



LUND UNIVERSITY
School of Economics and Management

Does size matter?

A study of Regional trade agreements

Erik Dahlqvist

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Supervisor:

Karin Olofsdotter

Abstract

Since the middle of the nineties, the amount of Regional Trade Agreements has risen sharply. This have created more opportunities for countries to join world trading and be more connected to the rest of the world. However, each trade agreement is unique and it is therefore interesting to evaluate if there are factors that are more important than others. This paper will be looking at combined GDP and population for the agreement, as well as GDP per capita and number of countries in the agreement. What level of integration the agreement experiences can also play an important role, therefore there is a distinction between Free trade agreements (FTAs) and Custom unions. A dataset of 75 low to middle income countries were assembled and the bilateral trade between them, as well as data for the trade agreements they are a part of. The gravity model was then applied with variables for the before mentioned factors. The results were that combined GDP have a small, but positive effect on bilateral trade between member countries, and that the number of countries have a negative effect for both FTAs and customs unions. This suggest that a trade agreement between few, more developed countries is beneficial.

Keywords: Trade, Regional trade agreements, Gravity model

Table of Contents

Introduction	4
Types of RTAs	5
Economic effects of an RTA	6
The rise of RTAs	6
Literature review	9
Method	13
Setting up the equation	14
Data	16
Results	18
Concluding remarks	21
References	23
Data sources	24
Appendix	25

Introduction

After the Second World War, there were steps taken to create a more inclusive and connected world. Organizations like the European Union (EU) and the United Nations (UN) began to take shape, as well as the GATT (General Agreement on Tariffs and Trade). The objective of GATT was to provide a ruleset for trade and to lower the tariffs between its member states. The goal was to alleviate trade barriers to allow for more trade between countries. The GATT would later be replaced by the WTO, but the general agreement is still there. (WTO, 2018)

Around the same time, in the mid-90ties, Regional Trade Agreements (RTAs) started to become more common, but unlike the GATT/WTO, who wanted to enhance trade on a global stage, RTAs were more focused on the home region. According to Bhagwati et al. (1996), this could constitute a “stumbling block” as countries within this region would divert their trade inwards. However, recent studies such as Trotignon (2010) and Urata (2007) have found that the trade diversion effect is quite small. Thus, as the years went on, it became apparent that trade were beneficial to your economy. And in the last couple of decades smaller countries have begun joining the scene (Urata, 2002, page 25). They have both joined already established economic areas to get access to those markets but have also formed new areas of economic cooperation to strengthen their economic power versus already established areas. Furthermore, the agreements more diverse which have allowed agreements to be signed by countries on both ends of the economic spectrum. These developments have caused the amount of trade agreements to increase dramatically the last decades and have become a significant part of the world economy. It can therefore be interesting to explore if there are certain factors that makes a certain trade agreement better than another, and that is what this paper will try to do. The factors in focus are GDP, population and number of countries within the agreement, as well as GDP per capita within the agreement. These were chosen as they represent the size of the trade agreement in different ways and the aim of this paper is to explore whether size plays a role in the trade between member states.

The approach to this will be to put together a data set consisting of all the bilateral trade combination between the 75 countries, as well as the data on what trade agreement they are

part of. This data will be the GDP for the agreement (combined GDP for all the countries), population for the agreement and number of countries, and whether it is a Free Trade Agreement (FTA) or Customs Union. The reason for focusing on solely FTAs and Customs Union, and not the further integrated forms of trade agreements is, first, to narrow the approach. Secondly, because FTAs and Customs Unions are far more common, and that focusing on just these two would yield better results. This data will span the period between 1995 and 2015 as this is where the large boom in trade agreements occur. The gravity model will then be applied to try to determine what factors makes a good trade agreement.

Types of RTAs

Before looking at characteristics of a Regional Trade Agreement (RTA) it needs to be established what it is and what it means to enter into a bilateral or plurilateral RTA with other countries. FTA is the most basic form of an RTA where the other forms are Customs Union, Common Market and Economic Union, in increasing level of integration.

