Processed Food Trade of Greece with EU and Non-EU Countries: An Empirical Analysis

Ghazalian, Pascal L.

University of Lethbridge

5 October 2015

PROCESSED FOOD TRADE OF GREECE WITH EU AND NON-EU COUNTRIES: AN EMPIRICAL ANALYSIS

Pascal L. Ghazalian
Associate Professor,
Department of Economics,
University of Lethbridge,
Lethbridge, Alberta, Canada, T1K 3M4
E-mail: pascal.ghazalian@uleth.ca

October 2015

Abstract

This paper examines the implications of the European Union (EU) regional trade preferences for processed food trade between Greece and its EU partners, and between Greece and non-EU countries. The empirical analysis relies on the gravity model, and uses different estimation techniques. The results show that the EU regional trade preferences led to substantial increases in processed food trade between Greece and its EU partners, emphasizing trade creation effects. The magnitudes of these increases are higher than the intra-EU average, and are more pronounced for Greece's imports than for Greece's exports. The results also indicate that the EU regional trade preferences brought about decreases in processed food trade between Greece and non-EU countries, implying trade diversion effects. The findings in this paper suggest that the Greek food processing industry would benefit from enhanced production, innovation, and market strategies to expand exports to the EU market and to counter import competition in the domestic market.

Keywords: European Union, food processing, gravity model, Greece, regional trade agreement, trade creation, trade diversion.

JEL Classification: F13, F14, F15

Introduction

The accession of Greece to the European Economic Community (EEC) on January 1st, 1981 has exposed the Greek food processing industry to new market conditions characterized by higher levels of market competition and wider scopes of trade opportunities.[1] The European Union (EU), which superseded the EEC through the Maastricht Treaty on November 1st of 1993, has further enhanced the extent of regional economic integration and has further impacted the Greek food processing industry. The implications of the EU/EEC regional trade preferences for the Greek food processing industry are primarily expressed through the market access provisions. The elimination of tariff and non-tariff barriers on imports of Greece from other EU/EEC member countries would naturally lead to increases in imports and, hence, in market competition faced by the Greek food processing firms in the domestic market. They would normally cause the exit of less-efficient firms from the Greek market, and they would provoke innovation activities as firm-surviving strategies.[2] Meanwhile, Greek food processing firms are expected to benefit from the intra-regional trade provisions through increases in exports to the EU/EEC markets. The realization of the regional market integration would promote spillover effects in terms of processing technologies, product innovations, and management strategies from more competitive EU/EEC-based firms to the Greek food processing industry.[3] Also, it would emphasize Greece's competitive advantage in processed food products, particularly those that are based on Greece's relatively abundant primary agricultural products. The EU/EEC food regulation policies are also expected to have an impact on Greece's processed food trade. In this context, De Frahan and Vancauteren

[1] The significance of the food processing industry is evident in the Greek manufacturing sector, and in the Greek economy as a whole. For instance, the food processing industry in Greece accounts for 21% of aggregate total sales of the Greek manufacturing sector, and it employs around 20% of the total employment in the Greek economy. In addition, there is a 10% of the total labour force in Greece involved in supplying raw materials to the food processing industry (Global Agricultural Information Network, 2012).

[2] In this context, Baltas (2003) noted that the economic integration process within the EU/EEC has raised the level of market competition, and has induced merger and acquisition activities through the Greek food processing industry.

[3] See Ghazalian (2013) for further discussion on the relationship between regional trade agreements and firms' production technology and efficiency.

(2006) found that the harmonization of food regulations across member countries has promoted intra-regional trade flows.[4]

There are some empirical studies that examines the various implications of Greece's accession to the EU/EEC for overall trade flows and economic performance. Arghyrou (2000) showed that the competitiveness of Greek firms did not prevail through the EU/EEC accession, due to lacks in product differentiation and specialization. Also, Arghyrou (2000) found evidence that Greece's international trade has been re-oriented toward EU/EEC partner countries, and has experienced a reduction with other countries. Koukouritakis (2004) found that Greece's accession to the EU/EEC has led to important trade deficits, due to significant increases in imports and relatively smaller increases in exports. Papazoglou (2007) analyzed the extent of Greece's trade potentials within the EU/EEC. The results revealed that exports of Greece to its EU/EEC partners fall below the potential levels, whereas imports of Greece from its EU/EEC partners stand above the predictions. Cuaresma *et al.* (2008) found that the EU/EEC membership has been more beneficial in terms of economic growth for countries with relatively lower Gross Domestic Product (GDP) per Capita (GDPC) such as Greece.[5] These positive implications are attributed to the net financial transfers from other EU/EEC members with higher GDPC, in addition to the technological diffusion effects. Also, Cuaresma *et al.* (2008) underlined the positive implications of trade openness, which is assumed to have been improved through the EU/EEC formation, on the economic growth of member countries.

Figure 1 depicts the patterns of processed food trade of Greece over the time period 1997-2013.[6] The values of trade flows are deflated, and they are presented in 2005 constant United States (US) Dollars (USD). The value of Greece's total processed food exports

[4] Nitsch (2000) found that national borders between EU/EEC member countries matter for intra-EU/EEC trade flows. Chen (2004) underlined that technical barriers and product-specific information costs have a significant effect on trade flows among EU/EEC member countries.

[5] Cappelen *et al.* (2003) indicated that EU/EEC regional support programs in terms of structural funds have promoted economic growth of EU/EEC member countries. However, the implications appeared to be less prominent in the case of Greece compared to other EU/EEC countries (e.g., Portugal, Spain).

[6] Given that this time period covers the post-EU formation, "EU" is henceforth used instead of "EU/EEC" through the rest of the paper.

shows some fluctuations over time, as it increases from 2300.9 million USD in 1997 to 3709.4 million USD in 2013. Greece's processed food exports to the EU and non-EU countries have increased from 1357.1 and 943.8 million USD in 1997 to 1816.6 and 1892.8 million USD in 2013, respectively. These statistics imply that the growth rate of Greece's exports appear to be moderately higher in the case of non-EU countries over this time period. Figure 1 also shows that the value of Greece's total processed food imports increased from 3698.5 million USD in 1997 to 6940.9 million USD in 2008, but subsequently decreased to 5600.7 million USD in 2013. Greece's imports from the EU countries follow similar patterns starting from an initial value of 3143.8 million USD in 1997, reaching a maximum of 5461.6 million USD in 2008, and subsequently decreasing to 3997.4 million USD in 2013. Greece's imports from non-EU countries show a generally ascending trend over time from 554.6 million USD in 1997 to 1603.3 million USD in 2013.

