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Trade in the Periphery

Portugal's trade integration in the EU

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Abstract

This paper studies international trade in the case of Portugal as a small and peripheral economy in Europe and its trade integration with the European Union. The purpose of the paper is to find if Portugal's EU accession in 1986 increased trade with EU members. Common for research on trade effects of EU integration is that ascending countries see significant increases in trade. Theory also suggest that countries should experience removal of trade barriers following accession to the EU. As is also common for these studies, the paper uses gravity models of international trade for measuring trade flows between Portugal and the EU. Specifically, Portuguese exports to ten EU countries are collected for the years 1983 to 1991. Then OLS estimations are made with the use of gravity models to assess EU accessions impact on Portugal's trade. The paper finds no empirical support for the hypothesis that EU accession increased Portuguese exports to the EU countries.

Keywords: European trade integration, EU accession, Portugal, EU, trade effects, Gravity Model.

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Abbreviations

EEC – The European Economic Community. A customs union, one of the first and founding agreements for the future creation of the EU. Was replaced and expanded on by the **EC** in 1965.

EC – The European Community. The successor of the EEC and replaced and expanded on by the **EU** in 1993.

EU – The European Union.

EFTA – European Free Trade Association. Portugal was a member between 1960 and 1986.

CU – Customs union.

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1. Introduction

” The good student”, became Portugal’s nickname after being given the title by Jaques Delors, president of the European Commission (1994). Between revolutions in the 70’s and international bailouts in the 80’s Portugal saw its fair share of lessons as it rose from one of Europe’ poorest countries to starting to converge with the EU averages in the 1990’s (Braga de Macedo, 2004).

The most obvious event to explain Portugal’s sudden spike in economic growth and developments in living standards is their accession to the European Union in 1986. EU membership has of course far too many economic factors and implications for a country than can be captured in this paper so to capture something that is measurable the focus will lie on trade effects of the EU membership.

The questions I will try to answer will therefore be:

What effects did EU accession have on Portuguese trade, and more specifically, did EU accession increase Portuguese exports?

This to find if EU membership has had the trade-increasing effect it is often credited in literature and in the public debate. Or if Portugal, often thought of as a “peripheral” country in the European context, can be an active European trade partner also without EU membership. This is a highly current topic as we are about to witness how trade is affected when a country leaves the EU in Brexit.

Studies on trade effects of EU membership are abundant in existing research and have been made for numerous countries or selection of countries and with specific event- or time focuses. However, this paper is the first to look at immediate effects of EU accession in Portugal with the use of the gravity model.

The gravity model of trade is a highly acknowledged empirical model for measuring trade flows between two countries. I will use two gravity models constructed like the standard ones used in empirical studies of this nature. With the models I will assess EU memberships impact on Portuguese exports to the EU countries in the years surrounding Portugal’s accession.

With respect to earlier research on trade effects of EU accession and to what theory tells us is expected for countries entering the customs union that the EU also constitutes, my hypothesis is that Portuguese exports to the EU countries will increase as they ascend to the EU in 1986.

This paper is divided into 7 sections. This, the first, being an introduction and overview to the paper. Next section aims to describe the context of trade in the EU and Portugal's position and history in this context. The third section gives an account for relevant previous research and a shorter review of findings on Portuguese trade. The fourth section is a review of theory on preferential liberalization and trade effects of removing tariffs and non-tariff barriers. The fifth section describes my empirical approach, the data used and the specification of the models I will be testing. The sixth section is the results that I have found. Finally, in the seventh section, I draw my conclusion with respect to the results of the previous section and to what has been accounted for in research and theory.

2. Background

2.1 The EU and Trade

To understand the trade effects of Portugal's entry we should first understand the trade effects of the EU. Baldwin and Wyplosz (2020) writes that to be a member of the EU means to be part of a preferential economic community, meaning that members have made it easier for trade amongst each other while at the same time making it harder for non-members to trade with the union. This is what preferential liberalization¹ is and it will be at the core of our analysis.

The EU is a complex being and has infinite economic implications and effects on its members, here I will go through the most important effects it has on trade. Starting with the EU customs union. A customs union (CU) is formed when countries agree on completely removing tariffs to trade between themselves while at the same time having a mutual tariff for non-member countries.

This customs union means that the import and export of goods may flow duty free between EU customs union members, the CU also harmonizes the duties on imports from non-member countries trying to sell their goods to the EU market (European Commission, 2020). When trade increases between members it is referred to as trade creation, when it does so on the behalf of decreased trade with countries outside the CU it is referred to as trade diversion.

The other important element of the EU is the EU Single Market. The Single Market defines the EU market as a single space without any restricting borders or other regulations to the movement of goods, services, factors of production, producers or consumers between member countries (European Commission, 2020).

2.2 Portugal before EU

To understand Portugal's EU integration, we should first look at some historical economic events of the later 1900's that paved the way for the ascension to the union.

Starting in the 1960's Portugal was one of the founding countries of the European Free Trade Association (EFTA). The EFTA was created by the countries that did not join the European Economic Community (EEC), which was the predecessor of the EU customs union. The EFTA

¹ Preferential liberalization will be elaborated in the Theory section.

is a free trade area and acts like a CU in removing tariffs between members, the difference from a CU is that there is no mutual tariff for non-member countries (EFTA, 2020).

Konstantopoulos (1991) has found that Portugal's EFTA membership earned them strong trade connections with the EC, which is the predecessor of the EU, as other EFTA countries became EC-members earlier than Portugal's own accession. However, there was still tariffs between the Portuguese- and EC-markets that had to be removed.

Royo (2013) describes that the early 1970's Portugal also entered Preferential Trade Agreements (PTA's) with the EC. These PTA's reduced tariffs on Portuguese exports to the EU market but did not remove them completely. Both the EFTA and the PTA's acted to open the Portuguese market and create multilateral trade flows with the EU market.

