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# **Assymetry in Trade Barriers in the European Union**

## **An analysis of cause and consequence of the differences in trade conditions in the EU**

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### **Abstract**

The conditions for trading differ in the EU, even though the idea of the single market was born almost six decades ago and started to go toward completion over two decades ago. These differences causes asymmetry in trade costs which lead to trade volumes, and in extension wealth, are less in the union than what they would be if the union was more harmonized. This paper is therefore aiming at finding what differences between countries causes the trade cost asymmetries, what the current trade theories predict the specific effects of the asymmetries are, and what possibilities exists to reduce the differences between the members of the nation. This will be done by summarizing the relevant theory, with the help of big data sets analyze what factors cause the asymmetries, and then put the found asymmetries and the theory together to find the effect. What the paper find is a European Union in which the non-Mediterranean western countries have clearly lower trade costs than the south and eastern parts of the union, but it also finds that all countries of the union would benefit from together bringing down the trade barriers in the part of the union were they are high; by harmonizing, investing, and collaborating.

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## **1. Introduction**

The recent developments in trade theory has to a great extent revolved around relaxing assumptions from previous theories in order to get closer to reality. One of the least explored assumptions is the assumption of trade barriers between two countries being equal in both directions. This assumption is present in many of the new trade theories such as Anderson and van Wincoop's (2003) gravity model and Krugman's (1991) center-periphery model. However, the assumption is a great simplification given trade cost is not just tariffs but instead includes every cost which occurs between the producer in one country and the consumer in another country. For example, the European Union (EU) members are among the most integrated and harmonized countries in the world, after have spend over two decades on building a single market within the union, and nonetheless do the countries in the EU still; according to 2010 data presented in Section 5; have differences in their trade barriers. This means the new trade models which use the assumption of symmetric trade costs are not applicable on the trade flows and the effects from trade in the EU.

Since much of modern trade theory has used the assumption of symmetric trade barriers has the last years seen the previous models been developed by new economists to new models which also allow for asymmetric trade costs in the models. All these more modern editions of the previous models shows that the reality with asymmetric trade costs got differences in trade volumes, and thereby differences in wealth, compared to the models with symmetric trade costs. However, any greater research on empirical data; in order to determine how great the asymmetries are, what causes the asymmetries, and what could be done to improve the situation and thereby increase wealth has not been conducted. Hence, for the EU who got asymmetries but already work for a single market is it is of relevance to investigate:

- What causes these asymmetries in trade costs within the union
- What effects these asymmetries have on trade and wealth in the union
- What can be done to reduce the asymmetries if deemed necessary

In order to answer the questions about trade cost asymmetries and show the relevance of their existence and effects do Section 2, Theory, handle a discussion of the theories which assumes symmetry in trade costs, as well as the editions of the theories which allows for asymmetric trade costs. Section 3, Previous Empirical Attempts, follow with a discussion of previous empirical research about trade costs and trade cost asymmetries in order to further show the existence and relevance of trade cost asymmetries. Section 4, Variables Affecting the Cost of Trade, goes into what causes the asymmetries in trade costs, as well as showing the magnitude of the asymmetry in the different variables. This is done by bringing forth arguments for why specific variables would

influence trade costs and by showing the variables effects by displaying differences in recent data, mainly data from the World Bank (WB) for the last three years, between different countries of the world. The data sources, but in this case only data from 2010, are then used in Section 5, Differences in the EU, in order to show that the variables which were found to cause trade cost asymmetries in Section 4 in similar fashions causes trade cost asymmetries in the EU. Further, the data in Section 5 is also used to calculate in what direction the trade barriers are asymmetric in the union, by comparing the results from the different result in lack of econometric possibilities to calculate total trade cost, with the south-eastern parts having greater trade costs than the north western. Section 6, Theory and Policy Implications, use the theories discussed in Section 2 and the result found in Section 5 to find what trade costs must change in order to increase trade and wealth in the union. Section 6 also includes concrete suggestions for how the relevant trade cost, the trade costs in the south-eastern parts of the union, can be brought down, based on the variables which have been found to cause the trade cost. Finally, Section 7, the conclusion, sums up the paper.

## **2. Theory**

Many modern trade theories incorporates the idea of symmetric trade costs. The main theory in which the assumption of symmetry is central is Anderson and van Wincoop's (2003) theoretical gravity equation, which is a model for countries aggregated trade. However, also other modern trade theories; such as Krugman's (1991) center-periphery model which is on an industry level and the implications of trade in Melitz's (2003) new new trade theory with heterogeneous firms which is a theory on firm level; make use of the assumption and therefore are they affected by the flaws of the assumption. In order to investigate the implications of asymmetric trade costs should therefore the three theories be investigated.

### i) The Gravity Equation

Anderson and van Wincoop's 2003 paper is an attempt to give the previously purely econometric gravity model, which claims the trade between countries do depend on the distance between them as well as their economic size, a theoretical foundation. The equation they managed to construct by this method, and by the assumption of symmetric trade costs, is equation (1):

$$x_{ij} = \frac{y_i y_j}{y^w} \left( \frac{t_{ij}}{P_i P_j} \right)^{1-\sigma} \quad (1)$$

$$P_i = \left[ \sum_j (\beta_j p_j t_{ji})^{1-\sigma} \right]^{\frac{1}{1-\sigma}} \quad (2)$$

Where  $i$  is the exporter,  $j$  is the importer,  $x_{ij}$  is the exports from country  $i$  to country  $j$ ,  $y_i$  is  $i$ 's economic size (commonly measured in GDP),  $y^w$  is the economic size of the world,  $t_{ij}$  is the trade barriers when exporting from  $i$  to  $j$ ,  $P_j$  is the consumer price index defined in equation (2),  $\sigma$  is the elasticity of substitution,  $\beta_j$  is a positive distribution parameter, and  $p_j$  is what the exports from  $i$  cost in  $j$ . As shown by Anderson and van Wincoop (2003) themselves is what would differ in equation (1) if the assumption in question was removed, id est if  $t_{ij} \neq t_{ji}$ , is that  $P_i$  would have to be redefined such that:

$$x_{ij} = \frac{y_i y_j}{y^w} \left( \frac{t_{ij}}{\Pi_i P_j} \right)^{1-\sigma} = \frac{y_i y_j}{y^w} \left( \frac{t_{ij}}{P_i P_j} \right)^{1-\sigma} \left( \frac{\Pi_i}{P_i} \right)^{\sigma-1} \quad (3)$$

$$\Pi_i \equiv \left( \sum_j \left( \frac{t_{ij}}{P_j} \right)^{1-\sigma} \theta_j \right)^{\frac{1}{1-\sigma}}, \theta_j = \frac{y_j}{y^w} \quad (4)$$

Hence, if the trade barriers are asymmetrical is the theoretical gravity theory wrong by a factor of  $(\Pi_i/P_i)^{\sigma-1}$ . Anderson and van Wincoop do speculate in whether asymmetry in trade costs do give noticeable differences for their result, id est whether the factor  $(\Pi_i/P_i)^{\sigma-1}$  is clearly different from zero. They do not believe this to be the case.

Bergstrand et al (2013) disproves their speculation of asymmetries irrelevance by showing asymmetric trade costs has great effects on the result, by showing that a gravity equation without the assumption of equal trade cost gives a distinctly different result compared to the gravity equation where trade costs were assumed to be symmetric. This was done by a series of Monte Carlo analyses as well as by using real empiric data. The Monte Carlo analysis shows Anderson and von Wincoop's estimated trade flows to be highly biased, compared to the analysis true values. A bias that made their gravity equation give expected values which were seldom even the same sign as the true mean. The analysis with real empiric data is based McCallum's (1995) data regarding the Canada-US border trade. Here the result, when the trade barriers are assumed to be asymmetrical, is that the gravity equation which assumes symmetric trade costs greatly overestimates the border barrier and therefore greatly overestimates the welfare effects of liberalizing trade between the two countries. In all do Bergstrand et al (2013) show that a greater asymmetry makes reality deviate from the theoretical gravity model more, therefore having greater effect on trade flows which means the size of the trade cost asymmetries are important for research as well as trade, integration, and growth.

## ii) Center-Periphery model

Krugman's (1991) center-periphery model do in difference from the gravity equation not predict trade quantities; as it instead shows how a country, or any other form of economic region such as the EU, over time splits up in an industrialized core with high economic activity and a periphery which is predominantly agriculture. The idea behind this model is that agricultural products are stuck to the land upon which it is farmed and hence is it impossible for it to change location from the periphery to the core, while industry can easily move their production and will do so if it can reach a higher profit by producing elsewhere. The reason why this would lead to an industrialized core is according to Krugman's argument that the industries earn on being located closely to each other since they that way can achieve external economies of scale and since they by being in the core is closer to the main market and therefore can avoid trade costs to most of the potential costumers. Therefore, a center-periphery situation is only likely to occur with medium sized trade costs. This is because if the trade costs are too great will firms in the core not be able to compete in the periphery and it will therefore not be any reason for firms to move from the periphery to the core, while if the trade costs are too small will it reduce the incentives to move to the core since firms in the periphery will have as good access to the core market as firms in the core. However, Krugman's paper do not discuss what would happen in a case were the trade costs are high in one direction, but low in the other.

