

Proposing an Index of Domination in an international trade relation: An illustrative analysis for the trade activity conducted among the EU and the ENP countries

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Abstract

The paper proposes an Index of Domination (the DK Index) in order to help identifying the dominant part (i.e. country) in an international trade relation. The DK Index takes into account the exports (imports) shares of a country under consideration to (from) a partner country and the world and the imports (exports) shares of the partner country from (to) the country under consideration and the world. Taking into account the aforementioned shares, the DK Index can point out whether a country under consideration dominates over a partner country, in an international trade relation. Illustratively, the proposed index is applied to data that concern trade activity conducted among the EU and the ENP countries (the EU-ENP trade).

Key words: *DK index, EU-ENP trade*

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1. Introduction

Newton (1687/1846) formulated (as a sequent of the well-known “apple incident”) the “Law of Universal Gravitation” stating that every point (i.e. point-like) mass in the universe attracts every other point mass with a force that is directly proportional to the product of their masses and inversely proportional to the square distance between them (see Box 1)¹. In the field of economics, Tinbergen (1962)² suggested that the gravitational logic could be applied to international trade flows (see Box 2 and Figure 1). This model (the “gravity model”; in analogy to the “Law of Universal Gravitation”) imprints, in empirical manner, the geographical (spatial) view of (international) trade activity. The gravity model has no theoretical underpinnings (Bergstrand, 1985), even though many theoretical justifications have been proposed (see the literature review provided by Evenett and Keller, 2002 and de Benedictis and Taglioni, 2011). Linnemann (1966) attempted to provide a theoretical basis for the gravity model using the general equilibrium theory (Walras, 1874/1954) as a benchmark. Analogous attempts have been made, *inter alia*, from Anderson (1979), on the basis of the Armington assumption (Armington, 1969), Krugman (1980) and Helpman and Krugman (1985), in an imperfect competition framework (Dixit and Stiglitz, 1977), Deardorff (1998), in a Heckscher-Ohlin framework (Heckscher, 1919; Ohlin, 1933/1966), and Eaton and Kortum (2002), in a Ricardian framework (Ricardo, 1817).

Box 1: The Law of Universal Gravitation

$$F = G \frac{m_1 m_2}{r^2}$$

F denotes the force between the masses

G is a gravitational constant (see Gilles, 1997)

m_1 denotes the mass of the first point

m_2 denotes the mass of the second point

r denotes the distance between the centers of the masses

Source: *Adjustment from Newton (1687/1846)*

¹ Even though the “Law of Universal Gravitation” has been superseded by the “Theory of General Relativity”, formulated by Einstein (1916), it continues to be used as an approximation of the gravity effects.

² Prior to the “official” formulation of the gravity model, Ravenstein (1885), Zipf (1946) and Pöyhönen (1963) seem to follow the gravity approach in their studies. The first two studies concern migration, whereas the last one concerns trade.

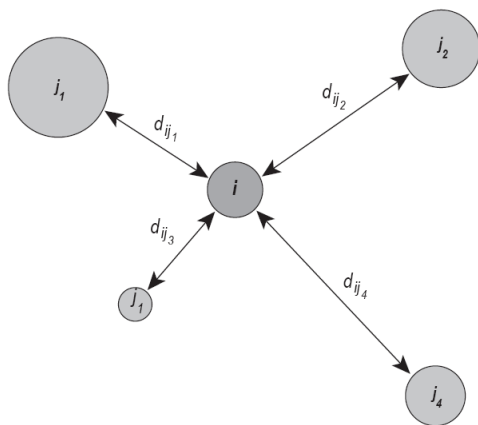
Box 2: The gravitational logic in the field of economics

$$F_{ij} = G \frac{m_i^\alpha m_j^\beta}{d_{ij}^\theta}$$

i denotes the origin
 j denotes the destination
 F denotes the flow from origin to destination
 G is a gravitational constant (see Gilles, 1997)
 d denotes the distance from origin to destination (usually measured center to center)
 m_i denotes the size of the origin (usually expressed in terms of population or GDP)
 m_j denotes the size of the destination (usually expressed in terms of population or GDP)
 α, β, θ are coefficients

Source: Adjustment from Tinbergen (1962)

Figure 1: The gravitational logic in the field of economics



Source: Keeble et al. (1981: 212) in Copus (1999: 4)

The gravity model provides “some of the clearest and more robust empirical findings in economics” (Leamer and Levinsohn, 1995: 1384) being able to “identify extreme cases of artificial barriers to trade, the role of distance and the effects of membership in various customs union and trade preference groups” (Taplin, 1967: 442). Being an expression of proximity and (potential) accessibility (connectivity), the gravity model is, indeed, considered to be something like a workhorse in empirical international trade literature (Deardorff, 1998; Baldwin and Taglioni, 2006; see the survey of the recent empirical literature provided by Kepaptsoglou et al., 2010). However – and without detracting its overall contribution, in any sense – it should be noted that the gravity

model presents one (serious) limitation; it is unable to point out the dominant part in an economic relation. As regards international trade relations in particular, the detection of the dominant part (i.e. country) is an extremely important task since such type of relations have not only geographical dimension but also political implications (which may have an impact on geography).

