraine will trade roughly twice as much (exp(0.82)=2.27) as with non-adjacent countries, other factors held constant. The coefficient is, however, not always robust – it looses significance in some of the further specifications.

Regional trade agreements

The main focus of our analysis is, however, regional effects, which are analysed one by one in subsequent models in Tables 1 and 2.

Starting with the effects of being a member of the CIS, it is clear from the coefficients on the common language dummy that it is highly positively associated with Ukraine's exports (*H4*). The effect is highest in the basic specification (specification 2), where it means that Ukraine exports almost 8 times as much (exp(2.04)=7.7) to countries that it shares a common language with, i.e. with

CIS members[7]. We have to admit though, that we cannot disentangle here the role of common language from duty-free regime or common historical and production links in facilitating high trade flows, as they are all incorporated in one variable, while adding other CIS related variables together with language would cause multicollinearity. When this is attempted – adding EURASEC and GUUAM in model 13 – both of these regional effects turn out highly insignificant, although Comecon remains significant and positive. At the same time, Comecon, Eurasec and GUUAM on their own have a strong and highly significant effect (models 3-5), although weaker than language dummy on itself[8]. Therefore we cannot make a definite conclusion as to whether to reject *H7*, as in reality path dependency, common language and free trade agreements most probably play an equally important role.

This result could relate to the first two out of the four main questions asked with gravity models: does the region tend to trade more naturally? And if yes, does the additional economic union add to this trade? Although it is hard to draw definite conclusions, it is clear that fragmentation of the economic space of CIS, by recalling operational FTAs and creating new, but smaller regional groupings (such as much debated Common Economic Space) would not be logical – trade with both Eurasec and GUUAM members has positive dynamics, and giving preference to one of them, as proposed in CES, would happen to the detriment to the other.

Turning to the effects of EU membership or having a preferential trade agreement with the EU, it is worth recalling here, that what we are asking is whether being left out from these agreements has any negative effect or is negatively associated with Ukrainian export performance due to potential self-sufficiency of the growing EU bloc or protectionist measures in sensitive sectors. The interesting result is that exports from Ukraine are *negatively* associated with EU *Customs Union* membership of its partners (Ukraine exporting only half as much to the EU as it should have, *ceteris paribus* (exp(-0.62)=0.54)), but *positively* associated with the EU preferential trade agreements (with

[7] The coefficient on language dummy is usually of a lower magnitude. Thus, in Frankel (1997) in pooled time series language coefficients fluctuate around .44 (which means countries with common language trade 55% more than without). When they tried different languages, only English and Chinese remained as highly important – Chinese speaking countries trade 4 times as much as other countries.

[8] And this is logical, as Eurasec and Guuam simply split the effect of language dummy.

about 72 percent more trade, (exp(0.54)=1.72))[9]. As can be seen from subsequent models, EU customs union retains its negative sign and significance, and EU PTA remains significantly positive.

The only plausible conclusion following from this result relates to the fact that unlike beneficiaries of PTA, EU CU members undertake common external trade policy of the EU, as well as become part of the common agricultural policy, with its renowned trade creation effects for the members and, at the same time, discriminatory effects for the non-members. It has been found in the literature that 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 Alan Winters, 2001), (Frankel Jeffrey et al., 1997)). A similar negative sign on trade between the EU and CIS countries has also been found by Kalyna (2001) – CIS countries under-trade approximately by 15 percent with the EU. Hence, there is evidence of a trade diverting effect for Ukraine from not having a preferential trade agreement with the EU. Most studies, done in a multi-equation setting, however, have found a positive sign on the EU dummy in trade (not exports) with Ukraine (e.g. Maryanchuk, 2005) or with CIS (e.g. Fidrmuc and Fidrmuc, 2003). Although the latter study did find a negative effect in the period 1990-1994.

With regard to other regions, it is notable that Central and East European Countries, with their CEFTA agreement, have had a strong positive effect. This finding can also be found in Freinkman *et al.* (2004) – this region has a very strong potential for Ukraine, which has been so far materialising judging from our results. NAFTA has mostly been insignificant, apart from on its own and in non-steel specifications – this also seems logical, given that US imposed heavy anti-dumping investigations and sanctions on Ukrainian steel. Not surprisingly, China comes out with a strong positive effect – it has become a very important importer of Ukrainian steel.