Former Portuguese president Cavaco Silva (2018) recounts, in 1974, twelve years prior to Portugal's entry to the EU in 1986, the country went through a military coup known as the "Carnation Revolution". As the coup removed the nearly 50-year dictatorship of António Salazar it was followed by a period of unstable political climate. This in combination with the economic policies by the pre-revolution regime, which sought state-expropriation of properties and impeded entrepreneurship, caused international opinions at the time that Portugal would not be able to catch up with EU levels of development.

Weeks (2019) describes, one of the immediate economic reforms following the revolution was the redistribution of assets and properties within the country through nationalization, as large parts of the economy had long been dominated by state-favoured oligopolistic markets. This redistribution and nationalization of markets was an effective way for quick improvements of Portuguese living standards. This also marks the point in time where the mainstream political goals in Portugal starts to lean towards liberal democracy, capitalism and EU membership.

2.3 Integrating Portugal

Mário Soares became the first prime minister of post-revolution Portugal in 1976 and in the same year of his election negotiations started for Portugal's accession to the EC. The main issue with accession was the mass-nationalizations of assets and state-regulation of markets carried out in the earlier post-revolution time. Therefore, the accession-process could only carry on once EU institutions were promised that measures would be taken to secure "European" values of liberalism and capitalism in Portugal (Weeks, 2019).

Regulation of markets and market prices in Portugal was seen by the EU as a barrier to efficient trade between the Portuguese and the EU market. In 1977 Portugal was forced to implement an IMF austerity programme to correct for the post-revolution nationalizations and regulations. This resulted in large cuts in wages and public expenditures, directly counteracting the improvement of living standards experienced in earlier years but was necessary to comply with EU directives (Royo, 2013).

As Portugal now became a part of the EU customs union this meant both the removal of tariffs on Portuguese exports to the EU market, but also the removal of tariffs on EU imports to the Portuguese market. Accession also meant harmonization of certain non-tariff barriers. Coppolaro and Lains (2013) argue that Portugal's main barriers of trade with EU countries at the time of their accession were in agricultural- and fishery goods. Where Portugal now had to harmonize technical regulations² with those of the EU.

Banco de Portugal (2009) has found that EU accession and adoption of EU trade directives led to large market liberalizations and especially removal of non-tariff barriers, leading to higher trade openness. These non-tariff barriers were mainly administrative border procedures such as controls and restrictions which increased the costs of time and transportation between countries.

Finally, in the 1980's Soares successor Aníbal Cavaco Silva finalized the "Europeanization" of the Portuguese economy. Under Cavaco Silva's mandate Portugal's membership application was approved and on January 1st in 1986 they became an EEC-member (Weeks, 2019).

2.4 Portugal in the EU, the first years

Following their entry to the union the Portuguese economy came to grow at very high rates for several years. One of the key economic factors for this was the increased amount of international capital invested in Portuguese manufacturing of textiles, clothing, paper and others. This was due to increased investment attraction following the new political stability in Portugal and the country's low cost for labour (Weeks, 2019).

As the EU evolved with the Maastricht Treaty it brought with it the European Single Market. This meant that the previously more restricted Portuguese market would become much more open to foreign competitors and goods. To prepare for this market-reform the country received

² Technical regulations are a general expression for rules on how a good is to be produced or what tests it must go through to be approved. Elaborated on in the Theory section.

several aids through EU structural funds to improve development- and infrastructure levels in the country (Weeks, 2019).

At the time of entry Portugal was already a highly trade-open country (trade stood for 75% of GDP), greatly due to the EFTA's creation in the 60's. Portugal was given a seven-year transition period at the time of their entry to remove remaining trade barriers not compliant with EU rules and to adopt the common trade policies. In 1992 these goals were met and one year later in 1993 Portugal joined the Single Market (Banco de Portugal, 2009).

Timeline Overview

Portugal co-founds the EFTA	1960
PTA's with the EC	1970
The Carnation Revolution	1974
Austerity programmes enforced by the IMF	1977
Portugal enters the EC	1986
Complete harmonization with EC trade policies	1992
Portugal joins EU single market	1993

3. Previous Research

The main interest of this section is to see what trade effects have been found from EU integration by earlier research. By examining EU trade effects for countries in general I will draw a conclusion on what should be the expected effects for Portugal. I will then also give an account for what has already been found concerning effects Portuguese trade.

3.1 Trade effects of the EU

Bussiere, Fidrmuc and Schnatz (2008) examine the case of Central- and South Eastern European Countries' (CSEECs) increased trade and integration with the EU. To find what effect EU integration has on trade the authors do this with a so-called gravity model, which is a standard tool for research on international trade. A set of variables standard to explaining trade flows (country GDP-size, distance, etc.) are first included and to capture the effects of EU integration a dummy variable for this is included

The results show that the increased trade between CSEECs and euro area countries can be explained by each CSEECs' degree of integration with the EU. The CSEECs which have experienced the largest increases in trade are both the economically largest and the most integrated ones, while smaller CSEECs see smaller integration in the EU market. The authors

conclude that although EU integration is given credit for CSEECs increased trade in this gravity model estimation, this trade increase is also a natural event of the disbandment of the Soviet Union, as focus has shifted away from the Eastern European market for the CSEECs (Bussiere, Fidrmuc and Schnatz, 2008).

In a recent study Mayer, Vicard and Zignago (2019) aim to show the impact of EU membership and especially of the EU Single Market has had on trade volumes. The authors go through extensive regression analysis to measure trade effects of EU membership and effects of the EU Single Market. The study compares member countries trade volumes within the union with their trade volumes for non-union trade agreements, these are referred to as regional trade agreements.

