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## EMPIRICAL STUDY OF PREFERENTIAL ARRANGEMENTS IMPACT ON UKRAINE'S EXTERNAL TRADE

*Стаття має на меті здійснити формальний кількісний аналіз двохсторонньої торгівлі України для знаходження значущості та напрямку впливу преференційних торгових режимів, у яких бере участь Україна, на її зовнішню торгівлю. Методологія вивчення взаємозв'язку полягає у використанні регресійного аналізу гравітаційної моделі двохсторонньої торгівлі та фіктивних змінних, які контролюють участь України у наступних режимах преференційної торгівлі – зони вільної торгівлі, Генеральна система преференцій, Світова торговельна організація. У той час, як було знайдено позитивний вплив зон вільної торгівлі і Генеральної системи преференцій на розвиток зовнішньої торгівлі України, оцінена регресія засвідчила відсутність позитивного впливу членства України у СОТ на двосторонню торгівлю України з іншими країнами світу у 2008-2009 рр. Також стаття містить характеристику обмежень здійсненого аналізу та наслідки для економічної політики.*

*The article has the purpose to conduct formal quantitative analysis of Ukraine's bilateral trade to find out the significance and direction of impact of preferential trade arrangements on Ukraine's external trade. The methodology of the study comprises regression analysis of gravity model of bilateral trade with dummy variables controlling for the following preferential trade arrangements – free trade area, General System of Preferences, World Trade Organization membership. While free trade areas and GSP regimes are found to have positive impact on Ukraine's external trade development, the estimated regression showed no positive influence of WTO membership on Ukraine's bilateral trade in 2008-2009. Limitations of the conducted analysis and economic policy implications are also discussed.*

**Key words:** Ukraine's external trade, gravity model, WTO memberships, free trade agreement

### **Introduction**

Ukraine as the newly independent state is in the process of formulating and implementing its external economic policy which is supposed to stimulate market relations and foster economic development of the country. Since the start of transition to the market the reform of the external sector was the major success, since the liberalization of external trade which was formerly under total control of the state stimulated the market transformation of the country, facilitated transfer of technology from abroad, contributed to the increase of households' income, increased the goods variety and corresponding services in the internal market. While the liberalization of the state monopoly of the external sector is over, the issue of better integration in in-

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ternational markets is still important for the country's economic policy.

Export sector remained the main driving force of the GDP and GDP per capita growth in Ukraine since 2000. Barrier-free access of Ukrainian producers to international markets is vital for sustainable economic development. Companies selling abroad (primarily metals, agricultural products, chemical industry products, some machinery) partially use proceeds to invest into new production capacities and in new technologies. Thus, the state policy reflecting the interests of wide layer of manufacturers and consumers is aiming to facilitate access of Ukrainian commodities and services to the international markets.

Nowadays Ukraine's integration and trade policy is located between two vectors – European and Eurasian. The first one can lead Ukraine to closer trade relations with EU countries that represent a 450 million high-income market for Ukrainian goods, but also can stimulate the transformation of Ukrainian weak institutions. The Eurasian vector constitutes closer relations with the Commonwealth of Independent States, exports to this region is important for Ukraine since it is more technologically intensive than the trade with developed countries of Europe. Currently external policy is oscillating between these two directions.

Nonetheless, besides the qualitative arguments toward specific trade policy measures, the formal study of the effectiveness of Ukraine's trade arrangements is needed. The purpose of this paper is to conduct regression analysis of Ukraine's bilateral trade to find out the significance and direction of influence of preferential trade arrangements among the various other factors that affect trade – economic potential of the partners, average income, transport costs.

### **Preferential arrangements in Ukraine's external policies**

The end of 2000's decade was marked by the intensification of Ukraine's efforts to extent the scope of the country's preferential trade arrangements. The first wave of such policies took place in the middle of 1990-s when Ukraine launched a series of free trade zone with the countries of the Commonwealth of Independent States and also with Macedonia. These preferential arrangements were a natural consequence of the long-standing cultural, economic and political ties of former USSR republics and former socialist bloc. Nonetheless, the researchers remained skeptical about the feasibility of those arrangements as during their history they have been characterized by numerous amendments and exclusions, "trade wars" and liberalization reversals which lowered the effectiveness of trade liberalization policies in the region.

