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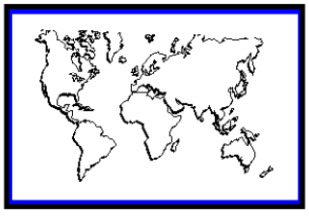

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The impact of FTAs on MENA trade in industrial and agricultural products

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Abstract

This paper analyses the impact of Free Trade Agreements (FTAs) on Middle East and North African Countries (MENA) trade for the period 1994-2010. The analysis distinguishes between industrial and agricultural trade separately to take into account the different liberalisation schedules. An augmented gravity model is estimated using up-to-date panel data techniques to control for all time-invariant bilateral factors that influence bilateral trade as well as for the so-called multilateral resistance. We also control for the endogeneity of the agreements and test for self-selection bias due to the presence of zero trade in our sample. The main findings indicate that both North-South-FTAs and South-South-FTAs have a similar impact in terms of increasing trade in MENA countries showing greater global market integration. We conclude that FTAs that include agricultural products, in which MENA countries have a clear comparative advantage, are more desirable for these countries than those only including industrial products.

JEL Classification: F10, F15

Key words: Free Trade Agreements, International Trade, Mediterranean integration, MENA countries, Gravity Equation, Panel Data

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1. Introduction

The reduction in the number of trade barriers through the implementation of trade agreements is a major step towards trade liberalisation and MENA countries have greatly increased their participation in FTAs in the last ten years, both in North-South FTAs (NS FTAs) and South-South FTAs (SS FTAs). But have they really helped to improve trade integration in the region? Customs tariffs in MENA countries have been reduced in the last 15 years by about 5 points and the openness ratio has risen from 47% in 2000 to 66% in 2008.[1] Exchanges with the European Union (EU) represent more than 60% of total trade for some MENA countries, but have been losing ground in the last years in favour of new emerging partners. Behar and Cirera (2010) state that only a few empirical papers have recently analysed the impact of NS and SS FTAs in developing countries and more research is needed addressing the real impact of FTAs on developing countries, in particular comparing the effects of NS FTA and SS FTA. Developing countries could profit in different ways from each type of agreement. On the one hand, FTAs between southern partners could be a first step towards improving diplomatic relations between potential members, especially between Arab countries, and they could be better positioned in the negotiations on the content of the agreements, because they are at the same level in terms of economic and political strength, which is not the case with North-South agreements. On the other hand, FTAs between northern and southern partners usually incorporate not only trade integration but also laws, institutions, regulations and financial programs that promote deeper integration. Their main disadvantage is southern countries' limited negotiating power in regard to the content of the agreement, which is dictated commonly by northern countries. Behar and Cirera (2010) show that both NS, SS and NN (North-North) agreements increase

bilateral trade in developing countries, SS agreements registering larger effects on trade despite developing countries not being natural trading partners.

A number of papers have recently analysed the impact of FTAs on MENA trade flows. Most of the studies cover only the late 1990s and early 2000s; Peridy (2005a, b); Cieslik and Hagemejer (2009) and only a few compare different FTAs, including North-South (NS) and South-South (SS) agreements, Abedini and Peridy (2008) and Cieslik and Hagemejer (2009). As far as we are aware, no studies have differentiated between industrial and agricultural products in the same analysis. The present study adds new insight along these lines. The main aim of this paper is to analyze the impact on trade flows of a number of FTAs which came into force for ten MENA countries during the period from 1994 to 2010. We estimate the trade effects of five NS FTAs and five SS FTAs[2] to compare whether agreements with northern partners are more desirable than those with southern partners, or vice versa. We also differentiate between trade in industrial and agricultural products to compare the effects when an FTA includes and does not include agriculture. We compare the average impact of the agreements on trade, differentiating between import and export flows. An augmented gravity model is estimated using up-to-date panel data techniques that allow to control for all bilateral factors that influence bilateral trade and are time-invariant (unobserved heterogeneity), as well as for the so-called multilateral resistance factors (the effect of relative prices with respect to all trading partners). We use the methodology recently proposed by Baier and Bergstrand (2007) to control for the endogeneity of the agreements and for multilateral resistance and we also control for self-selection bias due to the presence of zero trade in our sample.

The main results show that the majority of the FTAs considered increase bilateral trade between the countries involved in the agreement, except for the Euromed agreement, which only improves MENA imports from Europe. We also found that the inclusion of agricultural liberalisation in the agreements could mitigate MENA concessions on industrial import liberalisation.

The rest of the paper is organized as follows. Section 2 describes the FTAs analysed in the paper and revises the related literature. Section 3 presents the analytical framework. Section 4 specifies the empirical model, describes the data and presents the main results and Section 5 concludes.

2. Free Trade Agreements in MENA region

The main trading partner for MENA countries, especially for North African Countries, has been Europe, due to its geographical proximity and historical-colonial ties. The integration process between the South Mediterranean counties (SMC) and Europe started in 1969 with the Preferential Trade Agreements (PTAs) that liberalized industrial exports from Algeria, Morocco and Tunisia to EU countries. Within the framework of the "Global Mediterranean Policy", which started in 1972, bilateral cooperation agreements between the EU and Morocco, Israel, Tunisia, Egypt, Jordan, Lebanon and Syria were signed in 1975. These agreements included non-reciprocal trade preferences liberalizing industrial exports from some MENA countries to Europe.

With the aim of re-launching Euro-Mediterranean integration, the Barcelona Process started in 1995. One of its main goals was to complete a Free Trade Area between the European Union (EU) and each MENA partner involved in the process by 2010[3]. The main vehicle to reach full liberalisation is the negotiation and enforcement of interim

bilateral agreements between each South Mediterranean country and the EU. Within this framework, single interim bilateral agreements have already entered into force for seven countries. Tunisia was the first to sign the agreement in 1998, followed by Morocco and Israel in 2000, Jordan in 2002, Egypt in 2004, Algeria in 2005 and Lebanon in 2006. Syria initiated negotiations in 2008, but they were suspended due to the Arab democratic revolts, while Libya only has observer country status.

In addition to the Euromed Agreement, some MENA countries signed other FTAs with four northern countries that conform the European Free Trade Association (EFTA), namely EFTA countries. The FTA came into force with Turkey in 1992, Israel in 1993, Morocco in 1999, Jordan in 2002, Tunisia in 2005, Lebanon and Egypt in 2007. The coverage of the agreements is similar to the coverage of the Euromed Agreement and includes trade in industrial products, as well as trade in fish and other marine products and processed agriculture and also provisions relating to the elimination of other trade barriers. The agreements' rules of origin are based on the Euro-Mediterranean model.