The authors find that the single market results in deep integration for EU members and has a significant and positive impact on trade between members. When measuring trade effects for both goods and services it is found that EU membership and membership in the Single Market generates trade volumes three times as high as what is achieved through standardized regional trade agreements (Mayer, Vicard, Zignago, 2019).

It is concluded that the EU and the Single Market have large positive effects on trade for member countries. Especially for small and open economies membership constitutes a strong effect on their trade openness, leading to much higher EU-imports than without membership (Mayer, Vicard, Zignago, 2019).

In trying to isolate trade effects of EU accession and separating these from trade effects of market- and trade liberalisation in countries, Papazoglou, Pentecost and Marques (2006) assess this with a gravity model for ten countries joining the union.

They find that EU accession has a trade creation effect for countries joining the union where exports to the EU market rise with, on average, 12 percent. This creation of trade and increase in exports varies between the joining countries depending on how much trade was conducted with the EU countries before accession. Countries already well integrated in EU trade see smaller trade creation and less integrated countries see larger trade creation (Papazoglou, Pentecost and Marques, 2006).

Trade diversion from the rest of the world happens, especially diversion from the US and Russia, as imports from the EU rise with, on average, 50 percent for all the joining countries. Overall, the increases in imports are larger than increases in exports and accession results in

trade deficits for all joining countries. The authors conclude that EU accession's trade-increasing effects are largest for the joining countries with the lowest GDP per Capita (Papazoglou, Pentecost and Marques, 2006).

To conclude, for all the above three studies there seems to be a common result that EU integration is strongly related with trade creation with the EU countries. There also seems to be a relation between the degree of integration of a certain country and said country's trade creation, where already highly integrated countries experience smaller trade creation upon accession than less integrated ones.

3.2 Research on Portuguese Trade

Konstantopoulos (1991) writes about the trade effects of EU integration for Spain, Portugal, and Greece. The study analyses short-term changes in trade performance of the three countries before and after EC-accession. Konstantopoulos has found that before entry Portugal was more open relative to the other two countries and a larger percentage of their total trade was already conducted with EC-countries.

The total observed trade effects for Portugal in 1989, three years after accession, is a deterioration of the trade balance. Although exports with EC-countries did increase with more than 7% between 1985 and 1989, EC-imports increased with well over 10% (Konstantopoulos, 1991).

Abreu (2006) finds that not all sectors prepared well enough for the trade liberalization and the effects EU membership would come to have on the trade of Portugal. Although previously being highly dependent on exports, in the late 1990's the Portuguese economy shifted focus from goods-production to the non-tradeable sectors such as construction.

As employment- and wage levels rose Portugal lost its international competitiveness of being a cheap manufacturer. Abreu argues that Portugal, as a small and open economy, relied heavily on their competitiveness for exports and successful trade. The increased domestic demands were now met by new international import opportunities instead. (Abreu, 2006).

Banco de Portugal (2009) also finds that at that time factors of production in Portugal were slower to re-allocate between sectors than the EU average. There was also a gap between the latest production technologies and human capital levels in Portugal, further worsening the Portuguese trade competitiveness as Portugal's relative productivity fell.

4. Theory

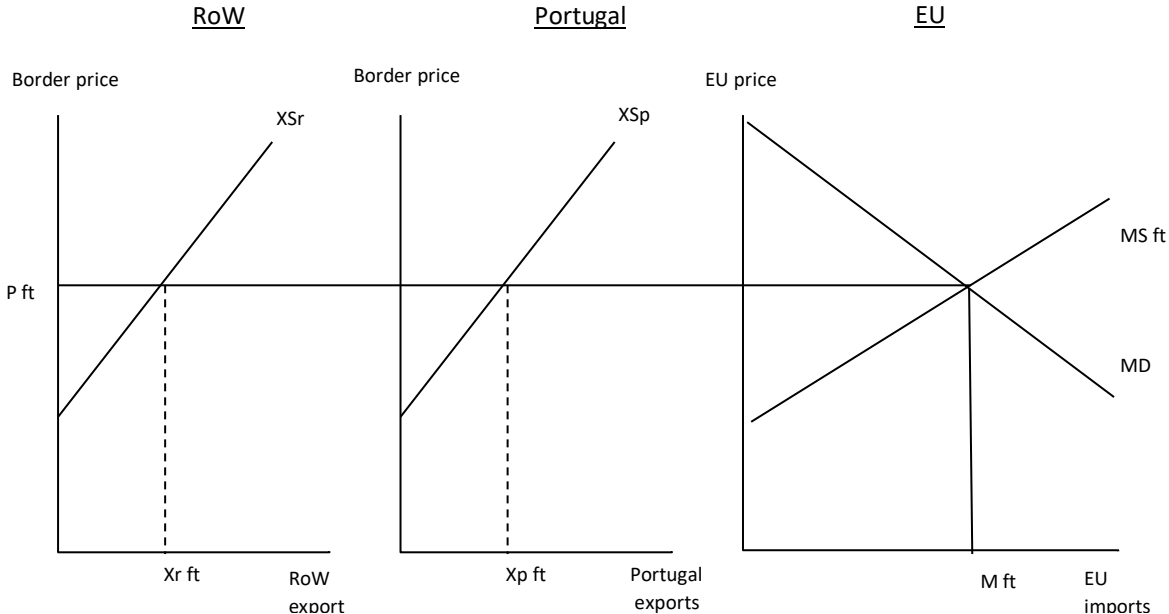
4.1 Preferential Liberalization

This section and its examples are credited Baldwin and Wyplosz (2020) explanation of the theory. Preferential liberalization, which could just as well be called discriminatory liberalization, means removing tariffs or non-tariff barriers to trade for a certain trading partner while keeping tariffs or non-tariff barriers for other trading partners.