Leite et al (2009) gives an answer on the last case by constructing a model which is an extension to Krugman's model and which allows for asymmetric trade costs both within the economic region as well as asymmetric trade costs between the region and the rest of the world. What they find is that the result depends rather on the ratio between the trade costs, just as in the case with the gravity equation. Further, they find that a higher ratio between the importing cost to the region and the exporting cost from the region result in a greater economic activity since the incentives to work in the region and export to the outside are increased, which is fully in accordance with the logic presented by Krugman. Furthermore, they find it also that if the internal trade costs in the region are lower will the economic activity increase due to an increased efficiency, caused by a form of center-periphery situation in the region. The consequence of this is that a decrease in internal trade cost will give benefits to the internal workers and to all farmers, while an increase in the import/export ratio will benefit the internal workers and the external farmers and harm the internal farmers and external workers.

### iii) The heterogeneous firms model

Melitz's (2003) heterogeneous firms model shows how different firms in the same economic region got different efficiency, which results in the firms being able to produce at different costs and therefore only survive on the domestic market if the price on the market is higher than the firms cost of production. Trade cost affect trade by dictating which firms can take the step from the domestic market to the export market, by having a production cost which is lower than the sum of the trade cost and the price on the foreign market. Therefore, Melitz argue, if the trade is liberalized will more firms be able to export since the trade cost has been reduced. However, at the same time will fewer firms be able to survive on the domestic market, since foreign firms enters the market and increase the competition. These two effects will lead to resources being moved from the less productive firms, who leave the domestic market, to the more productive firms, who enter the foreign market. Which means the country will experience growth since its factors of production will be used more efficiently.

Cheney (2008) therefore argue that if the trade costs are asymmetric will the firms in the country with higher trade costs see less competition on their domestic market and have it easier to compete on the foreign market than the firms in the country with low trade costs. Therefore, in a case with asymmetric trade costs will a country win, compared to the other country, the greater their relative trade cost is, even though lower trade costs is overall better in accordance with classic trade theory. Hence, will Graham's case for protectionism, as presented by Feenstra (2004), not necessarily work in countries with trade cost asymmetries since the smaller country might have a market with decreasing returns to scale but still lose from the trade due to the asymmetric trade barriers hinder its firms from spreading into the bigger market while firms from the bigger country more freely can pour into the smaller country's market. Further, in comparison to the case with symmetry will the total effect be a less growth in average firm efficiency, since in the country with low trade barriers will firms which were efficient enough to survive in the symmetry case be knocked-out, while in the country with high barriers will it take less efficiency to survive.

### **3. Previous Empirical Attempts**

There is not much previous empirical studies on the topic of asymmetries in trade costs. A great reason for this seem to be because it is hard to find data regarding trade costs and even if good data is found is it hard to calculate how different variables will affect the total trade barriers. However, there has been papers on the topic of trade costs which touch upon the topic, even if ever so slightly.

One of the most cited surveys on the topic of empirical measurements of trade costs is

Anderson and van Wincoop (2004) which estimates an average rich country to have a cost of trading of 170% of the marginal cost, which is of such proportions that asymmetries in it are relevant, where 74% of the cost happens between the two countries and 55% happens before and after crossing a country border. This is possible since the definition of trade cost in their paper, as well as in this paper, is “all costs incurred in getting a good to a final user other than the marginal cost of producing the good itself”. Such high costs means there is a great possibility for variation, and Anderson and van Wincoop do find such variation; for example are poorer countries trade costs vastly greater than richer countries. Moreover, they find different types of goods have different amount of costs of trading, the most expensive to trade can even be ten times more expensive than the cheapest. However, in criticism of their own results are they forced to conclude “[t]he quality of existing measures [of trade cost] is low”. This both through a greater collection of data and through more developed theories, specially development of the gravity models.

Also Limão and Venables (1999) have contributed to the topic. For example did they find empiric support for the way of export is rather important as water transport cost about an eight of land transport, which they find has great implications for landlocked countries, whose trade costs on average are 50% higher with a 60% lower trade volume than the average country with a costal border. Further, they also find the transport and therefore the cost is affected greatly by the infrastructure of the country, as the countries with infrastructure in the 75<sup>th</sup> percentile pays about 42% as much as the countries in the 25<sup>th</sup> percentile, which they find would give the 75<sup>th</sup> percentile trade volumes 78% less than the 25<sup>th</sup> percentile. Hence, the situation for landlocked countries depends both on the quality of their infrastructure, the quality of their neighbor with the closest port's infrastructure, and the relationship with said neighbor. Since trade has been shown to be correlated with GDP do they find the poor infrastructure to be a possible part reason for the low GDP and low growth in Africa.

Ferro, Wilson, and Otsuki (2013) uses the gravity model constructed by Helpman, Melitz and Rubinstein (2008) in order to test the effects of product standards on export decisions. They find that the higher the product standards are the less likely is it that an export occurs, id est the firms in the country with lower product standard are more likely to start exporting. Further, they find this effect is lower for richer countries and that this effect is only initial, if a decision to export has been made will the product standard not affect the further export volumes since the production has already been changed in order to meet the higher standards.



#### **4. Variables Affecting the Cost of Trade**

There are a multitude of possible variables which can affect the cost of trade between two countries. Some of the trade costs, such as insurance and boats, are likely to be similar for firms from all countries while other trade costs are more likely to cause asymmetries. The most intuitive among these are the policy trade barriers such as tariffs and other policy related taxes and fees, which for the past half centuries have been in the center of most attempts to reduce trade costs. However, trade costs are effected by much more than the straight forward political decisions, hence might countries who wish to have symmetrical trade costs in reality end up with great asymmetries. Variables which can cause asymmetries except policy trade barriers includes variables regarding unofficial direct trade costs, the ease by which a trade deal is made, the time it takes to trade, and the nature of the goods which are traded. However, whether or not a country is landlocked, even though it has been shown to be a factor by Limão and Venables (1999), will not be included due to the such Boolean data not fitting the rest of the data in this essay. The five described categories of variables will be discussed in one sub-section each, using data from the World Bank's World Development Indicators catalog (2014) which is the source even when the International Monetary Fund (IMF) or other organization are written as the collector of the data, except from when other source is stated specifically. It is also the sorting of variables in the World Bank's World Development Indicators which has determined what variables will be included, with the exception of language and corruption perception index.

##### **i) Policy related trade costs**

Policy related trade costs are for example tariffs, trade taxes, costs for documentation, fees for administration and technical regulations and similar. These can easily cause trade asymmetries, however they are the trade costs which are the easiest to control and therefore in trade unions, such as the EU, can their effects on trade cost asymmetries be eliminated. Since they are decided by policy is the data regarding them exact and plentiful, in comparison to much of the other data which is used to measure trade costs. For example, the World Bank has data regarding most favored nation (MFN) tariff rates which they have based on data from the World Trade Organization. The World Bank also has data from the Doing Business project regarding the combined direct costs for exporting and importing a container. Also the IMF has data on customs and other import duties in different countries and on taxes on exports. These five suggested variables; tariffs, import duties, export taxes, costs for exporting, and costs for importing ; all show empiric signs of causing differences in trade costs between different countries, hence can they be the reasons for asymmetries in trade costs.

The MFN tariff for a country is in this case measured as a weighted mean over different production categories, in order to capture what tariffs appear in their real trade and are measured using the Harmonized System to 6<sup>th</sup> or 8<sup>th</sup> digit. It had an average of 5.04% in 2011; the latest year with sufficient amount of countries (111) with data. However, Macau, Hong Kong, and Switzerland were down on 0%, EU were below average on 1.09%, and Iran were up on 21.77%, with many countries in Africa, the Caribbean, and the Pacific also being far past the average. This gives it a standard deviation of 4.67 percentage points, id est 93% of the average, and this great variation is known to cause asymmetries since EU has their Economic Partnership Agreements with the ACP causing the tariffs to be different depending on the direction of the trade. (Meyn & Stevens, 2007)

The import duties and export taxes are the total amount of the levies the country collects as soon as a resident sell or buy a good or service from a non-resident. They therefore differ from tariffs by showing what the trade cost was instead of showing what the tariff schemes said it should be. If one uses average exchange rate and data from the year 2010; the latest year with a sufficient amount of countries with data for both variables (32); does it show that, measured in US-dollars from 2010, did the average of these 32 countries earn about  $\$3 \cdot 10^8$  more on export taxes while the median earned about  $\$5 \cdot 10^8$  more on import duties. This great difference in mean and median shows a great spread in the data, with Russia on the extreme  $\$6 \cdot 10^{10}$  higher incomes on export taxes. If this is then further compared to the countries' external trade balance does 6 of the 32 have greater earnings from their import duties than their export taxes even though they export more than they import. Overall is it clear the taxes and duties on imports are greater than the taxes and duties on exports, but in a varying degree. Hence, this data can be concluded to be able to cause asymmetries in trade costs, however there is too few countries with sufficient data on the topic to come to any further conclusions and it is neither possible to in any clear way combine it with the data regarding the costs for exporting and importing