An additional NS FTA is that signed by Jordan and the US[4], which came into force in 2001 with the aim of promoting product and service exports between both countries. Each party shall progressively eliminate its customs duties over a period of ten years. Before this agreement, the two countries had signed an agreement for the creation of Qualifying Industrial Zones (QIZ) in 1998, which allowed products to enter the US duty-free if 35 percent of the appraised value was from Israel, Jordan, Egypt, or the West Bank and Gaza[5]. The decision to export under the FTA or QIZ framework depends on the rules of origin of each agreement. A similar FTA was signed by the US and Morocco[6] which came into force in 2006 and has a transition period of 18 years for the US and 25 years for Morocco. The FTA includes trade liberalisation for goods and

services. The agreement was signed after the end of the Multi-Fiber Agreement (MFA) on the 1st of January, 2005 and was seen by Morocco as an opportunity to diversify its economy. Hufbauer and Brunel (2009) analyse the agreement in detail.

More recently, Turkey has signed a number of FTAs with MENA countries. In particular, an FTA with Israel came into force in 1997, with Tunisia in 2005, with Morocco in 2006 and with Egypt and Syria in 2007. The content of the agreements is also quite similar to the content of the Euromed framework, though with minor differences, one being that each country has different transition periods to complete full liberalisation.[7] This shift in foreign policy in Turkey shows the new role that Turkey aims to play in Mediterranean relations, starting with ambitious trade integration plans in the region, (Balcer, 2013).

Apart from the bilateral agreements with Turkey, other varieties of South-South integration attempts have failed and efforts on behalf of the MENA countries have not been sufficient to develop successful arrangements[8]. In particular, Arab regional integration began in the 1950s after the creation of the Arab Common Market and under a number of treaties, conventions and councils[9], which had no impact and were unable to increase intra-regional trade. For this reason, a new attempt was made in 1964 with the signing of "The Arab Common Market Agreement", which sought to create a free trade area through the establishment of a common external tariff. Once again, this initiative failed to pave the way to further integration in the region, Broude (2009). Other attempts were "The Gulf Cooperation Council (GCC) "[10] in 1981 and "The Arab Maghreb Union"[11]. It was only in the 1990s, when Arab countries entered a new phase of South-South integration highlighting two relevant agreements, the Great Arab Free Trade Area (GAFTA) and the Agadir Agreement.

The GAFTA agreement was signed in 1997 by 14 Arab countries in order to create a free trade area among its members, with a gradual 10% annual reduction in tariffs and taxes between 1998 and 2007, so they will be totally eliminated in ten years. But with the aim of accelerating integration in the region, the Social Council of the Arab League announced full liberalisation for 2005. This agreement not only included the elimination of tariffs, but also all administrative, quantitative and safety and health barriers, which are not tariff-related. It also aimed to develop partnerships in the fields of technology, services, research and development and intellectual property among its members. It currently has 17 partners[12], but has not yet achieved the objectives of the agreement, mainly due to problems with the rules of origin, lack of mechanisms to solve disputes, high transport costs and generally higher non-tariff barriers. [13]

Within this context of Pan-Arab integration, Egypt, Jordan, Morocco and Tunisia signed the Agadir agreement in Rabat in 2004 to promote trade integration parallel to other projects.[14] The Agadir agreement entered into force in 2006 and aims to set up a free trade area between the signatory countries. The agreement establishes a free trade area and adopts the Pan-Euro-Med Rules of Origin, which allow the use of standardized inputs for the production of final goods from any country in the EU, EFTA or the signatories of the Agadir agreement itself to benefit from the exemption of tariffs with the EU. The agreement aims at providing full liberalisation of trade in industrial goods and agricultural products.

Another NS FTA came into force in 1997 between Israel and Canada. The agreement eliminates tariffs on all industrial products manufactured in both countries and also on a limited number of agricultural and fisheries products. Israel also concluded an FTA with Mexico that came into force in 2000 for industrial and some agricultural products.

Both parties agreed to eliminate customs duties for a list of products and, at the beginning of the following year, for the rest of products, completing full liberalisation in 2005. Finally, Jordan signed an FTA with Singapore in 2004, including industrial and agricultural goods. The agreement eliminates tariffs for imports from Jordan to Singapore since 2005, while tariffs for imports from Singapore are progressively reduced over a timeframe of 5 to 10 years. The agreement also gives the possibility of diagonal accumulation with countries that have concluded free trade agreements with Jordan and Singapore.

3. Empirical works analysing MENA integration

After describing the main integration processes in which MENA countries are involved, the central question that emerges is to what extent these processes have been successful in promoting trade and economic integration. While most of the research published focuses on other regions like the European Union, North America, Latin America and more recently Asia, relatively few studies have turned their attention to the impact of FTAs on MENA trade flows. Table 1 summarize the main studies that analyse the impact of the FTA on MENA trade using gravity models

Table 1: Ex-post studies analysing the impact of FTA on MENA Trade using gravity models.