The implications of Regional Trade Agreements (RTAs) are often empirically examined through Viner's (1950) framework of trade creation and trade diversion effects. In the absence of regional trade preferences, countries will normally import from lower-cost sources. The application of regional trade preferences would give advantage to imports coming from regional producers located in member countries. These producers could be, however, characterized by a relatively higher-cost of production compared to other producers located in non-member countries. Hence, trade among RTA member countries would increase reflecting the trade creation effect. Also, trade flows from non-member countries to member countries would decrease, enduring the trade diversion effect. The welfare implications of RTAs for member countries is contingent on the relative magnitudes of trade creation and trade diversion effects. There exists a sizeable empirical trade literature that examined the occurrence of trade creation and trade diversion effects on trade flows in general (Frankel, 1997; Soloaga and Winters, 2001; Carrère, 2006), and on trade flows in agricultural and processed food products (e.g., Sarker and Jayasinghe, 2007; Lambert and McKoy, 2009; Sun and Reed, 2010; Ghazalian *et al.*, 2011).

Given the significance of the food processing industry in the Greek economy, it is important to empirically determine how the EU regional trade preferences impacted Greece's processed food trade. Also, such analysis would provide directions to determine the pertinence of policies and strategies that improve the competitiveness of the Greek food

processing industry in the domestic, regional, and international markets. This study contributes to the empirical literature by examining the effects of the EU regional trade preferences on Greece's processed food trade flows, and by drawing a distinction through the trade creation and trade diversion effects between Greece and other EU member countries. It also uses different empirical specifications and estimation techniques through the analysis. The remainder of this paper is organized as follows. Next, a literature review on the food processing industry in Greece is provided. The following section presents the empirical specifications and outlines the estimation strategies. Next, the dataset is discussed and descriptive statistics are provided. This is followed by a section that presents and explains the benchmark empirical results. Next, the results from an alternative empirical model that disentangles the effects by the trade direction are provided and discussed. The final section concludes.

Literature Review on the Food Processing Industry in Greece

The characteristics of the Greek food processing industry are expected to constitute principal factors that determine the response of Greece's processed food trade to the EU regional trade preferences. In this context, there has been a range of studies that raised concerns about the competitiveness of the Greek food processing industry in the domestic, regional, and global markets. Böwer *et al.* (2014) indicated that Greece is a relatively closed economy, and that its export performance is generally lagging behind many other countries. They reported that Greece's export performance scores above predictions in few industries (e.g., transportation, tourism, primary agriculture), but falls below predictions through several other industries including the food processing industry. They explained that these lower export magnitudes are associated with lower competitiveness levels compared to other countries, and they indicated that this situation persisted since the early 1990s. Traill (2000) found that Greek food processing firms fall into the category of national branders, as opposed to the category of international product innovators that includes food processing firms in other EU countries (e.g., Denmark). Hence, Greek food processing firms may be facing more limitations in accessing the EU and other international markets given that they did not realize a full internationalization of their products.

Matopoulos and Bourlakis (2011) noted that the innovation performance of the food processing industry in Greece is lagging behind the innovation performance of food processing industries in other European countries. They attributed this situation to the non-realization of economies of scale and inefficient management. Rezitis and Kalantzi (2015) found that the technical efficiency of the Greek food processing industry has been deficient and, as a result, there has been a lower production level compared to the potential that can be reached when inputs are used more efficiently. Also, they noted that the extent of technical efficiency has been generally decreasing over the time period 1984-2007, primarily due to the lack of advanced technologies and capital stock through the Greek food processing industry.

There is a strand of the empirical literature that examined the market structure of the Greek food processing industry. Vlachvei and Oustapassidis (1997) found that domestic market shares of food processing firms in Greece are mainly determined through product differentiation and economies of scale. Then, Vlachvei and Oustapassidis (1998) detected two-way positive relationship between profitability in the Greek food processing industry and advertising. They also highlighted the connection between industrial concentration and economies of scale. Oustapassidis *et al.* (2000) complemented these results by showing that profitability in the Greek food processing industry is directly affected by efficiency and economies of scale. Also, Oustapassidis and Vlachvei (1999) studied the differences in profit margins between two sub-groups of the Greek food processing industry characterized by higher and lower product differentiation levels. They found that the relatively higher profit margins of the former sub-group are mainly attributed to greater sensitivity to advertising and demand changes. Dimara *et al.* (2008) found that technical efficiency and economies of scale increase the survival time and lower the hazard rate of exit of Greek food processing firms. Rezitis and Kalantzi (2012) indicated that the Greek food processing industry is characterized by higher markups, non-competitive market conditions, and elevated industrial concentration ratios.

Anastassopoulos (2003, 2004) showed that food processing subsidiaries of multinational enterprises (MNEs) have larger market shares and higher profit margins compared to domestic food processing firms in Greece. Also, these subsidiaries are characterized by relatively higher advertising and R&D intensities, whereas domestic firms compete through

a better knowledge of the Greek domestic processed food market. Baourakis *et al.* (2002) and Kalogeras *et al.* (2005) underlined considerable variations in the financial performance across Greek food processing firms. Mavrogiannis *et al.* (2008) examined the determinants of the export performance of Greek food processing firms. They highlighted the favourable roles of export marketing strategies and low export barriers in enhancing exporting activities.

Some studies looked into the implications of domestic and regional policies for the performance of the Greek food processing industry. Skuras *et al.* (2006) showed that capital subsidies, expressed through free capital and interest rate subsidization for invested capital, affect technical efficiency and, hence, total factor productivity through the Greek food processing industry. Also, Baltas (2007) found that domestic and EU subsidies have stimulated investments in the Greek food processing industry. The OECD's (2014) competition assessment reviews for Greece identified a significant number of regulatory barriers that cause market distortions and non-competitive conditions. Also, these reviews indicated that easing these regulatory restrictions would improve the efficiency and performance of the Greek food processing industry.

Empirical Specification

The empirical analysis examines the extent of trade flows between Greece and its EU trading partners using a gravity model. In its basic form, the gravity model predicts bilateral trade flows through the exporter's supply size, importer's demand size, bilateral geographic distance, and other bilateral variables (e.g., trade barriers and preferences, linguistic links, common borders). The empirical literature has used various gravity specifications to analyze the implications of regional trade preferences for trade flows in primary agricultural and processed food products (Sarker and Jayasinghe, 2007; Lambert and McKoy, 2009; Sun and Reed, 2010; Cardamone, 2011; Ghazalian *et al.*, 2011), and to examine the impacts of different policies and national characteristics on agricultural and food trade (Ghazalian and Furtan, 2007; Chevassus-Lozza *et al.*, 2008; Olper and Raimondi, 2009; Xiong and Beghin, 2012; Ghazalian *et al.*, 2007, 2012; Dal Bianco *et al.*,