Our last, but not least, finding with trade agreements, this time multilateral, is a negative and consistently significant sign on WTO dummy. This effect was also found by (Lissovolik and Lissovolik, 2006)) for Russian trade. In absolute terms this is somewhat surprising, given that a significant majority of Ukraine's partners are WTO members. But in terms of trade shares, indeed, an important role of Russia and China could well explain this outcome.

[9] EU PTA and EU CU dummies suffer from positive correlation of 0.58, but this does not seem to be too high to preclude OLS. Besides, sensitivity tests are performed by dropping one of these variables at a time.

Trade restrictiveness

Adding trade protectionism measures to the base-line model comes out with a negative and significant effect – tariff protection is indeed negatively affecting Ukrainian exports (specification 11). However, when broader trade protectionism measures are added in the form of Trade Restrictiveness Index (model 14) composed by Kee *et al.* (2006), which captures the trade restrictiveness of countries' trade policies (including non-tariff barriers) on their import bundles, they are associated with *more*, rather than less, trade, with the positive and significant coefficient 0.31. Although surprising, this effect has already been found in the literature (e.g. (Rodriguez et al., 2001)). A possible explanation here can be twofold: either Ukraine just trades more with countries that are protectionist, among which are CIS countries, or, another possibility, more trade causes more protection, such as that observed in Russia-Ukraine trade and repeated bans associated with it. The downside of this indicator is that it overlooks the fact that CIS members enjoy a free trade among themselves.

Non-steel exports

It is important, however, to acknowledge a high resource-intensity of Ukrainian exports – iron and steel takes up over 40 percent of total merchandise exports, and this could create a substantial bias in our analysis. We therefore deduct group 72 exports in HS1996 classification and perform similar tests on non-steel merchandise exports (specifications Non-steel 1, 2 and 3): the basic gravity model, customs-union "centred" model, and EU PTA model. There are several notable changes to the results. The negative effect of *income per capita* has declined, possibly meaning that, if Linder hypothesis were true with regard to Ukraine, it would be more the case for steel exports. Or, alternatively, that steel exports are less elastic to changes in partners' income per capita. The geographic *size* of the countries became consistently insignificant, which means that it is more with resource-intensive products that large countries tend to be more self-sufficient with. This could partially reflect the effect of China and Russia receiving the biggest share of Ukrainian steel exports. The most interesting result, however, is that EU CU is no longer significant, and remained so in various non-steel specifications, i.e. non-steel exports don't seem to experience trade diversion effects from EU customs union. This implies that Ukraine's underperformance in exporting to the EU is to a large extent due to EU steel quotas. The frequently quoted reason that Ukraine under-exports to the EU due to non-compliance of its manufactured products with international standards does not hold, at least statistically. Positive EU PTA effect for non-steel exports becomes even more

pronounced, more than doubling compared to total exports. Another big difference – underperformance of exports to WTO members is much higher for non-steel exports. And this is an interesting result, as one of the arguments usually put forward with WTO accession is easier access for iron and steel to WTO members. It remains to be explored why non-steel exports under-perform more with WTO members. And we have the same outcome with tariffs – they seem to be more of an obstacle for non-steel products.

Post-1998

Finally, to make sure our results are not significantly undermined by the 1998 financial crisis, we run regressions on the period *starting from 1998,* to eliminate a possible structural break. As can be seen from the last two columns in the second part of table 1, the results remain roughly the same, with the only notable difference being that the EU CU has a stronger negative effect.

Policy discussion and conclusions

Based on our analysis above we can make several policy conclusions. First of all, the asymmetry in geographical distribution of Ukrainian exports still remains, with a bias towards former Soviet bloc countries, which does not come as a surprise and has been confirmed on numerous occasions in the literature. Smaller economic groupings within the CIS, such as Eurasec and GUUAM, do not appear to be beneficial, after the common language and/or wider CIS free trade are controlled for. The same may be the case with the much debated Common Economic Space between Russia, Kazakhstan, Ukraine and Belarus – if associated with reduction of preferences to other CIS members, the ensuing reduction of the scale of CIS effect will most probably not bring welfare gains to Ukraine.