Authors	Aim	Period	FTA inluded in the abovementioned research	Results: Impact			Estimation method
Nugent and Yousef, 2005	Analyse, why the MENA countries trade too little.	1970, 1975, 1980, 1985, 1990 and 1992 for 186 countries	ASEAN EU GCC AMU ACM	Exports Positive Negative NS Negative …	Imports Positive Negative NS Negative Positive	Pooled Positive Negative Negative Positive …	Tobit procedure (Maximum Likelihood)
Peridy, 2005a	Analyze the impact of the EU-Mediterranean partnership and their implications for ASEAN countries	1975-2001 Exports from MENA to 42 countries.	REGijt (Regional agreement between EU and MENA countries)	Positive			Gravity model with $\eta i+ \delta j +\psi t$
Peridy, 2005b	Estimate the potential of trade between Agadir members to show potential gains or limitations of the agreement.	1975-2001 Exports from Agadir members plus Algeria to 42 countries	Inverse proxy for tariffs and NTB between EU and MENA countries	Higher border effects and lack of complementarity that limit the benefits to the Agadir agreement. EU agreement postive but no significant for the dynamic ABB			Gravity model with $\eta i+ \delta j$
Ruiz and Villarubia, 2007	Analyse the impact of Euromed association agreements between EU and MENA countries and how the omission of time-varying multilateral trade resistance terms in the estimation of a gravity equation introduces important biases in the results	1976 to 2005 bilateral exports flows for a total of 102 countries	EU EUROMED	Negative Negative			Gravity model with $\eta i+ \delta j +\psi_t$
Abedini and Peridy, 2008	Analyze the impact of the GAFTA agreement on member trade	1988-2005 Bilateral Exports from 56 countries	GAFTA EU MERCOSUR NAFTA EUROMED	Positive Positive NS NS Negative			Gravity model with $\eta i+ \delta j +\psi t +\varphi_{ij}$
FEMISE, 2008	Analyse the GAFTA welfare and trade impact, 10 years after the implementation of this agreement	1988-2005 Bilateral Exports from 56 countries	Average bilateral tariffs EU NAFTA MERCOSUR EUROMED GAFTA	Negative Positive NS Positive Negative Positive			Gravity model with $\eta i+ \delta j +\psi_t +\varphi_{ij}$
De Wulf et al, 2009	Obtain the perception of the economic operators in the EU-MED region with respect to the present FTA and the prospects for future deeper integration	1970-2008 exports for 100 countries	EUMED AGADIR GAFTA US-Chile,US-Israel NAFTA, CAN, AFTA, EFTA PATCRA, CACM, CER, Mercosur, Euro	NS NS Positive NS Positive Positive NS NS NS			Gravity model with $\phi_{it}+\gamma_{jt}+\varphi_{ij}$

Authors	Aim	Period	FTA inluded in the abovementioned research	Results: Impact		Estimation method
Cieslik and Hagemejer, 2009	Analyse the impact of the new Eu association agreements with the MENA countries	1980-2004 Import and exports from 7 MENA countries to 196 countries	EUROMED EFTA Arab Maghreb Union GCC CEECs FTA American Partners Other arab FTA	Exports Negative NS Positive NS Positive NS Positive	Imports Positive Positive NS Positive Positive Positive NS	Gravity model with $\eta i+ \delta j +\psi t +\varphi_{ij}$
Bergstrand et al, 2011	Analyse how six EU FTA have impacted on european imports and exports	1966-2008 Total Import and exports for 176 countries	EU-Chile EU- Mexico EU- South Africa EU-Tunisia EU-Morocco EU-Jordan	Exports Positive NS NS Positive Positive Non sig	Imports NS Positive Non sig Non sig Non sig Non sig	Gravity model with $\eta i+ \delta j +\psi_t$
Montalbano and Nenci, 2012	An "ex ante" evaluation of the long-run "treatment" effect of ENP on the EU-MED Free Trade Area	1992-2008 Exports from 42 reporting countries and to 49 trading partners	EU members EA AA	Postive Positive Negative		Gravity model with $\eta i+ \delta j +\psi_t +\varphi_{ij}$

* Country dummy specific effects: ηi, δj ; temporal dummy: ψt ; country-pair dummy: φij ; and country and time dummy: ϕit , γjt
NS, means No significance

Kepaptsoglou et al. (2010) reviews empirical studies in the last 10 years that use gravity model specifications to analyse the impact of FTAs on international trade flows. In the literature that examines trade integration effects on MENA trade flows using gravity models, some studies exclusively focus on North-South integration, namely Peridy (2005a), Ruiz and Villarubia (2007), Bergstrand et al.(2011) and Montalbano and Nenci (2012) the rest include also South-South integration agreements. Overall, most of them only cover the late 1990s and early 2000s and analyse the impact of FTAs on exports alone using total values, not taking into account the nature of the agreements.

Peridy (2005a) analyses the impact of regional arrangements between the EU and seven Mediterranean countries for the period 1975-2001. He employs a gravity equation and uses different model estimators (Fixed effects, Random Effects, Hausman and Taylor Model and a dynamic estimation with GMM). His main findings indicate that the regional agreement between the EU and MENA countries has a positive and significant

impact on exports from MENA countries to the European Union in all estimations, with trade creation estimated at around 20%-27% for the static specifications and 36% in the dynamic version. Peridy (2005b) focuses on the effects of the Agadir agreement, analyzing the impact of the regional trade agreement between 5 MENA countries and the EU from 1975 to 2001. His results show that despite the fact that the Agadir Agreement reduced trade barriers, the high border effects and lack of complementarities meant that the countries involved in the Agadir agreement obtained a limited benefit in terms of higher trade flows. Abedini and Peridy (2008) measured the impact that the GAFTA agreement has had on improving the exports of 15 member countries from 1988 to 2005, obtaining a positive and significant correlation in all estimates. They estimated a trade creation effect of around 16-24 percent. Their study also evaluated the impact of the Association Agreements (AAs) with the European Union and the new Euromed agreement, obtaining a positive and significant effect for the AAs with the EU and a negative effect for the Euromed agreement. Cieslik and Hagemejer (2009) also analyze both NS and SS FTAs using an augmented gravity model to estimate FTA effects on imports and exports for seven MENA countries between 1980-2004. Similar to Peridy (2005a), they include county pair-specific effects and time-specific effects and present different specifications to check for robustness, including OLS, two-way fixed effects and first differences. According to their findings, the EU-Association Agreement with MENA countries has a positive and significant effect on MENA imports from the EU, but does not help to increase MENA exports to the EU. In the case of FTAs with North American partners, they find a positive and significant effect on imports and exports, whereas the parameter estimates for Arab FTAs are mostly not statistically significant. Individual effects for each MENA country are also estimated, showing mixed results. Bergstrand et al. (2011) study the impact of six trade agreements for the

European Union, including the FTA between the EU and Jordan, Morocco and Tunisia. They used a gravity model for bilateral trade flows among 176 pairs of countries for the period 1966-2008. Their results show that the FTAs have only improved exports from the EU to Tunisia and Morocco, but not in the opposite direction.

Our analysis is closely related to Cieslik and Hagemejer (2009) but with three important improvements. First, we include more recent years in the analysis and consider new FTAs which have come into force until 2010, allowing to compare the effect of NS and SS agreements and their impact on MENA imports and exports. Second, we differentiate between trade in industrial and agricultural products and estimate the effect of the agreements separately, which is reasonable given the remarkable differences in terms of trade liberalisation for these two types of products. Finally, another important addition to the previous literature is the use of up-to-date panel-data estimation techniques that allow us to isolate the impact of the agreements on bilateral trade and establish causality more accurately. In particular, we control for both the endogeneity of the trade agreement variable and multilateral resistance terms, as suggested by Baier and Bergstrand (2007).