2015; Ghazalian, 2012, 2015).[7] In this study, the gravity model is used to examine Greece's processed food trade with EU and non-EU countries, and it is specified as:

$$
\begin{aligned}
\ln Trade_{ijt} = {} & \alpha_0 + \alpha_1 \ln S_{it} + \alpha_2 \ln D_{jt} + \alpha_3 \ln Distance_{ij} + \alpha_4 Language_{ij} + \alpha_5 Border_{ij} \\
& + \alpha_6 \left(EU - EU\right)_{ij} + \alpha_7 \left(GRC - EU\right)_{ij} + \alpha_8 \left(EU - nEU\right)_{ij} + \alpha_9 \left(GRC - nEU\right)_{ij} \\
& + \alpha_{10} MR_{it} + \alpha_{11} MR_{jt} + \alpha_{12} TP_{ijt} + \sum\nolimits_s \delta_s DT_s + \varepsilon_{ijt}
\end{aligned} \tag{1}
$$

where $Trade_{ijt}$ represents the value of processed food trade flows from an exporting country i to an importing country j at time t, S_{it} and D_{jt} capture the supply size capacity of the exporting country and the demand size capacity of the importing country, respectively, $Distance_{ij}$ represents the bilateral geographic distance between trading partners, $Language_{ij}$ is a dummy variable that equals one when countries share a common language and zero otherwise, and $Border_{ij}$ is a dummy variable that equals one when trading partners share a common border and zero otherwise.

The variable $\left(EU - EU\right)_{ij}$ captures the extent of intra-EU trade flows, reflecting the trade creation effect. It equals one when trade occurs between two EU member countries (including Greece) and zero otherwise. The variable $\left(GRC - EU\right)_{ij}$ depicts the extent of Greece-EU trade flows relative to the average intra-EU trade flows. It equals one for trade between Greece and an EU member country, and it equals zero otherwise. Hence, the implications of regional trade preferences for trade between two EU member countries are determined through the coefficient α_6. Meanwhile, the implications of regional trade preferences for trade between Greece and its EU partners exhibit a deviation from the average intra-EU estimate through the coefficient α_7. Accordingly, the overall implications of regional trade preferences for Greece-EU trade flows are depicted by the coefficient $\left(\alpha_6 + \alpha_7\right)$. Naturally, higher levels of trade flows among EU member countries would emanate from the direct implications of the intra-EU market access provisions associated with the removal tariff and non-tariff trade barriers, and also from the indirect

[7] Tamini *et al.* (2012) used a gravity model to carry out simulations that determine the welfare implications of domestic support and tariff policies for developing countries.

implications of other EU provisions, different business and industrial responses, and market adjustments.

The variable $\left(EU\text{ - }nEU\right)_{ij}$ is included to capture the trade diversion effect. It takes the value of one for trade observations between EU member countries (including Greece) and non-EU countries, and it takes the value of zero otherwise. It is worth noting that the trade diversion effect could be offset by positive implications of the larger and less-segmented EU market for trade flows between EU and non-EU countries. The variable $\left(GRC\text{ - }nEU\right)_{ij}$ depicts the extent of Greece's trade diversion effect above and over the average EU trade diversion effect. It takes the value of one for trade observations between Greece and non-EU countries and zero otherwise. It is worth noting that the variables related to the EU regional trade preferences are not characterized by a time subscript. This is because the EU membership status does not vary through the time period covered by the dataset for any country.

The multilateral remoteness variables are constructed as $MR_{it}=\left[\sum_h\left(w_{ht}/Distance_{ih}\right)\right]^{-1}$ and $MR_{jt}=\left[\sum_h\left(w_{ht}/Distance_{hj}\right)\right]^{-1}$, where w_{ht} represents the economic weight attached to the bilateral distance with a corresponding trade partner h (Nitsch, 2000; Baldwin and Harrigan, 2011; Head and Mayer, 2014). The empirical specification includes time-specific effect represented by a dummy variable DT_s for a given year s. Also, it controls for other country-pair trade preferences through the dummy variable TP_{ijt}. The latter equals one when a country-pair trade preference exists and zero otherwise. The stochastic error term is represented by ε_{ijt}.[8]

The basic log-linear form of the gravity model, which is commonly estimated through the Ordinary Least Squares (OLS) estimator, has endured significant empirical scrutiny.

[8] There is a strand of empirical literature that examined the implications of trade policies for agricultural and food trade at the extensive margin through the formation of new bilateral trading partnerships (Ghazalian *et al.*, 2009; Xiong and Beghin, 2012; Haq *et al.*, 2013). The empirical analysis in this study is implemented for aggregate bilateral processed food trade dataset that is primarily characterized by positive values of bilateral trade flows.

Santos Silva and Tenreyro (2006) showed that the estimation of the logarithmic specification of the gravity model through the OLS estimator yields biased estimates of the true elasticities. This is because Jensen's inequality, which can be portrayed through $E\left[\ln\left(Trade_{ijt}\right)\right] \neq \ln\left[E\left(Trade_{ijt}\right)\right]$, leads to distorted inferences in the presence of heteroskedasticity that often characterizes trade flow datasets. Santos Silva and Tenreyro (2006) recommended the estimation of the multiplicative form of the gravity model using the Poisson Pseudo-Maximum Likelihood (PPML) estimator. The PPML model assumes that the conditional variance and the conditional mean of the dependent variable are related through $E\left(Trade_{ijt}\middle|Z_{ijt}\right) \propto Var\left(Trade_{ijt}\middle|Z_{ijt}\right)$.

A following study by Burger *et al.* (2009) proposed the use of the Negative Binomial Pseudo-Maximum Likelihood (NBPML) estimator, because the latter allows the dispersion parameter to be different from zero. Specifically, the NBPML estimator is characterized by $E^2\left(Trade_{ijt}\middle|Z_{ijt}\right) \propto Var\left(Trade_{ijt}\middle|Z_{ijt}\right)$. The Likelihood Ratio (LR) test can be implemented to examine a null hypothesis that the dependent variable is characterized by equi-dispersion versus an alternative hypothesis that the dependent variable is characterized by over-dispersion. The rejection of the null hypothesis would favour the NBPML estimator over the PPML estimator. Hence, letting υ_{ijt} represent the stochastic error term, the empirical analysis also estimates the following multiplicative form of the gravity equation:

$$(2) \quad Trade_{ijt} = \exp\begin{pmatrix} \beta_0 + \beta_1 \ln S_{it} + \beta_2 \ln D_{jt} + \beta_3 \ln Distance_{ij} + \beta_4 Language_{ij} \\ +\beta_5 Border_{ij} + \beta_6 \left(EU\text{ - }EU\right)_{ij} + \beta_7 \left(GRC\text{ - }EU\right)_{ij} \\ +\beta_8 \left(EU\text{ - }nEU\right)_{ij} + \beta_9 \left(GRC\text{ - }nEU\right)_{ij} \\ +\beta_{10} MR_{it} + \beta_{11} MR_{jt} + \beta_{12} TP_{ijt} + \sum_s \gamma_s DT_s \end{pmatrix} + \upsilon_{ijt}$$

Data Description

The empirical analysis covers processed food trade between Organization for Economic Cooperation and Development (OECD) countries that include EU member countries as

well as other primarily developed countries.[9] The bilateral trade flow dataset is derived from the OECD bilateral trade database, and it comprises yearly observations on bilateral trade flows from 1997 to 2013. Table 1 provides descriptive statistics where the values of trade flows are reported in constant 2005 USD. The mean value of trade flows in the dataset is 489.9 million USD (with a standard deviation of 1211.1 million USD). The mean value of trade flows among EU member countries is relatively higher at 873.9 million USD (with a standard deviation of 1406.7 million USD). Comparatively, the values of trade flows between Greece and EU member countries have a lower mean of 203.7 million USD (with a standard deviation of 254.4 million USD).