The objective of the present paper is to propose an index (hereinafter: the DK Index³) for the detection of the dominant part (i.e. country) in an international trade relation, aspiring to provide a valuable insight to the empirical international trade literature. The DK Index takes into account the exports (imports) shares of a country under consideration to (from) a partner country and the world and the imports (exports) shares of the partner country from (to) the country under consideration and the world. Taking into account the aforementioned shares, the DK Index can point out whether a country under consideration dominates over a partner country, in an international trade relation. Illustratively, the proposed index is applied to data that concern trade activity conducted among the EU and the ENP⁴ countries (the EU-ENP trade).

The structure of the paper is as follows: Section 1 is introductory and states the objective of the paper. Section 2 presents the DK Index. Section 3 provides an illustrative analysis for the EU-ENP trade activity. Section 4 offers the conclusions.

2. Presentation of the DK Index

The seminal contributions of Nyusten and Dacey (1961 and 1968)⁵ provide the methodological basis for the detection (demarcation) of the dominant spatial (economic) units in a trade relation⁶, stating that a spatial unit under consideration is dominated by a partner spatial unit when: (a) its maximum outflow is directed towards the partner country, and (b) the total inflows of the partner country are greater than its own total inflows. Depending on the conditions exist, the countries are divided into dominant (i.e. dominate over all countries), dominated (i.e. dominated by all countries) and intermediate (i.e. dominate over some countries and dominated by some other countries).

³ The name of the index comes from the English word "domination" and the synonymous Greek word "κυριαρχία" ("kyriarxia").

⁴ The ENP, launched in 2004, is a unified EU policy framework towards the EU neighboring countries (i.e. the ENP countries). The objective of the ENP is to strengthen the prosperity, stability and security of the (enlarged) EU countries and the ENP countries (see Wesselink and Boschma, 2012 for an overview of the ENP).

⁵ Popularized by Taaffe and Gauthier (1973).

⁶ Even though the focus of the studies is on telephone calls.

Grasland (2011), in the framework of the EuroBroadMap research project⁷, adjusts the aforementioned methodology to the international trade relations, trying to detect dominant countries (separately for exports and imports flows). Searching for possible variations of the initial methodology (i.e. “relaxing” or changing (slightly) the initial criteria), Grasland (2011: 6) supports that “it is not possible to define *a priori* the best mathematical solution; it is rather the comparison of results that matter, and not the research of an “ideal” solution”. Though realistic, this position is somehow problematic since it “emits” rather mixed “signals”...

The proposed DK Index, drawing, mainly, its origin from the contribution made by Grasland (2011), aspires to provide a valuable insight to the empirical international trade literature. The DK index is estimated separately for exports and imports, taking into account the exports (imports) shares of a country under consideration to (from) a partner country and the world and the imports (exports) shares of the partner country from (to) the country under consideration and the world, respectively. Depending on the conditions exist, it is possible for a country under consideration to dominate over a partner country, to be dominated by a partner country or to retain a neutral relation with a partner country (i.e. neither to dominate over nor to be dominated by a partner country), in an international trade relation.

Concerning exports flows (see Box 3), in particular, a country under consideration dominates over a partner country (XD) when: (a) the percentage share of its exports to the partner country in relation to its total exports is lower than a specified threshold, and (b) the percentage share of the corresponding partner country imports' to its total imports is greater than a specified threshold. In contrast, a country under consideration is dominated by a partner country (Xd) when: (a) the percentage share of its exports to the partner country in relation to its total exports is greater than a specified threshold, and (b) the percentage share of the corresponding partner country imports' to its total imports is lower than a specified threshold. The relation between a country under consideration and a partner country is neutral in any other case.

Concerning imports flows (see Box 4), in particular, a country under consideration dominates over a partner country (MD) when: (a) the percentage share of its imports from the partner country in relation to its total imports is lower than a specified threshold, and (b) the percentage share of the corresponding partner country exports' to its total exports is greater than a specified threshold. In contrast, a country under consideration is dominated by a partner country (Md) when: (a) the percentage share of its imports from the partner country in relation to its total imports is greater than a specified threshold, and (b) the percentage share of the corresponding partner country exports' to its total exports is lower than a specified threshold. The relation between a country under consideration and a partner country is neutral in any other case.

⁷ See FP7-SHS-2007-1, EuroBroadMap: Visions of Europe in the World for details.

