

The Dynamics of Greek Exports during the Crisis: A Gravity Model Approach

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Objective of the study*



Economic adjustment programs, apart from addressing fiscal imbalances of Greek economy, also focused in the implementation of a structural reforms program

The objective of these reforms was to shape a new growth model for the Greek economy

Among other things, this new growth model includes transfer of resources from non tradable to tradeable sectors

This characteristic highlights the importance of enhancing Greek enterprises' exports

* **Preliminary results** from a study conducted at IOBE, with the support of the Bank of Greece. Neither institution is responsible for the findings and the analysis included in this presentation. Please do not quote.

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Objective of the study



- The scope of this study is to examine the driving forces behind bilateral trade of Greece and draw policy implications
- These factors include:

Geographical factors

e.g. distance, proximity

Cultural factors

e.g. language, religion

Trade agreements

e.g. Custom-Union, Agreements

Membership in EU or in other unions/organizations

e.g. EU-28, EA-19, WTO

Business environment characteristics

e.g. # of import/export documents, minimum capital for starting a business, # of tax payments, average tax rate

- **Tinbergen (1962):** Trade flows between two countries can be explained with an equation that is similar to Newton's Gravitational Law ($F = G \frac{m_1 m_2}{r^2}$)

Gravitational force, F , is replaced with trade flows

Masses m_1 and m_2 are replaced with GDPs

Gravitational constant, G , is replaced with a constant

Distance between the center of masses of two objects, r , is replaced with distance between two countries that have trade relations

- **Linnemann (1966) & Aitken (1973)** : Include as explanatory factors of international trade, qualitative factors (trade agreements and unions)
- **Anderson (1979)**: The first effort of theoretical foundation of Gravity Model. Product differentiation by country of origin (“Armington Assumption”)
- **Bergstrand (1985)**: “Armington Assumption”. More detailed explanation of the supply side of economies and inclusion of prices in the equation
- **Bergstrand (1989)**: Product differentiation among producing firms
- **Helpman (1987)**: Assume increasing returns to scale where products were differentiated by firms (monopolistically competitive), not only by country
- **Anderson & van Wincoop (2003)**: Exports (imports) from (into) country i to j depend on trade costs across ALL possible export markets (suppliers)
- **Kimura & Lee (2006) and Ceglowski (2006)**: Examined the effects of various factors on bilateral trade of services
- **Helpman, Melitz & Rubinstein (2008)**: Take into account not only positive trade flows between countries but also zero trade flows

Model advantages

It accounts for inward and outward multilateral resistance

These terms correct biases that arises from the fact that we are not estimating a cross section but a panel (Baldwin & Taglioni, 2006)

Fixed effects estimation

Construct exporter and importer dummies

The construction of these dummies account for unobserved heterogeneity

Restriction!

Variables that vary only in the same dimension as the fixed effects cannot be included in the model \Rightarrow they would perfectly collinear with fixed effects

Thus, it is only possible to identify the effect of variables that vary bilaterally in fixed effects model

- Countries export and import goods
- Large number of firms
- Each firm produces a single, unique product variety
- Goods are differentiated by place of origin
- Increasing returns to scale
- Identical, homothetic preferences
- Constant elasticity of substitution
- Selling goods locally involves on transport costs
- Selling goods internationally does involve transport costs
- The prices of non-domestically produced varieties are adjusted upwards to take account of transportation cost of moving goods between countries

