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Does Corruption Impede International Trade? New evidence from the EU and the MENA Countries

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This paper uses a gravity trade model to examine the effect of corruption on bilateral trade for a sample of 37 countries representing two regions: the Middle East and North Africa and the European Union during the period from 2002 to 2012. The study provides evidence that corruption negatively influences trade flows and that control of corruption improves trade potentialities. Also, subsamples estimations report robust support for this result but with more negative impact of corruption on regional trade for MENA countries. More traditional results suggest a positive effect of openness on the volume of trade, reflecting the need for regional integration. The empirical results provide evidence that, contrary to per capita GDP, GDP positively and significantly affects trade flows. Moreover, the study shows that countries may increase trade flows despite having different languages. However, distance and contiguity negatively impact trade flows. The nominal effective exchange rate as a price competitiveness variable positively and significantly influences trade flows.

1. Introduction

Examinations of foreign trade in industrialized nations and their growth trends show that countries which have liberalized their economies display higher economic growth rates. In this context, many developing countries have based their economic growth policies on the promotion of exports and generally on international trade. International trade volume is increasing for all countries and trade blocks as well. However, Trefler (1995) among others, reports that international trade flows are much less than they should be according to economic theory predictions. According to Eaton and Kortum (2002), international trade volumes would be five times larger than current levels if only trade was

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"*frictionless*". These disparities in the volume of international trade highlight the existence of impeding barriers to trade (De Groot et al., 2004). A plausible reason for this is provided by a United Nations (2007) report which shows that trade flows in developing countries are relatively low, which could point to barriers such as corruption that are often cited as hindering international trade and resulting in the "mystery of missing trade".

Given its negative effects on economic activity, the corruption phenomenon has represented a key research issue to economists since the 1960s. Back then, studies were essentially micro-economic and were limited to theoretical and descriptive analyses. Recently however, an increasing number of studies on corruption have considered numerous dimensions and demonstrated different potential impacts through which corruption may affect economic activity.

The literature on corruption provides several definitions of the concept. The most expanded definition provided by *Transparency International* defines it as '*an abuse of entrusted power for private gain.'* Yet, corruption is a phenomenon that differs from one country to another depending on the political, economic and social environment. An extensive body of literature has examined various effects of corruption on economic activity. As discussed in Ben Ali and Saha (2015), two main strands of literature can be discerned when dealing with the corruption-economic development nexus. The first is the "*grease the wheel*" strand in which corruption is perceived to act as a greasing of the bureaucracy wheel for the firms. In this regard, Beck and Maher (1986) believe that bribes and corruption in general are considered as a way to save time and effort and therefore improve investment and economic growth. The proponents of the "*grease the wheel*" approach in which corruption is seen to act as a greasing of the bureaucracy wheel for the firms argue that corruption could facilitate international trade. Recently, De Jong and Bogmans (2010) report that the more frequently bribes are paid to customs officials, the higher the amount of trade (imports in particular). This implies that bribe paying acts like a lubricant. Also, several studies considered the corruption-trade nexus and found that corruption can positively impact regional trade and could even be considered as one of the most important catalysts for growth. For instance, Horsewood and Voicu (2012) suggest that corruption may

actually have the power to enhance trade by acting as a lubricant in countries with a weak institutional structure.

The second strand of the literature is the "*sand the wheel*" side, which argues that corruption is harmful since it induces costs and inefficiencies and therefore decelerates economic growth. The general agreement in this regard states that poor quality institutions negatively affect a country's level of development (Rodrik et al., 2004). Numerous studies dealing with the corruption-international trade nexus from the "*sand the wheel*" approach exist in the literature. Both exports and imports are considered in this literature. From one side, when the quality of institutions is poor, referring to low quality of customs services and long waiting hours at the border, a country will have fewer imports (De Jong and Bogmans, 2010). From the other side, many studies argue that long waiting hours at the border restrict exports as well (Djankov et al., 2006). Based on firm level data, Kaufmann and Wei (1999) also report that corruption hinders trade as firms who are involved in bribery are likely to spend more time with officials.

From another point of view, countries that have rigid government regulations will more likely have protectionist trade policies, which would then require importers to obtain appropriate import licences before being able to import goods from abroad. As a consequence, this situation would encourage importers to rely on bribery and corruption as ways to facilitate business transactions (Krueger, 1974). Another effect that corruption has on international trade is associated with productivity. Poor quality of institutional structure causes low levels of output per worker, which makes the economy less competitive. Consequently, low competitiveness induced by low productivity leads to low volumes of international trade (Horsewood and Voicu, 2012). Moreover, incentives to engage in corruption will be greater as a country has more restrictive trade policies and the bureaucrats will then ask for more bribes. Based on this, there should be a negative relationship between bilateral trade and corruption, as well as a positive relationship between the degree of corruption and the volume of international trade (Horsewood and Voicu, 2012).