The novelty of our analysis lies in disentangling various regional effects, while controlling for tariff barriers and other trade restrictiveness policies, thereby reducing the uncertainty as to the meaning of regional dummies. Ukraine clearly under-exports to the EU Customs Union members. Thanks to relatively comprehensive tariff measures we can decompose tariff barriers from this negative EU CU effect, which still remains negative and significant. Here the question arises whether it is non-tariff EU policies that inhibit Ukrainian exports, or it is Ukrainian in-country barriers, like cumbersome customs clearance procedures, poor infrastructure for ensuring international standard certification or alike are to be held responsible for this underperformance. Contrary to frequently heard statements that tariffs are not crucial for the country's successfulness in entering another market, our findings seem to confirm the negative impact of tariffs on Ukrainian exports. Replacing tariff variable with a more comprehensive trade restrictiveness measure we see that customs union dummy looses its

significance – indeed suggesting that EU policies do have something to do with access to its internal market for non-members. The EU CU also turned out to loose its significance when only non-steel merchandise exports are considered. This is another indication of importance of EU procedures (in this case steel quotas), for access to the EU market.

Moreover, although our analysis could not yet fully capture the effects of EU enlargement, but trade with former Comecon members that exhibited strong positive trends in the period from 1996 to 2004 after the enlargement could become influenced by the negative EU CU effect, whatever its causes are, and thus all efforts should be taken to avoid that. Abolition of tariffs once the EU-Ukraine FTA is signed would go only half way to helping access of Ukrainian products to the EU market – a thorough harmonisation of trade related regulatory framework, with proactive negotiation on Ukraine's side of conditions for access of sensitive products, along with development of a favourable in-country trade infrastructure, are therefore crucial for restoring the normal level of trade with the EU.

This analysis would benefit from further research, in particular from panel data approach, to disentangle country specific fixed effects, although the dynamics would be limited mainly to income growth effect, as most other variables are time-invariant; further desegregation by sectors, at least to distinguish between agricultural, manufacturing and resource-intensive exports would be informative. And finally, in a broader sense, these were only rough macro-effects, which give no role to structural changes in the economy that would drive a positive change not only in the volume of exports, but first of all in their quality, allowing for a closer integration with developed economies.

Table 1. Results of pooled time-series regressions, 1996-2004, dependent variable: ln real exports