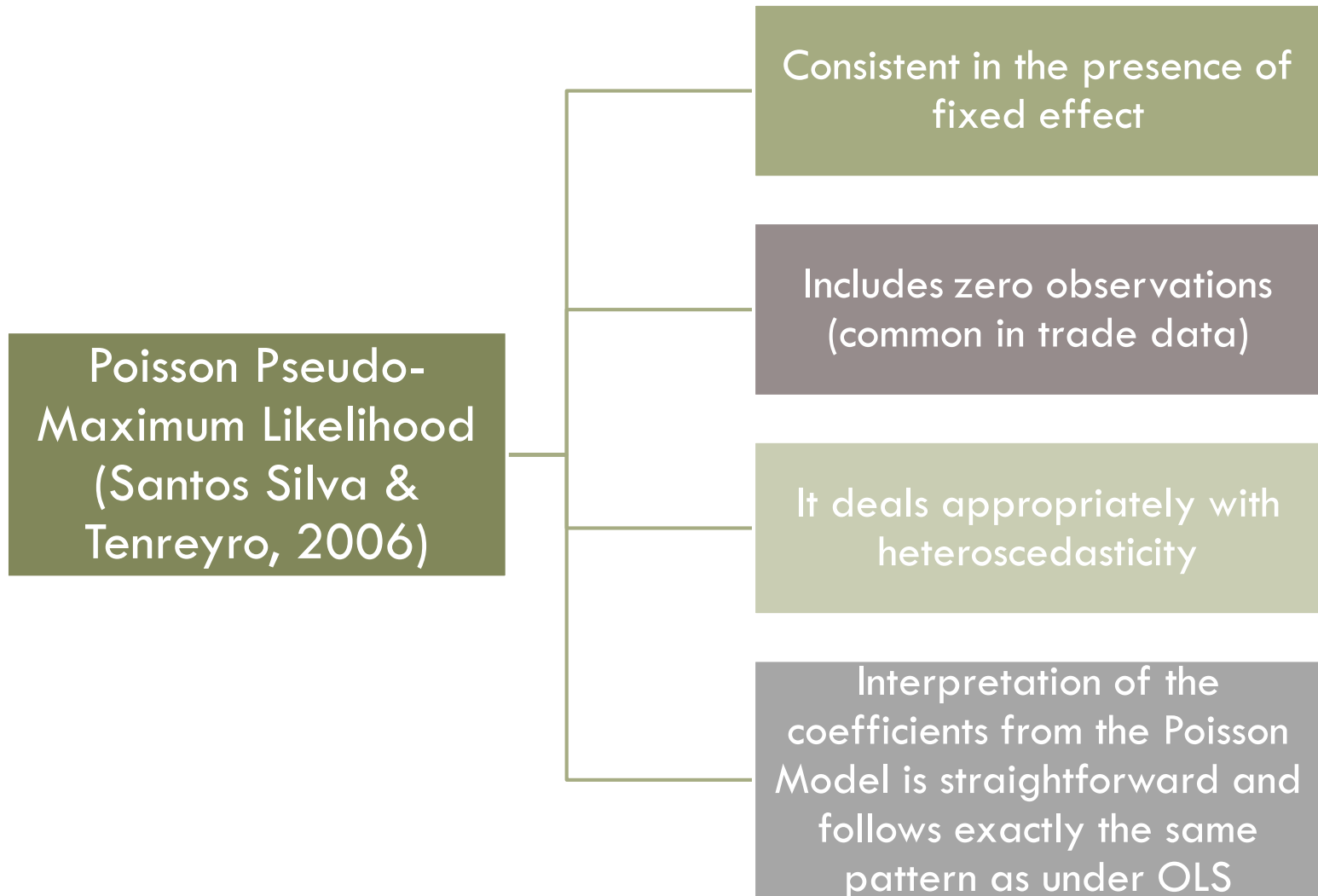
$$X_{ij} = \frac{y_i y_j}{y} \left(\frac{t_{ij}}{\Pi_i P_j} \right)^{1-\sigma}$$

$\Pi_i = \sum_{j=1}^c \left(\frac{t_{ij}}{P_j} \right)^{1-\sigma} \frac{y_j}{y}$: outward multilateral resistance term (unobservable)

$P_j = \sum_{i=1}^c \left(\frac{t_{ij}}{\Pi_i} \right)^{1-\sigma} \frac{y_i}{y}$: inward multilateral resistance term (unobservable)

$$\ln x_{ij} = C + F_i + F_j + (1 - \sigma) [\ln t_{ij}]$$

- $C = -\ln y$, regression constant
- $F_i = \ln y_i - \ln \Pi_i$, exporter fixed effects
- $F_j = \ln y_j - \ln P_j$, importer fixed effects
- σ : elasticity of substitution
- t_{ij} : trade cost, with $\ln t_{ij} = \beta_1 \text{distance} + \beta_2 \text{landborders} + \dots + \beta_n \text{WTO}$



Dependent variable (Y)