As far as corruption is involved, similarities in ethical standards among countries also play an important role in determining the level of trade between them. If both countries believe that bribing an official is

acceptable, depending on the business culture, then the international transaction will take place and this will increase international trade volume. This implies that the difference between the degrees of corruption between two countries will determine the volume of bilateral trade between them (Horsewood and Voicu, 2012). Similarly, firms that originate from countries with high ethical standards may be facing a bad reputation if they trade with a corrupt country. The resulting bad reputation may cause them to lose consumers in both domestic and foreign markets. Therefore, countries may prefer to undertake international transactions with countries that have similar ethical standards despite the possibility of high profitability exports somewhere else.

It is worth noting also that it is widely established in the literature that the effect of corruption on international trade depends on the nature of bribes. When the bribes to be paid are unknown in advance, traders develop a feeling of uncertainty. This "un-organised corruption" will reduce international trade since traders spend a longer time negotiating with and bribing officials, particularly for firms that are not willing to deal with these practices. (Shleifer and Vishny, 1993; Myint, 2000). However, when they are known in advance, predictable corruption could facilitate international trade.

As discussed above, both arguments, the "*grease the wheel*" and the "*sand the wheel*" approaches to the international trade-corruption relationship, are supported in the literature. Therefore, whether corruption is a factor that improves international trade or conversely it hinders international transactions is a subject that requires particular focus. To the best of our knowledge, no previous study has investigated this nexus by considering a large set of international trade determinants including corruption while considering different regions. The current study intends to take a further step and to fill this research gap by examining this nexus for the Middle East and North Africa countries and for the European Union countries as well. Two main motivations drive this study. First, we bring a new insight to the current empirical literature regarding the corruption-international trade nexus. Second, this study considers two different regions having different corruption levels which will make a major contribution regarding the impact of the level of economic development on the corruption-trade nexus.

The rest of the paper is organized as follows. Section 2 introduces the methodology, data, variables used and the estimation techniques. Section 3 discusses the main findings of this study. The last section concludes.

2. Model Specification, Estimation Methodology and Data

Since the precursory and seminal papers of Tinbergen (1962) and Pöyhönen (1963) and the extension of Linnemann (1966), gravity trade models (GTM) have been and are still the most used tools to assess bilateral trade flows between countries. The basic idea in these models is to integrate the spatial characteristics of each partner country in assessing their trade potential. These models have undergone several extensions by augmenting them using numerous factors and variables that could positively or negatively affect bilateral trade. In these models, the sizes of the exporting and importing economies are represented by GDP, giving a measure of the demand and supply potentials. Moreover, GTM includes dummy variables that affect trade volume between countries (Laaser and Schrader, 2002 and Anderson and Wincoop, 2003). For example, if the two countries have a common border, then a larger volume of trade will probably take place (Horsewood and Voicu, 2012). Besides the border effect, language also plays an important role in determining the level of trade (Horsewood and Voicu, 2012). Furthermore, export performance will be greatly influenced by a common history and the distance as a "proxy" for transport costs. Also, countries will prefer importing from a former colony (assuming a positive experience with it) than from other countries (Horsewood and Voicu, 2012).

All these variables can be specified and tested for correlation to indicate that they facilitate or restrict trade between two partner countries. Moreover, we introduce in this study two countries' corruption measures to capture the effect of corruption on trade potentialities. Thus our model is as follows:

$$Log\,(X_{ij}) = \alpha + \beta_1\, Log\,(GDP_{it}) + \beta_2\, Log\,(GDP_{jt}) + \beta_3\, Log\,(PGDP_{it}) + \beta_4\, Log\,(PGDP_{jt}) + \beta_5\, Log\,(OPEN_{it}) + \beta_6\, Log\,(OPEN_{jt}) + \beta_7\, Log\,(EXCH_{it}) + \beta_8\, Log\,(EXCH_{jt}) + \beta_9\, D_{ij} + \beta_{10}\, Contig_{ij} + \beta_{11}\, Comlang_{ij} + \beta_{12} + COR_{ij} + \beta_{13}\, COR_{jt} + \varepsilon_{ij}$$

Where:

The dependent variable X_{ij} is the bilateral annual export in current dollars from country i to country j. *i* and *j* are the exporting and the importing countries, respectively. Where α is an intercept and εijt is the error term. GDP_i and GDP_j are the gross domestic product in current dollars of countries i and j, respectively. Gross domestic products of partner countries express the potential market size. Therefore, the coefficients β_1 and $\beta_2$are expected to be positively correlated with bilateral trade. $PGDP_i$ and $PGDP_j$ are the per capita gross domestic product in current dollars for countries i and j, respectively. Per capita GDP reflects the impact of consumer purchasing power of the two partner countries. The distance between partner countries D_{ij} is a proxy for transport costs. So, we expect that distance negatively affects bilateral trade. $OPEN_i$ and $OPEN_j$ are the trade openness for the two countries, respectively. Openness accelerates bilateral trade by facilitating exchanges of goods and services. Therefore, we expect a positive correlation between openness and international trade. $EXCH_i$ and $EXCH_j$ are the nominal effective exchange rate of countries i and j, respectively. The nominal effective exchange rate is a proxy of price competitiveness of partner countries and it is supposed to positively affect trade flows. COR is a general measure of corruption in the exporting and the importing countries. We use in this study two main measures of corruption for this general measure: the corruption perception index (CPI) as a corruption indicator and the control of corruption index (COC) as governance indicator, which we introduce one by one in the model. CPI_i and CPI_j are the corruption perception indices for i and j, respectively. COC_{it} and COC_j are the control of corruption indexes for countries i and j, respectively. The contiguity ($Contig_{ij}$) is a dummy variable, taking value 1 if partners have a common border, and 0 otherwise. Common language variable ($Comlang_{ij}$) is a binary variable taking value 1 if countries have common languages and 0 otherwise.

We use in this study macroeconomic annual data for a sample of 37 countries. Fifteen countries from the Middle East and North Africa region (Bahrain, Iran, Iraq, Jordan, Kuwait, Libya, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, United Arab Emirates and Yemen). We also consider 22 countries from the European Union (Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland,

France, Germany**,** Greece, Ireland, Latvia, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden and United Kingdom). Data covers the period from 2002 to 2012. Export statistics are extracted from United Nations Standard International Trade Classification, revision 3. The countries' gross and per capita domestic products were extracted from WDI-World Bank Development Indicators. Trade openness and exchange rate nominal exchange rates were drawn from the United Nations Conference on Trade and Development statistics (UNCTAD). The data on bilateral distance and on dummy variables such as contiguity, common language, common colonizer and colonial link, were extracted from CEPII database (CEPII – GEO). The corruption perception index was extracted from Transparency International publications and the control of corruption index was obtained from the World Governance Indicators database.

Estimating the gravity model using pooled ordinary least squares yields inconsistent coefficient estimates with the existence of individual effects. Therefore, we proceed with the Hausman (1978) test. Estimation outcomes of the Hausman test are in favor of the random effect model. However, we present the fixed effect model for benchmark comparison.

We should note that the estimation of the fixed effect specification does not allow estimating the time invariant variables in our model, such as distance, contiguity, common colonizers, and the existence of common borders. To overcome the problems of heteroscedasticity, detected by the Modified Wald test for group wise heteroskedasticity and also the risks of serial correlation.

3. Results and Discussion

Estimation outcomes for the whole sample (European Union and the Middle East and North Africa countries) are presented in Table 1. They show that GDP positively and significantly affects trade flows. Indeed, an increase by 1 percent of GDP in the exporting and the importing countries induces, other things being equal, an increase in exports by 1.3 percent and 0.9 percent in these countries, respectively. GDP per capita has a negative and significant effect on bilateral trade. Such a result shows that the closer the per capita incomes of two countries, the greater will be the intensity of trade between them. In other words, trade is

hampered when living standards are different. The coefficient of trade openness has a positive and significant effect on the exporting country side and a negatively insignificant one on the importing country side. This result suggests that a 1 percent increase in the degree of openness in the exporter country induces an increase in exports of about 0.8 percent. This result shows the positive impact of openness policies in improving trade potentialities between countries and the negative impact of the presence of tariff barriers.