When entering into an FTA you remove tariffs and quotas within the area of the agreement, which would allow for more trade for less of a hassle between two or more countries. A customs union takes this to the next level and establishes common tariffs for countries who are not in the agreement. The next one would be the Common Market. This implies that between the countries there exist no restriction on the movement of factors of production. Lastly, there is Economic Union and as the name suggest, this is when the countries within the agreement share common economic policies. (Urata, 2002, page 21)

Economic effects of an RTA

There are several effects associated with joining an RTA. Firstly, there is the trade creation effect. This means that because of the removal of the trade barriers, such as tariffs and quotas, trade between the countries within the agreement will increase. This is, of course, a positive effect for the member countries as this will see them increase their trade. However, for the countries who are not in the agreement, but trade with countries within it, trade creation might have an adverse side effect, namely Trade Diversion. Trade Diversion implies that trade is diverted from one country to another, in this case it would be from a non-member to a member of the FTA. The result might therefore be that even if a country is the, comparatively, best at producing a certain good, it can lose out on trade for that good because it is not a member of the FTA. Thus, it is not all rainbows and sunshine when it comes to forming RTAs, there are negative effects as well.

(Urata, 2002, page 27-28)

The next effect would be the competition effect. Since there will be better access to both other members companies to your domestic market, as well as better access to the foreign markets for your companies, the potential market will expand. This will result in higher level of competition for companies within the agreement, which in turn will encourage them to make their production more efficient to retain their competitive edge. Furthermore, this competition effect might not be limited to only the members of the FTA, but also the non-members. As mentioned before, non-members will suffer from a trade diversion effect, therefore they can either accept their fate or try to push the efficiency of their industry even further to be able to compete again.

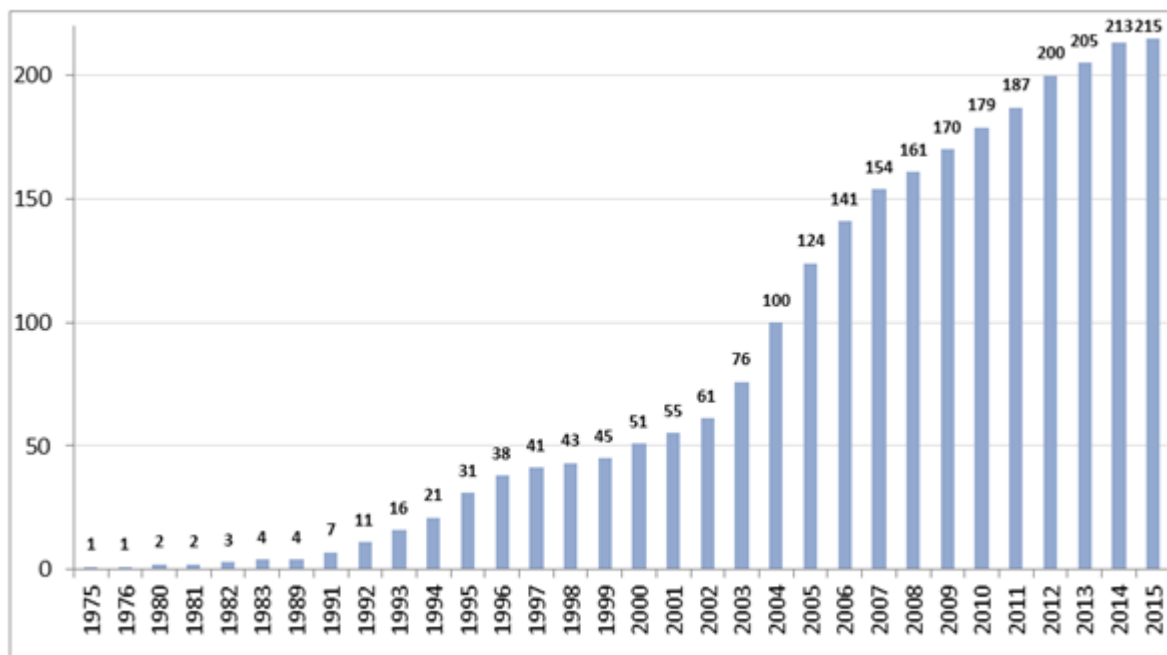
(Urata, 2002, page 27-28)

The rise of RTAs

As seen in figure 1, there was a sharp growth spike of the number of RTAs in the past two decades. This dramatic increase might be because of a couple of reasons. First of all, there might be a self-propelled effect of the increase, where countries want to be part of an RTA

because all of their friends are part of one and they do not want to be left without a chair when the music stops (Urata et al., 2007, page 2). A second reason might be the competition effect as discussed earlier. Joining a trade agreement would lead to more efficient production through advancement in production efficiency, as well as pushing less efficient companies out of the market. Thus, joining an FTA could possibly lead to faster development for developing countries as their companies would be forced to compete with other countries' companies. However, it might have the opposite effect of completely decimate the domestic companies because of them not being ready for the increased competition. This would leave the home country very dependent on imports which is not necessarily a good thing. (Urata, 2002, page 28)

Figure 1: Total Number of FTAs (Cumulative)



Note: FTA count includes FTAs under negotiation, signed but not yet in effect and in force.

