Abstract: In this paper the impact of Eurasian Customs Union on trade between Russia, Belarus and Kazakhstan is analyzed. Two main sources of data were applied: EEU analytical surveys and CIS trade data, which is used for econometrical analysis. The main finding is that influence of the Customs Union on trade has been insignificant.

Key words:

Eurasian Customs Union, Eurasian Economic Union, customs unions effect on trade

Introduction

Current integration project is the third in the Post-Soviet area, but unlike earlier projects this one is relatively successful. Russia, Belarus and Kazakhstan established the Eurasian Customs Union (EACU) in 2011, and upgraded it to the Eurasian Economic Union (EAEU) in 2015; two new members, Armenia and Kyrgyzstan joined the Union the same year. Thus, this integration project had been developing rapidly, and now it includes five countries and has become the second economic union in the world after EU. Countries in the Union have formed a number of institutions; among them is the Eurasian Economic Commission (EEC), an executive body of the Union, is the most important. Also, to promote the countries economic development, integration and cross-border projects, the countries have established the Eurasian Development Bank (EADB).

At the same time, the real effect of the Union on member countries' economies is debatable. Many experts claim that currently EAEU is more a political than economical initiative, and by developing it, Russia wants to achieve mostly strategic goals, guarantee and strengthen its influence on post-Soviet space. In fact, it is not possible to say for sure what are the true goals of politicians who formed the Union were. It is more likely that the goals of different politicians from three countries were different. But it is possible to observe and estimate the changes that the integration project has brought to its members. First of all, the Customs Union was supposed to influence the trade between member countries, and only after those changes in a trade structure could changes in investment flows and countries' economies. So, basically, if there are any real changes in economies, it should be observed it in trade. This is the reason of assessing the impact of the Customs Union and the Eurasian Economic Union on trade between countries. Since Armenia and Kirgizstan joined the union only in 2015 and the size of their respective economies is relatively small, the research was focused on three initial and major members of the Union and the trade among them.

Testing such impact could bring two important results. The first one is about the stability and power of the Union as an institution. The higher impact of the Union is, the more economic agents benefit from the trade between the Union countries. As a consequence, such trade is more important for those economic agents belonging to a country involved. The interests of those agents and importance for economy could be converted into political power. Thus, if the impact of the Union is high, the Union itself becomes more important and stable as a political establishment; and then the Union will continue to be developed in the foreseeable future. And vice versa, if the impact is low, the Union becomes less stable, and the consequence is that there will be more conflicts between its participants, and the Union's members will be less willing to put effort into further development.

Another purpose of this research is to understand member countries' political and economic structure, especially those of Russia. Usually, a customs union is a very effective means of stimulation trade between countries. At the same time, some experts claim that many of Russian economic initiatives are more about proclamations than real actions. So, if such a powerful means as a customs union hasn't caused any significant result, which brings another example of the weakness of the Union member countries economic structure.

One of the problems I have faced doing this research is the Union's economic instability caused by the fall of oil prices in 2014. As Russia and Kazakhstan are oil-exporting countries, the oil prices drop hit them dramatically (e.g. Russian GDP fell from 2 to 1.3 trillion GDP). Russia and Kazakhstan are the two largest EAEU economies, and that crisis affected the Union, and in fact, the whole Commonwealth of Independent States (CIS) too. Table 1 shows the dynamics of overall trade amount between the Union members and between the Union members and other world.

Table 1. Dynamic of EACU (EAEU) internal and external trade

Year	2011	2012	2013	2014	2015	2016
Union internal trade, bn. USD	62.3	68.6	64.1	57.4	45.4	42.5
Union external trade, bn. USD	913	939.3	931	868,5	579.5	509.7

So, as we can see, the Union as a whole started to show negative performance even before drop in 2015, in fact in 2013, when Russian economic crisis started.