Box 3: The DK Index: Exports' domination conditions

$$XD_{c-p,t} : \frac{XV_{c-p,t}}{XV_{c-w,t}} < XV^* \ \& \ \frac{MV_{p-c,t}}{MV_{p-w,t}} > MV^*$$

or

$$Xd_{c-p,t} : \frac{XV_{c-p,t}}{XV_{c-w,t}} > XV^* \ \& \ \frac{MV_{p-c,t}}{MV_{p-w,t}} < MV^*$$

XV denotes exports values

MV denotes imports values

XV^* is a threshold for exports values

MV^* is a threshold for imports values

c denotes country under consideration

p denotes a partner country

w denotes the world economy

t denotes the year under consideration

XD indicates that when these conditions are met, country c dominates over country p (alternatively, country p is dominated by country c) in terms of exports

Xd indicates that when these conditions are met, country c is dominated by country p (alternatively, country p dominates over country c) in terms of exports

Source: Author's elaboration

Box 4: The DK Index: Imports' domination conditions

$$MD_{c-p,t} : \frac{MV_{c-p,t}}{MV_{c-w,t}} < MV^* \ \& \ \frac{XV_{p-c,t}}{XV_{p-w,t}} > XV^*$$

or

$$Md_{c-p,t} : \frac{MV_{c-p,t}}{MV_{c-w,t}} > MV^* \ \& \ \frac{XV_{p-c,t}}{XV_{p-w,t}} < XV^*$$

XV denotes exports values

MV denotes imports values

XV^* is a threshold for exports values

MV^* is a threshold for imports values

c denotes country under consideration

p denotes a partner country

w denotes the world economy

t denotes the year under consideration

MD indicates that when these conditions are met, country c dominates over country p (alternatively, country p is dominated by country c) in terms of imports

Md indicates that when these conditions are met, country c is dominated by country p (alternatively, country p dominates over country c) in terms of imports

Source: Author's elaboration

The underlying rationale for the suggestion of the DK Index is that it is “easier” for a country under consideration to change trade partner when the trade relation (association) with a partner country is not close enough (i.e. the exports (imports) share to (from) a partner country is lower than a specified threshold). When this is not true for the partner country (i.e. the corresponding imports (exports) share from (to) the country under consideration is greater than a specified threshold), the country under consideration is the dominant one. Of course, at this point it has to be stated that the specification of the threshold is a totally subjective issue. It depends on the perception of each country with respect to its trade policy (and on issues relating to international economic relations (conditions), in general). Thus, it is likely for both countries to consider themselves dominant in a bilateral international trade relation.

3. Detecting the dominant part in the EU-ENP trade relations, using the DK Index

Illustratively, the proposed DK Index is applied to data that concern the EU-ENP⁸ trade activity (see Figure 2 for a depiction of the EU-ENP area). Since the ENP countries operate under conditions of “neighborhood Europeanization” (see Axt et al., 2007 and Schimmelfennig, 2012 for a discussion about the “Europeanization” debate), the study of the EU-ENP trade activity is in a position to provide valuable insight to both (economic integration) theory and policy-making.

The exercise utilizes trade data derived from the United Nations (UN) COMTRADE database⁹ and covers the period between 2000 and 2010. Trade data refer to the primary and the secondary sector of production. The requisite – for the interpretation of the DK Index – threshold is set to be at the level of 0.5% and the countries under consideration are the ENP countries, in any EU-ENP country pair. Thus, concerning exports flows, an ENP country dominates over an EU country (XD) when: (a) the percentage share of its exports to the EU country in relation to its total exports is lower than 0.5%, and (b) the percentage share of the corresponding EU country imports’ to its total imports is greater than 0.5%. In contrast, an ENP country is dominated by an EU country (Xd) when: (a) the percentage share of its exports to the EU country in relation to its total exports is greater than 0.5%, and (b) the percentage share of the corresponding EU country imports’ to its total imports is lower than 0.5%.

⁸ The ENP framework is proposed - in alphabetical order - to Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Israel, Jordan, Lebanon, Libya, Moldova, Morocco, Occupied Palestinian Territory (hereinafter: Palestine), Syria, Tunisia and Ukraine. The ENP is a bilateral policy, between the EU and each ENP country.

⁹ See <http://comtrade.un.org/db/> for details.

Figure 2: The EU-ENP area



Source: Author's elaboration

The relation between an ENP country and an EU country is neutral in any other case. Moreover, concerning imports flows, an ENP country dominates over an EU country (MD) when: (a) the percentage share of its imports from the EU country in relation to its total imports is lower than 0.5%, and (b) the percentage share of the corresponding EU country exports' to its total exports is greater than 0.5%. In contrast, an ENP country is dominated by an EU country (Md) when: (a) the percentage share of its imports from the EU country in relation to its total imports is greater than 0.5%, and (b) the percentage share of the corresponding EU country exports' to its total exports is lower than 0.5%. The relation between a country under consideration and a partner country is neutral in any other case.

Studying, for example, the exports flows from Algeria to Austria for the year 2000 – and given the threshold of 0.5% – it emerges that Austria is the dominant country, according to the DK Index. Algeria exports to Austria products that value \$183,042,434. The total (world) exports of Algeria value \$22,031,287,644. Thus, the Algerian exports to Austria are the 0.831% of its total exports (i.e. above the threshold). Austria imports from Algeria products that value \$183,042,434. The total (world) imports of Austria value \$68,373,911,913. Thus, the Austrian imports from Algeria are the 0.268% of its total imports (i.e. below the threshold). In another example, studying the imports flows of Algeria from Austria for the year 2000 – and given the threshold of 0.5% – it emerges that Austria is, again, the dominant country, according to the DK Index. Algeria imports from Austria products that value \$58,545,760. The total (world) imports of Algeria value \$9,152,077,226. Thus, the Algerian imports from Austria are the 0.640% of its total imports (i.e. above the threshold). Austria exports to Algeria products that value \$58,545,760. The total (world) exports of Austria value \$63,674,999,062. Thus, the Austrian exports to Algeria are the 0.092% of its total exports (i.e. below the threshold).