(Asia Regional Integration Center, 2015)

A third reason would be that there has been a push, not only to form trade agreements within your own region, but also form trade agreements “overseas”. This has opened up new areas for countries to expand to and has led to more opportunities of trade agreements for countries (Kokko et al., 2004, page 38). However, a large part of this expansion can be tied to the first reason of being afraid to be left out of a market. Thus, countries try to secure market shares in, for them, the more important markets so that their companies can stay competitive and not

suffer from trade diversion. This effect is called the domino effect (Kokko et al., 2004, page 37).

Furthermore, the trade agreements by themselves are getting more diverse. It is becoming more common for trade agreements to be formed between countries that are not in the same income group, high income with low income, for instance. Similarly, to the overseas expansion, this has popularized a new form of RTAs which in turn have led to more possibilities for trade agreements and thus more agreements can be formed (Kokko et al. 2004, page 39).

One last reason for the surge of trade agreements is the opposite end of the coin from securing economic advantages, namely trying to secure political power in a region. This can either be done to guard the home region versus strong adversaries overseas. Examples of this would be the European Union to combat the pressure from the US or Soviet Union. Another would be the ASEAN trade agreement to combat the pressure that came from China (Urata, 2002, page 27).

There is another effect associated with the rise of RTAs, and that is the spaghetti bowl effect. It was first coined by Bhagwati in 1995 and describes how countries are affected by the number of RTAs they are a part of. The “Spaghetti bowl” refers to multiple and crisscrossing RTAs where each have their own set of rules and restrictions. Having to abide to several different set of rules can create a trade barrier for firms (Sorgho, Z., 2016, page 287). The spaghetti bowl can be seen as a substitute for global integration, which the WTO strives for. However, with the slow progress of the Doha round, advancement in that seem to be far down the road. Countries must therefore achieve their trade goals in another way, and one way is to negotiate RTAs with a lot of countries (Urata et al., 2007, page 2).

Literature review

This paper makes use of the gravity model as an empirical method. Hence will this literature review be focused on the gravity model. The model will be further explained in the method section of this paper but as a small introduction here might be needed to follow the different papers in this review. It follows the same principal as its sibling in physics, the bigger the object, the larger attraction it has. In this version, the object is a country and it attracts trade. However, distance also has an effect as further away countries are less attracted to the country in question.

With the rise of trade agreements, there have also been a rise in the number of papers discussing them. But it is also important to have the right tools, therefore, Cheong (2010) wanted to explore different methods of analyzing the effect of a trade agreement. One of these methods is the Gravity model. In his paper, Cheong looks at the ASEAN Free trade agreement, but separates between newer member and older. He then looks at the difference in trade creation and trade diversion between the two groups. The results were that the older members saw a reduction to their trade within the agreement, whereas the newer member saw an increase. (Cheong, 2010)

Furthermore, Cheong acknowledges certain strengths and weaknesses of the Gravity Model. Given the high amount of flexibility and explanatory power, Cheong argues that it is a robust tool in analysing the effects of trade agreements. However, these traits rely heavily on data, and therefore it is important to handle the data correctly as it otherwise can lead to misleading results. (Cheong, 2010)

Another study who argues that it is important with correct use of data and variables when it comes to the Gravity model is Afesorgbor (2016). He argues that previous studies have used non-optimal methods when investigating the effects of trade agreements in Africa. He acknowledges two main shortcomings of these studies. The first being that they do not properly account for zero trade flows, and secondly, that they also do not account for the multilateral resistance term. According to Afesorgbor, this have created a bias and

inconsistency in the gravity model. Further, he performs his own analysis with the gravity model where he accounts for these factors. (Afesorgbor, 2016)

The author manages to show that there exists an upward bias from previous studies looking at African RTAs. He also shows that there is an overestimation of the results of these agreements when not accounting for the MRT and zero trade flow properly and cites this as one of the reasons why there is an upward bias in previous studies. Moreover, he acknowledges that there are efficiency differences between the different African RTAs. (Afesorgbor, 2016)