EEU statistics

In this part trade statistics provided by the Eurasian Economic Commission will be analyzed. EEU collects all the trade data of member countries and the Union as a whole, and two indicators are the most interesting: non-resource trade amount as a share of total trade between the countries and in-union trade as a share of total trade of the member countries. Those two factors are representing to goals of the Union: promoting in-union trade and diversifying its members economy.

Let's start with the trade structure among member countries. The data presented is from 2011 to 2016. Before 2015 the trade between three initial members was examined; 2015 and 2016 data was observed on the basis of five Union member countries. Figure 1 shows the results obtained.

Dynamics on the chart look positive, especially before the crisis. Shares of mineral products in overall trade within the Union fell from 39.8% in 2011 to 30.5% in 2014, when some other groups showed some growth - agricultural goods (from 9.3% to 13.7%), machinery (from 20% to 21.9%), chemical products (from 9.1% to 10%). In fact, this phenomenon is caused not only by pure economic reasons: during that period Kazakhstan stopped buying Russian oil, mostly because of logistical reasons. So the total cost of oil bought by Kazakhstan from Russia fell down from 2.5 billion USD to 187.9 million. During the same time framework, the amount of oil consumed by Belarus remained at the same level – 7.4 billion USD in 2011 and 7.6 billion USD in 2014. This might be explained by the fact that Russia sells oil to Belarus at below-market prices and doesn't want Belarus to increase oil exports[1]. So basically the positive

[1] Russian oil and gas export to Belarus is a form of subsidy, see Knobel,2015 (Russian)

dynamics we could observe in other industries is mainly caused by mineral sector trade stagnation, but the stagnation derived not being influenced by economic reasons. Thus, we cannot observe any positive economic impact of the Union on the structure of trade between its members.