The cost of exporting and cost of importing are measured in how great direct cost, measured in contemporary US-dollar, it costs to export respectively import a standard 20-foot container. These costs differ from tariffs and duties in that they are not necessarily put in place in order to limit trade, and that they therefore are not always removed in preferential trade agreements, such as the EU. This form of direct cost is calculating by adding all official non-tariff and non-tax costs which are put on the shipping of a standard container. These costs are related to documentation, administration, technical control, customs broker fees, inland transport, and terminal handling charges. However, the data is based on assumptions, since all surveyed firms are privately owned non-FDI exporting firms based in major cities with at least 60 employees who produce goods which are not military nor hazardous. Hence, the data might be skewed between countries with different

firm structures. The result in this data shows the average for the 188 countries with data on the topic is to have a cost of importing on \$1775 and a cost of exporting on \$1478, during the year 2013. This combines to an average asymmetry on \$309 more in import cost compared to export cost. This asymmetry is relevant also when comparing different countries, as it in The Gambia costs \$295 more to export than to import while it in South Sudan costs \$3950 more to import than to export, hence would this inter-African trade cost \$4245 more when the exports goes from The Gambia to South Sudan than it would in the opposite direction, which is 40.5% of the total export cost per container from The Gambia to South Sudan. This variable are thereby shown to be able to create great asymmetries. Further, there does not appear any very clear patterns regarding geographical regions nor income categories, for example is the asymmetry for exports between The Gambia and its close geographic neighbor, with roughly the same GDP per capita, Senegal 27.6% of the total cost per exported container.

In conclusion, the policy related direct costs on trade can create great asymmetries. This is logical since countries differ greatly in their economic politics and policies, which results in great differences in total policy depending on which direction the trade goes when one country's import policy is puzzled together with another country's export policy and vice versa. This logic is also strongly supported by empiric data, which shows the asymmetry can be vast compared to total costs.

#### ii) Unofficial trade costs

Unofficial trade costs include such things as corruption, bribes, and other direct expenses which the importing country is not in control of and try to combat. Since the unofficial direct trade costs adds on costs to tariffs can they give huge differences in total direct trade costs even when two countries have identical tariffs. Effects of this type, even though they can have great effects are very hard to measure in any accurate way since the people who causes these costs wants to hide it. Hence, the data one has to resort to is estimations, which for example have been done by Transparency International (2013) in their corruption perception index. However, a flaw in this index is that it is complicated to use it to calculate the magnitude of the cost caused by unofficial direct costs. One way to get a hint of the trade effects of corruption is however to look at the data regarding management time dealing with officials from the World Bank's Enterprise Survey, since this measure is caused by corruption and excessive bureaucracy. Therefore are there only two variables which are related to this category of costs, the corruption perception index and the time dealing with officials, and a partial analysis of unofficial trade cost can thus be split up into these two.

Transparency International's corruption perception index (CPI) is not only based on trade

related corruption, but is an overall corruption of politicians and officials. The index is hard to obtain, since the ones causing corruption always try to hide it, but is based on how experts at thirteen different organizations perceive the corruption in the different countries, among these organizations are the African Development Bank, Freedom House, the World Bank, and World Economic Forum. All countries and territories are ranked between 0 and 100, with an average on 42.7 and extreme points at 91 and 8. This great spread means there is a great room for asymmetries and clear patterns emerge in which rich countries like the Germanic countries and the Commonwealth realm are very clean from corruption, while countries with huge economic and political issues; Somalia, North Korea, Afghanistan, and the Sudans; have very great levels of corruption.

Time with managers have to spend on dealing with country officials is measured by an enterprise survey and looks at how great percentage of their time the managers of firms have to spend on dealing with officials, due to “taxes, customs, labor regulations, licensing and registration”. These percentages differ between different countries and can be caused both by complicated bureaucratic systems and by corruption, therefore do the data not give any clear indication but can be assume to give a hint. The data from 2009, a year when the sufficient amount of 54 countries had data, shows that in an average country do managers spend 9.3% of their time on dealing with officials, with a minimum of 0.5% in Eritrea and a maximum of 24.5% in Benin. Thus, this data shows a great space for asymmetries. However, when compared to the corruption perception index does it show a very weak correlation. Hence, the variable management time dealing with officials do not seem to give the hint regarding a country's corruption level as was predicted and this data should therefore be dismissed as irrelevant for the topic.

In conclusion, corruption and other unofficial direct costs are very likely to cause asymmetries in trade and are well worth to take into consideration. However, there is naturally a great lack of data on the topic, which results in the best source for information regarding their magnitude and effect comes from experts' perceptions.

### iii) Costs of making a deal

Firms in different countries have it differently easy to make deals with each other. Common hinders for such deals are differences in language, culture, product standards, documentation, and possibility to enforce the contract. First, asymmetric trade costs can be caused by language since firms from a region with a smaller language are more likely to be proficient in the language of their trade partner from a bigger language region than vice versa. This means the firm in the region with the smaller language can at a cheaper cost obtain the information they need about their partner and

other circumstances of the contract, since the cost of translating is lower due to a higher proficiency. Secondly, culture is likely to create asymmetric costs in the same manner since a dominant culture are likely to posse less a hinder due to outsiders greater knowledge and understanding of the culture. Moreover, different cultures have different levels of business friendliness, which can lead to higher trade costs from the more business friendly culture since they have to find their way in a less friendly culture. (Hofstede, 1994) Thirdly, the product standards are well known but hard to quantify, therefore hard to do calculations with. Moreover, these costs are only a problem when the first deal is made since the costs of applying to the foreign product standard thereafter is met in all future trade and has therefore been shown to have no effect on trade, this however still make a country more likely to export to a country with low product standards than to a country with higher standards. (Ferro et al, 2013) Finally, documentation and the possibility to enforce the contract ones it has been constructed is possible to measure, and they have been measured in the World Bank's Doing Business Project in amount of documents needed to export and amount of documents needed to import respectively the amount of days it takes on average to enforce the contract. Thus, this form of trade cost got many important components but just three easily measurable variables; documents to export, documents to import, and days to enforce contracts.

Documents to export and import are both measured as the amount of documents you need per shipment, after the actual contract has been signed, which are required by the government, shipping related authorities, health agencies, technical control agencies, and banks. This includes both permits and letter and credit, but do not include documents which you renew annually, such as tax clearance. Data from 2013, a year in which 188 countries had data, show that an average country require 7.25 documents to import and just 6.22 documents to import, which means on average did it take 1.03 documents more to import than to export. However, the extreme points were 3 more documents to export than to import, which is the case in China (PRC), and 8 more documents to import than to export, which is the case in Central African Republic (CAR). Hence, companies exporting from PRC to CAR faces 11 more documents than companies exporting from CAR to PRC, to be more precise is it 25 documents versus only 14 and the asymmetry is therefore just 44% of the total amount of documents for the exporting firm in PRC. This means that great asymmetries can occur in the cost caused by documentation. However, only 72% of the 188 countries got more needed documents in one direction of trade compared to the other, and in only 53% of the countries with a difference is this difference greater than one document, suggesting the asymmetries are in most cases very small.

The time it takes to enforce a contract can be assumed to correlate to a countries juridical system and thus to how secure a trade deal with a company in another country is, since it is counted

as the number of days you have to wait from when you file the lawsuit till determination. This is related to trade cost it is more expensive trading with a country in which it takes longer time before a trade deal is enforced if the trade partner has broken its part of the deal, in terms of risk and alternative cost. In 2013 had 188 countries data on the topic and it showed that on average did more than 20 months pass before a contract could be enforced, but with the best countries needing less than 5 months and the worst needing almost 5 years. This means the risk, measured in the juridical system of the country, is much greater in some countries compared to other and there is therefore great asymmetries, even though unknown how great the monetary effects are. There is however no clear geographic nor economic divisions in this data, with Suriname, Guinea-Bissau, and Afghanistan in the bottom on over 4 years, but with Uzbekistan, Bhutan, and Rwanda among the top 10 together with Singapore and New Zealand.

In sum, much of the data regarding the cost of deals is hard to find since it is based on the knowledge and skills of the ones who write the contracts. From the government's side is it easier to find data, even though product standards are hard to quantify, and this data show great differences in how much documentation countries demand and how great security regarding contract enforcement they can offer. Thus, the costs surrounding trade deals can cause great, even though hard calculated, asymmetries.

#### iv) Costs from trading time

The trading time affects the trade cost partly since it costs to store and handle the goods which is greater the longer time it takes to trade and because many goods decline in value as the time goes. Since this is all counted in time it is possible to get measures which are exact and so has been done in the World Bank's Doing Business Project and has been summed up as time to export, and time to import.

The measurement of time to export and time to import are both counted in days and include the time required to obtain documents, inland transport and handling, customs handling, and port and terminal handling. However, the transport time, id est the time it takes from one port to another, is not included in this measure. In 2013 did 188 countries have data on this topic with time to exporting being on average 22 days and time to import being on average 25 days, which results in it on average takes 2.8 days more to import than to export. However, the import time ranges from 4 days to over 4 months and export time ranges from 6 days to almost 3 months, which results in big ranges of asymmetries. This range from 75 days more to import than to export in South Sudan, to 12 more days to export than to import in Kazakhstan, causing a total asymmetry between them on 87 days, which is 41% of the total non-ocean export time for exporting firms in Kazakhstan. This

means this variable has great potential for asymmetries. Further, in difference from many of the other variables discussed does it exist data regarding the different components; such as lead time to export/import and time to clear exports through customs; which makes it possible to analyze where a certain country's issue lie. Hence, these costs might be among the greatest asymmetries and might at the same time be the easiest to get data on and handle.