Trade flows in nominal values

- WHY? Exports and imports are effectively deflated by the two multilateral resistance terms, which are special price indices

Unidirectional export and import flows

- Exports from Greece to the USA are recorded in one line of the database, and exports from the USA to Greece are recorded in a separate one

Independent variables (Xs)

Geographical and cultural variables

Indistance

geodetic distance

landborders

common borders (Bulgaria, Turkey)

language

common language (Cyprus)

religion

common religion (Bulgaria, Cyprus, Romania, Russia)

Currency and union variables

bothez19

(all countries but Lithuania)

botheu28

(all countries)

bothwto

(all 43 countries of our data set)

Trade agreements variables

customsunion: Data only for Turkey (Andorra, San Marino)

partnership: Data only for Russia (Armenia, Azerbaijan, Kazakhstan, Syria)

economicarea: Data only for Norway (Iceland)

global: Mexico

agreement: Data only for Switzerland (Faroe Islands)

Business environment variables:

- **dummyexpdoc**: dummy variable equal to 1 if the median of the number of export documents of exporting and importing country is above the corresponding median for the whole sample, and zero otherwise
- **dummyimpdoc** (# of import documents)
- **dmincap** (minimum capital required to start a business)
- **dpayments** (# of taxes/contributions paid and # of public entities involved in these payments)
- **dtaxrate** (tax burden)
- **dcredit** (credit expansion to firms)

World Input-Output database produced from Groningen University

Trade flows for 43 countries and 56 sectors of goods and services according to International Standard Industrial Classification Revision 4 (ISIC Rev. 4)

Data capture period 2000-2014 (panel data)

- Analytical data on bilateral trade of Greece are available for 42 countries and not for all countries with which it may have trade relations
- Data cover more than 85% of the total trade flows of the sample countries
- Data for the three main sectors (Agriculture, Manufacturing, Services) of the economy

Estimation results for Goods



- Expected results for the impact of:
 - distance (**Indistance**)
 - common borders (**landborders**)
 - language (**language**)
 - religion (**religion**)
- Participation in EZ-19, EU-28 and in WTO positively affects bilateral trade of Greece
- Trade agreements between EU-28 and
 - Russia (**partnership**)
 - Norway (**economic area**)
 - Turkey (**customs union**)
 - Mexico (**global**)
- positively affect bilateral trade of Greece
- Statistically insignificant results for agreement between EU-28 and Switzerland (**agreement**)

Goods	1	2	3	4	5	6
Indistance	-0.1447*** (4.50E-13)	-0.3954*** (0.0279)	-0.1447*** (3.91E-13)	-0.1447*** (6.02E-13)	-0.1250*** (2.99E-13)	-0.2799*** (0.0160)
landborders	1.8200*** (6.98E-13)	2.7032*** (0.0815)	1.8200*** (5.33E-13)	1.8200*** (8.01E-13)	0.5344*** (0.0328)	
language	0.5618*** (0.0212)	-0.1215*** (0.0277)	0.5618*** (0.0212)	0.5618*** (0.0212)	-0.0655* (0.0391)	-0.0110 (0.0555)
religion	0.3897*** (7.40E-13)	0.6078*** (0.0462)	0.3897*** (5.65E-13)	0.3897*** (8.52E-13)	1.8345*** (0.0328)	1.7550*** (0.0539)
bothez19	0.5286*** (0.0355)		0.5286*** (0.0355)	0.5286*** (0.0355)	0.5286*** (0.0355)	0.5286*** (0.0355)
botheu28		0.9876*** (0.1729)				
bothwto	0.3446*** (0.0887)	0.3439*** (0.0883)		0.3446*** (0.0887)	0.3446*** (0.0887)	0.3450*** (0.0887)
partnership			3.7829*** (2.77E-13)			
economicarea				1.0082*** (9.10E-13)		
global					0.0871*** (2.58E-13)	
customsunion						3.4505*** (0.0044)
Observations	1,260	1,260	1,260	1,260	1,260	1,260
Pseudo LL	-59,507.89	-56,248.28	-60,166.52	-59,507.89	-59,507.89	-59,507.89
R²	0.8071	0.8052	0.8042	0.8071	0.8071	0.8071
AIC	119,020	112,501	120,335	119,020	119,020	119,020
BIC	119,030	112,511	120,340	119,030	119,030	119,030
Mean VIF	4.88	5.69	2.78	4.91	4.86	4.55
χ²(2)	389.52	220.74	359.08	389.52	366.38	783.10
Prob>χ²	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