I will now describe the theoretical effects for a country joining a customs union. In a customs union several countries remove tariffs against each other. The joining country faces a tariff on trade when it is outside the CU, but that tariff is removed upon accession. To understand the CU case with several trading partners lets first look at what happens when tariffs are removed from just one country, called unilateral liberalization.

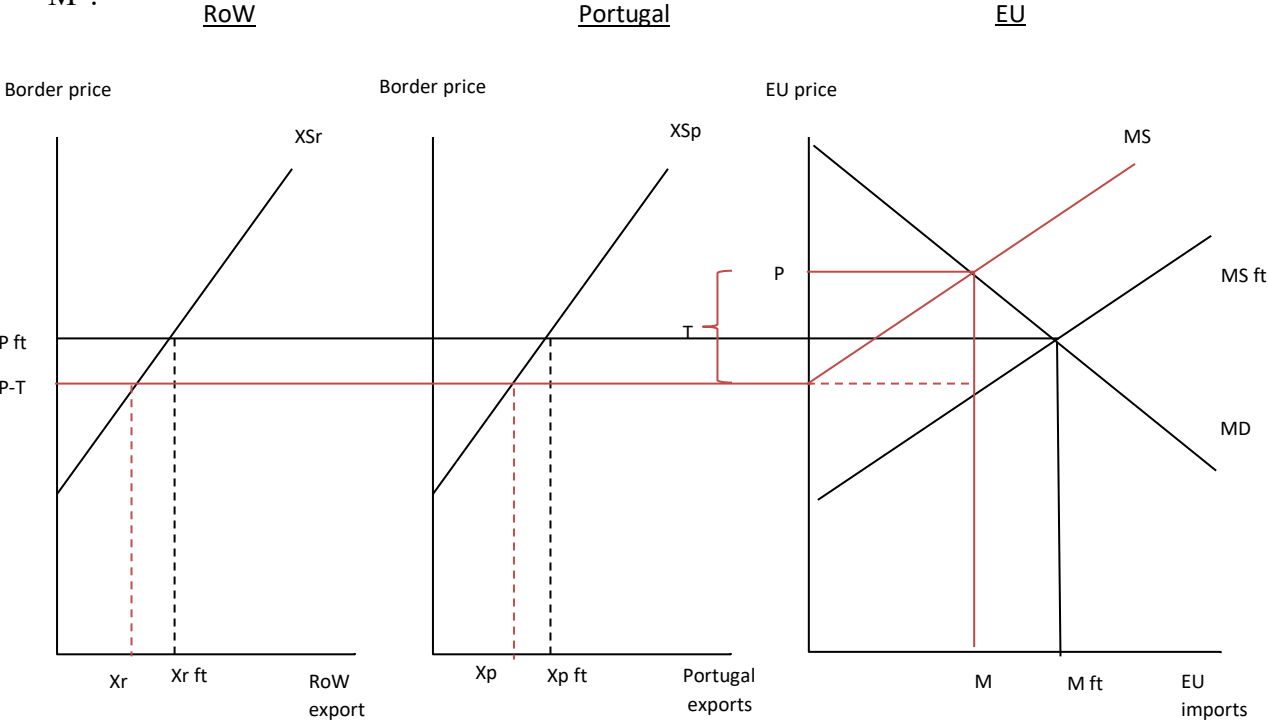
4.2 Unilateral preferential liberalization

Suppose we have three countries: EU, Portugal, and RoW. Have a look at graph 1, in the initial state EU is importing from both Portugal and RoW without applying any tariffs so there is free trade. The price that Portugal and Row charges EU, called the border price, is “P ft”, found on the Y-axes, and under free trade this is also the price EU’s consumers will pay. We can find the exporters supply curves as “XSp” in Portugal and “XSr” in RoW. With price “P ft”, Portugal and RoW will export the quantities “Xp ft” and “Xr ft” respectively, found on the X-axes. This creates the import supply curve “MS ft” in EU. The quantity imported in EU is “M ft” on the X-axis, it is found where “MS ft” meets the import demand curve “MD”.