#### v) Costs from the goods' nature

The nature of the goods affect the trade cost since different types of goods cost differently to export due to different standards, differences in how they have to be transported and different iceberg costs, since food decay more quickly than metal. Hence, asymmetric trade costs between two nations can come from the goods they export to each other. These asymmetries have been shown to exist in previous empirical research (Anderson & van Wincoop, 2004) and can be measured in the composition of the different nations exports. Data for this type of analysis is collected by many different institutions, for example do the World Bank have data, based on on the United Nations Statistics Division (UNSD), regarding how big part of the merchandise export is food exports, manufactures, and ores and metals export.

The different export categories are all defined based on the UNSD's Standard International Trade Classification Revision 3 where food is section 0 (food and live animals), 1 (beverages and tobacco), and 22 (oil-seeds and oleaginous fruits); manufactures is section 5 (chemicals and related products, n.e.s.), 7 (machinery and transport equipment), 8 (miscellaneous manufactured articles), and 6 except 68 (manufactured goods except non-ferrous metals); and ores and metals is section 27 (crude fertilizers and crude minerals), 28 (metalliferous ores and metal scrap), and 68 (non-ferrous metals). There also are additional sections; 2 (crude materials, inedible, except fuels), 3 (mineral fuels, lubricants and related materials), 9 (commodities and transactions not classified elsewhere), I (gold, monetary), II (gold coin and current coin); which in this report will be calculated as other merchandise export. In 2010 had 151 countries relevant data, which had only a problem with trade being registered in more than one category in Antigua and Barbuda, which showed that a negative percentage of their exports are in the category other merchandise exports and therefore are they dropped from the data. The result from the other 150 countries is that an average country in the world in 2010 had 43% of their exports in manufactures, only 25% in food, 9% in ores and metals, and 23% in other exports. However, the data shows great differences with food and manufactures exports both varying between 0% and 96%, ores and metals varying between 0% and 86%, and other exports varying between 0% and 98% between different countries. These great variations show that this can be a great cause of trade asymmetries since food get devalued much quicker than



metals and manufactures due to natural decay, and manufactures lose value faster than metals due to it faster get outdated, and the devaluation process of the other exports are unclear. In this data are there also clear patterns since the food heavy countries are often poorer countries, with the exception of New Zealand, and are often island nations. The manufactures heavy countries are first emerging economies, with Cambodia and China in the top, followed by high developed countries. The metal heavy countries are ones again poorer countries, with the exception of Iceland, but are in this case not islands, id est it is countries which got a ground which is ore and metal rich but are not yet rich enough to manufacture them. Finally, other exports are dominated by the oil countries, which is most likely due to their exports being naturally dominated by section 3 exports. Thus, the nature of the goods can be a reason for asymmetries in trade costs. Further, they are easy to calculate, since the registration is often done by law, and can be divided even further in order to see were the big differences are.

## **5. Differences in the EU**

The single market project of the European Union, which is a central party of the collaboration, began already in 1951 by the Treaty of Paris, went further in 1968 by the abolition of quotas and tariffs, and started to go toward completion in 1986 and 1992 through the Single European Act and Treaty of Maastricht. (European Commission, 2014a) However, even though the EU members might be the most integrated countries in the world who work toward stronger integration can asymmetries in trade costs still be found in the union, which means the union is not yet a single market. These asymmetries can appear through the variables discussed in the previous cases or through other variables. Hence, the EU will be specially studied in the same manners as above, using data from 2010 since it was the most recent year with sufficient amount of data in all variables and since no country joined the union in 2010. The union had 27 members in the year 2010, but Malta will be excluded from this due to a lack of data. This will be finalized by comparing the trade cost asymmetries for each country to the average EU member as well as to the union as a whole by summarizing all data used in the discussion in four tables. The data is again from the World Bank's World Development Indicators catalog (2014) unless specific source is given.



### i) Policy related trade costs

Since the policy related trade costs are decided by the respective governments directly should they be the easiest to harmonize within the union. Hence, it is not surprising all the 27 countries in the union have common tariffs which lay on 1.61% as a weighted mean of all products and on 0% between the member states. Further, the actual income from the import duties and export taxes are differing between the countries, but if it is assumed the tariff schedules are followed does this difference not mean there exists trade cost asymmetries between the nations but rather asymmetries in total trade. Finally, the cost of importing and cost of exporting a 20-foot container are not necessarily existing in order to hinder trade and even though they can be harmonized do data show this is not the case.

In 2010 did the average country in the EU have cost of importing on \$1073 and cost of exporting on \$1024, which both are less than the world averages on \$1645 respectively \$1384. This also means it on average costs \$49 more to import than to export with a standard deviation of \$77, which is a much tighter room for asymmetries to occur compared to that it in the world on average cost \$261 more to import than to export with a standard deviation of \$489. This means the EU is clearly more harmonized than the world in general, and between 14 of the 26 countries is the asymmetry less than \$80 per container. However between the two extremes, Latvia and Romania, does it still cost \$301 more to export from Romania to Latvia than the other way around, a pattern that also show between neighbors such as Latvia and Estonia where it costs \$221 more per container as a ship export from Tallinn to Riga compared to when it exports north again. Hence, there exists an asymmetry in this variable.

### ii) Unofficial trade costs

This set of costs is important but have been shown to be hard to handle since people try to hide data on the topic and because variables which can be assumed to correlate with corruption have been shown to not have any correlation with the experts view of what the corruption levels are on in reality. Hence, only Transparency International's corruption perceptions index (2010) will be included in the analysis of the EU. A difference between the 2010 CPI and the 2013 CPI, which was used previously, is that the scale is 0 to 10 instead of 0 to 100, hence will all scores be a tenth of what they were previously.

The CPI shows the EU in 2010 had an unweighted average on a level which would have earned the union the 28<sup>th</sup> position in a ranking of 178 countries, with the more populous countries being above this unweighted average. This means the union is relatively clean. However, there are

great differences within the union, which can cause asymmetries in trade costs. It ranges from the Nordics who are in the world top 5, to Greece and Bulgaria who are both in the 60<sup>th</sup> percentile. This means that there is a 5.8 CPI points difference between the cleanest and the dirtiest country in the region, 5.8 points is enough for a 33<sup>rd</sup> position in the ranking. Hence, it is clear that corruption exists in the union, even though the union on average is relatively clean, and this corruption is likely to cause asymmetries in trade costs.

### iii) Costs of making a deal

Differences in language, culture, product standards, documentation and possibility to enforce the contract were the variables which were found likely to affect the costs of making a deal which were previously discussed. Compared to when discussed on a world level is it possible in an EU setting to discuss all of them, except culture, by taking advantage of that fewer countries are in the analysis

Language differences are likely to cause asymmetries in trade cost in favor of the firm from the country with the smaller language. Moreover, if both countries are relatively small can it be an advantage to the firm from the country which is more proficient in English, or some other common language, since the deal then occurs in a language which is foreign to both partners. In 2010 did the EU have 23 official languages, which is almost one unique language per member state, of different sizes. It ranges from English, which is spoken by about a quarter of the worlds population (British Council, 2014), to Estonian which is the sole official language in Estonia and which has less than 1.3 million speakers and no closely related languages. It is still hard to in a general way quantify language and its impact on trade cost asymmetries. However, since so few countries are studied is it possible to compare the countries in couples, where the most extreme case seem to be between the United Kingdom and Estonia, since Estonians as a people have a “very high proficiency” (Education First, 2011) while only about 0.02% of Britons know sufficient Estonian. (Ethnologue, 2014) However, overall does it seem the north-western parts of the union have lower language related trade costs than the south-eastern parts, due to a higher English proficiency. (Education First, 2011) Hence, language is a possible cause of trade cost asymmetry in the union.

Product standards are even less an issue in the EU than in the world in general since much of the product standards have already been harmonized. (European Commission, 2014b) Hence, in most cases do product standards in the EU cause no asymmetries in trade costs and in the few cases were asymmetries might occur due to all standards not being harmonized is the data too hard to handle for product standards to be excluded as a variable. Further, as shown by Ferro et al (2013) do product standards just pose an original trade barrier and should therefore cause no asymmetries in the long run, in difference from the other variables, which means that their possible effect in the EU

is limited.

Documents needed to export and import are on average fewer in the EU than in the world in general, even though documentation is not a great factor in the world, with import documents amounting to 4.6 on average and export documents amounting to an average of 4.1 documents, compared to 7.3 and 6.2 respectively. This comes from EU being more harmonized than the rest of the world with an average at only 0.5 more documents at import compared to export which is half the world average, and with 3 documents in difference between the two extremes, compared to the world in general which has 11 documents between the two extremes. It should also be stated that both extremes contains four out of the 26 countries each which gives a standard deviation of less than 1 and which means it in many cases are no asymmetries even though certain asymmetries do exist in the union.