Until 2004 Ukraine had free trade arrangements with three Baltic States. These trade arrangements with Latvia, Lithuania and Estonia were abolished when Baltic States entered EU common market in 2004.

After conclusion of the free trade agreements with former Soviet republics Ukraine made efforts to liberalize trade with major trade partners in the west. After the Cooperation and Partnership agreement with EU was signed in 1994, EU countries granted Ukraine access to their market through the UN Generalized System of Preferences. This trade regime covered around 74% of Ukraine's trade with EU [1] in 2008 and helped maintain large trade volumes with western neighbors. Other countries that granted Generalized System of Preferences benefits to Ukraine were Canada, Japan, Turkey and USA [2].

Further step to liberalize external trade and integrate into world economy was related to GATT/WTO membership. Negotiations between Ukraine and WTO started in November 1993 and lasted 14 years. The process of Ukraine's accession into world most important trade forum lasted became more dynamic in 2005-2008. The efforts at the state level were intensified during the presidency of Victor Yushchenko who promoted Ukraine's integration into world economic institutions. During 2005-2008 Ukraine changed over 50 national regulations to comply

with WTO standards. The country introduced the requirements of WTO in the spheres of technical standards, intellectual property, export duties on agricultural products, insurance and banking, import of transport vehicles, taxation of agricultural firms, veterinary medicine, licensing, international good codification system, etc.

In 2009 approximately 52% of Ukraine's external turnover corresponded to the WTO members, while WTO members trade on average accounts for around 90% of world trade. This incompatibility of the trade structure results from the fact that large amount of trade Ukraine maintains with the Commonwealth of Independent States countries – primarily Russia, Belarus, Kazakhstan, Turkmenistan, Uzbekistan. In 2009 the Commonwealth of Independent States corresponded to 37% of Ukraine's exports and 40% of Ukraine's imports [3]. The trade partners from CIS region are not WTO members. Belarus, Russia and Kazakhstan formed customs union in 2010 maintaining the external tariff higher than Ukraine which has more liberalized trade regime. It remains the main obstacle to Ukraine's economic integration into Eurasian community, since WTO regulation prohibits increase in MFN tariff after entry into preferential trade regional organization.

The long process of WTO accession finished in 2008. On February 5 Protocol of Ukraine's accession into WTO was signed at General Council meeting. After protocol ratification in Ukraine WTO membership came in to effect on May 16, 2008. The WTO entry was expected to ease Ukraine's access to foreign markets, increase volume of Ukraine's external trade, to strengthen positions in international trade dispute settlement, attract foreign direct investment and improve internal investment climate. The significant expectation of WTO accession has been the possibility of free trade agreement with EU, Ukraine's negotiations with EU started shortly after entry to WTO in 2008. Ukraine accession into WTO paved the way to the conclusion of free trade agreement between EU and national economy which is scheduled to start in 2011. Greater integration into EU is preventing deeper integration with CIS countries many of which are not members of WTO. Thus, in case Ukraine would like to join customs union in CIS the country will have problems to comply with WTO regulations.

The actual impact of WTO accession on Ukraine's economy and development needs to be examined and forms the goal of the current study. The article will analyze the implications of WTO membership for Ukraine's trade and investment. The statistical methods will be used to follow the development of external trade and investment. They will be complemented by the regression analysis of Ukraine's trade in the framework of gravity model of trade which is widely used by researchers to analyze the factors of trade behind the transport costs and market size. The major problem of the research is the little history of Ukraine's WTO membership. Correspondingly there is still little empirical data available on foreign trade development during WTO membership to infer long-term conclusions. Yet this paper aims at studying the results of the first two year of Ukraine's membership in the World Trade Organization.