Estimation results for Goods



- **dummyexpdoc**: statistically insignificant \Rightarrow possibly reflects the fact that over time volume of imports in Greece is much higher than that of exports
- **dummyimpdoc**: Increased number of import documents negatively affects bilateral trade
- High minimum capital (**dmincap**) reduces available resources that could be used in fixed capital investments, hiring staff, advertising, trading network expansion e.tc.
- Statistically insignificant results for **dpayments** and **dtaxrate**
- Credit expansion (**dcredit**) allows firm to finance its function (building & machinery infrastructure, expansion of trading network, purchase of raw materials e.tc.)

Goods	1	2	3	4	5	6
Indistance	-0.5273*** (0.0000)	-0.5273*** (6.94E-13)	-0.5331*** (0.0039)	-0.0166 (0.0136)	-0.5310*** (0.0029)	-2.4724*** (0.0359)
landborders	2.4806*** (0.0046)	2.4927*** (0.0058)	2.3873*** (0.0028)	1.0034*** (0.0386)	2.4185*** (0.0479)	
language	0.0703*** (0.0000)	0.0703*** (1.51E-13)	0.0780*** (0.0027)	0.5193*** (0.0626)	0.0051 (0.0572)	0.5479*** (0.0148)
religion	0.8781*** (0.0169)	0.9044*** (1.78E-12)	0.8433*** (0.0083)	1.9082*** (0.0104)	0.8933*** (0.0088)	0.1953*** (0.0134)
bothwto	0.1010*** (6.78E-15)	0.1010*** (7.49E-15)	0.1311*** (0.0137)	0.0407 (0.0503)	0.1173*** (0.0148)	
bothez19				0.0958** (0.0384)		0.4517*** (0.0474)
dummyexpdoc	-0.0652 (0.0416)					
dummyimpdoc		-0.0912*** (0.0271)				
dmincap			-0.0836** (0.0412)			
dpayments				-0.1081 (0.0924)		
dtaxrate					-0.1089 (0.0945)	
dcredit						0.8232*** (0.0249)
Observations	840	840	1,008	840	840	662
Pseudo LL	-28.598,26	-28.433,72	-38.525,79	-28.283,20	-28.452,36	-18.179,56
R ²	0.8500	0.8504	0.8386	0.8535	0.8510	0.9135
AIC	57,199	56,889	77,054	56,570	56,907	36,361
BIC	57,203	56,894	77,059	56,580	56,912	36,366
Mean VIF	7.40	7.42	7.87	6.61	7.42	5.57
χ^2	123.27	259.79	145.69	12.17	21.26	1,233.23
Prob> χ^2	0.0000	0.0000	0.0000	0.0023	0.0000	0.0000

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

Estimation results for Services



- Positive impact of distance (**Indistance**). Due to internet use many services can be provided on-line
- Positive effect of common borders (**landborders**)
- Common language (**language**) positively affect bilateral trade of services
- Common currency (**bothea19**) and free movement of persons and services (**botheu28**) facilitate bilateral trade
- Positive effects of all trade agreements, but agreement with Mexico (**global**)
 - Low level of services trade between Greece and Mexico (\$11.5 million on average during period 2000-2014)
 - Fluctuations: \$7.8M in 2000, \$20.4M in 2008 and to \$8.5M in 2014