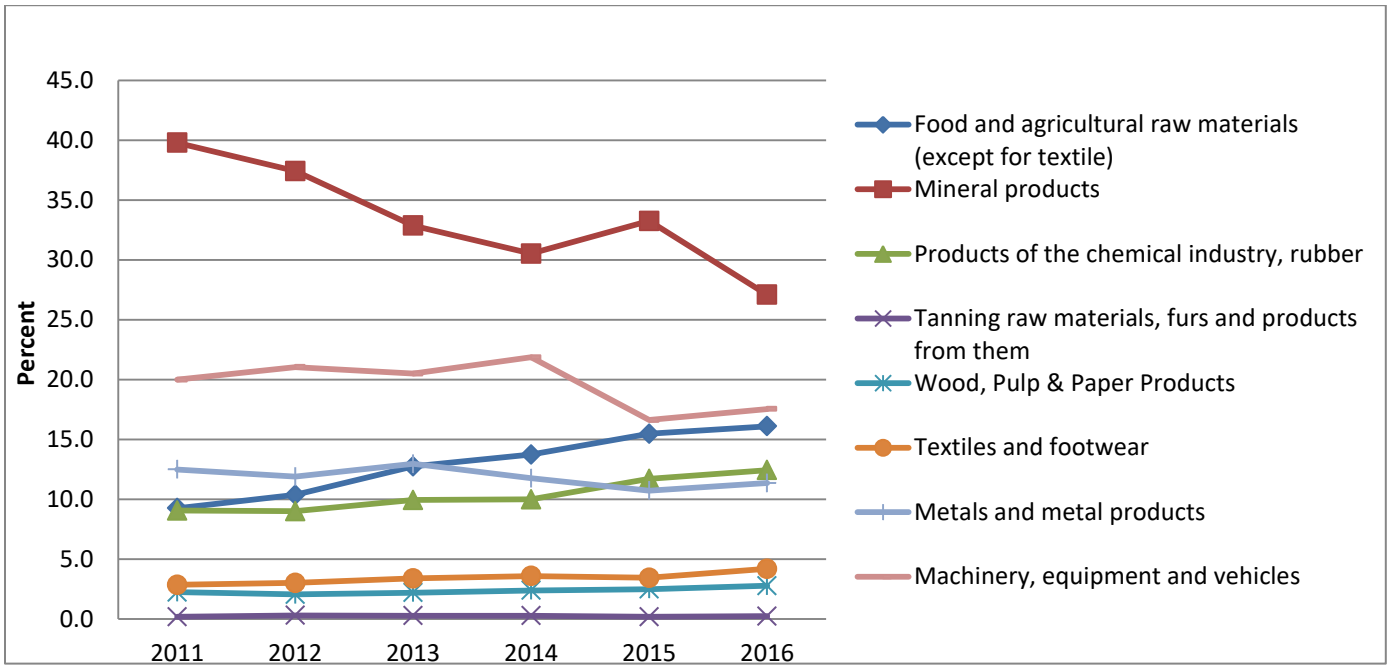

Figure 1: Trade structure among the Union members (source: EEU statistics).

The same tendency is relevant for the scale of in-union trade to external trade as an indicator of the Union effectiveness. Figure 2 shows its dynamics. As we can see, such dynamics was negative during the period from 2011 to 2014, and switched to positive during 2015 and 2016, but as we could already observe from table 1, that happened not because of in-union trade was growing faster than the trade with other countries, but because in-union trade was falling more slowly (this phenomena explained by the simple fact that the mineral resources, prices of which dropped by more than half, formed 70% of the Union external trade, but only 30% of the Union internal trade).

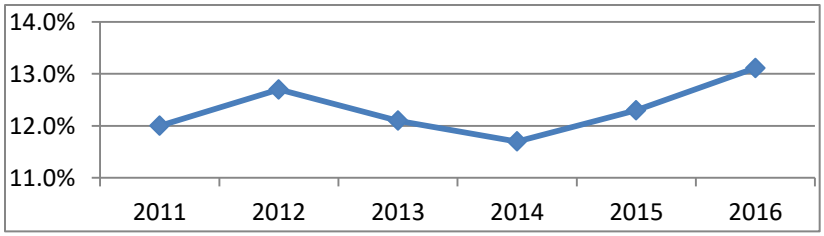

Figure 2: Sum of trade amounts between Russia, Belarus and Kazakhstan as a fraction EAEU external trade.

Thus, we couldn't find any effect from EACU and EAEU on trade observing the basic statistics. The Union failed to promote the trade between its members against trade with the rest of the world. To get more exact result there used a gravity model.

Gravity model analysis

Theoretical framework

The most common way of estimating the impact of economic union on trade is based on the gravity model, which was introduced by Jan Tinbergen in 1962. The key assumption of this model is that total amount of trade between two countries (TR) will be proportional to both countries GDP (GDP_1, GDP_2) taken in some power *beta* 1 and 2, and distance, taken in power *beta* 3, which is negative.

$$TR = e^{\beta_0} GDP_1^{\beta_1} GDP_2^{\beta_2} Dist^{\beta_3} e^{\beta_4 \beta_5 \dots \beta_n} \qquad (1)$$

Amount of trade between two countries depends not only on size of their GDP and distance between them, but also from other factors, which are represented in the equation (1) by dummy variables *beta* 4 – *beta* n. The most important among them are geographical (i.e. a common border) and cultural (i.e. a common language) factors. If we analyze panel data, years dummy variables also could be also included in the equation as in this research. When we control all important factors, we can add another dummy variable which represents customs union. By estimating this variable we could quantitatively measure an impact of customs union on trade between countries.

We could linearize equation (1) by taking logs from both sides:

$$\ln(TR) = \beta_0 + \beta_1 \log(GDP_1) + \beta_2 \log(GDP_2) + \beta_3 \log(Dist) + \beta_4 + \dots + \beta_n \qquad (2)$$

This equation could be estimated by OLS estimator.