	1	2	3	4	5	6	7	8	9	10	11	12
CONS	-5.63***	-10.86***	-6.43***	-10.31***	-7.04***	-7.11***	-6.29***	-6.31***	-5.85***	-5.81***	-7.97***	-10.04***
	(-5.03)	(-8.10)	(-5.03)	(-7.70)	(-5.45)	(-5.51)	(-4.87)	(-4.93)	(-4.26)	(-4.44)	(-6.08)	(-1.83)
LPGDP	0.79***	0.92***	0.90***	0.94***	0.89***	0.92***	0.89***	0.89***	0.89***	0.88***	0.92***	0.96***
	(28.59)	(22.01)	(20.64)	(22.13)	(20.40)	(20.65)	(20.43)	(20.43)	(20.49)	(19.60)	(20.93)	(20.30)
LPGDPCAP	-0.31***	-0.44***	-0.45***	-0.42***	-0.42***	-0.42***	-0.43***	-0.44***	-0.45***	-0.42***	-0.42***	-0.47***
	(-7.39)	(-9.09)	(-7.98)	(-7.99)	(-7.38)	(-7.28)	(-7.51)	(-7.77)	(-7.75)	(-7.31)	(-7.50)	(-8.07)
LDIST	-1.42***	-1.04***	-1.3***	-1.07***	-1.27***	-1.39***	-1.33***	-1.32***	-1.33***	-1.32***	-1.21***	-1.12***
	(-28.65)	(-15.92)	(-20.65)	(-16.51)	(-20.00)	(-21.56)	(-16.71)	(-20.77)	(-20.36)	(-20.75)	(-18.27)	(-15.30)
LPRODLAND		-0.17***	-0.14***	-0.15***	-0.12***	-0.14***	-0.13***	-0.13***	-0.14***	-0.13***	-014***	-0.18***
		(-4.71)	(-3.82)	(-4.30)	(-3.26)	(-3.62)	(-3.49)	(-3.52)	(-3.56)	(-3.41)	(-3.83)	(-4.26)
BORDER		0.82***	0.79***	-0.03	0.88***	0.73***	0.90***	1.01***	0.91***	0.93***	1.02***	1.55***
		(5.26)	(5.05)	(-0.20)	(5.79)	(-4.42)	(5.78)	(6.18)	(5.91)	(6.08)	(6.82)	(7.08)
LANDLOCK		-0.49***	-0.24	-0.38***	-0.24	-0.17	-0.19	-0.17	-0.18	-0.16	-0.19	-0.79***
		(-3.52)	(-1.59)	(-2.59)	(-1.60)	(-1.15)	(-1.19)	(-1.14)	(-1.20)	(-1.11)	(-1.30)	(-4.64)
LANGUAGE		2.04***										
		(14.98)										
EURASEC			1.42***									
			(5.40)									
COMECON				1.65***								
				(10.98)								
GUUAM					1.34***							
					(9.78)							
EU CU						-0.62***						
						(-4.27)						
EU PTA							-0.08					
							(-0.56)					
CEFTA								-0.21				
								(-1.20)				
NAFTA									0.42***			
									(2.09)			
CHINA										1.26***		
										(8.23)		
WTO											-0.56***	
											(-4.44)	
TARIFFS												-0.12**
												(-1.83)
HERITAGE												
Nr of obs	1209	1204	1204	1204	1204	1204	1204	1204	1204		1204	1041
F-stat	636.10	347.3	316.8	334.19	341.75	330.15	339.13	348.13	338.28		355.31	265.79
R^2	0.5903	0.64	0.60	0.62	0.60	0.60	0.60	0.60	0.60		0.60	0.61
Standard error	1.6413	1.54	1.61	1.56	1.61	1.62	1.62	1.62	1.62		1.60	1.57

	13	14	15	Non-steel 1	Non-steel 2	Non-steel 3	1998-2004	1998-2004
CONS	-11.19***	-11.5***	-17.36***	-12.83***	-12.97***	-13.88***	-10.46***	-11.88***
	(-6.57)	(-7.61)	(-8.57)	(9.95)	(-3.91)	(-4.32)	(-6.21)	(-7.72)
LPGDP	0.98***	0.96***	1.16***	0.96***	0.93***	0.92***	1.03***	1.01***
	(19.84)	(20.84)	(21.48)	(10.92)	(9.11)	(8.92)	(18.50)	(19.67)
LPGDPCAP	-0.43***	-0.46***	-0.55***	-0.23***	-0.26***	-0.39***	-0.50***	-0.52***
	(-7.12)	(-7.95)	(-8.54)	(-2.33)	(-2.13)	(-3.04)	(-7.57)	(-8.22)
LDIST	-1.1***	-0.84***	-0.91***	-1.42***	-1.36***	-0.98***	-1.28***	-0.93***
	(-11.93)	(-9.14)	(-9.85)	(-12.19)	(-8.07)	(-5.68)	(-13.57)	(-9.55)
LPRODLAND	-0.18***	-0.18***	-0.26***	-0.11	-0.07	-0.07	-0.20***	-0.20***
	(-4.12)	(-4.77)	(-5.32)	(-1.40)	(-0.69)	(-0.76)	(-4.10)	(-4.93)
BORDER	1.19***	0.98***	0.40**	0.87***	1.80***	2.16***	1.38***	0.82***
	(4.08)	(6.19)	(1.88)	(2.77)	(4.23)	(6.07)	(5.11)	(4.52)
LANDLOCK	-0.77***	-0.47***	-0.62***	-0.60***	-0.90***	-0.86***	-0.90***	-0.57***
	(-4.56)	(-3.30)	(-3.73)	(-2.09)	(-2.64)	(-2.52)	(-4.97)	(-3.68)
LANGUAGE	2.53***	2.03***	2.65***	2.68***	2.63***	2.49***	2.34***	1.99***
	(9.29)	(12.01)	(11.72)	(9.95)	(6.56)	(7.07)	(7.65)	(12.85)
EURASEC		0.09						
		(0.39)						
COMECON								
GUUAM		0.07						
		(0.46)						
EU CU	**-0.41*** **		0.05		**0.16**		**-0.65*** **	
	(-2.32)		(0.27)		**(0.53)**		**(-3.63)**	
EU PTA		**0.54*** **				**1.38*** **		**0.50*** **
		(3.54)				**(4.47)**		**(3.07)**
CEFTA	0.50**		0.95***		0.86**			
	(1.72)		(3.50)		(1.88)			
NAFTA	0.05	0.24	0.17		0.64***	0.60*		
	(0.80)	(1.20)	(0.73)		(1.92)	(1.64)		
CHINA	0.90***	1.08***	0.58***		0.75***	0.97***	0.59***	0.80***
	(5.12)	(6.82)	(2.84)		(2.43)	(3.19)	(3.29)	(4.74)
WTO	-0.29**	-0.35***	-0.29***		-0.76***	-0.95***	-0.30**	-0.36***
	(-1.81)	(-2.73)	(-1.80)		(-2.47)	(-3.15)	(-1.72)	(-2.58)
TARIFFS	-0.15***				-0.31***	-0.40***	-0.23***	
	(-2.18)				(-2.34)	(-3.02)	(-3.23)	
TRI			**0.31*** **					
			(3.04)					
Nr of obs	1041	1204	815	571	499	499	844	973
F-stat	358.2	377.4	287.63	127.84	84.84	95.61	329.1	369.7
R^2	0.62	0.64	0.69	0.57	0.54	0.55	0.64	0.66
Standard error	1.56	1.53	1.40	2.21	2.29	2.26	1.56	1.53