In a study from 2010, Jérôme Trotignon tries to determine if trade agreements are building blocks or stumbling blocks. These are terms coined by Bhagwati in 1991 when discussing whether RTAs would contribute to global trade (building blocks) or if the member countries would turn away from global trade to focus more on countries within their agreement. In other terms, if there would be a considerable trade diversion effect (stumbling blocks) (Bhagwati et al, 1996, page 3). To investigate this, Trotignon applies the gravity model on established trade agreements, such as the Mercosur and European union, between the years of 1986 and 2005. (Trotignon, 2010)

The author finds that all trade agreements show signs of being building block and not stumbling block as they boost exports and imports to non-members as well as member countries. With the exception of NAFTA, who shows a trade diversion effect. Important to note about this study is that the African continent is excluded study and the results might therefore not apply to that region. (Trotignon, 2010)

A second paper who had a similar approach was a paper from 2007 by Urata and Okabe. They also wanted to investigate the trade diversion and trade creation effect but had a larger data set with both more trade agreements and for a longer time period (1950-2005). The also

tried to investigate different kinds of goods. However, they also excluded countries from Africa.

As with Trogtignon (2010), they found that the trade diversion effects are limited, but trade creation is strong. When it came to the different types of goods, the authors found differences between them, as not all goods behaved the same. For NAFTA, they for instance found that there was trade diversion for all products except food and live animals. (Urata et al., 2007)

Afolabi et al. take another approach in a paper from 2017. Their aim was to investigate the effect on trade flow between countries in the ECOWAS (Economic Community of West African States) trade agreement. They also make use of the gravity model, but they only use a dummy to check for the effects. The analysis focus on the period between 1983 and 2013 and on the 15 countries in the ECOWAS agreement. (Afolabi et al., 2017)

They find that the trade agreement actually had a negative effect on the trade between member countries. This contradicts the other studies who have found a clear trade creation effect for the most part. The authors argue that this might be because of the similarity of exports within ECOWAS and the small volume of trade. Furthermore, they discuss the importance of properly accounting for unseen effect on trade, and not properly accounting for these might have had a negative impact on the result. (Afolabi et al., 2017)

In a paper from 2009, Darku attempts to evaluate the effect regional integration on Tanzania's trade. He utilizes the gravity model with country specific dummies instead of regional integration dummies as he argues that this will give a clearer picture of how Tanzania have been affected. His main goals are to test what effect the EU and the East African Community (EAC) have had on Tanzania's trade, as they are its traditional trade partners. And to test how open Tanzania's non-traditional trade partners are to exports from Tanzania. His sample consist of 24 countries (including Tanzania), over the period of 1980 to 2004. (Darku, 2009)

Darku manages to show that both the EU and EAC had a positive impact on Tanzania's trade. As argued by Darku, this is slightly contradictory to other studies, since it shows a positive effect of African integration. Furthermore, he finds that even though the goods from Tanzania have a hard time penetrating the market of its non-traditional trading partner, their goods have a much easier time reaching Tanzania's home market. (Darku, 2009)

Method

The gravity model has been used to estimate bilateral trade flows for quite some time. It began in the sixties when Jan Tinbergen showed that the trade flows between two countries were positively correlated with the size of the countries. Trade flows were therefore acting similarly to gravity and thereof the name. Over the years there have been attempts to perfect the model and provide a theoretical framework for it, with the first important attempt by Anderson (1979). He devised a model where consumers preferences were differentiated by the country of origin and consumers had demand for all differentiated goods. By this definition, every country would consume at least some of each good. Furthermore, all goods are traded, every country trade, and the demand for each product is the combined demand for both the home market and the foreign market. By this logic, the larger the country, the more it exports and imports. Anderson also touches on the subject of trade costs which he in 1979 describes as “icebergs”, when the goods arrive at its destination some of it has melted away due to trade costs. (Bacchetta et al., 2012, page 103-104)

Another contribution to the gravity model were published by Anderson and van Wincoop (2003). In this paper, they showed that to get a well estimated gravity equation, you needed to account for relative trade costs. The authors called it the “Multilateral Trade-Resistance” term. What they argued was that countries would have different propensities to trade with each other depending on where they were located in the world. For instance, Sweden and Denmark would have less propensity to trade with each other, because of their proximity to large trading countries in Europe, than Australia and New Zealand, being surrounded by water. (Bacchetta et al., 2012, page 104-105)