So, for both exports and imports flows, Austria is the dominant country in the Algerian-Austrian trade activity according to the DK Index (and given the threshold of 0.5%). Following the same logic, the dominant country, if there is such (i.e. if the relation is not neutral), in any EU-ENP country pair can be detected (see Tables A1 and A2, in the Appendix). The rough visualization of the results derived from the DK Index¹⁰ for the years 2000 and 2010 (see Tables A3, A4, A5 and A6, in the Appendix) indicates that for the vast majority of the EU-ENP country pairs either there is a neutral relation or the EU countries dominate over the ENP countries. Thus, it seems that the EU-ENP trade activity tends to consolidate a spatial pattern of unequal relations between the EU countries and their neighbors.

4. Conclusions

The present paper proposes the DK Index for the detection of the dominant part (i.e. country) in an international trade relation, aspiring to provide a valuable insight to the empirical international trade literature. Taking into account the exports (imports) shares of a country under consideration to (from) a partner country and the world and the imports (exports) shares of the partner country from (to) the country under consideration and the world, the DK Index can point out whether a country under consideration dominates over a partner country, in an international trade relation. The underlying rationale for the suggestion of the DK Index is that it is “easier” for a country under consideration to change trade partner when the trade relation (association) with a partner country is not close enough (i.e. the exports (imports) share to (from) a partner country is lower than a specified threshold). When this is not true for the partner country (i.e. the corresponding imports (exports) share from (to) the country under consideration is greater than a specified threshold), the country under consideration is the dominant one. Applied, illustratively, to data that concern trade activity conducted among the EU and the ENP countries (the EU-ENP trade), for the period 2000-2010, the DK Index indicates that for the vast majority of the EU-ENP country pairs either there is a neutral relation or the EU countries dominate over the ENP countries. This is an important finding for both (economic integration) theory and policy-making since it seems that the EU-ENP trade activity tends to consolidate a spatial pattern of unequal relations between the EU countries and their neighbors.

¹⁰ See Beauguitte, 2011 and Grasland, 2011 for (more) sophisticated methods for the visualization of the results derived from DK-like indicators.

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Abbreviations

ALG = Algeria

ARM = Armenia

AUT = Austria

AZE = Azerbaijan

BEL = Belgium

BLR = Belarus

BUL = Bulgaria

CYP = Cyprus

CZE = Czech Republic

DEN = Denmark

DK Index = Index of Domination (Kyriarxia) in an international trade relation

EGY = Egypt

ENP = European Neighborhood Policy

ESP = Spain

EST = Estonia

EU = European Union

FIN = Finland

FRA = France

GDP = Gross Domestic Products

GEO = Georgia

GER = Germany

GRE = Greece

HUN = Hungary

IRL = Ireland

ISR = Israel

ITA = Italy

JOR = Jordan

LAT = Latvia

LEB = Lebanon

LIB = Libya

LIT = Lithuania

LUX = Luxemburg

MAL = Malta

MD = a country under consideration dominates over a partner country, concerning imports flows

Md = a country under consideration is dominated by a partner country, concerning imports flows

MOL = Moldova

MOR = Morocco

n/a = not available

NED = Netherlands

PAL = Palestine

POL = Poland

POR = Portugal

ROM = Romania

SLK = Slovakia

SLN = Slovenia

SYR = Syria

SWE = Sweden

TUN = Tunisia

UK = United Kingdom

UKR = Ukraine

XD = a country under consideration dominates over a partner country, concerning exports flows

Xd = a country under consideration is dominated by a partner country, concerning exports flows

\$ = dollars (of the United States of America)

Appendix

Table A1: The DK Index: Exports' (from the ENP countries to the EU countries) domination conditions