The enforcement time is just slightly better in the union than in the world in general with 553 days on average and a standard deviation of 265 days, compared to an average of 618 days and a standard deviation of 305 days. Hence, the almost 3 years that are the difference between the most efficient country, Lithuania, and the least efficient country, Slovenia, shows the union got great asymmetries in the juridical system.

#### iv) Costs from trading time

The trading time in the union, measured as the time from when the good leave the factory until the shipment leaves the harbor respectively the time from when the shipment docks till the good is at the importer, is clearly lower and more harmonized than in the world in general. It takes on average just 11 days to import, world average on 25 days, and on average only 12 days to export, world average on 23 days. This results in an average of 0.69 days more to export with a standard deviation of 1.49, compared to a world average of 2.35 days more to import with a standard deviation of 5.82 days. Further, 19 of the 26 countries have 0, 1, or 2 days more for export than for import, thus is the asymmetries isolated to a few countries such as Bulgaria with 4 more days to exports and Ireland, Hungary, and Czech with 2 more days to import than to export. Hence, there is great harmony regarding trading time in the union, however asymmetry still exists.

This asymmetry can be analyzed further by comparing leading time to export and leading time to import. The two are defined as the median time for the time spent between the exporter respectively importer and the port. The result is that the difference between the two lead times do not seem to correlate with the asymmetry in total trade time, in fact Bulgaria who had 4 more days to export than to import have a 2 days longer lead time to import than to export. This means the asymmetries must occur in how the trade is handled by the customs, port, and terminal.

When the Logistics Performance Index; which is based on how companies, international institutions, and people who work in logistics perceive the quality and efficiency of countries logistic services and is constructed by the World Bank and Turku School of Economics; is compared to the asymmetries in trade time do neither any signs of correlation appear. This hints to that the asymmetry in trade time, in the case of the EU, either are caused by external factors or appears on random. Hence, infrastructure investments can reduce trade time and thereby increase trade, but it seem unlikely to reduce asymmetries in trade costs in the EU.

In conclusion, there exists great asymmetries in trade time within the EU, even after transport time has been excluded, but the reasons for these asymmetries do not seem to have a single simple cause, as instead all possible causes for them on their own show no greater correlation with the trade time.

#### v) Costs from the goods' nature

The EU countries are all very manufactures heavy with their exports always consisting at least to half of manufactures, with an average on 72% of the exports being manufactures. However, the industry composition differs greatly between the nations. The manufactures part of exports vary between 49% and 87%, foods part vary between 3% and 34%, ores and metals part vary between 1% and 17%, and the other sections of exports vary between 2% and 27%. Thus, there is no doubt the composition of the different countries exports has an effect on the asymmetry in trade cost by being very differing countries.

#### vi) Total asymmetries for the member states

In order to see the countries total asymmetries within the European Union will the data used in the discussion above be compared to the other countries as well as to the EU average in tables below, with the exception from language data which will be left out due to lack of reliable data, and due to a too great mix of languages. Ones again is all the data which is used and presented from the year 2010. Table 1 will compare the countries CPI, time to enforce contracts, the food sectors part of the exports and present the countries nominal GDP. Table 2 will show the separate export and import data for cost per 20-foot container, amount of documents needed, and time to trade. Finally, Table 3 shows the calculated asymmetries which are presented in Table 2. The averages which are presented in the three tables is both an unweighted average based solely on the values in the tables, as well as a weighted average in which the nominal GDP; which is presented in Table 1; has been used in order to take the difference in economic power into consideration. Both the averages however has an importance, since asymmetries toward the unweighted average shows a country's asymmetry

toward their average member trade partner, while the asymmetry toward the weighted average shows a country's asymmetry toward the union as a whole. Hence, the three tables gives a possibility to evaluate the total asymmetry each and every country in the EU has against their EU trade partners as well against the union as a whole by comparing the countries results in the tables with the two averages. For this to be possible is also a definition of what counts as the proximity of the averages needed, which is a 20<sup>th</sup> of the total range. This subsection ends with Table 4 where each countries result from the comparison in the three first tables is summarized, in order to get the complete picture.

Table 1 first present the countries nominal GDP, which are used to create the weighted average and therefore is worth discussing in order to see which countries mainly affects the weighted average. It shows Germany as the real heavy weight economy in the EU, with a nominal GDP which is 29% greater than the second biggest country and 20% of EU's total nominal GDP. Afterwards follows a block of France, United Kingdom, and Italy who all are above the weighted average nominal GDP, and who together makes up 42% of EU's nominal GDP. It then follows Spain and the Netherlands who both have a nominal GDP which are less than the weighted average but greater than the unweighted average, which means 20 countries have a nominal GDP which is less than the unweighted average. After follows 20 countries which all have less than 3% of the unions total nominal GDP, where of 9 countries have less than 1% of the total nominal GDP, and Lithuania, Latvia, Cyprus, and smallest of all Estonia all got less than 0.25%. The fact that three countries makes up 63% of the total nominal GDP, and 20 out of 26 countries have a nominal GDP which is lower than the unweighted average shows the union to be greatly skewed.

Table 1's third column contains data regarding corruption, in the form of CPI. This first shows, which was stated in the text, that the bigger countries are in general among the cleaner countries, since the weighted average is 0.5 higher than the unweighted average on a scale from 0 to 10. The data also shows a great and fairly even spread and a clearer picture of the early discussion with the Scandinavian countries clearly being the cleanest; with an 0.5 point gap to the rest; all of the non-Mediterranean west being the only countries above the weighted average, and the south eastern parts of the union plus Italy being the most corrupt; with an 0.4 point gap to the rest. It also shows Portugal, Spain, Cyprus, Slovenia, and Estonia being close to; within 0.6 points; the unweighted average and Estonia, France, and Belgium being close to the weighted average, thus not having low asymmetries toward their average trade partner respectively the union as a whole, by not being cleaner nor dirtier.

The third data set in Table 1 is time to enforce contracts. In this case is the unweighted and the weighted average practically equal on about 18 months, just a 0.5% difference, which is due to a

**Table 1: Nominal GDP, CPI, time to enforce a contract, and the food sectors part of the countries exports in the EU**

<b>Country</b>	<b>Nominal GDP</b>	<b>CPI</b>	<b>Time to enforce a contract</b>	<b>Food's part of exports</b>
Unweighted Average	\$626	6.3	553 days	11.1%
Weighted Average	\$1889	6.8	550 days	9.2%
Austria	\$380	7.9	397 days	6.9%
Belgium	\$473	7.1	505 days	8.8%
Bulgaria	\$48	3.6	564 days	16.1%
Cyprus	\$23	6.3	735 days	34.4%
Czech	\$199	4.6	611 days	3.9%
Denmark	\$313	9.3	410 days	18.4%
Estonia	\$19	6.5	425 days	9.9%
Finland	\$237	9.2	375 days	2.6%
France	\$2571	6.8	390 days	12.0%
Germany	\$3312	7.9	394 days	5.2%
Greece	\$295	3.5	1030 days	24.4%
Hungary	\$128	4.7	395 days	7.6%
Ireland	\$208	8.0	515 days	9.2%
Italy	\$2059	3.9	1210 days	7.9%
Latvia	\$24	4.3	309 days	16.8%
Lithuania	\$37	5.0	300 days	17.3%
Luxembourg	\$53	8.5	321 days	8.3%
Netherlands	\$781	8.8	514 days	13.5%
Poland	\$470	5.3	830 days	10.8%
Portugal	\$229	6.0	547 days	11.4%
Romania	\$165	3.7	512 days	8.1%
Slovakia	\$87	4.3	565 days	4.3%
Slovenia	\$47	6.4	1290 days	4.1%
Spain	\$1392	6.1	515 days	15.1%
Sweden	\$462	9.2	314 days	4.7%
United Kingdom	\$2267	7.6	399 days	6.3%

great value in Italy drags up the average. In this case is there also clearer groups of countries with Slovenia and Italy on 1290 days respectively 1210 days, which both are double the averages, followed 180 days lower by Greece on 1030 days. It then is 200 days down to the next country, Poland, followed by an additional 95 days down to Cyprus and an additional 124 days to Czech Republic on 611 days or roughly 20 months. It then follows 8 countries within the four months surrounding the average, id est between 16 and 20 months, which therefore are countries which have low asymmetries to average trade partners and to the union as a whole. The last group consists of 9 countries who all have enforcement times between 10 and 14 months, which therefore get asymmetries due to a too high efficiency.

The final column in Table 1 shows the part of the countries' exports which is in the food sector. It is impossible to completely rank the countries trade cost asymmetries caused by the composition of their exports since the exact devaluation time in the different categories are unknown and not possible to calculate, due to the difference in products in the different groups. However, it is possible to use the data to give rough estimates as long as the assumption that agricultural products in general losses their value much quicker than the other sectors hold. Hence, only the food sectors part of the exports is presented above, since it has the greatest effect. By using this assumption can clear differences between the countries be seen, first one being the unweighted average showing a food export which is 1.9 percentage points greater than the weighted average; which means the big economies are generally more industry heavy and export less agricultural goods. There is also differences between specific countries with Cyprus having 34.4% of their exports in the food section, which is followed first by Greece on 24.4% exports in food, and further is by Denmark on 18.4% exports in food. After Denmark do the countries start to come closer together even though it can be said to belong to a cluster together with Lithuania, Latvia, Bulgaria, and Spain. Roughly equal to the average do in this case mean 1.6 percentage points, which means 4 countries are around the unweighted mean and 8 countries are around the weighted mean, with Poland and Estonia be close enough to them both. Finally, Finland is clearly the least agricultural exporter on 2.6%, compared to Czech Republic which are second on 3.9%.