Services	1	2	3	4	5	6
Indistance	0.0510*** (2.90E-13)	-0.3877*** (0.0269)	0.0510*** (1.14E-13)	0.0510*** (2.94E-13)	0.4134*** (2.23E-12)	0.0153 (0.0310)
landborders	1.8147*** (5.28E-13)	1.8105*** (0.0787)	1.8147*** (8.59E-14)	1.8147*** (5.72E-13)	1.8478*** (0.0634)	
language	2.1717*** (0.0495)	1.3282*** (0.0252)	2.1717*** (0.0495)	2.1717*** (0.0495)	2.0953*** (0.0805)	1.6352*** (0.1109)
religion	0.0659*** (5.52E-13)	-0.6967*** (0.0462)	0.0659*** (9.39E-14)	0.0659*** (5.96E-13)	1.3658*** (0.0634)	1.7605*** (0.1043)
bothez19	0.5798*** (0.0812)		0.5798*** (0.0812)	0.5798*** (0.0812)	0.5798*** (0.0812)	0.5798*** (0.0812)
botheu28		1.0861*** (0.1651)				
bothwto	0.6192*** (0.1857)	0.6139*** (0.1841)		0.6192*** (0.1857)	0.6192*** (0.1857)	0.6192*** (0.1857)
partnership			2.2413*** (1.20E-13)			
economicarea				0.8785*** (5.18E-13)		
global					-0.9771*** (1.50E-12)	
customsunion						4.0408*** (0.0086)
Observations	1,260	1,260	1,260	1,260	1,260	1,260
Pseudo LL	-33,916.42	-32,945.12	-34,231.23	-33,916.42	-33,916.42	-33,916.42
R²	0.8737	0.8675	0.8732	0.8737	0.8737	0.8737
AIC	67,837	65,894	68,465	67,837	67,837	67,837
BIC	67,847	65,905	68,470	67,847	67,847	67,847
Mean VIF	4.88	5.69	2.78	4.91	4.86	4.55
χ²(2)	51.71	163.42	42.35	51.71	5.42	86.41
Prob>χ²	0.0000	0.0000	0.0000	0.0000	0.0664	0.0000

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

Estimation results for Services



□ Again

- high minimum capital (**dmincap**)
- payment of many taxes/contributions and the involvement of an increasing number of entities in these payments (**dpayments**)

- increased tax burden (**dtaxrate**)

reduce bilateral trade of services

- we can't conclude on the effect of credit expansion (**dcredit**) due to statistically insignificant results

Services	1	2	3	4
Indistance	0.3075*** (0.0032)	0.0026 (0.0104)	-0.3421*** (0.0038)	0.1388 (0.1188)
landborders	1.9191*** (0.0055)	1.3910*** (0.0300)	1.8627*** (0.0139)	
language	2.3985*** (0.0433)	2.0689*** (0.0773)	2.8454*** (0.0838)	0.2049*** (0.0498)
religion	1.2131*** (0.0107)	0.9291*** (0.0077)	0.8002*** (0.0114)	1.2662*** (0.0444)
bothwto	0.1788*** (0.0107)	-0.0089 (0.0386)	0.0935*** (0.0096)	
bothez19	0.0006 (0.0697)	-0.1237 (0.0841)	-0.2349* (0.1238)	0.4831*** (0.1567)
dmincap	-0.1516*** (0.0322)			
dpayments		-0.1382* (0.0718)		
dtaxrate			-0.1679*** (0.0585)	
dcredit				0.8320*** (0.0826)
Observations	1,008	840	840	662
Pseudo LL	-19,464.70	-14,027.32	-14,039.55	-17,644.72
R ²	0.9136	0.9226	0.9248	0.8670
AIC	38,933	28,059	28,083	35,291
BIC	38,943	28,068	28,093	35,296
Mean VIF	6.98	6.61	6.88	5.57
χ ²	256.48	1,418.59	7.98	1.56
Prob>χ ²	0.0000	0.0000	0.0185	0.2114

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

- We also estimate the gravity model for the most outward-looking sectors and those with rising export activity, which also exhibit an upward trend in trade in the EU and globally

Criteria
used to
select the
sectors:

$$\text{Net exports/ Gross production value index: } \frac{X_i - M_i}{O_i}, \square_i$$

$$\text{Trade balance index: } \frac{X_i - M_i}{X_i + M_i}, \square_i$$

$$\text{Openness to trade index: } \frac{X_i + M_i}{O_i}, \square_i$$

$$\text{Degree of import content of production index: } 1 - \frac{M_{O_i}}{O_i}, \square_i$$

$$\text{Balassa index: } RCA_i^k = \frac{X_i^k / \sum_i X_i^k}{\sum_k X_i^k / \sum_k \sum_i X_i^k}, \square_i$$

$$\text{Revealed symmetric comparative advantage index: } RSCA_i^k = (RCA_i^k - 1) / (RCA_i^k + 1), \square_i$$