### **Statistics of trade and investment in 2008-2009 years**

In 2006 the average most favored nation tariff in Ukraine amounted to 6.9%, including 23% on agricultural products and 4.4% on non-agricultural products. After WTO accession average MFN tariff decreased to 5.5, while the tariff on agricultural products was reduced to 13% and the tariff on industrial products remained the same [4]. Ukraine still maintains export duties on commodities that are subject to export charges today: scrap of ferrous metals and alloyed steel, sunflower seeds, live animals, skins of cattle. Ukraine also committed to liberalize cross border supply of services through mode 3 (commercial presence) in 139 out of 155 sectors. Ukraine opened the banking market allowing branches of foreign banks to operate in the country and in-

insurance market by allowing non-resident re-insurers dealing with certain kind of risks [5].

The first year of WTO membership coincided with the beginning of the world deepest recession since the Great Depression. Yet for external trade development 2008 was successful year due partly to the ease of access to the international markets. In 2008 comparative to 2007 the volume of external trade in goods and services of Ukraine rose by 33.8%, imports of goods and services – by 38.8%. The importance of WTO membership can be proved in 2008, since the smallest dynamics of Ukraine's external trade was attributed to the region of Commonwealth of Independent States consisting predominantly of non-WTO members. The exports to the CIS region rose by 24% (to Russia – by 20%), while exports to Europe increased by 33%, Asia – by 47%, USA – by 67%, Australia – 3.8 times. The abolition of import quotas on Ukrainian metal products helped to increase the trade of manufactured goods between Ukraine and EU and other European countries. Exports of metals to Bulgaria increased 3 times and to Romania – 1.7 times.

Imports of goods and services from Russia grew by 16% (non-WTO) while purchases from Europe increased by 32%, Asia – 69%, America – 71% [6]. Due to the fall of the general world supply and export prices external trade showed a negative dynamics from which it is hard to disentangle the impact of country's WTO membership. In 2009 total exports of Ukraine decreased by 37%, imports – by 44%.

The external trade of agricultural products amounted to 18 USD bln in 2008, 1,6 times more than in 2007. Positive agricultural trade balance accounted for 4,5 USD bln. Comparative to 2007 exports of agricultural products of Ukraine rose by 66%, though import also increased by 55%. The positive development of agricultural trade was facilitated by liberalization of export duties of sunflower seeds and import quotas of grain.

Significant result was expected in the area of foreign direct investment in Ukraine, though the expectations didn't materialize. The inflow of FDI into Ukrainian economy amounted to 6.2 USD billion in 2008, by 22% less than FDI inflow in 2007 [7]. 2008 and 2009 years were not good years to attract the foreign capital on the falling or unstable international financial markets.

The general conclusion from statistics analysis after WTO entry is that the initial push to external trade generated by WTO accession wasn't maintained as Ukraine entered the recession and faced falling demand on external markets.

Yet important result of WTO membership was the start of the negotiations between Ukraine and EU concerning the deep free trade area arrangement and EU association agreement. The deep and comprehensive area is unlikely to substantially decrease amount of mutual protection between Ukraine and EU, but its most important component is the further adaptation of Ukrainian industrial and agricultural production standards to EU and international norms. Deep free trade area is a channel through which positive institutional change in business environment and business/government relationship is expected to take place. EU remains second largest trade partner of Ukraine after Commonwealth of Independent States, accounting for 24% of Ukraine's exports in 2009 (CIS-37%). EU market with 450 million population and huge economic potential represents attractive trade possibilities for Ukrainian export goods producers.

### **Regression model of Ukraine's trade under WTO membership**

Andrew Rose in his paper "Do We Really Know that the WTO Increases Trade?" (2003) found little evidence that countries joining or belonging to the GATT/WTO have larger trade volumes than outsiders [8]. The study utilized standard "gravity" model of bilateral merchandise trade and a large panel data set covering over fifty years and 175 countries. The gravity model of bilateral trade explains the natural logarithm of trade with the logarithms of the distance between the countries and their joint income. The papers found strong connection between trade

volumes and distance, GDP, GDP per capita, regional free trade zone arrangement, common language, common colonial history, being a beneficiary of General System of Preferences, WTO membership. The author obtained statistically significant results; nearly 65% of the trade variable is explained by the chosen factors of trade. On average more distant countries trade less. Economically larger (with higher GDP) countries have larger trade volumes, while countries with higher average income have greater amount of trade between each other. Countries that are members of regional preferential trade arrangements trade more, as do countries sharing the same language or border. Shared colonial history encourages trade. Since the dependent variable is the natural logarithm of real trade, the GSP is estimated to raise trade over one hundred percent (since  $\exp(.86) - 1 \approx 136\%$ )! The general result if the Rose's paper is that there is no positive impact of WTO on bilateral trade volume. But since the GSP is associated with an approximate doubling of trade, only some WTO policies facilitate international trade.