4. Analytical Framework

The gravity model of trade, which is one of the most well accepted models used to explain bilateral trade flows, has been selected as the analytical framework in this paper. As reported in the previous section, it has been extensively used to estimate the impact of trade policy actions on bilateral trade flows.

The basic model states that trade between two countries is proportional to the product of there economies, which can be measured using their respective GDPs, and inversely

proportional to the distance between them, which is considered as a proxy for trade costs.

$$T_{ijt} = \alpha_0 Y_{it} Y_{jt} Dist_{ij} \quad (1)$$

This model has been augmented with other variables that may potentially affect trade between countries. More specifically, common language, colonial ties, common border and trade agreements are used as proxies for familiarity, information and reduction in artificial trade barriers. Typically, the gravity equation is specified in logarithmic linear form and is estimated using cross-section or panel data. According to the most recent literature, the use of panel data is highly recommended to control for the unobserved heterogeneity of various sources, the endogeneity of the FTAs and for multilateral resistance factors. Anderson and van Wincoop (2003) recommend accounting for "multilateral trade resistance" in the estimation of gravity equations. One way to control for this is to add time-varying, directional, country-specific dummies, because bilateral trade flows depend on bilateral trade costs relative to multilateral trade costs.

Another important issue is that trade policy is not strictly exogenous and consequently any analyses of the effects of free trade agreements using the gravity equation can suffer from endogeneity bias, as pointed out by Baier and Bergstrand (2007). These authors recommend the use of panel data regression techniques and the inclusion of bilateral fixed effects (dyadic fixed effects) to capture unobservable time-invariant bilateral factors that can affect trade flows. They also include exporter-and-time and importer-and-time fixed effects to capture unobservable time-varying "multilateral price/resistance" terms of the exporter and importer countries. The model that corrects for endogeneity bias and controls for multilateral resistance is given by,

$$\ln X_{ijt} = \beta_0 + \beta_1 FTA_{ijt} + \eta_{ij} + \delta_{it} + \psi_{jt} + \varepsilon_{ijt} \quad (2)$$

where η_{ij} denotes dyadic fixed effects, specified as dummy variables for each bilateral relationship and δ_{it} ,ψ_{jt} are exporter-and-time and importer-and-time fixed effects. The inclusion of these fixed effects implies that we are not able to identify income and distance effects, but the target variable, $FTA_{ijt,}$ which denotes free trade agreements and varies bilaterally and over time will be correctly identified.

The treatment of zeros and missing values in trade data is another important issue. Zero trade could be present due to rounding errors when the value of trade is very small or close to zero, there could be missing data that are recorded as zero, or that could also represent a real absence of trade between two countries. In the latter case, if we want to use the logarithmic form of the gravity equation, we need to be sure that these zero values do not include relevant information about the absence of trade between countries, because zero values will be dropped from the estimation and we would be losing valuable information. Hence, a good knowledge of the reason why there are zeros in our database is necessary in order to select the most appropriate estimation method. In our case, around 10 percent of values are missing and we test whether these values contain relevant information about the decision to trade between country pairs or whether they are only reporting errors (see Table A.2 and Table A.3 in Appendix). In order to do so, the following procedure is applied. First we try to identify how many zero trade flows are observed for several years in a row to determine the non-random nature of the zeros. What we find is that 63 percent of zeros are located between two positive trade flows in the previous and following years. We also use a Heckman's two-step procedure to determine whether our data display selection bias. In the first step we estimate a Probit equation using MLE, namely a selection equation, where we include an additional

variable[15] that we assume affects the decision to enter a foreign market, but not the amount exported. In the second step we use a panel data model to examine the effect of the independent variables on the amount of trade and we include the inverse mills ratio[16] obtained in the first step as an additional independent variable

Empirical Application

4.1 Data Description and Empirical Model

We use bilateral exports and imports from 10 MENA countries[17] to 61 destinations (see Table A.4 in Appendix), which represent around 90 percent of their total trade, bilateral imports have been computed in CIF prices and bilateral exports in FOB prices, both in thousands US dollars. Exports and imports are from the COMTRADE database for the period 1994-2010[18] using the Standard International Trade Classification (SITC), Revision 3. We use sectoral data to estimate the impact of FTAs on total non oil trade, agricultural and industrial trade flows separately. In order to obtain total non oil trade we use total trade subtracting mineral fuel and lubricants (code 3, SITC revision 3). For agricultural trade flows we took the "food" standard definition from COMTRADE that considers the sum of sections 0, 1, 22 and 4 from the SITC revision 3 classification as total agricultural trade flows and we calculate industrial trade using the standard definition of "manufactures" from COMTRADE that considers the sum of sections 5 60,61,62,63,64,65,66,67,69,7 and 8 from the SITC revision 3 classification. Table 2 presents summary statistics for the variables used.

Table 2. Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
total	20400	245662.9	912233	0	2.23e+07
manufactures	20400	195574.6	794462.5	0	2.14e+07
agricultural	20400	25780.94	86372.5	0	2069366

total means the observation for total trade less oil products and fuels, manufactures means all manufactured trade and agricultural means all trade of agricultural products.

As regards FTAs, we consider all FTAs that entered into force for the ten considered MENA countries during the period and one customs union (Turkey-EU). These agreements include five North-South agreements: EUROMED, EFTAMED, USAMED, Israel-Canada and the Turkey-EU customs union; and five South-South agreements: AGADIR, GAFTA, Turkey-MED, Israel-Mexico and Jordan-Singapore. The data on FTAs are obtained from the World Trade Organization database (See Table A.1 in Appendix , for a list of agreements with the country members and dates of their came into force).