Selected sectors:

A03: Fishing and aquaculture

C10-C12: Manufacture of food products,
beverages and tobacco products

C20: Manufacture of chemicals and
chemical products

C24: Manufacture of basic metals

H50: Water transport

N: Administrative and support service activities

Sectoral estimation results



- **landborders:** Negative impact. Bilateral trade with Bulgaria are among the lowest (\$2.7 million on average). In the case of Turkey bilateral trade is declining and in 2014 amounted to \$7.4 million, i.e. at 2001 levels
- **business environment dummies:** Expected negative signs

	Fishing and aquaculture: A03	
Indistance	-0.6584*** (0.0050)	-2.0065*** (0.0420)
landborders	-0.0357*** (0.0050)	-1.0468*** (0.1114)
language	0.1184** (0.0492)	0.4929*** (0.1354)
religion	0.6701*** (0.0086)	-3.6932*** (0.1235)
bothwto	0.5053*** (0.0000)	0.6321*** (0.0292)
bothez19	0.1537** (0.0664)	0.0413 (0.2025)
dummyimpdoc	-0.1302** (0.0593)	
dmincap		-0.2477*** (0.0887)
Observations	810	970
Pseudo LL	-1,177.12	-1,387.51
R²	0.6604	0.6540
AIC	2,362	2,783
BIC	2,381	2,803
Mean VIF	6.64	7.11
χ²	306.78	593.50
Prob>χ²	0.0000	0.0000

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

Sectoral estimation results



- **landborders:** Strong positive effect. Bilateral trade with Turkey and Bulgaria increased from \$50.9M in 2000 to \$407.7M in 2014 (+7.0 times)
- **botheu28:** Strong positive effect. Bilateral trade with member-states of EU28 increased from \$2.8B in 2000 to \$5.1B in 2014 (+82.1%)
- **business environment dummies:** Expected effects

	Manufacture of food products, beverages and tobacco products: C10-C12	
Indistance	-0.3542*** (0.0026)	-1.6067*** (0.0320)
landborders	1.9662*** (0.0101)	
language	1.9427*** (0.0341)	0.6013*** (0.0088)
religion	1.6876*** (0.0079)	0.2817*** (0.0451)
bothwto	0.3741*** (0.0066)	
bothez19	0.2756*** (0.0488)	
botheu28		1.4327*** (0.3112)
dtaxrate	-0,0761* (0,0431)	
dcredit		0,0899*** (0,0150)
Observation	840	662
Pseudo LL	-4,404.03	-5,316.51
R ²	0.9515	0.9072
AIC	8,812	10,637
BIC	8,822	10,646
Mean VIF	6.88	7.25
χ ²	165.92	78.44
Prob>χ ²	0.0000	0.0000

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

Sectoral estimation results



- **landborders:** Strong positive effect. Extensive trade with Turkey (4rd: \$178.6M) and Bulgaria (9th: \$73.3M). Increasing trade flows during period 2000-2014
- **religion:** Positive effect. Bulgaria (9th: \$73,3M) Cyprus (10th: \$72M), Romania (11th: \$71,5M). Increasing trade flows during period 2000-2014
- **bothwto:** Negative effect. Significant drop in bilateral trade from 2008 onwards (from \$4.7B to \$2.9B, -39%)
- **business environment dummies:** Expected signs

	Manufacture of chemicals and chemical products: C20	
Indistance	-0.7522*** (0.0129)	-1.2980*** (0.0438)
landborders	2.0659*** (0.0306)	
language	0.1504*** (0.0110)	0.7264*** (0.0115)
religion	0.5567*** (0.0172)	1.3573*** (0.0613)
bothwto	-0.1363*** (0.0146)	
botheu28	0.7359*** (0.0617)	0.9414*** (0.2753)
dmincap	-0.1064** (0.0438)	
dcredit		0.6466*** (0.0201)
Observations	1,008	662
Pseudo LL	-3,532.56	-3,361.13
R ²	0.9422	0.9018
AIC	7,069	6,724
BIC	7,079	6,729
Mean VIF	8.25	7.25
χ^2	1,185.39	49.24
Prob> χ^2	0.0000	0.0000