Table 2 shows costs related more specifically to exporting or to importing. The table shows, by the difference in weighted and unweighted average, the bigger countries has in general higher costs per container even though they have clearly fewer documents and it take shorter time to trade for them, for both export and import. Further, there is a correlation between the values for exporting and the values for importing; id est the asymmetries are not very extreme; but there is no clear correlation between costs, documents, and trading time. These cost will not cause asymmetries in bilateral trade unless the difference between the exporting cost and the importing cost differs in the

**Table 2:** Costs during exporting respectively importing in the EU

Country	Exporting	Importing				
	Cost per container	Amount of documents	Time to trade	Cost per container	Amount of documents	Time to trade
Unweighted Average	\$1024.1	4.1	12 days	\$1073.4	4.6	11.3 days
Weighted Average	\$1078.7	3.6	11 days	\$1122.4	3.7	10.2 days
Austria	\$1180	3	9 days	\$1195	4	8 days
Belgium	\$1240	4	9 days	\$1400	4	9 days
Bulgaria	\$1526	4	22 days	\$1586	5	18 days
Cyprus	\$815	5	7 days	\$955	7	5 days
Czech	\$1120	4	18 days	\$1165	6	20 days
Denmark	\$794	4	6 days	\$744	3	5 days
Estonia	\$745	3	6 days	\$725	4	5 days
Finland	\$590	4	9 days	\$620	5	8 days
France	\$1285	2	10 days	\$1395	2	11 days
Germany	\$902	4	8 days	\$937	4	7 days
Greece	\$1078	4	20 days	\$1265	6	19 days
Hungary	\$1015	6	16 days	\$1055	6	18 days
Ireland	\$1109	2	8 days	\$1121	2	10 days
Italy	\$1295	3	20 days	\$1245	3	18 days
Latvia	\$600	5	10 days	\$801	6	11 days
Lithuania	\$870	4	10 days	\$980	5	10 days
Luxembourg	\$1420	5	8 days	\$1420	4	7 days
Netherlands	\$925	4	7 days	\$942	5	6 days
Poland	\$884	5	17 days	\$884	4	17 days
Portugal	\$730	4	16 days	\$899	4	14 days
Romania	\$1275	5	13 days	\$1175	6	13 days
Slovakia	\$1530	7	17 days	\$1505	6	16 days
Slovenia	\$710	5	19 days	\$765	7	17 days
Spain	\$1271	4	10 days	\$1350	4	10 days
Sweden	\$717	3	9 days	\$735	3	6 days
United Kingdom	\$1000	4	8 days	\$1045	4	6 days



two countries, since two countries with equal internal asymmetries has symmetric trade costs the exporters exporting cost plus the importers importing cost. Thus, the data in Table 2 cannot be used to give good result on bilateral trade cost asymmetries, and using the unweighted average data to calculate the asymmetry to the average trade partner is therefore pointless. Instead, in Table 3 are internal asymmetries between import and export costs presented, which can be used to compare asymmetries in bilateral trade. However, the data in Table 2 can be used to compare countries toward the union as a whole, since it can be seen as the countries export to and import from the common market and therefore are their total costs more important than their internal asymmetries in the case of asymmetries toward the union as a whole. Moreover, due to the high correlation between export costs and import costs will only the export costs be analyzed in this text.

The export cost side in Table 2 has three variables where of the first is cost per exported standard 20-foot container. The export cost has extremes with Slovakia and Bulgaria up at \$1530 respectively \$1526 followed first by Luxembourg on \$1420, which is \$125 more than the fourth most expensive, and with the other extreme at Latvia and Finland on \$600 respectively \$590, which is \$110 less than any other country. The other countries are more centered around the average, however with only four countries; Czech Republic, Ireland, and Greece; being close to the weighted average, which means it in general is great asymmetries within the union regarding export costs.

The other two export side variables in Table 2 are amount of documents needed to export, and time needed to export. They both differ from other discussed variables by having rather low ranges of values, which means they are divided in more clear groups and the previous definition of being in the vicinity of the average has to be rounded to the closest integer in order to contain more possible values. The documents needed to export have extremes with Slovakia and Hungary up at 7 respectively 6 documents and Ireland and France down at 2 documents. Further, there are 6 countries which demand 5 documents and 16 countries, 62%, who demand documents at the average of 3 to 4. The export time has a slightly greater range with Bulgaria at the upper extreme with 22 days, 2 more than Greece and Italy which are the second slowest, and with Denmark and Estonia at the lower extreme at 6 days, with two countries at 7 days. However, surprising here is the big lack of countries which are in the middle, with only 4 countries clocking within the average which in this case span from 10 to 12 days. With all the Germanic countries, plus a few additional countries, being below the average and most countries above the average being Mediterranean and Eastern European.

Table 3 can be used to compare both asymmetrical trade costs with the average trade partner, as well as with the union as a whole. It starts with asymmetries in cost per container, were the weighted average is \$5.6 closer to symmetry, even though both unweighted and weighted average

**Table 3:** Asymmetries cost by difference in importing and exporting costs in the EU

<b>Country</b>	<b>Asymmetries in cost per container</b>	<b>Asymmetries in amount of documents</b>	<b>Asymmetries in time to trade</b>
Unweighted Average	-\$49.3	-0.5	0.7 days
Weighted Average	-\$43.7	-0.1	0.8 days
Austria	-\$15	-1	1 days
Belgium	-\$160	0	0 days
Bulgaria	-\$60	-1	4 days
Cyprus	-\$140	-2	2 days
Czech	-\$45	-2	-2 days
Denmark	\$50	1	1 days
Estonia	\$20	-1	1 days
Finland	-\$30	-1	1 days
France	-\$110	0	-1 days
Germany	-\$35	0	1 days
Greece	-\$187	-2	1 days
Hungary	-\$40	0	-2 days
Ireland	-\$12	0	-2 days
Italy	\$50	0	2 days
Latvia	-\$201	-1	-1 days
Lithuania	-\$110	-1	0 days
Luxembourg	\$0	1	1 days
Netherlands	-\$17	-1	1 days
Poland	\$0	1	0 days
Portugal	-\$169	0	2 days
Romania	\$100	-1	0 days
Slovakia	\$25	1	1 days
Slovenia	-\$55	-2	2 days
Spain	-\$79	0	0 days
Sweden	-\$18	0	3 days
United Kingdom	-\$45	0	2 days

shows that in the general case does it cost more to import. It shows a great variety, however with only Romania distancing itself greatly from any other country with \$100 more to export than to import, with Italy and Denmark on second place down on \$50. On the other extreme is Latvia, on \$201 more to import than to export, which however is a lead with just \$14. Notably, is also that 6 countries are close to both the two averages; on a \$18.5 radius; and therefore experience low asymmetries both with members and with the union as a whole; while only Finland is solely close to the weighted average.

The amount of exporting and importing documents is close to symmetric in all countries, which lead to an unweighted average on 0.5 more documents to import and the slightly less 0.1 more documents to import in weighted average. This leads to four discrete groups in which 4 countries have 2 more document to import than to export, 8 countries have 1 more document to import, 4 countries have 1 more document to export than to import, and 10 countries got equally many documents in both directions. Those 10 countries are also in the vicinity of the weighted average, and no country is in the vicinity of the unweighted average.

Table 3 finally shows asymmetry between exporting time and importing time, which ones again is close to symmetric in an average country with an unweighted average on 0.7 days more to export than to import and weighted average on 0.8 days more to export. In difference from the documents is this data divided into 7 groups, with Bulgaria on 4 days more to export than to import, and Sweden on 3 days more to export. The other 5 groups consists of 5 countries having 2 more days to export than to import, 3 countries having 2 more days to import than to export, 2 countries with 1 more day to import, 5 countries with symmetry in export time, and 9 countries having 1 more day to export than to import. These 9 countries are both at the weighted and the unweighted average and do therefore on average experience no asymmetries.

If the three columns in Table 3 are analyzed together do a picture appear in which some countries in general have a lower ratio between import costs and export costs while other than the unweighted average while other countries in general have a higher ratio than the unweighted average. This gives a result in which Western Europe; except Belgium, France, and Spain; plus Estonia, Hungary, Poland, and Slovakia all have a lower ratio between import costs and export costs than average while the rest, which mainly are eastern European countries, have a higher ratio between import costs and export costs. Hence, Table 3 shows which countries are more import friendly and which countries are more export friendly, in comparison to each other.