Rose's paper discovered that membership in the GATT/WTO have no substantial effect on trade. The dummy variables for one or both of the countries being GATT/WTO members both have small negative coefficients (-0.04 and -0.06 correspondingly). It means that that membership in the GATT or WTO actually reduces bilateral trade. Extension of the GSP from one country to another seems to have a large positive effect on trade, the GSP variable has positive coefficient of 0.86.

The purpose of this study is to capture the influence of preferential agreements on Ukraine's external trade. The methodology used is the regression analysis of the bilateral trade gravity model employed widely to analyze external relations of countries. To study the connection between participation in preferential trade arrangements and pattern of Ukraine's external trade the gravity model includes not only economic size and distance between partners, but also other variables important for mutual trade. The gravity model of external trade which is analyzed has the following form:

$$\ln Trade_{ij} = \alpha + \beta_1 \ln GDP_j + \beta_2 \ln Dist_{ij} + \beta_3 \ln GDPpc_j + \beta_4 FTA + \beta_5 GSP + \beta_6 WTO + \varepsilon_j \quad (1.1)$$

Where  $\ln Trade$  – natural logarithm of annual trade turnover (export plus import) of Ukraine in 2009 with a particular country, current prices,

$\ln GDP_j$  - natural logarithm of gross domestic product of Ukraine's partner in current prices,

$Dist$  – logarithm of distance between Kyiv and capital of trade partner in km,

$\ln GDPpc$  – natural logarithm of GDP per capita of a trading partner,

$FTA$  – dummy variable, equal to 1, if Ukraine has a free trade zone arrangement with a trade partner,

$GSP$  – dummy variable, equal to 1, if partner grants trade preferences to Ukraine under General System of Preferences (currently Canada, EU countries, Japan, Turkey, USA),

$WTO$  – dummy variable, equal to 1, if Ukraine and its trade partner are both members of WTO in the corresponding year.

Trade statistics is taken from official Ukraine data (State Statistics Committee of Ukraine) [7], GDP, GDP per capita data was taken from IMF World Economic Outlook Database [ ], data for dummy variables was obtained from World Trade Organization [ ], UNCTAD [2], Ministry of Economy of Ukraine. The panel data covers 144 largest trade partners of Ukraine from all parts of the world across 4 year – 2006-2007 (2 years prior of WTO accession) and symmetrically 2008-2009 (2 years of Ukraine's WTO membership). Regression analysis of the above-mentioned model for Ukraine and 144 trade partners in 2006-2008 rendered the following results:

$$\ln Trade = 0.483 \ln GDP - 0.219 \ln Dist - 0.191 \ln GDPpc + 0.103 FTA + 0.091 GSP - 0.373 WTO$$

$$\frac{\quad}{\quad} (11.809^{***}) \quad (-5.130^{***}) \quad (-4.357^{***}) \quad (2.833^{***}) + (1.988^{**}) \quad (-11.442^{***}) (1.2)$$

$$R^2 = 0,42$$

The regression shows little degree of adequacy, about 42% of variation in trade is explained by 6 independent variables. Originally 2 more dummy variables controlling for the common border and language between trading partners were included in the regression, but the model estimation rendered very insignificant coefficients for these variables and little correlation with trade turnover.

The estimated coefficients show the amount of Ukraine's trade depends positively on the economic size and market size of a trade partner, represented by the GDP amount: the greater the income of the country, the larger amount of trade turnover Ukraine has with this country. On average increase in partners GDP by 1% increases bilateral trade by 0.483%. The obtained coefficient is highly significant with 0% probability of Type II error.