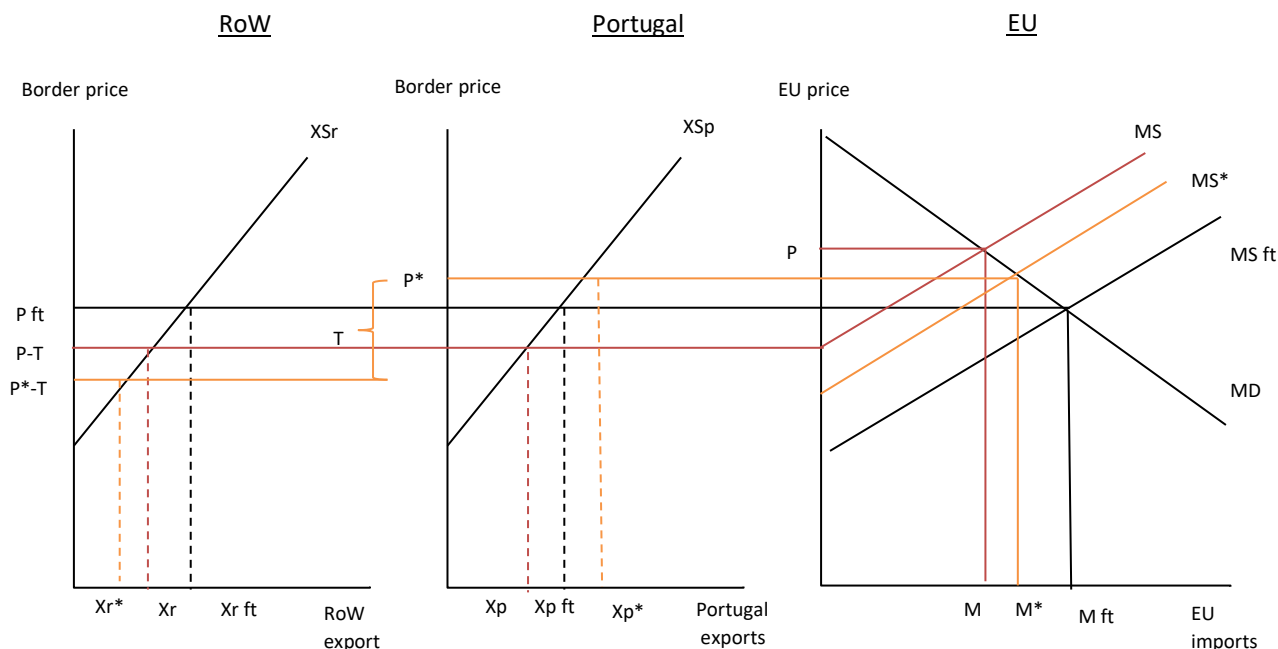
Graph 1

Next, suppose that EU applies an equal tariff called “T” on imports from Portugal and RoW. See graph 2, where the red lines indicate the new prices and quantities. The tariff increases prices on imported goods in EU. To keep the price from rising too much and losing all import demand in EU, Portugal and RoW now lower their border prices to “P-T”. The price paid in EU will be simply “P”, the difference which is exactly the tariffs size can be seen as the distance “T”. At this lower border price, Portugal and Row will only want to supply “Xp” and “Xr” quantities. This shifts the import supply curve in EU to “MS” and the new imports quantity is “M”.



Graph 2

Now we are ready to see what happens when EU implements a unilateral preferential liberalization for Portugal (discriminatory liberalization against RoW) so that Portugal now gets to sell its goods in EU tariff-free while RoW still has the tariff. See Graph 3, where the orange lines indicate the new prices and quantities.



Graph 3

This results in new border prices for both Portugal and RoW. When Portugal now gets to sell their goods tariff-free they are supplying a larger quantity “ X_{p^*} ” at a higher price “ P^* ”. This “ P^* ” is not only Portugal’s border price but also the domestic price in EU that consumers pay since the tariff is removed. This advantageous outcome for the country no longer having to pay the tariff is a general effect of preferential liberalization called “Smiths certitude.”

RoW, on the other hand, is now supplying a smaller quantity “ X_{r^*} ” at a lower price “ P^*-T ”. This makes sense when we realize that to keep their competitiveness in EUs market RoW must sell their goods at the same price as Portugal does. Since they are still subject to the tariff, the RoW border price must be exactly equal to Portugal’s price minus the tariff, which is again “ P^*-T ”. This disadvantageous outcome for the country still having the tariff is an effect called “Haberler’s spillover”.

Finally, in EU we see that the preferential liberalization of Portugal has resulted in a shift of the import supply curve from “ MS ” to “ MS^* ”. The price has dropped compared to prices under equal tariffs. In our graph the quantity has increased, meaning that Portugal’s supply-increase has been larger than the RoWs supply-decrease. This results in the new imports quantity “ M^* ” in EU. The sum of changes in supply from Portugal and RoW will not necessarily be positive, therefore this effect of preferential liberalization is called “Viner’s ambiguity” (Baldwin, Wyplosz, 2020).

To summarize, theory of unilateral preferential liberalization tells us that the country being preferred on can trade tariff free and this allows them to charge a higher price at a larger quantity compared to countries not preferred on. If we look at graph 3, we see that Portugal can charge

a higher price and export a larger quantity not only compared to when there was an equal tariff but also to when there was free trade, the effect is that Portuguese trade increases in value³.

So, when Portugal joined the EU in 1986, it joined a CU. In the EU-CU Portugal had their trade made tariff free against several countries. The effects for preferential liberalization in several countries will be the same for Portugal as in the single country case, just that the effect is duplicated. Therefore, according to theory I hypothesize that the value of Portuguese exports to the EU countries should increase with accession.

4.3 Non-tariff barriers

Baldwin and Wyplosz (2020) again, as stated in the beginning of this chapter preferential liberalization can also mean the removal of non-tariff barriers to trade between countries. The most relevant of these for our analysis are frictional barriers between countries, and more specifically technical regulations.

Technical regulations are barriers such as standardized ways of manufacturing certain goods or subjecting goods to certain quality tests. This can result in being barriers to trade if, for example, Portugal must spend extensive time on- or have large costs for testing their products before they can be sold on the EU market (Baldwin, Wyplosz, 2020).

When Portugal enters the EU not only tariffs disappear as a result from joining the CU, but also technical regulations are harmonized with the EU's and Portugal sees the removal of non-tariff barriers. This reduces trade costs and increases the Portuguese to export to the EU market, which should again increase value of Portuguese exports to the EU.

So, theory tells us that when Portugal joins the EU it sees the removal of tariffs as it enters the CU, and the removal of non-tariff barriers as technical regulations harmonize with the EU's. The hypothesis is therefore once again that value of Portuguese exports to the EU countries should increase with accession.

³ Since we are measuring exports in a currency value, if the "value of exports increase" it's the same as saying simply that "exports increase".

5. Empirical approach

To capture the effects of EU membership on Portugal's trade a gravity model will be used to measure trade flows coming from Portugal to the EU-10⁴ countries before and after EU accession. As shown in the "Previous Research"-section, gravity models are common practice for assessing trade flows and testing variables for affecting these flows.