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

Sectoral estimation results



- **Indistance:** Positive effect. When a product is very important in the production process (e.g. aluminum) distance does not play negative role
- **landborders:** Strong positive effect. Extensive trade with Turkey (3rd: \$249.3M) and Bulgaria (5th: \$187.5M)
- **religion:** Strong positive effect. Extensive trade with Bulgaria (5th: \$187.5M), Romania (6th: \$175.1M), Russia (10th: \$92.1M)
- **bothwto:** Negative effect. Significant drop in bilateral trade from 2008 onwards (from \$5.3B to \$3.5B, -34%)
- **business environment dummies:** Expected negative effects

	Manufacture of basic metals: C24		
Indistance	0.9812*** (0.0077)	0.0249* (0.0150)	0.0331* (0.0195)
landborders	4.6427*** (0.0048)	2.6777*** (0.0298)	3.3124*** (0.0140)
language	1.8344*** (0.0199)	-1.4140*** (0.0120)	1.7898*** (0.0178)
religion	0.8774*** (0.0053)	2.2253*** (0.0176)	1.8778*** (0.0495)
bothwto	-0.2267*** (0.0000)	-0.2294*** (0.0230)	-0.3515*** (0.0525)
botheu28	0.3187*** (0.0153)	0.5586*** (0.0625)	0.3331*** (0.0293)
dummyimpdoc	-0.2510*** (0.0737)		
dmincap		-0.1122* (0.0693)	
dpayments			-0.2299** (0.1021)
Observations	840	1,008	840
Pseudo LL	-4,130.77	-5,766.20	-4,158.16
R²	0.8962	0.8508	0.8927
AIC	8,266	11,536	8,320
BIC	8,275	11,546	8,330
Mean VIF	8.36	8.25	7.62
χ²	6,765.10	138.29	194.64
Prob>χ²	0.0000	0.0000	0.0000

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

Sectoral estimation results



- **Indistance:** Negative impact. Most of Greece's trading partners are countries close to Greece (EU-28, Russia, Turkey)
- **religion:** Negative impact which cannot be explained from the available data (bilateral trade increased from \$105.8M in 2000 to \$486.1M in 2014)
- **Business environment dummies:** Expected negative signs

	Water transport: H50	
Indistance	-0.7654*** (0.0042)	-0.8104*** (0.0019)
landborders	1.9753*** (0.0031)	1.9732*** (0.0335)
language	0.9901*** (0.0028)	0.8113*** (0.0402)
religion	-0.7009*** (0.0091)	-0.5665*** (0.0059)
bothwto	0.3708*** (0.0142)	0.2992*** (0.0106)
dmincap	-0.1809*** (0.0428)	
dtaxrate		-0.1383** (0.0660)
Observations	1,008	840
Pseudo LL	-8,551.68	-6,118.14
R ²	0.8628	0.8925
AIC	17,107	12,240
BIC	17,117	12,250
Mean VIF	7.87	7.42
χ ²	229.99	110.22
Prob>χ ²	0.0000	0.0000

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

Sectoral estimation results



- **Indistance:** Positive effect. A number of services is offered with the use of internet (USA 2nd: \$75.6M)
- **landborders:** Negative effect. Limited bilateral trade with Turkey (\$14.1M) and Bulgaria (\$4.7M). Decreasing trade flows during period 2000-2014
- **religion:** Strong positive effect. Increasing bilateral trade with Romania (from \$1.4M in 2000 to \$4M in 2014, +65%) and Cyprus (from \$5.6M to \$15.1M, +1.7 times)
- **business environment dummies:** Expected effects

	Administrative and support service activities: N	
Indistance	0.1945*** (0.0063)	1.8060*** (0.0895)
landborders	-0.8003*** (0.0047)	
language	1.6906*** (0.0041)	-0.3403*** (0.0385)
religion	1.7486*** (0.0137)	1.7222*** (0.0334)
bothwto	0.3097*** (0.0206)	
bothez19		0.5271*** (0.1180)
dmincap	-0.2341*** (0.0625)	
dcredit		0.4896*** (0.0624)
Observations	1,008	662
Pseudo LL	-1,679.93	-1,494.26
R ²	0.8627	0.7879
AIC	3,362	2,991
BIC	3,367	2,995
Mean VIF	7.87	5.57
χ ²	58.33	37.99
Prob>χ ²	0.0000	0.0000