The problem of that original model is that it can catch only pairwise factors, or factors that affect both trade partners. But countries differ not only by their GDP, but also by other factors such as economic structure or government trade policy. In other words, this model predicts that if two countries A and B have the same amount of GDP, similar geographical position and cultural patterns, according to the model for any country C the amount of trade between A and C should be equal to trade between B and C, which is not supported by real data [2]. To catch this effect of uniqueness of each country, we replace GDP by dummy variable for each economy. In this survey both GDP and country representative variables methodologies were used.

Data set

During this research annual trade data between CIS countries during the period from 2001 to 2015 was analyzed. The data is provided by the International Trade Center. Taking year 2001 as a starting point is reasonable: by 2001 most of the post-Soviet countries finished the first period of their economic transition, at least their GDR started to grow and thus they started to follow the global economy trend.

Choosing CIS countries gives the following advantages:

[2] For an example, take Malaysia and Singapore as A and B. Since those two countries close geographically and have roughly the same size of GDP, the model predicts that trade amounts between Malaysia and any third country and Singapore and any third country will be same. In fact that is much higher for Singapore.

1) Geography: all former USSR countries are close geographically, so we do not need to use any special methodology to control the influence of geographical factors on trade.

2) Language/culture: all countries in the set are also close culturally; at least most of CIS population could speak Russian and thus use it as *lingva franca*. So, we do not need to control language/culture difference during this survey.

GDP data was taken from the World Bank. Distance variable was constructed as a sum of pairwise distances between cities representing major economic regions of each country weighted by population of each region.

Also, three countries – Uzbekistan, Turkmenistan and Tajikistan do not report their trade data, so data of trade between those countries is unavailable and thus omitted from this survey, and trade data between those countries and other countries is mirror data. Moreover, relations between Azerbaijan and Armenia are hostile, thus they do not have any bilateral trade, or at least do not report it, so this data is also omitted. Finally, in 2003 and 2004 total amount of trade between Armenia and Tajikistan (reported by Armenia) was less than $1000, so to avoid negative log numbers those two observations were adjusted to 1000. So, there are 930 observations at all (15 years * (12 * 11) / 2 pairs of countries – 60 omitted observations).

Regression results

Regression results are presented in table 2. As mentioned before, two gravity model types were used to estimate trade between CIS countries. Model 1 (columns 1 to 3) is GDP-based model, model 2 (columns 4 to 6) is based on country representative dummies. Result of the estimation of model 1 without dummy variables for custom or economic union presented in column 1. It consists of GDP of larger and smaller partners in logarithm form; distance in log form; dummy variable for common border; dummy variable for pair of countries that have possible sea trade routes, but doesn't have a common border (only three pairs of countries); dummy variable for trade partners from same region (Europe, Caucasus and Middle Asia) but without common border; dummy variable for each year (result of estimation presented separately in table 3); GDP per capita of larger and smaller partner, which is important characteristic of a country; dummy variable for trade between Russia, Kazakhstan and Belarus.

In columns 2 and 3 the Union trade variables is estimated: column 2 - dummy variable for overall Union (this dummy is 1 for trade between Russia, Kazakhstan and Belarus from year 2011 to year 2015) and column 3 – five dummy variables for each year from 2011 to 2015.

Column 4 contains the result of model 2 estimation. It consists of 11 dummy variables – one variable for each country (Kirgizstan as a basis). Since GDP and GDP per capita are characteristics of a country, they removed from this model (being put they become insignificant). All the other variables are similar to model 1.

Interpretation of regression results:

1) Both large economy GDP and small economy GDP have coefficient near 1, and distance has coefficient slightly smaller than -1. Those coefficients are close to usual results of gravity model analysis.