XD or Xd (with EU)	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010	
	XD	SLN	XD	LAT SLN	XD	LAT	XD	GER NED UK	XD	GER NED UK	XD	SLN	XD	GER UK	XD	BEL GER ITA UK	XD	BEL GER ITA UK	XD	LAT	XD	LAT SLN GER POR UK
ALG	Xd	AUT BEL GER UK	Xd	AUT BEL GER ITA POR UK	Xd	GER ITA POR UK	Xd	GER NED UK	Xd	GER NED UK	Xd	GER ITA UK	Xd	GER UK	Xd	BEL GER ITA UK	Xd	BEL GER ITA UK	Xd	BEL GER UK	Xd	LAT SLN GER POR UK
ARM	Xd	BEL GER ITA NED	Xd	BEL GER ITA LIT NED SLN	Xd	BEL GER ITA	Xd	BEL GER ITA NED UK	Xd	BEL GER ITA NED ROM	Xd	BEL GER ITA NED POL ROM	Xd	BEL GER ITA NED POL ROM	Xd	BEL GER ITA NED POL ROM	Xd	AUT BEL GER ITA NED POL ROM	Xd	AUT BEL GER ITA NED POL ROM	Xd	BEL GER ITA NED ROM
AZE	Xd	AUT FRA GER ITA UK	Xd	AUT FRA GER GRE ITA	Xd	AUT ESP FRA GRE ITA	Xd	AUT FRA GER GRE ITA	Xd	AUT FRA GER GRE ITA	Xd	AUT FIN FRA GER GRE ITA	Xd		Xd		Xd		Xd		Xd	ESP FRA GER GRE NED UK
BLR	Xd	ESP FRA GER HUN ITA NED POL SWE UK	Xd	ESP FRA GER HUN ITA NED POL SWE UK	Xd	ESP FRA GER HUN ITA NED POL UK	Xd	BEL ESP FRA GER HUN ITA NED UK	Xd	BEL ESP FRA GER HUN ITA NED UK	Xd	DEN ESP FRA GER HUN ITA NED UK	Xd	CZE DEN FRA GER ITA ROM UK	Xd	DEN FRA GER HUN ITA UK	Xd	DEN FIN FRA GER ITA UK	Xd	FRA GER UK	Xd	GER POL UK
EGY		n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a	Xd	CYP	Xd	CYP	Xd	CYP MAL BEL ESP FRA GER ITA NED
GEO	Xd	BEL ESP FRA GER GRE ITA NED ROM UK	Xd	BEL ESP FRA GER GRE IRL MAL NED UK	Xd	BEL ESP FRA GER GRE IRL MAL NED UK	Xd	AUT BEL BUL CYP ESP FRA GER GRE IRL NED POR SLN UK	Xd	AUT BEL BUL CYP ESP FRA GER GRE IRL NED POR SLN UK	Xd	BEL BUL CYP ESP FRA GER GRE IRL NED POR ROM UK	Xd	BEL BUL CYP ESP FRA GER GRE IRL NED POR ROM UK	Xd	BEL BUL CYP ESP FRA GER GRE IRL NED POL UK	Xd	BEL CZE ESP FRA GER GRE IRL NED POL SLN UK	Xd	AUT BEL CZE ESP FRA GER GRE IRL NED POL SLN UK	Xd	AUT CZE ESP FRA GER GRE IRL NED POL ROM SWE UK
ISR	Xd	CYP GRE ROM SLN	Xd	MAL	Xd	MAL ROM	Xd	ROM	Xd	ROM	Xd	ROM	Xd	MAL	Xd	MAL	Xd	MAL	Xd	MAL	Xd	SLN
JOR	Xd	ESP FRA GER ITA NED UK	Xd	ESP GER NED UK	Xd	GER NED UK	Xd	ESP GER NED UK	Xd	BUL ESP GER ITA NED POL UK	Xd	ESP ITA GER NED UK	Xd	ESP ITA NED UK	Xd	GER ITA NED UK	Xd	ESP ITA NED UK	Xd	GER ITA NED UK	Xd	ITA NED UK
LEB	Xd	BEL CYP ESP FRA GER GRE ITA NED ROM UK	Xd	BEL CYP ESP FRA GER GRE ITA NED UK	Xd	BEL CYP ESP FRA GER GRE ITA NED UK	Xd	BEL CYP ESP FRA GER GRE ITA NED UK	Xd	BEL CYP ESP FRA GER GRE ITA NED SWE UK	Xd	BEL CYP ESP FRA GER GRE ITA NED POL SWE UK	Xd	BEL CYP ESP FRA GER GRE ITA NED POL UK	Xd	BEL CYP ESP FRA GER GRE ITA NED POL UK	Xd	BEL CYP ESP FRA GER GRE ITA NED UK	Xd	BEL CYP ESP FRA GER GRE ITA NED UK	Xd	BEL CYP ESP FRA GER GRE ITA NED UK
LIB		n/a		n/a		n/a		n/a		n/a		n/a		n/a	Xd	FRA NED UK	Xd	MAL AUT NED UK	Xd	MAL AUT GER NED UK	Xd	GER NED UK
MOL	Xd	AUT BEL CYP ESP FRA GER HUN ITA	Xd	AUT BEL CYP ESP FRA GER HUN ITA	Xd	AUT BEL CYP ESP FRA GER ITA LIT	Xd	AUT BEL CYP ESP FRA GER GRE ITA	Xd	AUT BEL CYP ESP FRA GER GRE HUN ITA	Xd	AUT BEL CYP ESP FRA GER GRE HUN ITA	Xd	AUT BEL CYP ESP FRA GER GRE HUN ITA	Xd	AUT BEL CYP ESP FRA GER GRE HUN ITA	Xd	AUT BEL CYP ESP FRA GER GRE HUN ITA	Xd	AUT BEL CYP ESP FRA GER GRE HUN ITA	Xd	AUT BEL CYP ESP FRA GER GRE HUN ITA