The preferred model is a logarithmic version based on Anderson and van Wincoop (2003) proposed by Baier and Bergstrand (2007). We start by considering the most basic model specifications that account for both unobservable heterogeneity (time-invariant bilateral) and multilateral resistance, namely importer-and-time and exporter-and-time dummies as proposed by Baier and Bergstrand (2007). In this way we are able to control for all time-variant importer (δ_{it}) and exporter (ψ_{jt}) characteristics and for all bilateral time-invariant factors (η_{ij}) that affect bilateral trade between countries. The model specification is given by,

$$\ln T_{ijt} = \beta_0 + \beta_1 EUROMED_{ij,t} + \beta_2 EFTAMED_{Ij,t} + \beta_3 USAMED_{ij,t} + \beta_4 TURMED_{ij,t} + \beta_5 GAFTA_{ij,t} + \beta_6 AGADIR_{ij,t} + \beta_7 TUREU_{ij,t} + \beta_8 ISRCAN_{ij,t} + \beta_9 ISRMEX_{ij,t} + \beta_{10} JORSGP_{ij,t} + \eta_{ij} + \delta_{it} + \psi_{jt} + \varepsilon_{ijt} \quad (3)$$

We have two dependent variables, where T_{ijt} denotes, in a first estimation, exports (manufactured exports, total non oil exports and agricultural exports alternatively) from country *i* to country *j* in year *t,* and also denotes imports (manufactured imports, total non oil imports and agricultural imports alternatively) from country *i* to country *j* in

year *t* for a second estimation. The variables $EUROMED_{ij,t}$, $EFTAMED_{ij,t}$, $USAMED_{ij,t}$, $TURMED_{ij,t}$, $GAFTA_{ij,t}$, $AGADIR_{ij,t}$, $TUReu_{ij,t}$, $ISRCAN_{ij,t}$, $ISRMEX_{ij,t}$, and $JORSGP_{ij,t}$ are FTA dummy variables which take a value of 1 when the importer *i* and exporter *j* are both members of the agreement, starting the year in which it came into force. η_{ij} is a country-pair fixed effect and δ_{it} and ψ_{jt} are importer-and-time and exporter-and-time fixed effects[19].

A second specification introduces the first lag of the FTA variable and a third includes the second lag in addition to the first, in this way the delayed effects of the agreements are taken into account.

The next section presents the results of the estimation and discusses the effect that each agreement has had on bilateral trade flows for MENA countries.

4.2 Estimations and Results

The results of the Heckman two-step estimation show that after including the inverse Mills ratio in the estimations, most estimated coefficients stay almost the same in terms of sign and magnitude and we consequently conclude that correction is not necessary (see Table A.3 in Appendix). The model is estimated using fixed effects after rejecting the null hypothesis of the Hausman test (orthogonality between the regressors and the bilateral unobserved heterogeneity). The main results are displayed in Tables 3 and 4 for manufactured, total non oil and agricultural imports and exports, respectively. Results for GAFTA and AGADIR are only estimated using import values because after comparing the export and import values reported by MENA countries we found greater differences between the value of imports at CIF prices and exports valued at FOB prices, imports sometimes recording values that were 300 or 500 percent higher than

export values. These differences cannot be explained by costs, insurance and freight alone, but rather are measurement errors. Therefore, to analyse the effect of intra-Arab agreements in which all the countries reported are also partners, we only use the value of imports among member countries of these agreements. Results from the first specification are in Table 3 for manufactures, total non oil trade and agricultural imports and exports, respectively. Results from the second specification including a lagged variable for each FTA, results from the third specification including two lagged variables and specification four, which controls for strict exogeneity by including two lagged values and one lead value of FTA, are Table 8 for manufactures, agricultural and total non oil products.

Table 4 presents the average treatment effect (ATE) of each FTA for manufactured and agricultural products, where ATE is the sum of all statistically significant coefficient estimates of each FTA. For a complete table with all the coefficients estimates from the equation see Table A.6, A.7 and A.8 in Appedix.

When discussing the results of a specific FTA, MENA countries or the MENA region refers to all MENA countries that are members of the agreement in question, but not all the MENA countries included in the study.

Table 3. Panel gravity equations with bilateral fixed and country-and-time effects

	Manufactures (1)		Total (1)		Agricultural (1)	
	Imp	Exp	Imp	Exp	Imp	Exp
EUROMEDij,t	0.282***	-0.336***	0.234***	-0.262**	-0.184	-0.219
	(0.088)	(0.129)	(0.078)	(0.125)	(0.120)	(0.134)
EFTAMEDij,t	0.315	-0.221	0.163	-0.158	0.330	-0.046
	(0.227)	(0.269)	(0.221)	(0.228)	(0.397)	(0.384)
USAMEDij,t	0.347	1.642	-0.018	1.487*	0.338	0.473
	(0.514)	(1.076)	(0.318)	(0.885)	(0.416)	(0.518)
TURMED ij,t	0.387*	0.163	0.383**	-0.114	-0.219	0.505
	(0.206)	(0.307)	(0.157)	(0.488)	(0.184)	(0.562)
GAFTA ij,t	-0.067		-0.179		0.561*	
	(0.400)		(0.353)		(0.338)	
AGADIR ij,t	-0.086		0.153		0.543	
	(0.220)		(0.161)		(0.386)	
TUREU ij,t	0.415**	0.562**	0.450**	0.388	0.692***	-0.164
	(0.192)	(0.274)	(0.206)	(0.263)	(0.258)	(0.196)
ISRCAN ij,t	0.407***	-0.049	0.234	-0.162	-0.347	-0.710**
	(0.145)	(0.236)	(0.161)	(0.199)	(0.386)	(0.277)
ISRMEX ij,t	0.852***	-0.518	0.345	-0.094	-0.450	0.522
	(0.310)	(0.387)	(0.399)	(0.430)	(0.429)	(0.487)
JORSGP ij,t	-0.001	0.197	0.095	0.307	1.388***	-2.125***
	(0.164)	(0.316)	(0.132)	(0.358)	(0.256)	(0.563)
Nobs	9274	9103	9351	9200	8577	7955
Within R2	0.472	0.294	0.504	0.283	0.332	0.257
rmse	0.697	1.034	0.642	0.958	1.025	1.054
ll	-9247.772	-12651.71	-8558.05	-12092.32	-11812.2	-11126.96

***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below the coefficients. eumed denotes the FTA between MENA countries involved in the agreement and the EU, eftamed denotes the FTA between MENA countries involved in the agreement and EFTA countries, USAmed denotes the FTA between Morocco and Jordan, turmed denotes the FTA between MENA countries involved in the agreement and Turkey, gafta denotes the FTA between Arab counties involved in the Great Arab Free Trade Area, agadir denotes the Agadir agreement between Morocco, Tunisia, Egypt and Jordan. TUReu denotes the custom union between the EU and Turkey, ISRCAN denotes the FTA between Israel and Canada, ISRMEX denotes the FTA between Israel and Mexico and JORSGP denotes the FTA between Jordan and Singapore.