Furthermore, it has become apparent that one needs to account for several environmental and social variables when it comes to estimating a gravity equation. These variables are often non-numerical and are, in the case of this essay, represented as dummy variables. They may

include common language, border or colonial past, but can also be trade agreements or if the country is landlocked. (Bussière et al, 2005, page 15)

Generally, when estimating a gravity equation, the natural logarithms of all the variables are taken as you can obtain a log-linear equation which can be estimated by an ordinary least square regression. However, this type of regression is not great at handling zero trade flows. The reason for this is quite simple, $\ln(0)$ is not defined. There is a couple of ways to tackle this problem, the easiest of which is just to change the zero to a one. This would allow you to take the natural logarithm, but this would also treat all zeros as zero trade flow, when in fact it could be a missing value. Thus, there is a risk of distorting the results. It was therefore chosen to do a Poisson regression instead. This regression type is non-linear which means that there is no need to take the natural logarithm of the trade value variable and, therefore the zeroes can be saved. (Bacchetta et al., 2012, page 113)

Setting up the equation

For the general gravity equation part, the variables used in this paper is straight forward. GDP of both the exporting country and the importing country is used, the sum of the population of both countries as the estimation would get stuck if the two populations were separated. A distance variable is used to catch general trade costs between countries. The distance measured is between the two countries capitals. A dummy variable for common borders, common language and common colonial background were also added. Thus, the first part looks like this:

$$X_i = c + \ln GDP_i + \ln GDP_j + \ln TotalPopulation_{ij} + \ln dist + d_1 + d_2 + d_3 + \varepsilon$$

Where X is the trade value, which in this case is the export of the home country. c is a constant and ε is the error term. i represents the exporting country and j the importing country. d_1, d_2 and d_3 are dummy variables for common borders, common language and common colonial background.

Then to set up the second part of the equation, an interaction variable was added which were designed to determine if there existed a trade agreement between the two countries, and if so, if it were an FTA or customs union. This variable then interacted with the GDP of the whole trade agreement, as well as the number of countries in the agreement. It was tested with the population and GDP per capita as well, but it did not yield any significant or interesting results. To control for the multilateral trade resistance, exporter and importer specific dummies were added. This would catch the unseen fixed effects between countries as they could otherwise distort the result, as discussed earlier.

When assembling the data set, the European Union was excluded, as it could have distorted the results with its high level of integration over a long period of time, as well as its size. Choosing low to middle income countries made it easier to do, of course. However, having an RTA with a big region or country, for instance the US or the EU, can have positive effects on a country's trade with other countries. This effect is captured by the importer and exporter dummies as well. This effect should thus not affect the results in a significant way.

Finally, a year dummy was introduced to control for business cycles. Since the study will pass through the years of the great recession, it seems prudent to mitigate the effect of business cycles as much as possible. With these additions, the final equation becomes:

$$X_i = c + \ln GDP_i + \ln GDP_j + \ln TotalPopulation_{ij} + \ln dist + d_1 + d_2 + d_3 + \frac{FTA}{CU} : \ln A.GDP + \frac{FTA}{CU} : \ln A.Countries + year + imp + exp + \varepsilon$$

Where X is the trade value, which in this case is the export of the home country. c is a constant and ε is the error term. i represents the exporting country and j the importing country. $A.GDP$ is the combined GDP for all countries within the agreement and $A.Countries$ are the number of countries in the agreement d_1, d_2 and d_3 are dummy variables for common borders, common language and common colonial background. $Year$ is the year dummy and imp/exp is the importer and exporter dummies.

Data

The data consist of a dataset containing 75 different low to middle income countries and the trade between these countries over the period of 21 years between 1995 and 2015. A list of the countries used can be found in the appendix. The countries were chosen at random in an attempt to limit the potential bias for certain regions or continents. Moreover, every continent is represented in a significant way, however, since countries were excluded that were part of the European Union, there are relatively few countries from Europe. When the pairs were assembled the export values were collected from the UN Comtrade database. The reason behind focusing on exports was to investigate what countries could gain from joining a trade agreement since most countries are focused on improving their exports. This paper will focus on the goods trade and therefore exclude trade in services.