Decomposing Greece-EU trade flows into exports from Greece to EU partners and imports to Greece from EU partners reveals more considerable differences. This is where the corresponding means stand at 110.8 million USD (with a standard deviation of 156.1 million USD) and 296.7 million USD (with a standard deviation of 297.5 million USD), respectively. These trade statistics suggest that the patterns of processed food trade between Greece and its EU partners are relatively more inclined toward the importing direction. The trade relationship between Greece and non-EU countries in the dataset is less prominent, as it stands at an exporting mean value and an importing mean value of 34.6 million USD (with a standard deviation of 50.2 million USD) and 15.1 million USD (with a standard deviation of 16.1 million USD), respectively.

The geographic and socio-economic variables are obtained from the *Centre d'Études Prospectives et d'Informations Internationales* (CEPII). The bilateral distance variable corresponds to the measure developed by Head and Mayer (2010) that accounts for the dispersion of economic activities within each country. The mean of the bilateral distance between all OECD countries in the dataset equals 6103.3 Km (with a standard deviation of 5474.1 Km). The corresponding mean of bilateral distance among EU member countries is considerably lower, standing at 1419.1 Km (with a standard deviation of 689.4 Km). The mean of bilateral distance between Greece and its EU partners is higher than the EU

[9] The EU member countries that are covered in the dataset are: Austria, Belgium-Luxembourg, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, and the United Kingdom. The non-EU countries covered through the dataset are: Australia, Canada, Japan, Korea (Rep. of), Mexico, New Zealand, Norway, Switzerland, Turkey, and the United States.

average, being equal to 2134.9 Km (with a standard deviation of 505.5 Km). Greece does not share either a common border or a common language with any other OECD country in the dataset. The values of national Gross Domestic Product (GDP) are collected from the the World Bank database, and are converted into constant 2005 USD.

Benchmark Empirical Results

The benchmark empirical results are presented in Table 2. Column (1) shows the results from the conventional Ordinary Least Squares (OLS) estimation of the log-linearized form of the gravity equation (1). Columns (2) and (3) present the results obtained from estimating the multiplicative form of the gravity equation (2) using the PPML estimator and the NBPML estimator, respectively. The reference group for bilateral trade involving EU countries, is the bilateral trade between OECD countries that do not share a membership in any RTA through the empirical specification. The LR test indicates the existence of over-dispersion (null hypothesis of equi-dispersion is rejected at the 1% level of significance), favouring the NBPML estimator over the PPML estimator. Hence, the discussion of the empirical results will be mostly focusing on the NBPML estimates.

The NBPML estimates show that the magnitude of bilateral processed food trade among EU member countries is higher by exp(1.315)=3.72 times than the magnitude of the reference bilateral trade among OECD countries that do not share a common RTA membership, *ceteris paribus*. This finding reflects the trade creation effect of the EU regional trade preferences. The estimated coefficient on the Greece-EU dummy variable is positive and statistically significant at the 1% level, indicating that the magnitude of bilateral trade between Greece and its EU partners is higher than the magnitude of bilateral trade among EU member countries by exp (1.079)=2.94 times, *ceteris paribus*. Also, the magnitude of bilateral trade between Greece and its EU partners is higher by exp(1.079+1.315)=10.96 times than the magnitude of the reference bilateral trade among OECD countries that do not share a common RTA membership, *ceteris paribus*.

The estimated coefficient on the dummy variable capturing trade between EU and non-EU countries is positive and statistically significant at the 1% level. It implies a fairly higher magnitude of bilateral trade by a factor of exp(0.126)=1.13 compared to the reference

bilateral trade flows among OECD countries. This finding could be associated with the promoting implications of the larger and less-segmented EU market for trade with outsiders, offsetting the trade diversion effect. The estimated coefficient on the dummy variable for trade between Greece and non-EU countries is negative and statistically significant at the 1% level. It suggests that the trade diversion effect prevails through lower levels of trade flows by a factor of exp(-1.165+0.126)=0.35 compared to the reference bilateral trade flows among OECD countries.[10]

The extents of trade creation and trade diversion effects for Greece's trade with EU and non-EU countries, respectively, can be illustrated using the mean values of trade flows. For instance, EU regional trade preferences are associated with higher bilateral trade flows between Greece and its EU partners reaching 203.7*(1-1/10.96) =185.1 million constant 2005 USD, and with a lower bilateral trade flows between Greece and non-EU countries amounting to 24.8*(1-1/0.35)=-46.1 million constant 2005 USD.

Other results show that the exporter's supply and importer's demand capacities have positive implications for trade flows. Also, an increase in bilateral distance by 1% reduces trade flows by around 0.65%. Countries sharing a common language and a common border have higher trade magnitudes by exp(0.731)=2.08 times and exp(0.652)=1.92 times, respectively, *ceteris paribus*. These results are relevant for several EU country-pair trade relationships (e.g., Belgium and France that share common language and common border). The estimated coefficients on both remoteness variables are statistically significant and have the expected positive signs.

Next, the empirical analysis performs NBPML estimations on two sub-datasets covering the earlier time period 1997-2001 and the more recent time period 2009-2013 to examine whether the EU regional trade preferences exhibit different implications for trade flows

[10] The results obtained from other estimators show some considerable differences compared to the NBPML estimates. For instance, the PPML estimated coefficient on $\left(EU\text{ - }EU\right)_{ij}$ indicates a smaller magnitude of exp(0.781)=2.18. Also, the PPML estimated coefficient on $\left(EU\text{ - }nEU\right)_{ij}$ is negative and statistically significant at the 1% level. It suggests the prevalence of the trade diversion effect in contrast to the NBPML results.

over time. For instance, the effects of EU regional trade preferences on processed food trade could take time to be completed due to gradual market adjustments and industrial responses. The results are presented in columns (4) and (5) of Table 2 for the earlier and most recent time periods, respectively. They are found to be generally comparable to each other and to the benchmark empirical results in column (3), implying that the implications of the EU regional trade preferences for trade flows have been comparable over time. This finding suggests that major industrial responses and market adjustments to the EU market integration process could have been realized prior to the time period covered through this empirical analysis.