Table 4. Average treatment effect (ATE) of an FTA between a country pair for manufactured products

	Manufactures								Agricultural							
Variable	Imp (1)	Imp (2)	Imp (3)	Imp (4)	Exp (1)	Exp (2)	Exp (3)	Exp (4)	Imp (1)	Imp (2)	Imp (3)	Imp (4)	Exp (1)	Exp (2)	Exp (3)	Exp (4)
EUROMEDij,t	0.282***	0.310***	0.299***	0.131	-0.336***	-0.236*	-0.233*	-0.330***	-0.184	-0.267**	-0.250*	-0.373***	-0.219	-0.141	-0.171	-0.130
EUROMEDij,t-1		-0.043	-0.028	-0.010		-0.121	0.043	0.033		0.081	0.108	0.121		-0.050	0.078	0.065
EUROMEDij,t-2			-0.026	-0.021			-0.182*	-0.243**			-0.042	-0.010			-0.173	-0.123
EUROMEDij,t+1				0.218**				0.061				0.170				-0.023
Total ATE	0.282	0.310	0.299	0.218	-0.336	-0.236	-0.415	-0.573		-0.267	-0.250	-0.373				
EFTAMEDij,t	0.315	0.056	0.005	0.336	-0.221	-0.333*	-0.288	0.015	0.330	0.318	0.258	0.052	-0.046	-0.004	-0.006	-0.128
EFTAMEDij,t-1		0.341	0.548	0.593		0.193	-0.320	-0.346		0.016	0.221	0.283		-0.123	0.086	0.115
EFTAMEDij,t-2			-0.263	-0.272			0.602*	0.631*			-0.281	-0.315			-0.239	-0.242
EFTAMEDij,t+1				-0.374				-0.332				0.235				0.125
Total ATE						-0.333	0.602	0.631								
USAMEDij,t	0.347	-0.332	-0.370	0.003	1.642	0.796	0.852	0.678***	0.338	0.743***	0.768***	0.496***	0.473	0.133	0.188	0.361
USAMEDij,t-1		0.726	0.718	0.681		1.038**	0.158	0.154		-0.422	-0.358	-0.373		0.439**	0.223	0.217
USAMEDij,t-2			-0.001	0.029			1.053***	1.176***			-0.060	-0.156			0.275	0.263
USAMEDij,t+1				-0.404				0.242				0.304				-0.187
Total ATE						1.038	1.053	1.854		0.743	0.768	0.496		0.439		
TURMEDij,t	0.387*	0.252*	0.202	0.181	0.163	0.150	0.165	0.184	-0.219	-0.277	-0.350*	-0.157	0.505	0.523	0.532	0.641*
TURMEDij,t-1		0.1	-0.021	-0.012		0.136	0.112	0.110		0.020	-0.050	-0.034		0.024	-0.294	-0.324
TURMEDij,t-2			0.129	0.202			0.052	-0.021			0.033	0.010			0.501	0.307
TURMEDij,t+1				0.044				-0.070				-0.283				-0.130
Total ATE	0.387	0.252									-0.350					0.641
GAFTAij,t	-0.067	-0.126	0.036	-0.017					0.561*	-0.233	-0.193	-0.276				
GAFTAij,t-1		0.477*	0.003	0.011						0.817**	-0.088	-0.084				
GAFTAij,t-2			0.435*	0.434*							0.914***	0.919***				
GAFTAij,t+1				0.103								0.115				
Total ATE		0.477	0.435	0.434					0.561	0.817	0.914	0.919				
ISRCANij,t	0.407***	0.502***	0.497**	0.488**	-0.049	0.192	0.320*	0.310	-0.347	-0.967***	-1.780***	-1.798***	-0.710**	-0.215	-0.142	-0.141
ISRCANij,t-1		-0.132	-0.294*	-0.290*		-0.096	-0.005	0.004		1.193***	1.268***	1.256***		-0.322	-0.149	-0.150
ISRCANij,t-2			0.176	0.222			-0.099	-0.136			-0.112	-0.048			-0.184	-0.197
ISRCANij,t+1																
Total ATE	0.407	0.502	0.203	0.198			0.320			0.226	-0.512	-0.542	-0.710			
ISRMEXij,t	0.852***	1.617***	1.836***	1.074***	-0.518	-0.306	-0.309	-0.052	-0.450	-0.784	-0.391	-1.024**	0.522	-0.233	-0.410*	-0.417**
ISRMEXij,t-1		-0.862*	-0.372	-0.355		-0.398	-0.433*	-0.432*		0.714*	-0.037	-0.033		0.424	-0.581*	-0.615**
ISRMEXij,t-2			-0.541	-0.548*			0.032	0.056			0.826**	0.801**			1.121***	1.106***
ISRMEXij,t+1				0.986***				-0.391				0.816				0.039
Total ATE	0.852	0.755	1.836	0.526			-0.433	-0.432		0.714	0.826	-0.223			0.130	0.074
JORSGPij,t	-0.001	0.024	-0.008	-0.418***	0.197	-0.086	0.068	0.329	1.388***	1.809***	1.784***	0.526*	-2.125***	-0.559	-0.389	0.325
JORSGPij,t-1		-0.008	0.400**	0.417**		0.492*	0.851***	0.857***		-0.476	-0.370	-0.358		-1.845**	-0.504	-0.496
JORSGPij,t-2			-0.513**	-0.479**			-0.461	-0.403			-0.147	-0.152			-1.679**	-1.324*
JORSGPij,t+1				0.454**				-0.301				1.413***				-0.813**
Total ATE			-0.113	-0.443		0.492	0.851	0.857	1.388	1.809	1.784	1.939	-2.125	-1.845	-1.679	-2.137

*ATE is the sum of all statistically significant estimates of each FTA. "ns" means that coefficients are not significant. (1) are regressions with only FTA (t),, (2) are regressions with FTA(t) and FTAt-1, (3) are regressions with FTA(t) FTAt-1 and FTAt-2 and (4) with FTA(t) FTAt-1 and FTAt-2 and FTA(t+1)