Table 2: Regression results

	Countries represented by GDP			Countries represented by dummy variables		
Bilateral trade amount, log	(1) Model	(2) Overall impact	(3) Year-by-year impact	(4) Model	(5) Overall impact	(6) Year-by-year impact
Trade within the Union		**0.0379207 (0.3794103)**			**0.0181565 (0.2861738)**	
Trade within the Union, year 2011			**-0.0465579 (0.7280831)**			**0.005897 (0.611139)**
Trade within the Union, year 2012			**0.031129 (0.7280768)**			**0.0542372 (0.6111391)**
Trade within the Union, year 2013			**-0.0411111 (0.7280685)**			**0.0110661 (0.6111391)**
Trade within the Union, year 2014			**0.0352688 (0.7280543)**			**0.0249678 (0.6111391)**
Trade within the Union, year 2015			**0.2108392 (0.7280942)**			**-0.0054073 (0.6112536)**
Larger economy GDP, log	1.196609*** (0.0390073)	1.196612*** (0.0390286)	1.196574*** (0.0391134)			
Smaller economy GDP, log	1.051391*** (0.0567606)	1.051428*** (0.0567928)	1.051513*** (0.0569168)			
Countries' dummies[3]				5.725046 – -0.3812386	5.720185 – -0.3819827	5.72018 – -0.3819807
Distance, log	-1.195351*** (0.1063646)	-1.195351*** (0.1064228)	-1.195461*** (0.1066541)	-1.78113*** (0.1102927)	-1.783055*** (0.1098121)	-1.783054*** (0.1100568)
Common Border	0.6597334*** (0.1560936)	0.6597229*** (0.156179)	0.6595111*** (0.1565191)	-0.161322 (0.1574241)	-0.1654371 (0.155885)	-0.1654279 (0.1562331)
Sea trade	0.2433779 (0.1936338)	0.2433765 (0.1937397)	0.243199 (0.1941605)	-0.2153875 (0.1805303)	-0.2164295 (0.1804459)	-0.216427 (0.1808482)
Same region	0.8702041*** (0.1978396)	0.8702644*** (0.1979487)	0.8703137*** (0.198378)	-0.1676744 (0.1963209)	-0.167357 (0.1963166)	-0.1673819 (0.19675)
Year variables[4]	-0.0779722 – -1.557719	-.0779687 – -1.559501	-.077999 – -1.568385	.0942175 – 1.554833	.0942175 – 1.553883	.0942175 – 1.555024
Larger economy GDP per capita	-0.2530251*** (0.0793023)	-0.253083*** (0.0793478)	-0.2528442*** (0.0795243)			
Smaller economy GDP per capita	-0.154481*** (0.0384577)	-0.154499*** (0.0384791)	-0.1544665*** (0.0385627)			
Trade between Russia, Kazakhstan and Belarus	0.1994546 (0.207222)	0.1868181 (0.2428436)	0.1866279 (0.2433708)	-0.0250499 (0.1919032)		
Constant	-29.8021*** (1.136283)	-29.80185*** (1.136907)	-29.80376*** (1.139391)	20.42966*** (0.9024039)	20.44709*** (0.8980253)	20.44708*** (0.900027)
R-squared	0.8388	0.8388	0.8388	0.8790	0.8790	0.8790

[3] Coefficients for countries dummy variables presented in table 3
[4] Coefficients for years dummy variables presented in table 3

2) Coefficients for common border, sea border and same region obtained by model 1 (column 1) are positive, among them common border and same region are significant. But second model gives us negative insignificant coefficients. That means, than in CIS area border effect and same region of trade partners doesn't matter much, distance plays more important role. Also, the sea trade coefficient is insignificant, which means that possibility of sea trade doesn't help countries to promote bilateral trade.

3) Year variables in both models have year 2001 as a basis. Year coefficients obtained by estimating model 1 are declining, which means that with the course of time trade among CIS plays less and less important role for its members.

4) Both coefficients for GDP per capital in model 1 are negative. With fixed GDP that means that countries with higher population tend to trade more. This is also a very intuitive result.