5.1 The Gravity Model for International Trade

In 1962 Jan Tinbergen assessed bilateral trade flows for two countries using Newtons law for gravity, the model proved to be extremely useful and has kept proving itself over the years to become one of the most recognized research tools in international economics (Chaney, 2013).

The classic model is often set up like the one below, which directly reflects Newtons law, where the gravitational force between two objects is determined positively by each objects' respective mass and negatively by the distance between them.

$$T_{ij} = A * \frac{GDP_i * GDP_j}{Dist_{ij}}$$

Where:

T_{ij} = Bilateral trade flow between country "i" and country "j"

A = Some arbitrary constant

GDP_i = GDP for country "i"

GDP_j = GDP for country "j"

$Dist_{ij}$ = Distance between country "i" and country "j"

So, to understand Newtons law in an economics sense, the mass of the two objects are here instead represented by two countries GDP sizes which affects trade levels positively. Distance keeps its negative effect in the equation, as increased distance between the two countries will affect trade levels negatively (Chaney, 2013).

⁴ Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxemburg, Netherlands and Spain.

To make use of this equation in econometrics the model is log-linearized to be able to make OLS regressions on and estimations of coefficients. The model from above then takes the following econometric form for two countries at a given point in time.

$$\ln T_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln Dist_{ij} + \varepsilon_{ij}$$

This model can then be expanded with other variables affecting trade flows. Some standard variables for this are population sizes and if country “i” and “j” share a common language, a common border or colonial links, the last three would be constructed as dummy variables and are expected to increase trade flows (Shepherd, 2013).

5.2 Specifying a Gravity Model for Portugal

The purpose of this paper is to pinpoint what effects EU accession has had on Portuguese trade flows and, as would be expected from theory, if EU accession has increased Portugal’s exports to union members (the EU-10 countries).

For examining this, trade flows between Portugal and the EU-10 will be collected both before and after Portuguese accession. A gravity model with standard variables from above will be constructed with the addition of an EU-dummy variable, capturing trade effects of EU accession. Two models will be tested with OLS in Stata, the first equation is for aggregated trade flows and the second is for product-disaggregated trade flows.

$$\ln m_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln pop_{it} + \beta_4 \ln pop_{jt} + \beta_5 \ln Dist_{ij} + \beta_7 EU_{ij} + \varepsilon_{ijt}^5$$

All non-dummy variables are log-linearized and therefore the “ln” in front of them.

The dependent variable $\ln m_{ijt}$ are the bilateral trade flows, these are measured as imports to country “i”, which is one of the EU-10 countries, from country “j”, which is Portugal for all observations. These also vary by the time dimension “t” and have been collected between the years of 1983 and 1991. These imports are measured in current USD.

⁵ Standard variables would normally also include “Language”-, “Colony”- and “Border” dummies, but since Portugal does not share a common language or any colonial history with any of the EU-10 countries these two variables are not relevant and since Portugal only shares a border with Spain in the data sample the “Border” dummy would just become a Spain dummy (Sheperd, 2013).

For the explanatory variables, $\ln GDP_{it}$ is the importing country's GDP at time "t" and $\ln GDP_{jt}$ Portugal's GDP at time "t", measured in current USD. Larger GDP size is expected to increase trade since larger economies have larger capacity to produce and export more, and larger demands which indicates the need to import more. Estimations of coefficients for both the importing country and exporting country (Portugal's) GDP should be positive.

$\ln pop_{it}$ and $\ln pop_{jt}$ are the populations sizes for country "i" and Portugal at time "t". These variables are standard to include but their effect is disputed on in the literature concerning gravity models of trade. Markheim (1994) exemplifies how large population countries have higher demands for imports but at the same time have larger production possibilities to satisfy domestic demand. Small population countries can have smaller demands for imports but at the same time less domestic production. So, the expected effect of this variable is ambiguous.

$\ln Dist_{ij}$ is the distance between country "i" and Portugal. Since distance between countries is a constant property it is not dependent on time and the "t"-subscript is dropped. Larger distances between countries are expected to decrease trade as larger distances relates to increasing costs of transportation and estimations of coefficients should be negative.

Lastly comes a dummy variable and the error term ε_{ijt} . The error term captures the error in the model's measurements in trying to fit the explanatory variables on the dependent variable. Then for the variable of most interest for this paper, EU_{ij} , a dummy taking the value one if both country "i" and Portugal are EU members and zero if not. With respect to theory and earlier research the EU-dummy is expected to have a positive effect on trade.

For the second equation, it will look exactly like the one above and have the same explanatory variables. The difference is in the dependent variable, where the import flows are now based on product-disaggregated data. The new dependent variable then takes the form $\ln m_{ijxt}$ where the new subscript "x" indicates that each import flow is now for a certain type of product. This to achieve a larger number of observations and greater variance in the data.

5.3 Data

Panel data of imports to each EU-10 country originating from Portugal is collected between the years 1983-1991. The timespan is chosen to capture and to try to isolate effects of EU accession in 1986. Imports is chosen before exports as countries tend to have better and more rigorous documentation of imports (due to tariff interests etc.).

The data for the first regression with aggregate trade flows is collected from the CEPII TRADHIST dataset (2016). This data consists of country-paired import flows for years 1983-1991 measured in current Great British Pounds (GBP) and converted to USD, as most other data is easiest available in USD as well.

Data for GDP is collected from The World Bank (2019) and is measured in current USD. Population sizes are collected from Penn World Table (2019). Distance is from the CEPII GeoDist dataset (2011) and is measured as bilateral distance between country pairs in kilometres.