Empirical Results from an Alternative Specification

The implications of the EU regional trade preferences for processed food trade were presented in the previous section as an overall effect covering Greece's exports to EU countries and Greece's imports from EU countries. Next, the empirical analysis disentangles the effects of the EU regional trade preferences by the direction of trade flows. Hence, the overall Greece-EU dummy variable $\left(GRC\text{ - }EU\right)_{ij}$ is dissected into two dummy variables. The first dummy variable depicts Greece's exports to EU member countries, and it is represented by $\left(GRC \to EU\right)_{ij}$. It equals one when the exporter is Greece and the importer is an EU member country, and it equals zero otherwise. The second dummy variable, $\left(EU \to GRC\right)_{ij}$, covers Greece's imports from EU member countries. It takes the value of one when the importer is Greece and the exporter is an EU member country, and it takes the value of zero otherwise. Similarly, the basic dummy variable for trade between Greece and non-EU countries is disentangled to capture the exporting and importing directions of trade, and it is substituted by the dummy variables $\left(GRC \to nEU\right)_{ij}$ and $\left(nEU \to GRC\right)_{ij}$. The empirical specification is completed through the replacement of the basic dummy variable for trade between EU and non-EU countries by the dummy variables capturing exports of EU countries to non-EU countries and imports of EU

countries from non-EU countries. These dummy variables are depicted by $\left(EU \to nEU\right)_{ij}$ and $\left(nEU \to EU\right)_{ij}$, respectively.[11]

Table 3 presents the results obtained through different estimators and, as in the previous case, the discussion is mainly carried out through the favoured NBPML estimates in column (3). The results reveal that there are considerable variations in the implications of the EU regional trade preferences for Greece's exporting and importing relationships with the EU partners. The estimated coefficient on $\left(GRC \to EU\right)_{ij}$ is not statistically significant, indicating that the magnitude of Greece's exports to the EU partners is statistically equivalent to the magnitude of trade among the EU member countries. The latter stands at exp(1.415)=4.12 times higher than the reference trade among OECD countries, *ceteris paribus*. The estimated coefficient on $\left(EU \to GRC\right)_{ij}$ reveals that the implications of the EU regional trade preferences are substantially more pronounced for Greece's imports from the EU partners than for Greece's exports to the EU partners. It is found to be positive and statistically significant at the 1% level, indicating that the magnitude of Greece's processed food imports from EU member countries is higher than the magnitude of imports of an EU member country from another EU member country by exp(1.361)=3.90 times, *ceteris paribus*. Also, it shows that Greece's imports from its EU partners is exp(1.361+1.415)=16.05 times higher than the reference trade among OECD countries, *ceteris paribus*.

The results show that the exports of EU member countries to non-EU countries are higher than the reference bilateral trade among OECD countries by exp(0.502)=1.65 times, *ceteris paribus*. However, the imports of EU member countries from non-EU countries are moderately below the reference bilateral trade among OECD countries by a factor of exp(-0.180)=0.84, *ceteris paribus*. These findings imply that the trade diversion effect occurs from the importing direction. However, the extent of this effect appears to be relatively small.

[11] The basic intra-EU dummy variable is expectedly not dissected into exporting and importing directions.

The estimated coefficients on $\left(GRC \to nEU\right)_{ij}$ and $\left(nEU \to GRC\right)_{ij}$ are both negative and statistically significant at the 1% level. They imply that Greece's exports to non-EU countries and Greece's imports from non-EU countries are lower than the corresponding estimates for the EU member countries by factors of exp(-1.613)=0.20 and exp(-0.767)=0.46, respectively. Also, the factors become exp(-1.613+0.502)=0.33 and exp(-0.767-0.180)=0.39 when determined relative to the reference bilateral trade among OECD countries. Hence, the trade diversion effect occurs for Greece's trade with non-EU countries through the exporting and importing directions.

As an illustration at the mean values, EU regional trade preferences are associated with a higher level of bilateral processed food exports from Greece to its EU partners amounting to 110.8*(1-1/4.12)=83.9 million constant 2005 USD, and with a lower bilateral processed food exports from Greece to non-EU countries by 34.6*(1-1/0.33)=-70.2 million constant 2005 USD. Also, at the mean values, the results illustrate that the EU regional trade preferences promoted higher bilateral processed food imports to Greece from its EU partners by 296.7*(1-1/16.05)=278.2 million constant 2005 USD, and lower bilateral processed food imports to Greece from non-EU countries by 15.1*(1-1/0.39)=-23.6 million constant 2005 USD.

Finally, columns (4) and (5) of Table 3 present the results obtained through the NBPML estimation implemented on two sub-datasets covering the earlier time period 1997-2001 and the more recent time period 2009-2013, respectively. They are found to be similar to each other and to the overall estimates presented in column (3) of Table 3, indicating that the implications of the EU regional trade preferences for trade flows remained generally stable over time through the importing and exporting directions.

Conclusion

The accession of Greece to the EU/EEC constituted a prominent event that impacted the Greek food processing industry. The EU/EEC market access provisions have brought about increases in domestic market competition levels, but they have also generated new trade opportunities through the EU/EEC market. The response of Greece's processed food

trade to the EU/EEC market integration policies is expected to be function of the characteristics of the Greek food processing industry. These characteristics are often described through lower competitiveness levels, inadequate innovation activities, and technological inefficiencies compared to the food processing industries in other EU/EEC countries. In this context, it becomes pertinent to analyze the performance of the Greek food processing industry in the domestic, regional, and international markets.

This paper examines the implications of the EU regional trade preferences for Greece's processed food trade with EU partners and with non-EU countries. The empirical analysis is implemented through a gravity model using different estimation techniques. The results show that the EU regional trade preferences have a positive effect on Greece's trade with the EU partners. The magnitude of this effect is stronger than the average effect that occurred for trade among EU member countries. Hence, the EU regional trade preferences have generated a Greece-EU trade creation effect that is above the intra-EU average. Also, the EU regional trade preferences are found to be associated with a trade diversion effect that prevailed through processed food trade between Greece and non-EU countries, underscoring significant decreases. This outcome is in contrast with the average effect on trade between EU and non-EU countries that is not statistically significant.

Disentangling the effects by the trade direction reveals a more nuanced outcome. The results indicate that the EU regional trade preferences induced an increase in processed food exports from Greece to its EU partners that is statistically equivalent to the average intra-EU trade creation effect. Meanwhile, the EU regional trade preferences are found to be associated with a significant surge in Greece's processed food imports from its EU partners, standing well above the average intra-EU trade creation effect. Also, the EU regional trade preferences led to decreases in processed food trade between Greece and non-EU countries from both the importing and exporting directions. These results deviate from the increasing effect on exports from EU countries to non-EU countries, and from the modest decreasing effect on imports of EU countries from non-EU countries.