The nominal effective exchange rate as a price competitiveness variable positively and significantly influences trade flows. The exchange rate of the exporting country has a positive coefficient showing that a depreciation of the currency of the exporting country leads to a significant and positive impact on its exports. The distance as a proxy for transportation costs has a negative coefficient and is highly significant at the 1 percent level. Moreover, the contiguity, which indicates the presence of common borders, presents a negative and significant coefficient. Common language is positive but not significant, suggesting that countries may increase trade flows while having different languages. As for corruption measures, the corruption perception indexes positively influence trade flows on both the exporter and the importer side. On the exporter side, a decrease in corruption in the exporting country improves trade. On the importer side, a decrease in corruption will induce an increase in trade volume. Estimation outcomes of our second estimation where we introduce the control of corruption index are reported in Table 1. The control of corruption index positively and significantly impacts trade flows. Indeed, an increase in the control of corruption by 1 percent in the exporting and importing countries respectively induces trade growth of 0.47% and 0.42% in these countries. The results for GDP and GDP per capita have kept the same signs. Importer countries' trade openness has a positive and significant effect with the persistence of the positive impact also in the exporting country. The contiguity coefficient gives final evidence that the existence of common borders enhances exports.

Table 1: Overall sample Estimation

	Fixed effects		Random effects		GLS	
	1	**2**	**1**	**2**	**1**	**2**
LogGDP$_i$	1,048406	1,100603	1,168418	0,9940215	1,295808	1,335465
	(13,38)***	(6,07)***	(31,71)***	(9,19)***	(81,32)***	(91,05)***
LogGDP$_j$	0,6665687	0,7390006	0,8372126	0,6096996	0,9035705	0,9777669
	(8,94)***	(3,65)***	(23,5)***	(5,44)***	(57,94)***	(66,58)***
LogGDP$_i$ Per capita	-0,2050527	-0,3872646	-0,250314	-0,0278966	-0,3866657	-0,9165306
	(-2,21)***	(-1,75)**	(-5,33)***	(-0,24)	(-14,9)***	(-21,58)***
LogGDP$_j$ Per capita	-0,3690696	-0,5272752	-0,5435728	-0,3988784	-0,2945588	-0,6857785
	(-4,11)***	(-2,36)***	(-12,19)***	(-3,28)***	(-12,4)***	(-16,27)***
LogOPEN$_i$	0,6916691	0,7907834	0,6297736	0,8796953	0,7787582	1,380838
	(7,95)***	(3,79)***	(8,48)***	(4,93)***	(14,26)***	(28,53)***
LogOPEN$_j$	0,2161687	0,3700665	0,1011437	0,4224324	-0,0431581	0,2975729
	(3,26)***	(2,2)**	(1,78)**	(3,06)***	(-0,8)	(6,12)***
LogEXCH$_i$	0,008976	-0,356333	0,1586189	-0,3992713	1,821985	0,0289468
	(0,07)	(-1,14)	(1,41)*	(-1,38)*	(14,79)***	(0,19)
LogEXCH$_j$	0,1702083	0,8012591	0,210401	0,9879806	0,2138409	0,1775638
	(2,18)**	(3,75)***	(2,79)***	(4,83)***	(2,24)**	(1,29)*
D$_{ij}$			-1,408565	-1,409621	-1,129102	-0,4619827
			(-18,11)***	(-6,15)***	(-47,5)***	(-20,24)***
Contig$_{ij}$			-0,3213357	0,0664463	-0,1247578	1,062812
			(-1,26)	(0,13)	(-1,64)*	(18,31)***
Comlang$_{ij}$			0,3320941	-0,1208288	0,803585	-0,424663
			(2,01)***	(-0,35)	(15,5)***	(-7,31)***
CPI$_i$	0,0779212		0,1425338		0,2299942	
	(4,82)***		(9,82)***		(19,13)***	
CPI$_j$	0,060476		0,1063552		0,115325	
	(3,82)***		(7,5)***		(10,25)***	
COC$_i$		0,1836488		0,4661501		0,4667622
		(1,52)*		(4,52)***		(15,57)***
COC$_j$		0,3468965		0,3888193		0,4175169
		(3,04)***		(3,83)***		(13,97)***
Intercept	-14,34299	-14,56517	-10,758	-3,23302	-27,10602	-14,72976
	(-8,14)***	(-3,98)***	(-8,86)***	(-0,96)	(-32,26)***	(-14,83)***
Observations	12135	12135	12135	12135	12135	12135
Groups	1224	1224	1224	1224	1224	1224
Fisher Test	40,79	40,55				
P-value	0,0000	0,0000				
Wald chi2 (13)			6446,81	6564,58	30628,46	30914,01
P-value			0,0000	0,0000	0,0000	0,0000
Hausman Test,	186,88	138,64				
P-value	0,0000	0,0000				
R^2	0,2579		0,6963			

T-Student are reported in parentheses. ***, **, and * indicate significance levels at 1, 5, and 10 percent, respectively.