When it comes to the GDP and population data for a separate country, and for the general gravity model variables, the gravity dataset from CEPII was used. The Gravity dataset is quite a comprehensive dataset containing every country pair between the years of 1948 and 2015. For the GDP and population data, they use the data collected by the World Bank. CEPII also had an indicator for if the country pair were in a trade agreement with each other, but that indicator had to be altered a bit. The missing values were filled in, but a value had to be added to indicate if the country pair were in a Customs union, to be able to separate between FTAs and customs unions in the regression.

All the data for the different trade agreements were collected. The combined GDP and population for all the member states were collected, as well as the number of countries who are signed to the trade agreement. For the number of countries, the WTO database of trade agreements was used which was also used to determine when a country joined a specific trade agreement, when it was relevant. The GDP and population statistics were, however, a bit harder to assemble. Sometimes they would be available on the agreements own home page, otherwise the GDP and population had to be manually calculated by looking up the different statistics through the World Bank database and then adding them together. At the

end information on 38 different trade agreements had been collected, with between 2 and 19 member states. Some of the country pairs were part of two different trade agreements and in such a case it was chosen to count it towards the most integrated agreement, which would be a customs union.

Since there was no easy way of getting the combined GDP and population for the agreement, it was decided to calculate those statistics for only one year and then apply it to all years in the set. This will, of course, not be as accurate as have the correct statistics for each year, but this makes it more manageable. Another issue was that there was a lot of zeros when it came to the trade values. This is a problem when studying developing countries, but there is a few ways of dealing with this issue which are discussed in the gravity model section of this paper.

Results

Table 1

Variable		Coefficient	Robust Std. Err.	P> z	95% Conf.	Interval
Exporter GDP		0.3785	0.0892	0.000	0.2036	0.5532
Importer GDP		0.2861	0.0706	0.000	0.1476	0.4247
Total Population		-0.3104	0.0451	0.000	-0.3987	-0.2220
Distance		-1.0887	0.0278	0.000	-1.1432	-1.0341
Common Border		0.1749	0.453	0.000	0.0861	0.2636
Common Language		0.4878	0.0500	0.000	0.3900	0.5857
Colonial relationship		2.3440	0.1005	0.000	2.1470	2.5409
FTA	No. of Countries	-0.3402	0.0692	0.000	-0.4757	-0.2047
FTA	Tot. GDP	0.0371	0.0049	0.000	0.0275	0.0466
CU	No. of Countries	-0.2645	0.0917	0.004	-0.4441	-0.0849
CU	Tot. GDP	0.0331	0.0059	0.000	0.0216	0.0447

The results are displayed in Table 1. For the most part, it was possible to get results consistent with other gravity regressions. GDP for both the exporter and importer have a positive effect on the export and the distance have a sharp negative effect. These are both fairly intuitive since GDP can represent the market size and distance can represent trade costs. Common borders and common language also positive effect, with common language taking the edge. These are both factors that alleviate some of the trade costs or barriers. Having a common border would, of course, eliminate most of the distance and having a common language would make communication easier. However, there are some variables that stand out of the standard variables. That the total population of the exporter and importer

country was negative was quite surprising. Since the population represents the amount of consumers, it would be easy to think that it would have a positive effect on the export. But this can have something to do with what countries used in this sample. Only low to middle income countries were used, but that does not mean that they have a small population. The amount of developing countries can therefore have had a negative impact on the population variable. Furthermore, colonial relationship seems to have a large impact on your exports. This can once again be because of the sample, where a lot of countries had a common colonial background. This goes to show that the colonial bond is still very strong, even after the separation from the colonial power. However, colonies tended to be in close proximity to each other, therefore can the colony variable be seen as another way of catching the proximity aspect of trade.

When it comes to the results of the trade agreement specific variables, the results were interesting. The combined GDP of the whole agreement have a positive effect on bilateral trade between members. It is, however, a quite small effect, but significant nonetheless. This might be tied to one of the reasons for the surge in the amount of trade agreements, namely that countries are joining trade agreements not because they already have a strong economy, but because they want to bolster it through competition and market size. Therefore, the effect of the combined GDP is much smaller on bilateral trade than the individual GDPs of the countries.