This paper shows that the performance of the Greek food processing industry through the regional exporting market has been statistically equivalent to the average exporting performance of the food processing industries in EU member countries. However, it appears

that the Greek food processing industry endured an above average surge in domestic market competition levels through considerable increases in imports originating from EU member countries. These findings suggest that enhancing production efficiencies, innovation activities, and market strategies through the Greek food processing firms could further expand their shares in the EU market, and could formulate an industrial response vis-à-vis the increases in market competition levels that are brought about by higher levels of imports, particularly from EU member countries. Also, domestic and regional policies could contribute in promoting the competitiveness of the Greek food processing industry by easing the regulatory restrictions, providing capital subsidies, and developing export-enhancing infrastructure.

References

Anastassopoulos, G. (2003). MNE subsidiaries versus domestic enterprises: an analysis of their ownership and location-specific advantages. *Applied Economics*, *35*(13), 1505-1514.

Anastassopoulos, G. (2004). Profitability differences between MNE subsidiaries and domestic firms: The case of the food industry in Greece. *Agribusiness*, *20*(1), 45-60.

Arghyrou, M. G. (2000). EU participation and the external trade of Greece: An appraisal of the evidence. *Applied Economics*, *32*(2), 151-159.

Baldwin, R., & Harrigan, J. (2011). Zeros, quality, and space: Trade theory and trade evidence. *American Economic Journal: Microeconomics*, *3*(2), 60-88.

Baltas, N. K. (2003). *Investment in the Processing of Agricultural Products and Food in Greece*. Nova Publishers, Hauppauge, NY.

Baltas, N. K. (2007). Investment in the Greek processing of agricultural products and food: A panel data approach. *Journal of Applied Business Research*, *23*(4), 105-116.

Baourakis, G., Doumpos, M., Kalogeras, N., & Zopounidis, C. (2002). Multicriteria analysis and assessment of financial viability of agribusinesses: The case of marketing co-operatives and juice-producing companies. *Agribusiness*, *18*(4), 543-558.

Böwer, U., Michou, V., & Ungerer, C. (2014). The puzzle of the missing Greek exports. Working paper No. 518, Directorate-General for Economic and Financial Affairs, European Commission, Brussels, Belgium.

Burger, M., Van Oort, F., & Linders, G. J. (2009). On the specification of the gravity model of trade: Zeros, excess zeros and zero-inflated estimation. *Spatial Economic Analysis*, *4*(2), 167-190.

Cappelen, A., Castellacci, F., Fagerberg, J., & Verspagen, B. (2003). The impact of EU regional support on growth and convergence in the European Union. *Journal of Common Market Studies*, *41*(4), 621-644.

Cardamone, P. (2011). The effect of preferential trade agreements on monthly fruit exports to the European Union. *European Review of Agricultural Economics*, *38*(4), 553-586.

Carrère, C. (2006). Revisiting the effects of regional trade agreements on trade flows with proper specification of the gravity model. *European Economic Review*, *50*(2), 223-247.

Chen, N. (2004). Intra-national versus international trade in the European Union: Why do national borders matter?. *Journal of International Economics*, *63*(1), 93-118.

Chevassus-Lozza, E., Latouche, K., Majkovič, D., & Unguru, M. (2008). The importance of EU-15 borders for CEECs agri-food exports: The role of tariffs and non-tariff measures in the pre-accession period. *Food Policy*, *33*(6), 595-606.

Cuaresma, J. C., Ritzberger-Grünwald, D., & Silgoner, M. A. (2008). Growth, convergence and EU membership. *Applied Economics*, *40*(5), 643-656.

Dal Bianco, A., Boatto, V. L., Caracciolo, F., & Santeramo, F. G. (2015). Tariffs and non-tariff frictions in the world wine trade. *European Review of Agricultural Economics*, *Forthcoming*.

De Frahan, B. H., & Vancauteren, M. (2006). Harmonisation of food regulations and trade in the Single Market: evidence from disaggregated data. *European Review of Agricultural Economics*, *33*(3), 337-360.

Dimara, E., Skuras, D., Tsekouras, K., & Tzelepis, D. (2008). Productive efficiency and firm exit in the food sector. *Food Policy*, *33*(2), 185-196.

Frankel, J. (1997). *Regional Trading Blocs in the World Economic System*. Institute for International Economics, Washington, DC.

Ghazalian, P. L. (2012). Home bias in primary agricultural and processed food trade: Assessing the effects of national degree of uncertainty aversion. *Journal of Agricultural Economics*, *63*(2), 265-290.

Ghazalian, P. L. (2013). On the relationship between regional trade agreements and agricultural technology and productivity. *Agricultural and Food Economics*, *1*(1), 7.

Ghazalian, P. L. (2015). The new tomato suspension agreement: What are the implications for trade flows?. *Canadian Journal of Agricultural Economics*, *63*(3), 359-380.

Ghazalian, P. L., & Furtan, W. H. (2007). The effect of innovation on agricultural and agri-food exports in OECD countries. *Journal of Agricultural and Resource Economics*, *32*(3), 448-461.

Ghazalian, P. L., Larue, B., & Gervais, J. P. (2009). Exporting to new destinations and the effects of tariffs: the case of meat commodities. *Agricultural Economics*, *40*(6), 701-714.

Ghazalian, P. L., Larue, B., & Gervais, J. P. (2011). Assessing the implications of regional preferential market access for meat commodities. *Agribusiness*, *27*(3), 292-310.

Ghazalian, P., Tamini, L., Larue, B., & Gervais, J. P. (2007). A Gravity approach to evaluate the significance of trade liberalization in vertically-related goods in the presence of non-tariff barriers. Working paper No. 2744, University Library of Munich, Munich, Germany.

Ghazalian, P. L., Tamini, L. D., Larue, B., & Gervais, J. P. (2012). A gravity model to account for vertical linkages between markets with an application to the cattle/beef sector. *The Journal of International Trade & Economic Development*, *21*(4), 579-601.

Global Agricultural Information Network. (2012). *Greece - Food Processing Ingredients*. Report No. GR1207. United States Department of Agriculture (USDA), Washington, DC.

Haq, Z. U., Meilke, K., & Cranfield, J. (2013). Selection bias in a gravity model of agrifood trade. *European Review of Agricultural Economics*, *40*(2), 331-360.

Head, K., & Mayer, T. (2010). Illusory border effects: Distance mismeasurement inflates estimates of home bias in trade. In: van Bergeijk, P. A. G., & Brakman, S. (Eds.), *The Gravity Model in International Trade: Advances and Applications*. Cambridge University Press, Cambridge, UK.