5) Model 1 shows insignificant but positive coefficient for trade between Russia, Kazakhstan and Belarus. In fact, as this is presented by model 2, this effect doesn't exist, this three countries trade with each other the same as to any another country. This positive coefficient obtained from estimation of model 1 is the result of presence of Belarus. As we see from table 3, Belarus has a very high coefficient compare to its GDP or tends to actively trade with all CIS partners. Because of its insignificance, the dummy variable for trade between tree countries was removed from the model 2 (columns 5 and 6).

6) Both models give us insignificant coefficients for variables, representing for overall impact of EAEU on trade between three countries. That means that during the period from 2011 to 2015 (existence of the EAEU) a dynamic of trade between Russia, Belarus and Kazakhstan follows a global CIS trend (according to the results, obtained by estimating model 1, trade between those countries was slightly higher during the overall time period, but still follows the trend).

Year by year estimation by model 1 gives us a slightly higher value of coefficient on dummy variable for year 2015 (but also insignificant), but this effect caused by the economic shock, not by EAEU, as we can see from model 2. All the other coefficients are very close to zero and roughly the same, so we could not observe any positive trend.

So the basic statistical result that we got from regression analysis – difference between trade amount of custom union member countries and trade amount of CIS countries during years 2011-2015 is statistically insignificant. Which means that internal trade of among EACU members followed the global CIS trend.

Results

In this survey trade data provided by the EEC was analyzed and gravity model was used to assess an impact of EACU and EAEU on trade between its major members – Russia, Belarus and Kazakhstan. The result of this research is that there is no substantial influence of the union on overall trade between these three countries. This result is supported by other researchers. In his article "EAEU without emotions" the head of the Center for Integration Research of EADB Evgeny Vinokurov wrote: "Statistics of [EAEU] internal trade value amount … are often used as an argument against it"[5] (he personally disagree this point). Also, some scholars bring examples of rapid growth of trade of some particular goods, but no one state that union caused significant effect on overall amount.

[5] Evgeny Vinokurov , "EAEU without emotions" Economic Issues 12/2016 (Russian)

Table 3: Sets of coefficients for years' and countries' dummy variables:

	Year dummies (column 1)	Year dummies (column 4)		Country dummies (column 4)
2002	-0.0779722 (0.2102149)	0.0942175 (0.1826976)	Russia	5.725046*** (0.1305743)
2003	-0.1960096 (0.2111645)	0.3265709* (0.1826976)	Kazakhstan	3.039732*** (0.1263513)
2004	-0.3488863 (0.2138658)	0.6172957*** (0.1826976)	Ukraine	3.711816*** (0.1198187)
2005	-0.394943* (0.2180052)	0.9978289*** (0.1826976)	Uzbekistan	1.343032*** (0.1268449)
2006	-0.5516076** (0.2236629)	1.277185*** (0.1826976)	Belarus	2.464539*** (0.1243116)
2007	-0.7299786*** (0.2319118)	1.622759*** (0.1826976)	Azerbaijan	1.184777*** (0.1314097)
2008	-1.107068*** (0.2417726)	1.774788*** (0.1826976)	Turkmenistan	1.043226*** (0.127818)
2009	-1.107863*** (0.2358177)	1.50046*** (0.1826976)	Georgia	0.207513 (0.1264982)
2010	-1.211227*** (0.2406893)	1.640027*** (0.1826976)	Armenia	-1.213122*** (0.1353747)
2011	-1.26184*** (0.2483667)	1.958544*** (0.1826976)	Tajikistan	-0.4372489*** (0.1266215)
2012	-1.429944*** (0.2516024)	1.945321*** (0.1826976)	Moldova	-0.3812386*** (0.120531)
2013	-1.544192*** (0.2547679)	1.980615*** (0.1826976)		
2014	-1.600272*** (0.253808)	1.909097*** (0.1826976)		
2015	-1.557719*** (0.2443963)	1.554833*** (0.18272)		

This result means that EAEU, despite of huge administrative framework, are comparatively weak institution. Union members proclaimed trade freedom, but in fact, don't want to open their markets even to other union members. While tariff barriers have been removed, non-tariff barriers still exist, and their number is huge. EEC makes a lot of effort to remove it, but so far hasn't succeeded. The most important non-tariff barriers are presented in "white book" of trade barriers, published by EEU.