	LIT NED POL POR ROM UK		NED POL POR ROM UK		NED ROM UK		LIT NED POR ROM UK		ITA NED POL POR ROM UK		NED POL ROM UK		ITA LIT NED POL POR ROM UK		ITA NED POL ROM SWE UK		NED POL ROM SWE UK		NED POL ROM SLK SWE UK		POL ROM SLK UK	
MOR	n/a		n/a	Xd Xd	AUT BEL GER GRE IRL ITA NED POR UK	Xd Xd	AUT BEL GER IRL ITA NED POR UK	Xd Xd	AUT BEL GER IRL ITA NED POR UK		n/a		n/a	Xd Xd	AUT BEL GER GRE ITA NED POL POR UK	Xd Xd	AUT BEL GER ITA NED POL POR UK	Xd Xd	AUT BEL GER ITA NED POL POR UK	Xd Xd	AUT BEL GER ITA LIT NED POL POR UK	
PAL	n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a		n/a	
SYR	n/a	Xd Xd	AUT BEL ESP FRA GER ITA NED POR ROM UK	Xd Xd	AUT BEL ESP FRA GER ITA NED POR ROM UK	Xd Xd	AUT BEL ESP FRA GER ITA NED POR UK	Xd Xd	AUT BEL ESP FRA GER ITA NED POR UK	Xd Xd	AUT ESP FRA GER ITA NED UK	Xd Xd	AUT ESP FRA GER ITA NED UK	Xd Xd	AUT BEL ESP FRA GER HUN ITA NED UK	Xd Xd	AUT BUL ESP FRA GER GRE ITA NED UK				n/a	
TUN	Xd Xd	AUT BEL ESP GER NED POR UK	Xd Xd	AUT BEL ESP GER NED POL UK	Xd Xd	AUT BEL ESP GER NED POL UK	Xd Xd	AUT BEL ESP GER NED POL UK	Xd Xd	AUT BEL ESP GER NED POL UK	Xd Xd	AUT BEL ESP GER NED POL UK	Xd Xd	AUT BEL ESP GER NED POL UK	Xd Xd	AUT BEL ESP GER NED POL UK	Xd Xd	AUT BEL ESP GER NED POL UK	Xd Xd	AUT BEL ESP GER NED POL SLK UK	Xd Xd	AUT BEL ESP GER NED POL SLK UK
UKR	n/a	Xd	CYP EST LAT	Xd		Xd		Xd		Xd		Xd		Xd		Xd		Xd		Xd		
		Xd	AUT BEL ESP FRA GER ITA NED UK	Xd		Xd		Xd		Xd		Xd		Xd		Xd		Xd		Xd		

Source: UN COMTRADE Database / Authors' Elaboration

Table A2: The DK Index: Imports' (from the EU countries to the ENP countries)
domination conditions