The distance between capital cities proxies the transport costs and is inversely related to the trade amount between Ukraine and particular country: increase in the distance by 1% on average corresponds to 0.22% decrease in trade. Distance is widely used in gravity model to capture the transport costs associated with delivery of goods to a particular country: the longer the distance is the more expensive it is to transportation merchandise to the destination. The regression results comply with the theory and are highly significant.

Coefficient at income per capita in the trading partner render interesting results: Ukraine on average traded with countries with lower income. If the per capita income is lower by 1%, the trade volume is on average larger by 0.1915. This result can be explained as follows. Ukraine's export has low technological intensity. On average only 17% of total merchandise trade of Ukraine is technological, thus Ukraine's trade will not follow intra-industry trade pattern, but be rather explained by the comparative advantage. Almost 60% of exports to the Commonwealth of Independent States represent machines and equipment and this region accounts for around one third of Ukraine's trade. But former Soviet republics are mostly low middle income countries, thus on average Ukraine trades with lower income countries, since intra-industry trade requires a higher level of economic and technological development that Ukraine hasn't achieved yet.

The chosen dummy variables can reveal if Ukraine has higher trade volumes already explained by GDP, GDP per capita of trading partners and distance between them with certain group of countries. The analyzed groups have been 1) the trading partners granted Ukraine benefits under Generalized System of Preferences, 2) trading partners that signed preferential trade arrangements with Ukraine, 3) countries that are member of WTO in the years of Ukraine's WTO membership.

The coefficient at the dummy variable FTA, controlling for the fact that Ukraine and its trade partner have free trade zone agreement is statistically significant and positive showing that the free trade regime is associated with higher trade volumes for Ukraine. After 2004 only former Soviet republics and Macedonia were Ukraine's trade partner with whom Ukraine stroke free trade zone agreements yet in the 1990-s. The regression results show that these arrangements facilitated the higher export and import volumes of Ukraine: preferential trade arrangement is expected to raise trade by 11% ( $\exp(0.101)-1$ ). The obtained coefficient is highly significant with 0% probability of Type II error.

The dummy variable for General System of Preferences showed that Ukraine on average has 10% higher trade volume with Canada, USA, EU countries, Japan and Turkey which grant her trade preferences. The estimated coefficient has 5% probability of Type II error. The importance

of GSP status for Ukraine in 2006-2009 has the same influence on trade as free trade zones. The largest GSP granter of Ukraine is the European Union corresponding to one third of Ukraine's total trade. Thus, this system facilitated significantly Ukraine's trade in Europe.

In contrast the dummy variable for the joint participation of Ukraine and its partner in WTO shows that WTO membership had negative influence on Ukraine's trade development in 2008-2009. On average the fact that Ukraine and its trading partner are members of WTO in corresponding year lowers trade by 45%, the amount that in absolute value is larger than common influence of free trade zone and General System of Preferences arrangements. This situation may be connected with the fact that the period of Ukraine's participation in WTO is too short for the changes to have effect. Also world financial crises may have disrupted the results which already lack extensive statistical coverage. Though fall in income is partially taken into account, since GDP and GDP per capita variables had correspondingly less value in 2009 year when effect of world financial crises was the deepest.

### Results for 2008, 2009 and 2008-2009

The model estimation is modified to explore the impact of WTO membership of Ukraine in the concrete years of the WTO membership – 2008 and 2008-2009 years. The model specification and data sources remain the same while three more regressions are run for the set of data corresponding to different time period: 1) 2008, 2) 2009, 3) 2008-2009.

The following regression results were obtained:

1) Data for 2008:

$$\ln Trade = 0.703 \ln GDP - 0.385 \ln Dist - 0.086 \ln GDPpc + 0.202 FTA + 0.008 GSP - 0.008 WTO$$

$$\underline{\hspace{1cm}} (12.530^{***}) \underline{\hspace{1cm}} (-6.276^{***}) \underline{\hspace{1cm}} (-1.396^{***}) \underline{\hspace{1cm}} (3.996^{***}) + (1.126) \underline{\hspace{1cm}} (-0.170)$$

$$R^2 = 0,72$$

2) Data for 2009:

$$\ln Trade = 0.695 \ln GDP - 0.414 \ln Dist - 0.089 \ln GDPpc + 0.222 FTA - 0.010 GSP - 0.039 WTO$$

$$\underline{\hspace{1cm}} (12.488^{***}) \underline{\hspace{1cm}} (-6.756^{***}) \underline{\hspace{1cm}} (-1.547) \underline{\hspace{1cm}} (4.397^{***}) \underline{\hspace{1cm}} (-0.155) \underline{\hspace{1cm}} (-0.786)$$

$$R^2 = 0,742$$

3) Data 2008-2009

$$\ln Trade = 0.481 \ln GDP - 0.245 \ln Dist - 0.234 \ln GDPpc + 0.108 FTA + 0.033 GSP + 0.0 WTO$$

$$\underline{\hspace{1cm}} (7.351^{***}) \underline{\hspace{1cm}} (-3.396^{***}) \underline{\hspace{1cm}} (-3.384^{***}) \underline{\hspace{1cm}} (1.817^*) \underline{\hspace{1cm}} (0.427) \underline{\hspace{1cm}} (0.006)$$

$$R^2 = 0,239$$

The regressions limited to the years of Ukraine's WTO membership demonstrate the strength of the gravity model: higher trade volumes of Ukraine are associated with the larger GDP of a trading partner and less distance between Ukraine and a trading partner. The obtained coefficients for variable  $\ln GDP$  and  $\ln GDPpc$  have 0 probability of Type II error. The things are more complicated with the dummy variables corresponding to various forms of preferential trade arrangements. The free trade zone arrangement on average stimulated Ukraine's trade in 2008 and 2009 years. In all three modified regressions the FTA dummy variable has significant coefficients.

The influence of General System of Preferences on Ukraine's bilateral trade was not found. Low significance level of the obtained coefficients does not allow to infer any substantial im-

pact of this preferential arrangement on Ukraine's trade in 2008 and 2009. The reason for that may be the world financial crises broke that influence that was present in 2005-2006 years.

The WTO membership didn't seem to matter for Ukraine's external trade in the first two years of Ukraine as a member of international trade forum. While the estimation of the 2006-2009 years data found negative impact of WTO membership on trade, estimation of 2008-2009 data found no significant influence of WTO membership on Ukraine's total trade.

### **Conclusions**

Thus, the conducted analysis found positive relation of Ukraine's trade volume to the market size of its trading partners, free trade regimes between countries, and negative connection with the distance between capital of the trading partners, as well as average per capita income of Ukraine's trade partner. The estimated model found negative connection of WTO membership and trade volume of Ukraine. The importance of free trade agreements and General System of Preferences for the Ukraine's trade volume maybe a foundation for projection that free trade zone agreement between Ukraine and EU countries will positively affect the export and import relations.

The regression of the data limited to the two years of Ukraine's WTO membership also didn't reveal positive influence of WTO on Ukraine's bilateral trade. World financial crisis and little history of Ukraine's WTO membership may be held responsible for the absence of positive results of formal analysis of Ukraine's external data. But better results maybe obtained by changing the regression model or by breaking up the data into industrial countries and other countries sections.

The positive influence of free trade zone arrangement demonstrates that probably conclusion of free trade zone agreement with EU countries maybe more effective in boosting Ukraine's trade rather than single WTO membership. Actually WTO entry of Ukraine had a goal of fulfilling the EU requirements of being WTO member before deep and comprehensive free trade. Thus the results obtained in this paper may be evidence that external trade policy should proceed to more progressive preferential trade agreement with EU to catch more external trade creation effect.

The gravity model of Ukraine's trade may be used to project the future Ukraine's external trade flows in case some of the policy variables may change. For example, projections of the impact of deep and comprehensive free trade area between EU and Ukraine can be obtained by extrapolating dependent variable and controlling FTA dummy variable.

The possible extensions of research could be use of longer time period for WTO membership related to post-crisis trade development of Ukraine. Also more factors could be included in the model to raise the level of the explanatory power of the independent variable. These factors could be level of tariff protection, index of trade freedom or level of economic freedom in general etc.

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