t-statistic in parentheses, * and ** - significance at 95% and 90% confidence level respectively.**

Bibliography

BERGSTRAND, J. H. (1990) The Heckscher-Ohlin-Samuelson Model, the Linder Hypothesis and the Determinants of Bilateral Intraindustry Trade. *Economic Journal,* 100**,** 1216-1229.

BUCKWALTER, D. W. (1998) Geopolitical legacies and central European export linkages: A historical and gravity model analysis of Hungary. *Professional Geographer,* 50**,** 57-70.

CARRERE, C. (2006) Revisiting the effects of regional trade agreements on trade flows with proper specification of the gravity model. *European Economic Review,* 50**,** 223-247.

EGERT, B., HALPERN, L. & MACDONALD, R. (2006) Equilibrium exchange rates in transition economies: Taking stock of the issues. *Journal of Economic Surveys,* 20**,** 257-324.

FIDRMUC J. & J. FIDRMUC (2003) "Disintegration and Trade". *Review of International Economics,* 11(5), 811-829.

FRANKEL JEFFREY, A., WEI, S.-J., STEIN, E. & INSTITUTE FOR INTERNATIONAL, E. (1997) *Regional trading blocs in the world economic system,* Washington, DC, Institute for International Economics.

FREINKMAN, L., E. POLYAKOV & C. REVENCO (2004) "Trade Performance and Regional
Integration in the CIS," ISSN 1726-5878; No. 38 (Washington, The World Bank).

JOHANSON, J. J.-E. VAHNLE (1997) *Management of internationalization*. RP 92/2. Institute of International Business. Stockholm School of Economics

GREENAWAY, D. & MILNER, C. (2002) Regionalism and gravity. *Scottish Journal of Political Economy,* 49**,** 574-585.

HEAD K. (2003) "Gravity for beginners", unpublished

HELPMAN, E. (1987) Imperfect Competition and International-Trade - Opening Remarks. *European Economic Review,* 31**,** 77-81.

HELPMAN, E. & KRUGMAN, P. R. (1985) *Market structure and foreign trade: increasing returns, imperfect competition and the international economy,* Cambridge, Mass. ; London, MIT Press.

KALYNA, A. (2001) "Integrating Europe: prospects for Ukraine trade performance". MA thesis. EERC, Kiev.

KEE H., NICITA A. AND M. OLARREAGA (2006) "Estimating trade restrictiveness indices". WB PRWP Nr. 3840

LINDER, S. B. (1961) *An essay on trade and transformation.* New York: John Wiley

LISSOVOLIK, B. & LISSOVOLIK, Y. (2006) Russia and the WTO: The "gravity" of outsider status. *Imf Staff Papers,* 53**,** 1-27.