MD or Md (with EU)	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010					
	MD	Md	MD	Md	MD	Md	MD	Md	MD	Md	MD	Md	MD	Md	MD	Md	MD	Md	MD	Md	MD	Md				
ALG	MD	AUT BEL CZE ESP FIN ITA NED POL UK	MD	AUT BEL CZE ESP FIN ITA NED POL UK	MD	BUL FIN GER ITA NED POL SWE UK	MD	AUT BEL FIN GER ITA NED POL SWE UK	MD	AUT BEL FIN GER ITA NED POL SWE UK	MD	AUT BEL FIN GER ITA NED POL SWE UK	MD	AUT BEL FIN GER ITA NED POL SWE UK	MD	AUT BEL FIN GER ITA NED POL SWE UK	MD	GRE BEL GER NED POL SWE UK	MD	SLN AUT BEL GER NED POL SWE UK	MD	BEL FIN GER NED POL ROM SWE UK				
ARM	MD	BEL BUL CZE FRA GER ITA NED SWE UK	MD	AUT BEL BUL CZE ESP FRA GER GRE ITA LIT NED ROM SWE UK	MD	BEL BUL FRA GER ITA NED ROM UK	MD	BEL ESP FRA GER ITA NED UK	MD	AUT BEL BUL CZE ESP FRA GER GRE ITA NED ROM UK	MD	BEL BUL CZE ESP FRA GER GRE ITA NED UK	MD	AUT BEL BUL CZE ESP FRA GER GRE ITA NED UK	MD	AUT BEL BUL CZE ESP FRA GER GRE ITA NED UK	MD	AUT BEL BUL CZE ESP FRA GER GRE ITA NED SWE UK	MD	AUT BEL BUL CZE ESP FRA GER GRE ITA NED POL SWE UK	MD	AUT BEL BUL CZE FRA GER ITA NED ROM SWE UK	MD	AUT BEL BUL CZE ESP FRA GER HUN ITA NED ROM SWE UK		
AZE	MD	AUT BEL CZE FRA GER ITA NED POL SWE UK	MD	AUT BEL CZE FRA GER GRE ITA NED POL SWE UK	MD	AUT BEL CZE FRA GER ITA NED POL SWE UK	MD	BEL ESP FRA GER ITA NED SWE UK	MD	AUT BEL CZE FRA GER ITA NED POL SWE UK	MD	AUT BEL FIN FRA GER ITA NED POL SWE UK	n/a	n/a	n/a	n/a	MD	AUT BEL CZE ESP FRA GER HUN ITA NED POL SWE UK	MD	AUT BEL CZE ESP FRA GER HUN ITA NED POL SWE UK	MD	AUT BEL CZE ESP FRA GER HUN ITA NED POL SWE UK				
BLR	MD	AUT BEL CZE DEN ESP FRA GER ITA NED UK	MD	BEL CZE ESP FRA GER ITA NED SWE UK	MD	BEL CZE ESP FRA GER ITA NED SWE UK	MD	AUT BEL CZE ESP FRA GER ITA NED SWE UK	MD	BEL CZE ESP FRA GER ITA NED SWE UK	MD	AUT BEL CZE ESP FRA GER HUN ITA NED SWE UK	MD	BEL CZE ESP FRA GER HUN ITA NED SWE UK	MD	AUT BEL CZE ESP FRA GER HUN ITA NED SWE UK	MD	AUT BEL CZE ESP FRA GER HUN ITA NED SWE UK	MD	AUT BEL CZE ESP FRA GER HUN ITA NED UK	MD	EST AUT BEL CZE ESP FRA GER HUN ITA NED ROM UK				
EGY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	MD	CYP EST GRE	MD	AUT BEL FIN FRA GER NED	MD	BUL CYP EST GRE	MD	BUL CYP EST GRE				
GEO	MD	AUT BEL CZE DEN ESP FIN FRA GER GRE HUN ITA NED POL ROM SWE UK	MD	AUT BEL DEN ESP FIN FRA GER GRE HUN ITA NED POL ROM UK	MD	AUT BEL CZE ESP FIN FRA GER GRE HUN ITA NED ROM UK	MD	AUT BEL CZE ESP FRA GER GRE HUN ITA NED ROM SWE UK	MD	AUT BEL CZE ESP FRA GRE HUN IRL ITA NED POL ROM UK	MD	AUT BEL CZE ESP FIN FRA GRE HUN ITA LIT NED POL ROM UK	MD	AUT BEL CZE ESP FIN FRA GRE HUN ITA NED POL SWE UK	MD	AUT BEL CZE ESP FRA GRE HUN ITA NED POL ROM UK	MD	AUT BEL CZE ESP FIN FRA HUN ITA NED POL ROM UK	MD	AUT BEL CZE ESP FRA HUN ITA NED POL ROM UK	MD	AUT BEL CZE ESP FRA HUN ITA NED POL ROM UK	MD	AUT BEL CZE ESP FRA HUN ITA NED POL ROM UK		
ISR	MD	BUL CYP ROM	MD	BUL CYP GRE ROM	MD	BUL CYP GRE ROM	MD	BUL CYP GRE ROM	MD	BUL CYP GRE ROM	MD	BUL CYP GRE ROM	MD	BUL CYP GRE ROM	MD	CYP ROM	MD	BUL CYP GRE	MD	CYP GRE	MD	CYP GRE	MD	CYP GRE		
	Md	FIN FRA GER IRL NED SWE	Md	FRA GER IRL NED SWE	Md	DEN FIN FRA GER IRL NED SWE	Md	ESP FRA GER IRL NED SWE	Md	ESP FRA GER IRL NED SWE	Md	ESP FRA GER IRL NED SWE	Md	ESP FRA GER IRL NED SWE	Md	CZE ESP FRA GER IRL ITA NED SWE	Md	CZE ESP FRA GER IRL ITA NED SWE	Md	AUT CZE ESP FRA GER ITA NED POL SWE	Md	AUT CZE ESP FRA GER HUN IRL NED POL SWE UK	Md	CZE ESP FRA GER HUN IRL NED POL SWE UK		
JOR	MD	AUT BEL DEN ESP FRA GER ITA NED SWE UK	MD	AUT BEL DEN ESP FIN FRA GER ITA NED SWE UK	MD	AUT BEL ESP FIN FRA GER GRE IRL ITA NED SWE UK	MD	CYP DEN ESP FIN FRA GER IRL ITA NED SWE UK	MD	CYP DEN ESP FIN FRA GER IRL ITA NED SWE UK	MD	CYP DEN ESP FIN FRA GER HUN ITA NED SWE UK	MD	CYP BEL CZE ESP FIN FRA GER HUN ITA NED SWE UK	MD	CYP BEL CZE ESP FIN FRA GER HUN ITA NED SWE UK	MD	CYP BEL CZE ESP FIN FRA GER HUN ITA NED SWE UK	MD	CYP BEL CZE ESP FIN FRA GER HUN ITA NED SWE UK	MD	CYP BEL CZE ESP FIN FRA GER HUN ITA NED SWE UK	MD	CYP BEL CZE ESP FIN FRA GER IRL ITA NED ROM SWE UK	MD	CYP BEL CZE ESP FIN FRA GER IRL ITA NED ROM SWE UK