For the second regression with product-disaggregated imports, data is collected from the CEPII TradeProd dataset (2012). Imports from Portugal are now broken down in 20 different product categories by International Standard Industrial Classification⁶ (ISIC), creating 20 observations for each country pair and year. This spoils the panel element of the data since Stata will not read observations for repeating years as panel data. However, since I am -for simplicity- not using fixed effects but OLS for both models this does not affect our results. In the disaggregated data Belgium’s and Luxemburg’s import figures are now measured in one flow, making the EU-10 countries nine instead.

5.4 Correlation of variables and data

	lnm	lnGDPI	lnGDPj	lnpopi	lnpopj	lnDist	EU
lnm	1.0000						
lnGDPI	0.9190	1.0000					
lnGDPj	0.3219	0.2307	1.0000				
lnpopi	0.8148	0.9479	0.0056	1.0000			
lnpopj	-0.1292	-0.1081	-0.4598	-0.0020	1.0000		
lnDist	-0.3504	-0.1888	0.0000	-0.2485	-0.0000	1.0000	
EU	0.2815	0.2043	0.8561	0.0045	-0.3370	0.0000	1.0000

Table 1, Model 1

Table 2 displays the correlation matrix for the first model, where import flows “lnm” are measured in aggregated form. The figures of interest are the ones measuring the explanatory variables correlation (the rows below “lnm”) to the dependent variable “lnm” (the first column).

⁶ The data is based on ISIC revision 2 while todays standard is revision 4.

	lnm	lnGDPi	lnGDPj	lnpopi	lnpopj	lnDist	EU
lnm	1.0000						
lnGDPi	0.6293	1.0000					
lnGDPj	0.2827	0.2845	1.0000				
lnpopi	0.5278	0.9222	0.0071	1.0000			
lnpopj	-0.1201	-0.1336	-0.4598	-0.0025	1.0000		
lnDist	-0.3149	-0.2320	0.0000	-0.3545	0.0000	1.0000	
EU	0.2484	0.2521	0.8561	0.0058	-0.3370	-0.0000	1.0000

Table 2, Model 2

Table 3 is the same type of correlation matrix as above but here for model 2, with product-disaggregated import flows. In this model import flows are split up into 20 different product classes and there is a far larger number of observations (1620 rather than 90 in model 1) creating more variance in the data.

A correlation of 1 or -1 means a perfect linear relationship between the two variables, so naturally “lnm” has a perfectly linear positive relationship to itself. What is interesting is the other variables correlation to the imports term. The correlation values tell us how the variables develop in relation to one another, GDP for both countries and the population of the importing country increases when imports increase. While population of Portugal and Distance between the importing country and Portugal decrease when imports increase (vice versa). Since the EU variable is a dummy and just goes from 0 to 1 in the data its correlation is not of interest. These relationships hold for both tables and models.

5.5 Common estimation problems

Both models will be estimated with OLS in Stata. In assessing a gravity model there are some common pitfalls to be aware of. The first is the problem of heteroskedasticity, this occurs when the error terms do not follow a constant variance. To fix for this and achieve homoskedasticity, constant variance of error terms, I choose the option of Robust Standard Errors in Stata which prevents the error terms from being generated in arbitrary patterns resulting in heteroskedasticity (Sheperd, 2013).

Secondly, I want to note the risk of multicollinearity. From the correlation tables 2 and 3 we can see that population of the importing country is strongly correlated with said country’s GDP.

This can be a sign of multicollinearity in the data. Described by Gujarati and Porter (2010), multicollinearity is problematic as it makes estimations of coefficients imprecise and small changes in data can result in big changes in the result. However, the variables specified in this paper are standard for the gravity model and to keep to what is the empirical standard I will stick with these variables.

Finally, a common problem is empty observations, where data for some countries or years are missing. For the first model with aggregated data this was no problem as aggregated import flows were available for every country and year. For the second model with disaggregated data two product categories were left out as they did not exist for all countries and years. This, however, made the combined imports only marginally smaller.

6. Results

6.1 OLS Regressions

On the next page follows the results from OLS estimations. The left-hand column is model 1 with aggregated import flows. The right-hand column is model 2 with product-disaggregated import flows.

Following Shepherds' (2013) guidelines for Gravity Model intuition, coefficients of the continuous variables (GDP, population and distance) should be interpreted as the percentage change in the dependent variable when the explanatory variable with said coefficient increases by 1 percent.

The main interest of study here is of course the EU-dummy and its estimate. Since it is a dummy variable its coefficient cannot be interpreted like the continuous variables'. Because the EU-dummy only takes value zero or one, the whole $\beta_7 EU$ - term will be either zero when $EU=0$ or some constant exactly equal to β_7 when $EU=1$. Therefore, it is not a percent effect on imports, but the coefficient is the change in intercept when Portugal is an EU member (Gujarati, Porter, 2010).

Results Table 1

VARIABLES	Model 1 lnm	Model 2 lnm
GDP Importer	1.780*** (0.139)	2.242*** (0.134)
GDP Portugal	-0.105 (0.217)	-0.222 (0.191)
Pop. Importer	-0.890*** (0.143)	-1.491*** (0.151)
Pop. Portugal	38.192 (41.593)	32.504 (33.897)
Distance	-0.876*** (0.100)	-1.309*** (0.091)
EU	-0.097 (0.181)	-0.099 (0.158)
Observations	90	1,620
R-squared	0.930	0.476

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

For the main study variable, the EU-dummy, there is no significance. So, accession has no effect on Portuguese exports to EU members. This is not reflective of what has been shown from earlier research such as Papazoglou, Pentecost and Marques (2006), which have shown that trade creation happens for accessing countries with EU members. Theory of preferential liberalization would also suggest that Portuguese exports should increase for the sample countries as they are all part of the same CU and the same preferential trade agreements.