MARYANCHUK I. V. "Ukrainian international trade: How far from the potential". EERC WP 05/14.

MATYAS, L. (1997) Proper econometric specification of the gravity model. *World Economy,* 20**,** 363-368.

MCPHERSON, M. A., REDFEARN, M. R. & TIESLAU, M. A. (2001) International trade and developing countries: an empirical investigation of the Linder hypothesis. *Applied Economics,* 33**,** 649-657.

RODRIGUEZ, F., RODRIK, D., HSEH, C. T. & JONES, C. I. (2001) Trade policy and economic growth: A skeptic's guide to the cross-national evidence. *Nber Macroeconomics Annual 2000.*

SOLOAGA, I. & ALAN WINTERSB, L. (2001) Regionalism in the nineties: what effect on trade? *The North American Journal of Economics and Finance,* 12**,** 1-29.

THURSBY, J. G. & THURSBY, M. C. (1987) Bilateral Trade-Flows, the Linder Hypothesis, and Exchange Risk. *Review of Economics and Statistics,* 69**,** 488-495.

VINER, J. (1950) *The Customs Union Issue. Carnegie Endowment for International Peace, New York*

Annex 1. Correlation matrix of dependent and independent variables

	Realx	Prgdp	prgdpcap	Dist	Prland	Landlock	Comm_lang	Comecon	Eurasec	Eu_pta	Eu_cu	Wto	Nafta	Cefta	China	GUUAM	Tariff	TRI
Realx	1.00																	
Prgdp	0.51	1.00																
Prgdpcap	0.31	0.63	1.00															
Dist	-0.51	-0.14	-0.19	1.00														
Prland	0.25	-0.08	-0.15	-0.41	1.00													
Landlock	-0.01	-0.15	-0.33	-0.22	0.14	1.00												
Comm_lang	0.27	-0.08	-0.15	-0.41	0.06	0.34	1.00											
Comecon	0.32	-0.03	-0.10	-0.50	0.07	0.21	0.65	1.00										
Eurasec	0.12	-0.00	-0.06	-0.14	0.09	0.18	0.35	0.30	1.00									
Eu_pta	0.41	0.31	0.51	-0.55	-0.11	-0.09	-0.01	0.16	-0.06	1.00								
Eu_cu	0.29	0.32	0.43	-0.34	0.06	-0.08	-0.07	-0.07	-0.03	0.56	1.00							
Wto	-0.03	0.21	0.24	0.17	0.17	-0.12	-0.31	-0.15	-0.14	0.14	0.19	1.00						
Nafta	0.11	0.21	0.18	0.10	0.20	-0.06	-0.04	-0.05	-0.02	-0.02	-0.04	0.08	1.00					
Cefta	0.21	0.06	0.09	-0.35	-0.01	0.11	-0.06	0.40	-0.02	0.40	-0.06	0.22	-0.03	1.00				
China	0.31	0.11	-0.03	0.04	0.13	-0.04	-0.02	-0.03	-0.01	-0.04	-0.02	-0.05	-0.01	-0.02	1.00			
Guuam	0.12	-0.05	-0.11	-0.20	-0.01	0.20	0.47	0.25	-0.02	-0.08	-0.04	-0.14	-0.02	-0.03	-0.01	1.00		
Tariff	-0.29	0.01	-0.01	0.41	0.02	-0.27	-0.86	-0.60	-0.34	-0.03	0.05	0.33	0.03	-0.03	0.03	-0.42	1.00	
TRI	0.18	0.22	-0.02	-0.03	0.23	-0.23	-0.15	-0.18	-0.04	-0.01	0.02	-0.03	-0.03	-0.10	-0.00	-0.05	0.23	1.00