To conclude this subsection has the discussion been summarized in Table 4. In the summary will only the countries asymmetries toward the union as a whole be taken into account, since the two averages have shown to be in a very close vicinity of each other and because the result in

**Table 4:** Summary of asymmetries between countries and the EU as a whole\*

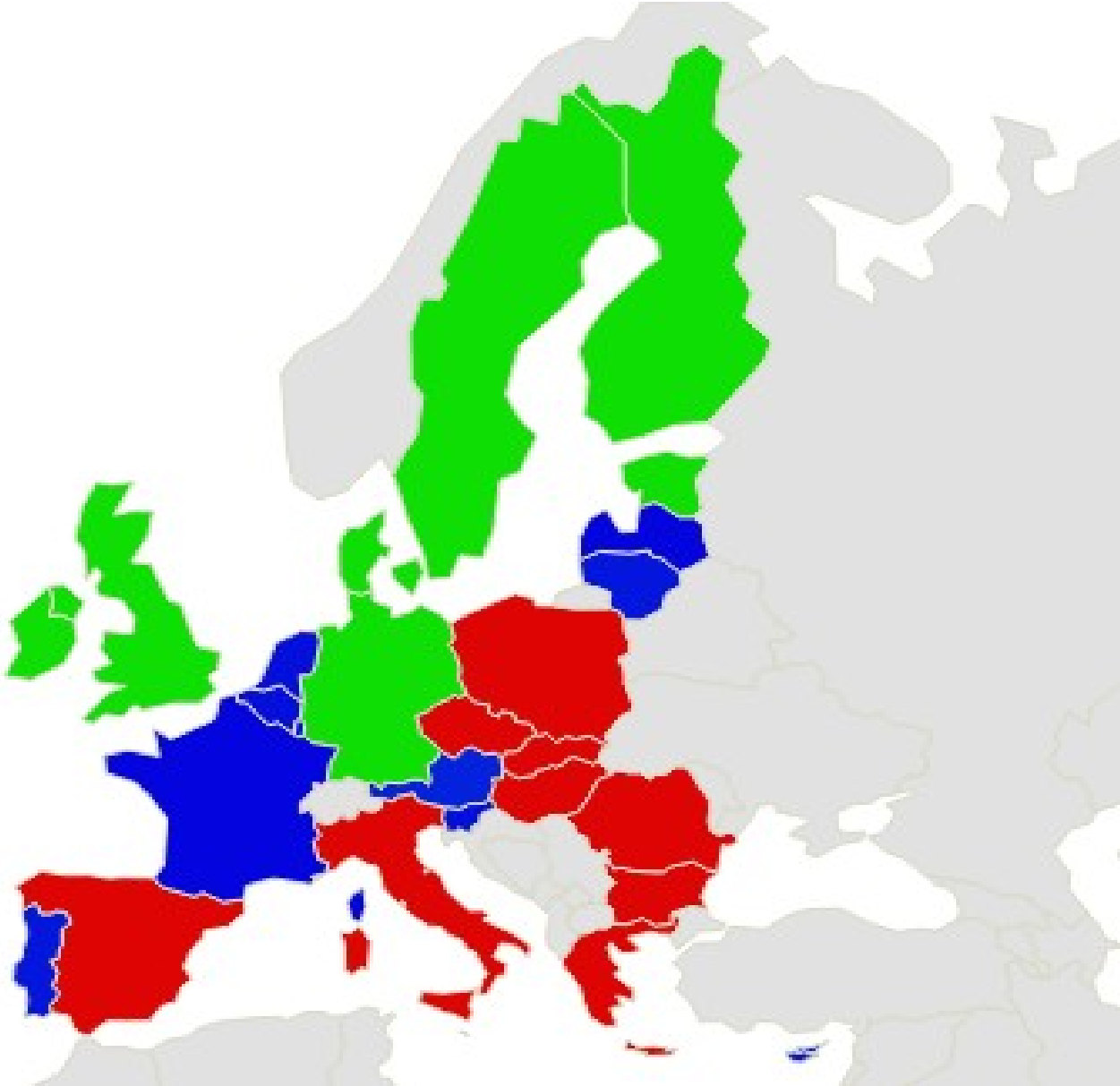
Country	CPI	Time to enforce a contract	Food's part of exports	Cost per container	Amount of documents	Time to trade	Sum	Sum of absolute values
Austria	2	2	1	-2	0	1	4	8
Belgium	0	0	0	-2	0	1	-1	3
Bulgaria	-3	0	-2	-3	0	-3	-11	11
Cyprus	-1	-2	-3	3	-2	2	-3	13
Czech	-3	-1	2	0	0	-3	-5	9
Denmark	3	2	-3	3	0	3	8	14
Estonia	0	2	0	3	0	3	8	8
Finland	3	2	2	3	0	1	11	11
France	0	2	-1	-2	2	0	1	7
Germany	2	2	2	2	0	1	9	9
Greece	-3	-3	-3	0	0	1	-8	10
Hungary	-3	2	0	1	-3	-3	-6	12
Ireland	2	0	0	0	2	2	6	6
Italy	-3	-3	0	-2	0	-3	-11	11
Latvia	-3	2	-2	3	-2	0	-2	12
Lithuania	-3	3	-3	2	0	0	-1	11
Luxembourg	3	2	0	-3	-2	2	2	12
Netherlands	3	0	-2	2	0	2	5	9
Poland	-3	-3	0	2	-2	-3	-9	13
Portugal	-2	0	0	3	0	-3	-2	8
Romania	-3	0	0	-2	-2	-1	-8	8
Slovakia	-3	0	2	-3	-3	-3	-10	14
Slovenia	-1	-3	2	3	-2	-3	-4	14
Spain	-2	0	-2	-2	0	0	-6	6
Sweden	3	2	2	3	0	1	11	11
United Kingdom	2	2	1	-1	0	2	6	8
<b>Sum</b>	-13	10	-7	11	-14	-3	-16	58
<b>Sum of absolute values</b>	59	40	35	55	22	47	158	258

\*0 means within a 20<sup>th</sup> of the range, ±1 means within a 10<sup>th</sup> of the range, ±2 means within a 4<sup>th</sup> of the range, and ±3 means further away than that. A positive number means a higher efficiency than average, id est a lower CPI and otherwise values closer to zero, while a negative sign means less efficient.

Table 3, which would be needed to be used for the unweighted averages of export costs, is more ambiguous than Table 4 allows. What the table reveals is an EU where the asymmetries are wide spread and all countries have them in some fields, even though Belgium just has it in two out of six included fields. Moreover, just 9 out of the 26 countries were consistently more or less efficient than average, while the rest of the countries found their asymmetries varying between the two, as seen by comparing the sum column and the sum of absolute values column. Further, the different variables show rather different amounts of asymmetry, as seen by the sum of absolute values row, and are also skewed in different directions, as seen by comparing the sum row with the sum of absolute values row. Even though it is hard to in a clear way combine the result from the six different variables since they all affect the total trade cost differently and there is therefore no reliable way to calculate a total trade cost, thus neither a total trade cost asymmetry. However, by looking at the sum column and comparing it with the sum of absolute values column, in order to see how big part of the countries' asymmetry points are in the same direction, can the countries be divided into countries which have asymmetries due to being more efficient than the average, countries which have low asymmetries, and countries which have asymmetries due to being less efficient than the average.

Comparing the countries by the described method shows the countries which are too efficient for symmetry in the EU are the non-Mediterranean western Europe, plus Estonia and with an exception for Benelux and Austria. The countries which are too inefficient on the other hand are the Mediterranean and eastern European EU members, with exception from Portugal, Slovenia, France, Cyprus, and the Baltic. All countries which have been excluded from any of the other categories are closer to the middle, however in general leaning toward the same efficiency as their neighbors. Hence, with the help of the asymmetries it is possible to draw a border in the EU based on geography and culture, as illustrated in Map 1. This border is also to a great extent the same border which is between countries with lower import cost to export cost ratio and countries with higher import cost to export cost ratio, with the more efficient countries in general having a lower ratio. However, the border does not seem to follow economic size in any greater extent, given the sum of the countries' sums is just slightly negative in comparison to the sum of the absolute values of the countries' sums. Thus, according to the six variables which have been used in Table 4 is the EU not a single market, but in fact at least two markets who are divided up by geography and culture and with a barrier of asymmetric trade costs between them. In which the countries with higher barriers to trade generally resides in the south-east and the countries with lower barriers to trade generally resides in the north-west.

**Map 1:** The EU's three categories of trade efficiency



Created by Henrik Rundgren based on the result from Table 4. Green are over-efficient, red are under-efficient, and blue has a close to average efficiency.

## **6. Theory and Policy Implications**

The EU has been found to have asymmetries in trade costs, the magnitude of which is unknown due to issues with combining the variables to a total trade cost. These asymmetries exist even though the EU for decades have tried to create a common market. Hence, it is important to discuss what the effects of the existence of these asymmetries are, compared to a scenario in which the single market existed with complete harmony. It is also important to discuss what can be done in order to reduce the asymmetries in the European Union, and what effects this would have on the union.

### i) Theory implications of the asymmetries

The theories which will be used in order to enlighten the result of the union's single market being split up by asymmetries are the same theories which were discussed in the theory section of this paper; *id est* the Anderson and van Wincoop's (2003) gravity model, Krugman's (1991) center-periphery model, and Melitz's (2003) heterogeneous firm model.