Another problem is the member countries economic structure. All of three countries are mostly state-owned economies, in every country state-owned enterprise produce more than half of GDP. This economic structure is far from ideal because it isn't flexible and don't react on external changes. This problem of EAEU is mentioned in the "Eurasian economic integration – 2017" report. This is also a reason, why EAEU failed to create "a competition of jurisdictions" – competition between different countries with the goal to attract enterprises as taxpayers. In his article in "Vedomosti" Eugenii Vinokurov also mentioned three reasons. First, major parts of economies are state-owned; second, countries protect their markets by non-tariff measures even against EAEU partners; third, most private

enterprises works with state-owned enterprises and are tied to them[6]. Of course, all of these factors are negatively affect trade.

As a result, the union didn't bring any new connection, while old Soviet era ties have become less and less important. Also, since Russia is a dominating economy of the union, its economic crisis influences the whole union (it can be observed from dynamics of internal and external trade of the union, table 1). Of course, other members are searching for another possibilities of development, and don't want to be further tied with Russia. Thus, until Russia changes its economic model, EAEU remains a comparatively weak institution.

Appendix A: Brief literature and sources review

Eurasian Economic Union is a very popular research topic in Russia and other member countries. But most of the research on this topic is done from political science point of view, when the number of economical researches of this topic a relatively small.

The major source EAEU statistics and analytics is the department of statistics of EEC. The main language of materials is Russian, but some data also provided in English. Statistics could be found here:

http://www.eurasiancommission.org/en/act/integr_i_makroec/dep_stat/union_stat/Pages/default.aspx

Also, a lot of economic researches on EAEU are done by the EADB Centre for Integration studies. The most of their research are published in Russian, but some works are also translated to English. An official web-page of the Centre is:

https://eabr.org/en/analytics/integration-research/

The gravity model now is a workhorse of trade researches. So there are many paper and textbooks uses or teach gravity model. Here I mention some of them:

- Ramón Mahía (2016). *Gravity equations for international trade model*

- Head, K. (2003), "Gravity for beginners", mimeo, University of British Columbia. http://vi.unctad.org/tda/background/Introduction%20to%20Gravity%20Models/gravity.pdf

- *Head, K., & Mayer, T. (2013). Gravity equations: Workhorse, toolkit, and cookbook. Handbook of international economics, 4.* http://strategy.sauder.ubc.ca/head/papers/headmayer_revised.pdf
  A really complete and in depth work about gravity equations and their use for empirical exercises.

- *Luca Salvatici (2013). The Gravity Model in International Trade AGRODEP Technical Note TN -04.* *http://www.agrodep.org/sites/default/files/Technical_notes/AGRODEP-TN-04-2_1.pdf*
  For those seeking for technical details about some of the main on the econometrical side of gravity equations.

[6] "Why competition within EAEU turn out ineffective" Eugeny Vinokurov, Vedomosti (Russian) https://www.vedomosti.ru/economics/blogs/2017/05/22/690856-konkurentsiya-yurisdiktsii-evraziiskom-neeffektivnoi

- *Silva, J. S., & Tenreyro, S. (2006). The log of gravity. The Review of Economics and statistics, 88(4), 641-658.*
  http://personal.lse.ac.uk/tenreyro/jensen08k.pdf
  Seminal work on the econometric implications of Jensen's inequality in the context of gravity equation:

- *Anderson, J. E. and van Wincoop, E. (2003), "Gravity with gravitas: a solution to the border puzzle", American Economic Review 93: 170–92.*