Head, K., & Mayer, T. (2014). Gravity equations: Workhorse, toolkit, and cookbook. In: Gopinath, G, Helpman, E., & Rogoff, K. (Eds.), *Handbook of International Economics, Vol. (4)*. Elsevier, Amsterdam, the Netherlands.

Kalogeras, N., Baourakis, G., Zopounidis, C., & van Dijk, G. (2005). Evaluating the financial performance of agri-food firms: A multicriteria decision-aid approach. *Journal of Food Engineering*, *70*(3), 365-371.

Koukouritakis, M. (2004). EU accession effects on trade flows: The case of Greece. *South-Eastern Europe Journal of Economics*, *2*(2), 61-79.

Lambert, D., & McKoy, S. (2009). Trade creation and diversion effects of preferential trade associations on agricultural and food trade. *Journal of Agricultural Economics*, *60*(1), 17-39.

Matopoulos, A., & Bourlakis, M. (2011). Identifying innovation strategies: Insights from the Greek food manufacturing sector. *International Journal of Innovation and Regional Development*, *3*(2), 159-173.

Mavrogiannis, M., Bourlakis, M. A., Dawson, P. J., & Ness, M. R. (2008). Assessing export performance in the Greek food and beverage industry: An integrated structural equation model approach. *British Food Journal*, *110*(7), 638-654.

Nitsch, V. (2000). National borders and international trade: Evidence from the European Union. *Canadian Journal of Economics*, *33*(4), 1091-1105.

Notta, O., & Vlachvei, A. (2015). Marketing responses of Greek food manufacturing firms due to economic crisis. *Procedia-Social and Behavioral Sciences*, *175*(1), 350-357.

Olper, A., & Raimondi, V. (2009). Patterns and determinants of international trade costs in the food industry. *Journal of Agricultural Economics*, *60*(2), 273-297.

Organization for Economic Cooperation and Development (OECD). (2014). *OECD Competition Assessment Reviews: Greece*. OECD Publishing, Paris, France.

Oustapassidis, K., & Vlachvei, A. (1999). Profitability and product differentiation in Greek food industries. *Applied Economics*, *31*(10), 1293-1298.

Oustapassidis, K., Vlachvei, A., & Notta, O. (2000). Efficiency and market power in Greek food industries. *American Journal of Agricultural Economics*, *82*(3), 623-629.

Papazoglou, C. (2007). Greece's potential trade flows: A gravity model approach. *International Advances in Economic Research*, *13*(4), 403-414.

Rezitis, A. N., & Kalantzi, M. A. (2012). Investigating market structure of the Greek food and beverages manufacturing industry: A Hall-Roeger approach. *Agricultural Economics Review*, *13*(1), 49-65.

Rezitis, A. N., & Kalantzi, M. A. (2015). Investigating technical efficiency and its determinants by data envelopment analysis: An application in the Greek food and beverages manufacturing industry. *Agribusiness, Forthcoming*.

Santos Silva, J. M. C., & Tenreyro, S. 2006. The log of gravity. *The Review of Economics and statistics*, *88*(4), 641-658.

Sarker, R., & Jayasinghe, S. (2007). Regional trade agreements and trade in agri-food products: Evidence for the European Union from gravity modeling using disaggregated data. *Agricultural Economics*, *37*(1), 93-104.

Skuras, D., Tsekouras, K., Dimara, E., & Tzelepis, D. (2006). The effects of regional capital subsidies on productivity growth: A case study of the Greek food and beverage manufacturing industry. *Journal of Regional Science*, *46*(2), 355-381.

Soloaga, I., & Winters, L. A. (2001). Regionalism in the nineties: What effect on trade?. *The North American Journal of Economics and Finance*, *12*(1), 1-29.

Sun, L., & Reed, M. R. (2010). Impacts of free trade agreements on agricultural trade creation and trade diversion. *American Journal of Agricultural Economics*, *92*(5), 1351-1363.

Tamini, L., Ghazalian, P., Gervais, J. P., & Larue, B. (2012). Trade liberalization in primary and processed agricultural products: Should developing countries favour tariff or domestic support reductions?. *International Economic Journal*, *26*(1), 85-107.

Traill, W. B. (2000). Strategic groups of EU food manufacturers. *Journal of Agricultural Economics*, *51*(1), 45-60.

Viner, J. 1950. *The Customs Union Issue*. Carnegie Endowment, New York, NY.

Vlachvei, A., & Oustapassidis, K. (1997). Determinants of market shares of consumer-industries in Greek food manufacturing: A firm level analysis. *Medit*, *8*(1), 3-5.

Vlachvei, A., & Oustapassidis, K. (1998). Advertising, concentration and profitability in Greek food manufacturing industries. *Agricultural Economics*, *18*(2), 191-198.

Xiong, B., & Beghin, J. (2012). Does European aflatoxin regulation hurt groundnut exporters from Africa?. *European Review of Agricultural Economics*, *39*(4), 589-609.