Source: author's calculations

Annex 2. Breakdown of regional groupings employed in the analysis

Country	EU CU	EU PTA	Eurasec	Comecon	WTO	NAFTA	CEFTA
Afghanistan							
Albania				X			
Algeria		X					
Angola					X		
Azerbaijan							
Argentina					X		
Australia					X		
Austria	X	X			X		
Bahamas							
Bahrain					X		
Bangladesh					X		
Armenia				X	X		
Belgium-Luxembroug	X	X			X		
Bermuda							
Bolivia					X		
Bosnia&Herzegovina							
Brazil					X		
Belize					X		
Br. Virgin Isds		X					
Bulgaria		X		X	X		X
Myanmar							
Burundi					X		
Belarus			X	X			
Cambodia							
Cameroon					X		
Canada					X	X	
Cape Verde							
Cayman Isds		X					
Central African Rep.					X		
Sri Lanka					X		
Chad					X		
Chile		X (2002-)			X		
China					X		
Colombia					X		
Congo					X		
Dem. Rep. of Congo					X		
Costa Rica					X		
Croatia		X (2001-)			X		X (2002-)
Cuba				X			
Cyprus	X (2004)	X			X		
Czech Republic	X (2004)	X		X	X		X
Benin					X		
Denmark	X	X			X		
Dominica					X		
Dominican Republic					X		
Ecuador					X		
El Salvador					X		
Equatorial Guinea							
Ethiopia							
Eritrea							

Estonia	X (2004)	X		X	X		
Finland	X	X			X		
France	X	X			X		
Djibouti					X		
Gabon					X		
Georgia				X	X		
Gambia					X		
Germany	X	X			X		
Ghana					X		
Gibraltar							
Greece	X	X			X		
Guatemala					X		
Guinea					X		
Guyana					X		
Haiti					X		
Honduras					X		
China, Hong Kong					X		
Hungary	X (2004)	X		X	X		X
Iceland		X			X		
Indonesia					X		
Iran							
Iraq							
Ireland	X	X			X		
Israel		X (2000-)			X		
Italy	X	X			X		
Cote D'Ivoire					X		
Jamaica					X		
Japan					X		
Kazakhstan			X	X			
Jordan		X (2002-)			X		
Kenya					X		
DPR of Korea							
Korea					X		
Kuwait					X		
Kyrgyzstan			X	X	X		
Lebanon		X (2003-)					
Latvia	X (2004)	X		X	X		
Liberia							
Libya							
Lithuania	X (2004)	X		X	X		
China, Macao					X		
Madagascar					X		
Malaysia					X		
Mali					X		
Malta	X (2004)	X			X		
Mauritania					X		
Mauritius					X		
Mexico		X (2000-)			X	X	
Mongolia				X	X		
Moldova				X	X		
Morocco		X (2000-)			X		
Mozambique					X		
Oman					X		

Namibia					X		
Nauru							
Nepal					X		
Netherlands	X	X			X		
Neth. Antilles		X			X		
Vanuatu							
New Zealand					X		
Nicaragua					X		
Niger					X		
Nigeria					X		
Norway		X			X		
Marshall Isds							
Pakistan					X		
Panama					X		
Papua New Guinea					X		
Paraguay					X		
Peru					X		
Philippines					X		
Poland	X (2004)	X		X	X		X
Portugal		X			X		
Guinea-Bissau					X		
Qatar					X		
Romania		X		X	X		X
Russian Federation			X	X			
Rwanda					X		
Saint Kitts and Nevis					X		
Anguilla		X					
St Vincent and the Grenadines					X		
Sao Tome and Principe							
Saudi Arabia					X		
Senegal					X		
Seychelles							
Sierra Leone					X		
India					X		
Singapore					X		
Slovakia	X (2004)	X		X	X		X
Vietnam				X			
Slovenia	X (2004)	X			X		X
South Africa					X		
Zimbabwe					X		
Spain	X	X			X		
Sudan							
Suriname					X		
Sweden	X	X			X		
Switzerland		X			X		
Syria		X					
Tajikistan			X	X			
Thailand					X		
Togo					X		
Trinidad and Tobago					X		
UAE					X		
Tunisia		X			X		

Turkey	X	X			X		
Turkmenistan							
Uganda					X		
Macedonia					X		
Egypt					X		
UK	X	X			X		
Tanzania					X		
USA					X	X	
Burkina Faso					X		
Uruguay					X		
Uzbekistan				X			
Venezuela					X		
Yemen							
Serbia and Montenegro							
Zambia					X		