LEB	MD																					
	Md	BEL CZE DEN ESP FIN FRA GER IRL ITA NED ROM SWE UK	MD		CYP	BEL DEN ESP FIN FRA GER IRE ITA NED UK	MD		CYP	BEL DEN ESP FIN FRA GER IRE ITA NED ROM SWE UK	MD		CYP	BEL DEN ESP FIN FRA GER IRE ITA NED ROM SWE UK	MD		CYP	BEL DEN ESP FIN FRA GER IRE ITA NED ROM SWE UK	MD		CYP	BEL DEN ESP FIN FRA GER IRE ITA NED ROM SWE UK
LIB		n/a																				
MOL	MD																					
	Md	AUT BEL BUL CZE ESP FRA GER GRE HUN ITA LIT LUX NED POL SLK SWE UK	MD		AUT BEL BUL CZE DEN ESP FIN FRA GER GRE HUN ITA LIT NED POL SLK SWE UK	MD		AUT BEL BUL CZE ESP FIN FRA GER GRE HUN ITA LIT NED POL SLK SWE UK	MD		AUT BEL BUL CZE ESP FIN FRA GER GRE HUN ITA LIT NED POL SLK SWE UK	MD		AUT BEL BUL CZE ESP FIN FRA GER GRE HUN ITA LIT NED POL SLK SWE UK	MD		AUT BEL BUL CZE ESP FIN FRA GER GRE HUN ITA LIT NED POL SLK SWE UK	MD		AUT BEL BUL CZE ESP FIN FRA GER GRE HUN ITA LIT NED POL SLK SWE UK	MD	
MOR		n/a																				
PAL		n/a																				
SYR		n/a																				
TUN	MD																					
	Md	BEL ESP FIN GER GRE NED SWE UK	MD		BEL ESP GER NED SWE UK	MD		BEL ESP GER NED SWE UK	MD		BEL ESP FIN GER NED SWE UK	MD		BEL ESP FIN GER NED SWE UK	MD		BEL ESP GER NED SWE UK	MD		BEL ESP GER NED SWE UK	MD	
UKR		n/a																				

Source: UN COMTRADE Database / Authors' Elaboration

Table A3: Exports' (from the ENP countries to the EU countries) domination conditions (year 2000)

	AUT	BEL	BUL	CZE	CYP	DEN	ESP	EST	FIN	FRA	GER	GRE	HUN	IRL	ITA	LAT	LIT	LUX	MAL	NED	POL	POR	ROM	SIK	SLN	SWE	UK
ALG																											
ARM																											
AZE																											
BLR																											
EGY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
GEO																											
ISR																											
JOR																											
LEB	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MOL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
MOR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SYR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
TUN																											
UKR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	country C (i.e. ENP) dominates over country P (i.e. EU)																								country C (i.e. ENP) is dominated by country P (i.e. EU)		
	neutral relation																								country C (i.e. ENP) is dominated by country P (i.e. EU)		

Source: UN COMTRADE Database / Author's Elaboration

Table A4: Exports' (from the ENP countries to the EU countries) domination conditions (year 2010)

	AUT	BEL	BUL	CZE	CYP	DEN	ESP	EST	FIN	FRA	GER	GRE	HUN	IRL	ITA	LAT	LIT	LUX	MAL	NED	POL	POR	ROM	SIK	SLN	SWE	UK
ALG																											
ARM																											
AZE																											
BLR																											
EGY																											
GEO																											
ISR																											
JOR																											
LEB																											
LIB																											
MOL																											
MOR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
PAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SYR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
TUN																											
UKR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	country C (i.e. ENP) dominates over country P (i.e. EU)																								country C (i.e. ENP) is dominated by country P (i.e. EU)		
	neutral relation																								country C (i.e. ENP) is dominated by country P (i.e. EU)		

Source: UN COMTRADE Database / Author's Elaboration

Table A5: Imports' (from the EU countries to the ENP countries) domination conditions (year 2000)

	AUT	BEL	BUL	CZE	CYP	DEN	ESP	EST	FIN	FRA	GER	GRE	HUN	IRL	ITA	LAT	LIT	LUX	MAL	NED	POL	POR	ROM	SLK	SIN	SWE	UK	
ALG																												
ARM																												
AZE																												
BLR																												
EGY	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
GEO																												
ISR																												
JOR																												
LEB																												
LIB	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
MDR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
PAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
SYR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
TUN																												
UKR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
country C (i.e. ENP) dominates over country P (i.e. EU)																												
country C (i.e. ENP) is dominated by country P (i.e. EU)																												
neutral relation																												

Source: UN COMTRADE Database / Author's Elaboration

Table A6: Imports' (from the EU countries to the ENP countries) domination conditions (year 2010)

	AUT	BEL	BUL	CZE	CYP	DEN	ESP	EST	FIN	FRA	GER	GRE	HUN	IRL	ITA	LAT	LIT	LUX	MAL	NED	POL	POR	ROM	SLK	SIN	SWE	UK	
ALG																												
ARM																												
AZE																												
BLR																												
EGY																												
GEO																												
ISR																												
JOR																												
LEB																												
LIB																												
MDR																												
MOR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
PAL	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
SYR	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
TUN																												
UKR																												
country C (i.e. ENP) dominates over country P (i.e. EU)																												
country C (i.e. ENP) is dominated by country P (i.e. EU)																												
neutral relation																												

Source: UN COMTRADE Database / Author's Elaboration