Table 2: GLS subsamples estimation - MENA and UE

X_{ij}	MENA		UE	
	1	**2**	**1**	**2**
$LogGDP_i$	1,354424	1,326043	1,347128	1,335465
	(21,02)***	(20,88)***	(92,3)***	(91,05)***
$LogGDP_j$	0,8149041	0,8773522	0,9874217	0,9777669
	(14,6)***	(15,18)***	(67,58)***	(66,58)***
$LogGDP_i$ Per capita	-0,4072991	-0,5150981	-0,9873841	-0,9165306
	(-6,13)***	(-7,12)***	(-23,06)***	(-21,58)***
$LogGDP_j$ Per capita	-0,3137279	-0,3578538	-0,7381866	-0,6857785
	(-4,79)***	(-5,12)***	(-17,38)***	(-16,27)***
$LogOPEN_i$	1,237805	1,536163	1,389463	1,380838
	(5,99)***	(7,55)***	(28,92)***	(28,53)***
$LogOPEN_j$	0,9995504	1,169287	0,3021024	0,2975729
	(5,4)***	(6,33)***	(6,26)***	(6,12)***
$LogEXCH_i$	-0,1362274	-0,1848577	0,1225033	0,0289468
	(-0,48)	(-0,65)	(0,79)	(0,19)
$LogEXCH_j$	1,185143	1,149854	0,26118	0,1775638
	(5,27)***	(5,05)***	(1,91)*	(1,29)*
D_{ij}	-1,132767	-1,139159	-0,4682808	-0,4619827
	(-14,89)***	(-15,02)***	(-20,69)***	(-20,24)***
$Contig_{ij}$	0,1867116	0,1942587	1,058759	1,062812
	(1,08)	(1,13)	(18,38)***	(18,31)***
$Comlang_{ij}$	-0,1129198	0,0092566	-0,4346584	-0,424663
	(-0,99)	(0,08)	(-7,54)***	(-7,31)***
CPI_i	0,6624822		0,2142584	
	(12,33)***		(17,41)***	
CPI_j	0,1732958		0,1879865	
	(3,66)***		(15,33)***	
COC_i		1,459785		0,4667622
		(12,34)***		(15,57)***
COC_j		0,3917583		0,4175169
		(3,99)***		(13,97)***
Intercept	-21,4012	-16,65578	-16,40818	-14,72976
	(-8,48)***	(-6,73)***	(-16,78)***	(-14,83)***
Observations	1431	1431	5078	5078
Groups	169	169	462	462
Wald chi2	1825,93	1839,27	31642,69	31078,02
P-value	0,0000	0,0000	0,0000	0,0000

T-Student are reported in parentheses. ***, **, and * indicate significance levels at 1, 5, and 10 percent, respectively

To check for our previous effects, we subdivided our sample into two sub-samples, namely the European Union sample (EU) and the Middle East and North Africa Countries sample (MENA).

Estimation outcomes are presented in Table 2. Estimation for the MENA sample reports traditional results. For example, GDP positively and significantly affects trade flows. GDP per capita still negatively and significantly affects export flows. For openness it has positive and significant coefficients for both exporting and importing countries. The nominal effective exchange rate has a positive and significant effect on exports for the importing country, while it has a negative and non-significant effect on the exporter side. Corruption remains a negative factor for trade growth. For example, the control of corruption as a proxy for good governance positively and significantly affects trade flows.

Estimation outcomes for the European Union sample show that GDP, per capita GDP and the effective exchange rates have the same previous effects. However the two dummy variables (contiguity, common language) are highly significant in explaining trade flows. On the one hand, contiguity positively influences bilateral trade. This result shows that two countries with common borders will exchange more. On the other hand, the absence of common languages hinders intraregional trade with a clearly negative effect. As for corruption, our results confirm the evidence that good governance with an anti-corruptive institutional system promotes regional trade. We should note in this regard that the negative effect of corruption on international trade is more important for MENA countries than for the European countries.

4. Conclusion

This paper mainly aims to assess the determinants of regional trade and to investigate whether corruption hinders international trade, or whether it encourages cross-border trade. We considered a panel data gravity model with a sample of 37 countries representing two different geographical regions.

Our results highlight the negative effect of different forms of corrupted behaviour on international trade. More traditional results suggest a positive effect of openness on the volume of trade, reflecting the need for regional integration. With different corruption levels, corruption does hinder trade within the European Union but it has more impact in the Middle East and North Africa countries. Moreover, similarities in the ethical business environment between trading partners contribute to increasing the volume of bilateral trade. The greater these similarities are, the higher will be trade volumes.

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