As expected, the results in Table 3 indicate that the Euromed FTA has a positive and significant impact on MENA imports from EU countries and negative and significant effect for MENA exports to the EU. Both results are similar to those in Cieslik and Hagemejer (2009), who obtained that the FTA decreases MENA exports to Europe by 19 percent and increases MENA imports from Europe by 41 percent. The agreement has been especially beneficial for manufactured imports from the EU (Table 3, column 1), indicating that the presence of an FTA between the EU and Euromed partners increases manufactured imports by 32.6^{20} percent, other factors remaining constant. When we add lagged variables to capture the delayed effect of the FTA (See Table 4), we observe that the average treatment effect remains very similar to the coefficients without lagged variables. Indeed, the lagged variables are not statistically significant in the case of imports. It is worth noting that liberalisation for industrial European products started when the agreement came into force and particularly after the second, fourth, and fifth years of the FTA up until full liberalisation twelve years later, and only two lagged variables of the Euromed FTA are not enough to capture the delayed effect of the agreement. Despite this, the total effect of the FTA is captured when it came into force in year t. When we test for strict exogeneity by adding forward FTA values and observe that changes in $EUMED_{ij,t+1}$ are correlated with actual trade, we consider that it is the expected outcome because despite the absence of trade liberalisation for European exports to the MENA countries before the Euromed FTA, Europe was already the first exporter in the region. As regards MENA industrial exports to EU markets, they had already been liberalized under previous bilateral cooperation agreements at the beginning of the 70s, so the new trade agreement should not be reason to increase MENA industrial exports to the EU. The negative and statistically significant impact that we obtain of the FTA on MENA exports to European markets due to the increase in

European manufactured imports to local markets after the liberalisation of European imports, and the consequently stronger competition faced by MENA firms. In this context, some local firms are no longer productive and tend to disappear, negatively affecting MENA exports. This effect increased when we included the lagged effect of the agreement, reflecting a higher negative effect two years after the agreement came into force, revealing an adjustment effect.

For the EFTAMED agreement, we found a statistically positive impact on MENA manufactured exports. Table 4 shows that this effect appears two years after the agreement came into force. The liberalisation schedule of the agreement is quite similar to Euromed and MENA exports were duty free when the agreement for industrial products came into force, while EFTA exports shall be progressively liberalized. Hence, the positive effect obtained for the second lagged value of the FTA could be explained as follows: the agreement has an effect on trade two years after it comes into force.

The FTA concluded between the USA and Jordan and later with Morocco have a positive and significant effect on MENA exports (see Table 4). Similar to the effect obtained for the EFTAMED agreement, the second lagged variable of the FTA is statistically significant, meaning the effect appears two years after the FTA came into force. Due to the adaptation of Jordan exports from QIZ to the new FTA. The USA FTA includes trade liberalisation for certain agricultural products and has been very beneficial to US agricultural products. In fact, the FTA has increased MENA imports from the USA by 110 percent and MENA exports to the USA by 55 percent. As Hufbauer and Brunel (2009) show, the FTA has been very beneficial for traditional US agricultural exports like wheat, corn and oilseeds, but also for other products linked to the FTA, such as livestock feed, dairy products, fruit and vegetables and live animals

for breeding and for Morocco exports of Miscellaneous edible products and preparations; Essential oils and resinoids and perfume materials and Fish (not marine mammals), crustaceans, molluscs but trends remain very similar to those before the agreement.

In relation to the effect of the FTA between some MENA countries and Turkey, the results in Table 3 show that it has a positive and significant impact on imports from Turkey and a positive but not significant effect on manufactured MENA exports. The FTA with Turkey has a similar nature to those with the EU. Customs duties for MENA industrial products were abolished in Turkey with the entry into force of the agreement, but results do not show that the increase in MENA exports in Turkey is caused by the agreement. Furthermore, some Turkish industrial products entered MENA countries duty free after the agreement came into force and others will be progressively liberalized. Our results show that Turkey exports to MENA countries increased by around 47 percent when the agreement came into force.

When the agreement between Israel and Canada came into force, tariffs on all industrial products manufactured in Canada and Israel were eliminated as well as on a limited number of agricultural and fisheries products. The results show that the FTA increased manufactured Israeli imports from Canada by around 23 percent[21] and Israeli exports by around 37 percent. The Israel-Mexico free trade agreement included liberalisation for industrial and agricultural products when the agreement came into force. The findings in Table 4 show that the FTA concluded between both countries increased Mexican manufactured and agricultural exports and negatively affected Israeli manufactured exports, but had a positive impact on agricultural exports the year after the agreement came into force.

The agreement between Jordan and Singapore included trade liberalisation for manufactured and agricultural products. In our analysis we found that the agreement decreased MENA manufactured imports from Singapore, but increased agricultural imports. After analysing the make-up of MENA agricultural imports and comparing it to the agricultural products included in the agreement, we found that this increase is due to the reduction in tariffs on agricultural preparations, cereals, spices and palm oil, all of which are included in the FTA. In addition, the FTA has a positive and significant impact on Jordan manufactured exports, but negatively affects agricultural exports.

Regarding the effect of intra-Arab integration, we analyse the effect of the GAFTA agreement and the Agadir agreement. The GAFTA free trade agreement involves trade liberalisation for all products. As observed in Table 8, the GAFTA FTA has a positive and significant effect on trade two years after the agreement came into force, collecting the phased effect of liberalisation, since tariffs were reduced by an annual 10% until 2005, when liberalisation was fully completed. This result is similar to that obtained by Abedini and Peridy (2008). We also find that the FTA has a positive impact on agricultural products (as shown in Table 4).

In relation to the Agadir agreement, the results do not show any impact on manufactured or agricultural imports, as we can see in Table 4. One reason could be that the period analysed is too short and includes a period of economic crisis.

5. Conclusions

This paper investigates the impact of several North-South and South-South FTAs on trade flows for ten MENA countries during the period 1994-2010. We use an augmented gravity model which we estimate using up-to-date panel data techniques that

allow us to control for all the factors that influence bilateral trade and which are time-invariant (unobserved heterogeneity), as well as for the so-called multilateral resistance terms. We undertake the analysis not only for aggregate trade but also for trade in industrial products and trade in agricultural products separately.

The results presented show that both NS-FTA and SS-FTA have a similar impact on trade in MENA countries showing a greater global market integration. We found in general that FTAs that include agricultural products, which is where they have the greatest comparative advantage and could help to restructure their trade balance, are more desirable for MENA countries than those that only include industrial products. Therefore, MENA countries need special attention when negotiating future agreements. Efforts towards establishing better integration among Arab countries show satisfactory progress. The Great Arab Common Market (GAFTA) in particular has been fruitful to help to increase bilateral trade between Arab countries, while we do not find the same effect in the case of the Agadir agreement because it was implemented too recently for a consistent evaluation. This turn towards greater Arab integration represents new opportunities for Arab countries to promote dialogue between them and establish new economic opportunities in the region.