The second variable checked for was if the amount of countries within the agreement had an effect on bilateral trade flows. As is clear in table 1, it has a negative effect for both customs unions and FTAs. This effect is also much stronger than the GDP effect. This is interesting because this means that it is not necessarily to our advantage to join a big trade agreement. Important to note is that the trade for an individual country to the rest of the countries within the agreement might still be positive, but that there is decreasing returns for each country in the agreement. One reason for this might be that with more countries, the competition increases alongside the market size. This means that there might be more demand for a certain good, but the supply is lagging behind. And because of the increased competition, the demand might fall because of the increased supply. Another reason for this negativity might

have to do with the data collected. A significant amount of the trade agreements which had a lot of countries in them, existed in Africa. Since that region is somewhat less developed than others, it might have had a negative impact on the results. Both of these examples would decrease the bilateral trade because of an increase in the number of countries within a certain agreement. This also might create an incentive to keep countries out of an agreement, at least countries that have a relatively low GDP, as it has already been established a high combined GDP is preferable, since it has a positive, but small, effect on bilateral trade. Kokko et al. (2004) also argues that because of the development in certain parts of Africa, countries in those regions have a hard time taking advantage of the benefits from a large trade agreement, for instance the increased market size and competition effect. Instead, this trade agreements are formed to strengthen the bargaining power of the region.

The difference between Customs unions and FTAs seem to be quite small. The positive effect of the combined GDP is very close at 0.037 for FTAs and 0.033 for CU. However, the negative effect of the number of countries seem to be more severe for FTAs at -0.34, and -0.26 for customs unions. They are still both positive and negative, respectively, though.

Concluding remarks

The results produced in this paper shows that the size of a trade agreement, specifically FTAs and customs unions, plays a significant part when you look at bilateral trade between the member states. The combined GDP of all member states have a small but positive effect on trade. This implies that it can be of interest to strive to include countries with high GDPs, however, since this effect is quite small it might be better to focus on other aspects of the country who is applying for membership. The results also show that there is a negative effect associated with the number of countries in the agreement, on bilateral trade. This implies that there might be a diversion of trade not only from non-members to member, but also between the member states as well. This is an interesting find since this would create an incentive to keep the amount of member states as low as possible, or at least evaluate the potential effects of a new member closely. Important to note is that this test only catches bilateral trade and not the total trade within the agreement. The total trade might still benefit from a new member state.

The amount of data collected for this dataset is sufficient. However, there are some issues. Firstly, the sample size is not small, but neither is it extensive. This might have created bias towards certain regions or trade agreements and that in turn might have skewed the results. A lot of the bigger agreements were in Africa and since that region is somewhat less developed than others, it could have had a negative effect on the results. Secondly, the way the combined GDP and population statistics were collected had an adverse effect on the results. But the effect of this does, most likely, not have a very big impact on the results.

For future research it would be recommended to first, expand the dataset to include more countries. This would limit the bias towards certain regions and trade agreements and produce more clear results. It would also be recommended to focus solely on countries within a trade agreement. This would allow to more closely compare the trade within each agreement, but also be able to more closely identify factors that might influence each agreement.

The results show that it is important to evaluate what factors are important to focus on when discussing the efficiency of trade agreements. This is especially true now since protectionism have begun to seep back into the world economy from certain parts of the world and the amount of trade agreements available to a country might become fewer and fewer.

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Data sources

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- UN COMTRADE Database
<https://comtrade.un.org/>
- WTO RTA Database
<https://rtais.wto.org/UI/PublicMaintainRTAHome.aspx>
- World Bank
<https://data.worldbank.org/>

Appendix

Angola, Albania, Argentina, Armenia, Azerbaijan, Benin, Bangladesh, Belarus, Belize, Bolivia, Brazil, Botswana, Cote d'Ivoire, Cameroon, Colombia, Comoros, Costa Rica, Algeria, Ecuador, Egypt, Eritrea, Ethiopia, Fiji, Georgia, Ghana, Gambia, Equatorial Guinea, Grenada, Guatemala, Honduras, Indonesia, India, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyz, Cambodia, Lao, Lebanon, Liberia, Sri Lanka, Morocco, Moldova, Mexico, Macedon, Myanmar, Mongolia, Malawi, Malaysia, Namibia, Niger, Nigeria, Nicaragua, Nepal, Pakistan, Panama, Peru, Philippines, Papua New guinea, Paraguay, Russia, Rwanda, Senegal, Suriname, Swaziland, Togo, Thailand, Tajikistan, Tanzania, Samoa, Yemen, Serbia, South Africa, Zambia