Other explanatory variables see mixed results. For the importing countries GDP, there is the expected effect at 1% significance level. A one percent increase in country “i” GDP would increase Portuguese imports by 1.78% (Model 1) or 2.24% (Model 2). A larger GDP means a higher propensity to trade and increases imports from Portugal.

Population of the importing country has a negative effect on imports from Portugal at 1% significance level. A one percent increase in country “i” population reduces Portuguese imports by 0.89% (Model 1) or 1.49% (Model 2). As noted earlier the expectations on this coefficients effect is ambiguous. The result indicates that larger populations are less inclined to import from Portugal, possibly due to larger domestic production as noted by Markheim.

For Portugal’s GDP and population there is no significance so no effect on trade. This could be a result of the data since Portugal is the only exporting country in our data, as most gravity studies use several exporters.

Finally, distance acts as would be expected with a negative effect on trade and with a 1% significance level. A one percent increase in distance between country “i” and Portugal reduces imports by 0.88% (Model 1) or 1.31% (Model 2). This reflects that there are indeed increasing costs of transportation as distance between country “i” and Portugal increases.

6.2 Testing for Robustness

To see how robust the results of the above models are the data will be tested again, using OLS regression, but with some manipulations of the data and variables to change assumptions for the models. First using the same equations as above but for a smaller group of countries, the three largest importers of Portuguese goods. For test two I will test how the results differ when using two new equations which are removed of the population variables. Results from the two tests are found in the appendix. “Model 1” is still for aggregated imports and “Model 2” is still for disaggregated imports.

6.2.1 Selected Importers

Table 2 in the appendix shows results from OLS estimations of the same equations as above but using only the three largest importers of Portuguese goods, which are Germany, Spain and France. Larger economic mass (GDP size) of country “i” increases trade, which is reflected in the data where the largest GDP sizes (Germany, Spain and France) also do have the largest

imports from Portugal. This test is done to see how the choice of countries observed affects the outcome of our models.

Looking at table 2 in the appendix it is found that the GDP- and Population variables for the importing countries and the Distance variable all keep their effects on trade as in the original regression, but effects have been amplified. The GDP variable for Portugal now has a negative effect on trade, with statistical significance of 5%. The results for the EU dummy remain unchanged and there is still no support to the hypothesis that accession increased Portuguese exports to the EU.

6.2.2. Re-specifying the equations

Table 3 in the appendix shows results from OLS regression of two new equations. The difference in these equations are that the Population variable for both the importing country and Portugal have been removed. This is done to create results without the ambiguous effect and the risk of multicollinearity (discussed earlier) of the population variable.

Looking at table 3 in the appendix it is found that GDP variables for both the importing country and Portugal now have positive effect on trade, with statistical significance of 1%. Distance also keeps its negative effect on trade as it has for all tested equations. Since the rate of fit in R^2 only sees a marginal decrease without population it indicates that these variables are not of high relevance for our model. However, the EU dummy still has no effect on trade and there is no support for the hypothesis.

7. Conclusion

The aim of this paper has been to find if EU accession has led to increased exports for Portugal. The most important point to draw from the above results is that the EU-dummy's effect on trade is insignificant. There is no empirical support to the hypothesis that EU accession increased Portuguese exports to the EU countries.

Given what is previously found from both research and theory, EU accession should lead to trade creation with the member countries for the country joining the union. Both due to market liberalizations and to the elimination of tariffs and non-tariff barriers as customs union rules come in to play. With respect to the regression results of this paper the question then becomes why there is no trade creation for Portugal with the union members at the immediate time of accession.

In the studies from both Papazoglou, Pentecost, Marques (2006) and Bussiere, Fidrmuc, Schnatz (2008) it is found that trade creation of accession is smallest for the countries already highly integrated in EU trade and in the EU market. This could be true for Portugal as they developed strong trade relations with European countries through the EFTA and PTA's in the 1960's and 1970's.

As Konstantopoulos (1991) finds, when some of these countries left the EFTA for the EU in the 1970's Portugal had become a well-integrated trade partner of theirs. Later in the 1970's the EU also initiated PTA's with Portugal, increasing access to the EU market for Portuguese exports. Therefore, it could be argued that Portugal was already highly integrated in the EU market at the time of their accession.

As the models presented in this paper tries to capture the immediate effects of the accession-moment in 1986 they will not capture any gradual trade creation that resulted from a gradual integration process.

If it is the case, that Portugal was integrated to the point that they did not experience any increased trade at the accession-time, this raises several new questions about trade integration in Europe. Perhaps a de facto membership in the EU is not a necessity for being a deeply integrated European trade partner. This is especially interesting considering the United Kingdoms recent withdrawal from the union.

To conclude, I hope this paper can motivate to find the full story of Portuguese trade integration and to inspire future research on what are the true trade effects, if there are any, of EU accession and EU integration.

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9. Appendix

Results Table 2

VARIABLES	Model 1 lnm	Model 2 lnm
GDP Importer	2.912*** (0.496)	4.160*** (0.893)
GDP Portugal	-0.760** (0.360)	-1.684** (0.735)
Pop. Importer	-1.243*** (0.355)	-1.919** (0.834)
Pop. Portugal	29.423 (27.232)	26.655 (51.075)
Distance	-1.741*** (0.445)	-2.824*** (0.843)
EU	-0.114 (0.118)	-0.168 (0.243)
Observations	27	540
R-squared	0.972	0.259

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Results Table 3

VARIABLES	Model 1 lnm	Model 2 lnm
GDP Importer	0.888*** (0.025)	0.969*** (0.036)
GDP Portugal	0.444** (0.217)	0.582*** (0.166)
Distance	-0.682*** (0.143)	-0.863*** (0.079)
EU	0.002 (0.224)	0.028 (0.163)
Observations	90	1,620
R-squared	0.892	0.441

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1