Figure 1: Processed Food Trade of Greece

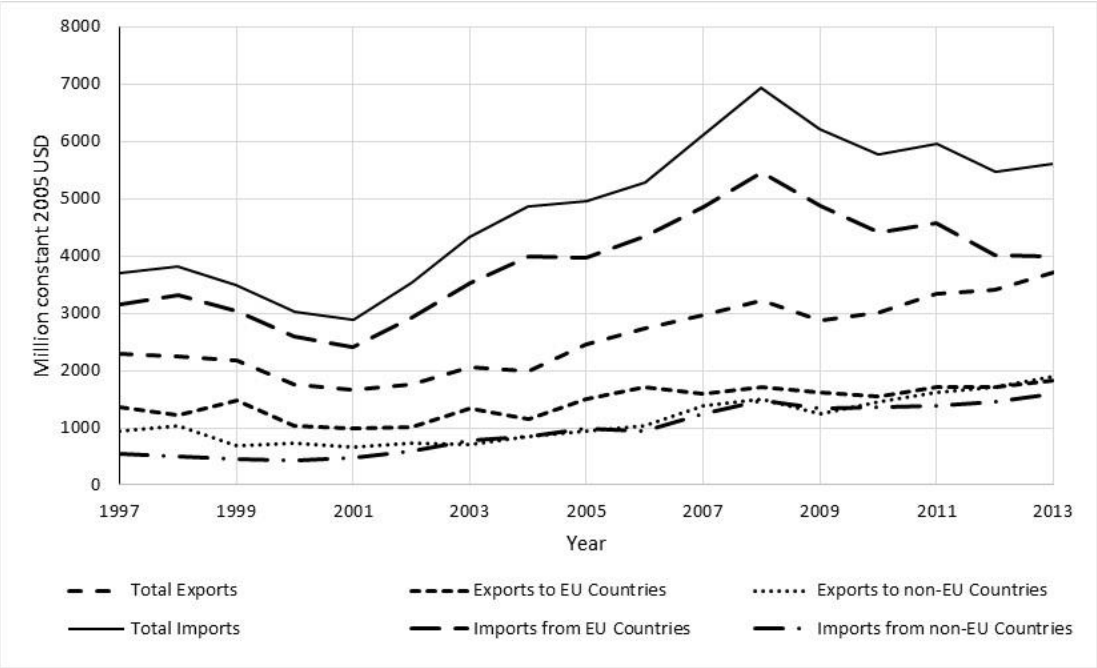

Table 1: Descriptive Statistics

	Mean	Standard Deviation
Trade among OECD countries (million constant 2005 USD)	489.9	1211.1
Trade among EU countries ((million constant 2005 USD)	873.9	1406.7
Trade between Greece and EU countries (million constant 2005 USD)	203.7	254.4
Exports from Greece to EU countries (million constant 2005 USD)	110.8	156.1
Imports of Greece from EU countries (million constant 2005 USD)	296.7	297.5
Trade between Greece and non-EU countries (million constant 2005 USD)	24.8	38.5
Exports from Greece to non-EU countries (million constant 2005 USD)	34.6	50.2
Imports of Greece from non-EU countries (million constant 2005 USD)	15.1	16.1
Bilateral geographic distance among OECD countries (Km)	6103.3	5474.1
Bilateral geographic distance among EU countries (Km)	1419.1	689.4
Bilateral geographic distance between Greece and EU countries (Km)	2134.9	505.5
Common language (dummy variable)	0.107	0.309
Common border (dummy variable)	0.080	0.271
GDP (billion constant 2005 USD)	1430.7	2587.8

Table 2: Empirical Results (Overall Estimates)

	(1)	(2)	(3)	(4)	(5)
	OLS	PPML	NBPML	NBPML	NBPML
Greece-EU	0.739***	1.045***	1.079***	1.090***	1.023***
	(0.097)	(0.082)	(0.108)	(0.213)	(0.179)
EU-EU	1.278***	0.781***	1.315***	1.138***	1.278***
	(0.056)	(0.065)	(0.052)	(0.099)	(0.090)
Greece-nEU	-0.966***	-1.242***	-1.165***	-1.017***	-1.216***
	(0.079)	(0.072)	(0.079)	(0.158)	(0.130)
EU-nEU	0.075	-0.356***	0.126***	0.011	0.109
	(0.049)	(0.062)	(0.044)	(0.082)	(0.076)
Log of Supply Capacity	0.444***	0.599***	0.346***	0.353***	0.380***
	(0.015)	(0.015)	(0.011)	(0.020)	(0.021)
Log of Demand Capacity	0.816***	0.668***	0.773***	0.785***	0.761***
	(0.011)	(0.013)	(0.010)	(0.019)	(0.019)
Log of Bilateral Distance	-0.767***	-0.784***	-0.649***	-0.641***	-0.660***
	(0.024)	(0.031)	(0.022)	(0.040)	(0.038)
Common Language	1.154***	0.464***	0.731***	0.786***	0.674***
	(0.035)	(0.033)	(0.033)	(0.061)	(0.062)
Common Border	0.548***	0.465***	0.652***	0.555***	0.705***
	(0.045)	(0.037)	(0.040)	(0.074)	(0.071)
Log of MR (Exporter)	0.235***	0.212***	0.555***	0.564***	0.462***
	(0.034)	(0.044)	(0.026)	(0.049)	(0.047)
Log of MR (Importer)	0.640***	0.618***	0.546***	0.459***	0.573***
	(0.032)	(0.039)	(0.030)	(0.054)	(0.052)
Number of Observations	9384	9384	9384	2760	2760
LR test (p-value)			0.000	0.000	0.000

Notes: Robust standard errors are reported in parentheses with "***" denoting statistical significance at 1%, level.

Table 3: Empirical Results (Estimates by Exporting and Importing Directions)

	(1)	(2)	(3)	(4)	(5)
	OLS	PPML	NBPML	NBPML	NBPML
Greece-EU (Exports)	0.175*	0.415***	-0.029	-0.081	0.072
	(0.093)	(0.100)	(0.091)	(0.184)	(0.145)
Greece-EU (Imports)	1.305***	1.491***	1.361***	1.384***	1.342***
	(0.155)	(0.097)	(0.134)	(0.260)	(0.231)
EU-EU	1.277***	0.737***	1.415***	1.254***	1.328***
	(0.056)	(0.065)	(0.050)	(0.095)	(0.087)
Greece-nEU (Exports)	-1.145***	-1.282***	-1.613***	-1.522***	-1.544***
	(0.085)	(0.089)	(0.081)	(0.159)	(0.132)
Greece-nEU (Imports)	-0.788***	-1.231***	-0.767***	-0.617***	-0.917***
	(0.133)	(0.085)	(0.110)	(0.217)	(0.191)
EU-nEU (Exports)	0.363***	-0.148**	0.502***	0.390***	0.377***
	(0.050)	(0.064)	(0.046)	(0.091)	(0.077)
EU-nEU (Imports)	-0.213***	-0.702***	-0.180***	-0.236**	-0.152*
	(0.058)	(0.067)	(0.049)	(0.095)	(0.087)
Log of Supply Capacity	0.430***	0.573***	0.312***	0.320***	0.353***
	(0.015)	(0.015)	(0.012)	(0.020)	(0.021)
Log of Demand Capacity	0.830***	0.694***	0.800***	0.812***	0.783***
	(0.011)	(0.013)	(0.010)	(0.019)	(0.018)
Log of Bilateral Distance	-0.768***	-0.784***	-0.668***	-0.673***	-0.672***
	(0.024)	(0.031)	(0.021)	(0.038)	(0.036)
Common Language	1.150***	0.462***	0.721***	0.778***	0.668***
	(0.034)	(0.032)	(0.032)	(0.060)	(0.061)
Common Border	0.550***	0.466***	0.639***	0.521***	0.704***
	(0.045)	(0.038)	(0.041)	(0.075)	(0.073)
Log of MR (Exporter)	0.401***	0.331***	0.761***	0.777***	0.611***
	(0.036)	(0.045)	(0.028)	(0.054)	(0.050)
Log of MR (Importer)	0.475***	0.467***	0.404***	0.344***	0.443***
	(0.034)	(0.040)	(0.031)	(0.058)	(0.053)
Number of Observations	9384	9384	9384	2760	2760
LR test (p-value)			0.000	0.000	0.000

Notes: Robust standard errors are reported in parentheses with "***", "**", and "*" denoting statistical significance at 1%, 5%, and 10% level, respectively.