Semi-robust standard errors in parenthesis, ***p<0.01, **p<0.05, *p<0.10

Summary of results



Distance:

- negatively affects bilateral trade of goods (e.g. Manufacture of chemicals and chemical products, Fishing and aquaculture, Manufacture of food products, beverages and tobacco products)
- positively affects bilateral trade of services (e.g. Administrative and support service activities)
- when a product is a very important input in the production process (e.g. Manufacture of basic metals), distance does not play a negative role

Landborders:

- strong positive effects in the examined sectors but in Fishing and aquaculture and Administrative and support service activities (small and falling bilateral trade with Turkey and Bulgaria in these sectors)

Language:

- Positive impact

Religion:

- Positive impact, which in some cases is strong (Manufacture of basic metals, Manufacture of chemicals and chemical products, Administrative and support service activities: increasing bilateral trade)
- Negative impact only in Water transport (cannot be explained from the available data)

Participation in EU-28, EZ-19, WTO:

- In general, positive impact
- But negative impact of participation in WTO in Manufacture of basic metals and in Manufacture of chemicals and chemical products (significant drop in bilateral trade from 2008 onwards)

Trade agreements (Russia, Turkey, Norway, Mexico):

- In general, positive effects
- Negative effects only in the case of Mexico, in trade of Services (from \$7.8M in 2000 to \$20.4M in 2008 and back to \$8.5M in 2014)

Business environment dummies:

- **dummyexpdoc:** statistically insignificant \Rightarrow possibly reflects the fact that over time volume of imports in Greece is much higher than that of exports
- **dummyimpdoc:** negative effect
- **dmincap:** negative effect
- **dpayments:** negative effect
- **dtaxrate:** negative effect
- **dcredit:** positive effect. The strongest effect among all reforms dummies

Strongest negative effect than minimum capital

Estimations for period 2009-2014:

- Most business environment dummies have statistically insignificant results \Rightarrow severe recession and high uncertainty have hindered – at least until 2014 – the potential positive effects of reforms
- **dcredit:** negative effect \Rightarrow harsh financial conditions and domestic debt crisis led to an increase in cost of money and to a significant reduction of available funds from the banking system

Minimum capital for starting a business:

Emphasis to the period and the way minimum capital should be paid.
For example:

- Gradual payment within three years for sectors with a high minimum capital requirement
- Degrees of freedom as regards payment for fixed capital intensive sectors

Import/export procedures:

Greater emphasis on physical checks of goods than on proper completion of the necessary documents

Physical checks should be gradually reduced to the ones necessary

Replacement of such procedures by intramural certified procedures

ICT systems should cover the maximum number of custom and tax procedures required for an import (e.g. payment of fees, duties, VAT, stamp duty)

Access to credit

Banking system

- Forfaiting: Financing tool of trade receivables, applicable for medium to long-term export transactions
- Program “Extroversion” (Panhellenic Exporters Association & banks): covers insurance costs of exporting firms
- Support from international organizations that provide funding for exporting businesses: European Bank for Reconstruction and Development, Trade Facilitation Program)

National Strategic Reference Framework (ESPA) 2014-2020

- More funding programs for extrovert businesses

Investment Law funding (No 4399/2016)

Reduction of tax burden

Impact analysis of alternative fiscal scenarios comprising a corporate tax rate reduction by using the IMF – GIMF model

1st scenario

- Corporate tax rate cut by 5 p.p.
- Increase of income tax (by 0.05 p.p.), consumption tax (by 0.15 p.p.), real estate tax so that fiscal surplus (as % of GDP) should not change by more than 1.1%.

2nd scenario

- Corporate tax rate cut by 5 p.p.
- Reduction of public consumption and public investment by 0.54%.
- Reduction of transfer payments to the public so that the budget surplus as a percentage of GDP stays stable.

Over the medium and long-term, in both scenarios, the indicative, proposed reduction in the average tax rate boosts investment activity, employment, GDP, real wage and labor income

Thank you for your attention!

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