The gravity model's main use is to calculate how great trade flow countries will have, based on just a handful of variables. Among them is trade costs which are assumed to be symmetrical, and if this assumption is false do Anderson and van Wincoop's gravity model get skewed with the factor  $(\Pi_i/P_i)^{\sigma-1}$ . According to the calculations by Bergstrand et al (2013) is the effect of the factor real and do cause great reductions in average trade volumes between the two countries with reduced average welfare as an effect. Hence, the gravity model with asymmetries suggest an EU with asymmetries in trade costs has less trade between the members, which means lower integration, and has lower welfare compared to a case in which the trade costs would be harmonized within the union. It is therefore in the interest of all the union's members to reduce the asymmetries, in order to increase integration and welfare for the whole union. However the symmetry, according to the gravity model with symmetry, should preferably be created by reducing the trade cost in countries with high barriers, instead of increasing them in countries with low, in order to reach the wished effect. Hence, it should therefore be a goal for the union as a whole to help the countries with higher trade barriers, which has been shown to in general be the Mediterranean and Eastern European countries, to bring down their trade barriers.

The center-periphery model when allowing for asymmetries in trade costs suggests the lower the internal trade cost are in a region, such as the EU, the greater will the economic activity be in the region which will be positive both for the region's workers and the region's farmers. Further, the model suggest the higher the import cost to export cost ratio is in a region, the more likely is that region to become a core since the greater incentive is there to be located in the region's market; thereby avoiding import costs; and export elsewhere. As shown in Table 3 are the countries within

the EU with higher ratios between import and export cost generally in the east of Europe, while the countries with lower ratios are generally in the west. This suggests the east to be more likely to become the core, while the west is more likely to become periphery. However, in contrast to this do the Blue Banana, Europe's economic core, exist in the west, spanning from northern Italy through the Rhine Valley to England and all possible future successors of it are also in the west, all of them coinciding with Europe's most populous areas. (Hospers, 2003) That the center-periphery situation in Europe do not follow the trade cost ratios is in accordance with Krugman's (1991) original model since it predicts firms gather where most costumers are, to get lower trade costs to the majority, and where most other firms are, in order to enjoy external economies of scale. Hence, more symmetric trade costs, thereby more harmonized trade cost ratios, are likely to result in the core of the EU getting stronger while the periphery gets weaker, since the incentives to stay in the periphery would decrease. This would lead to more efficient firms in the union, since more would get access to increasing external economies of scale, which would benefit both workers and farmers in the union due to decreased internal trade costs in the union. However, it would also result in a relatively poorer periphery. Hence, harmonizing trade costs by bringing down the higher barriers would, according to the center-periphery model with asymmetric trade cost, result in more efficient firms in the union as a whole, greater wealth in the union as a whole, and also greater inequality in the union, which might lead to a less stable union.

Finally, the heterogeneous firm model with asymmetries in trade costs suggests firms in a country with higher barriers to trade will have a greater chance to act on a trade partners market than the trade partner with lower barriers to trade. In the current EU does this mean the firms from the south-eastern parts of Europe have a greater chance to act on the common market than the firms from the north-western parts of Europe. Hence, if the trade costs in the union would become symmetric would all firms have an equal chance to compete on a single market, which would lead to only the union's most efficient firms would survive. This would lead to the union performing better in international competition, to the union being more integrated with common firms, but also likely to lead to fewer firms in the south-east parts of the union since the north-eastern parts of the union are the ones who would get improved conditions, which just like in the center-periphery model might lead to greater inequality and instability in the union.

The prediction from the three used models is that if the union went toward more symmetric trade costs by reducing the barriers to trade in the Mediterranean and eastern parts of the union would the whole union experience an increased wealth. It would also lead to more efficient firms in the union, through increased competition and a stronger core around the Rhine in which the firms would get greater external economies of scale. However, it is likely the north-western parts of the



union would benefit more from the symmetries and problems with inequality and dissatisfaction in the south-eastern parts might be the result.

#### ii) Policy implications of the asymmetries

The theory implications of the trade cost asymmetries which exists in the union suggests the trade cost related policies which the union would gain the most from are policies which would reduce the trade barriers in the Mediterranean and eastern parts of EU down to the levels of the north-western parts, as well as policies which would make sure to not let great inequalities between the unions members be the result. The later is easy to fix by creating different forms of support systems and money transfers, so no part of the union will feel that it has lost on the symmetric trade barriers. To bring down the higher trade barriers is a question with more policy answers since as shown do the asymmetries exist in many possible areas, even though tariffs, product standards, and trade taxes have been close to eliminated as causes for asymmetries in the union. The ones which has been discussed and shown to be causes of the asymmetries in the union are documents needed to export and import, cost of exporting and importing a container, time to export and import, time to enforce a contract, corruption, language and culture, and the composition of the countries exports.

Documents needed to export is the easiest asymmetry cause, of the ones listed above, to fix since it is possible to control through policy by having the same rules for trade, business, and banking in the whole union, as if the whole union was a single market.

The time it takes to export and import is partly connected to the rules of trade and asymmetries in it would therefore be reduced if common rules were applied in the union. However, the time it takes to trade also depend on the country's infrastructure. Hence, financing of projects to improve the infrastructure in the countries with higher trade barriers in order to facilitate trade is an investment the whole union could benefit from in increased wealth.

The cost of exporting and importing a standard container is related to both trade rules and to trade time, since the cost increases the longer the container has to be handled. Thus, the policies which are already suggested would also reduce asymmetries caused by the costs of trading. However, this cost is also related to the logistics firms which handles the trade, which are likely to become more similar as the trade costs become more symmetric and thereby gives a more equal competition, and also to corruption costs.

Corruption is hard to tackle, but seems to be an important part of the puzzle. Policies which could help to bring down the great corruption which is present in many of the countries with high trade barriers are support to the legal system of the effected countries as well as legal collaboration.

Time to enforce a contract would in a similar fashion be helped to be harmonized by legal collaboration, and possibly also greater common rules in business and trade. Asymmetries in the efficiency of the courts are also likely to stem from differences in corruption, which is a further reason to bring down corruption in the south-eastern parts of the union, as well as stem from differences in bureaucracy which would also be harmonized by more similar rules.

Asymmetries in trade barriers caused by language and culture could be helped by policies which seek to bring Europeans together, such as the Erasmus project. Thus, even though the original point of these projects were to bring peace and understanding between the different peoples of the union might they even have economic effects and are therefore from an economist point of view worth investing more in.

Finally, the asymmetries in trade costs caused by differences in what the countries export can be a result of the center-periphery model, since it predicts an industrialized core with a more agricultural periphery. Policies to reduce asymmetries in export composition are therefore likely to counter act the center-periphery process, which has been found to give increased wealth with more efficient firms, and such policies are therefore probably likely to reduce trade cost asymmetries but are still counter productive if a wealthier union is the goal. This cause for asymmetries in trade barriers are therefore better left unfixed.

The general policies which are needed in order to get a wealthier, more competitive, and strong union are therefore policies to keep the inequality down, policies related to harmonizing trade and business related laws and rules, and investments in infrastructure in less efficient countries, anti-corruption measures in dirtier countries, and projects which brings people from the whole union closer together.

## **7. Conclusion**

The essay has been able to produce usable result, since it stands clear there is an issue with trade cost asymmetries within the European Union and since the three questions which the essay tried to answer; what cause the asymmetries, what effects do the asymmetries have, and how can they be reduced; have all got partial answers.

The causes of the asymmetries in trade costs within the EU have been found to be based on a multitude of variables, were of some have been found to be corruption, time to enforce a contract, export composition, cost to export and import a standard container, documents needed to export and import, time needed to export and import, and language and culture differences. These asymmetries

that has been created has also been found to have a geographical difference with the south-eastern parts of the union having clearly higher trade barriers than the north-eastern parts of the union. However, many of the variables; specially corruption, and language and culture differences; have been found to have big problems with accurate data. Hence, better data could heavily improve the results and could also help revealing additional variables which cause trade cost asymmetries. Also, the total magnitude of the asymmetries have not been found, even though the result regarding in which direction the asymmetries are is reliable, since there is no good way to calculate the total trade costs in an accurate way and a method of calculations would hence be able to determine the relevance of the result for trade and wealth in the union.

The effects from the asymmetries in the union have been based on three models; a gravity model, the center-periphery model, and a model with heterogeneous firms. The effects which have been found show that a decrease of the trade barriers in the south-eastern parts of the union would increase symmetry, trade volumes, wealth, but also increase inequality between the members of the union. The three theories have different perspectives on the topic and using other models to estimate the effects of the asymmetries is unlikely to spawn other results. However, further research which is based on other theory is still needed to give support to the results which are found in this paper.

The policies which in this paper are suggested as methods to reduce the trade cost asymmetries; were of all are related to common trade and business rules, greater infrastructure in the parts of the union where it is lacking, and greater collaboration within the union; are all based on what was found to cause the asymmetries and what the theories suggested had to be change in order to increase trade and wealth. Hence, the discovery of further and more precise causes for the asymmetry and a deeper theoretical foundation for how the causes could be counteracted could result in better policy and is therefore worth future research.

This paper can therefore be claimed to have found the results it was searching for. Results which states that many different variables of varying importance contribute to create asymmetries in the European Union which reduces trade and wealth in the union and which could be countered by deeper integration.

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