In the case of Euromed integration the results show that the FTA promotes EU exports to MENA countries, but does not have a positive impact on MENA exports to the EU. Despite this fact, Europe is still the most important trading partner of some MENA countries and a reduction in the trade imbalance between the two regions is desirable. While settlement negotiations do not include trade liberalisation in agricultural products, where MENA countries are more competitive, MENA countries need to orient their industrial policy to profit from tariff reductions in intermediate inputs to increase their productivity and be more competitive in international markets.

In this context, new partners for MENA countries, like Turkey, appear in the Mediterranean relationship context, where the FTA has fostered increases in Turkish manufactured exports to the MENA region. FTAs with the USA also promote industrial exports to the USA and increase agricultural imports to MENA countries, especially wheat. The rest of the FTAs show how the inclusion of agricultural products in the liberalisation is fairer for MENA countries than only including industrial products, as in the case of Euromed or the FTA signed with Turkey.

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APPENDIX

Table A.1. List of FTA and country members

FTA	Country (i)	Year of entry into force (t)	Full liberalisation	Country (j)
EUMED	Tunisia Israel Morocco Jordan Egypt Algeria Lebanon	1998 2000 2000 2002 2004 2005 2006	12 years after the FTA came into force plus 3 years of derogation beyond the initial transitional period. 4 for Egypt	Since 1995: Belgium, Germany, France, Luxemburg, Italy, Netherlands, United Kingdom, Ireland, Denmark, Greece, Spain, Portugal, Austria, Sweden and Finland. (UE15) Since 2004: Cyprus, Czech Republic, Estonia, Hungry, Lithuania, Latvia, Malta, Poland, Slovak Republic y Slovenia. (UE25) Since 2007: Rumania y Bulgaria (UE27)
EFTAMED	Morocco Jordan Tunisia Lebanon Egypt	1999 2002 2005 2007 2007	12 years after the came into force	Iceland, Liechtenstein, Norway and Switzerland
USAMED*	Jordan Morocco	2001 2006	2010 14 years after the FTA came into force for Morocco and 24 years for USA	United States
TURMED	Israel Tunisia Morocco Egypt Syria	1997 2005 2006 2007 2007	2000 2014 2015 2020 2019	Turkey
GAFTA	Egypt Tunisia Morocco Jordan Libya Lebanon Algeria Syria	1998 1998 1998 1998 1998 1998 1998 1998	Full liberalisation in 2005	Arabia Saudi, Algeria, Egypt, Arab Emirates, Iraq, Libya, Jordan, Kuwait, Lebanon, Morocco, Syria, Tunisia
ISR*	Israel	1997 2000	1999 2005	Canada Mexico
JORSGP	Jordan	2005	2015	Singapore
AGADIR	Morocco Jordan Egypt Tunisia	2006 2006 2006 2006	2006	Morocco, Jordan, Egypt, Tunisia
TUREU	Turkey	1996	1996	EU27

It is worth mentioning that an FTA between Israel and US came into force in 1985, however our period of analysis starts in 1990. Therefore, we cannot estimate the effect of this agreement.

Table A.2. Description of zero trade flows

Variable	Missing	Total	% Missing
manufactures	1,849	20,400	9.06
total	2,023	20,400	9.92
agricultural	3,868	20,400	18.96

Table A.3. Dealing with Zero Trade. Heckman Procedure.

	1st step (xtprobit)	2nd step (OLS)	1st step (xtprobit)	2nd step (OLS)	OLS without lambda	OLS without lambda
	(Imports)	(Imports)	(Exports)	(Exports)	(Imports)	(Exports)
lyp	0.260**	0.654***	0.416***	1.016***	0.636***	0.983***
	(0.102)	(0.017)	(0.094)	(0.026)	(0.017)	(0.026)
lyr	0.634***	1.366***	0.559***	1.041***	1.323***	0.994***
	(0.076)	(0.014)	(0.067)	(0.019)	(0.014)	(0.018)
ld	0.103	-1.173***	-0.034	-0.921***	-1.198***	-0.941***
	(0.134)	(0.024)	(0.122)	(0.035)	(0.024)	(0.035)
lycp	-0.050	0.046	-0.324**	0.399***	0.041	0.429***
	(0.150)	(0.029)	(0.139)	(0.043)	(0.029)	(0.042)
lycr	0.507***	0.190***	0.569***	0.165***	0.124***	0.112***
	(0.105)	(0.022)	(0.096)	(0.033)	(0.022)	(0.032)
border	-1.099**	-1.571***	-1.031**	-0.523***	-1.003***	-0.239
	(0.518)	(0.137)	(0.488)	(0.156)	(0.131)	(0.151)
lang	-0.709**	0.126**	-0.139	1.239***	0.341***	1.321***
	(0.305)	(0.056)	(0.295)	(0.077)	(0.055)	(0.076)
colony	0.568	0.441***	1.269*	0.962***	0.288**	0.872***
	(0.695)	(0.120)	(0.704)	(0.143)	(0.120)	(0.143)
fta	0.666***	0.407***	1.095***	0.840***	0.361***	0.750***
	(0.110)	(0.042)	(0.119)	(0.066)	(0.043)	(0.064)
samereligion	-0.847***		-0.756***			
	(0.294)		(0.281)			
lambda		1.860***		1.579***		
		(0.134)		(0.235)		
Constant	-24.739***	-35.269***	-24.477***	-42.564***	-32.753***	-40.000***
	-2.553	(0.560)	-2.290	(0.894)	(0.529)	(0.810)
N.Obs	10190	9265	10190	9097	9265	9097

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below coefficients

Table A.4. Country list

United Arab Emirates	France	Morocco
Argentina	United Kingdom	Mexico
Australia	Greece	Malta
Austria	Hong Kong	Netherlands
Belgium-Luxemburg	Hungary	Norway
Bulgaria	Indonesia	New Zealand
Brazil	India	Poland
Canada	Ireland	Portugal
Switzerland	Iran	Romania
Chile	Iceland	Russia
China	Israel	Saudi Arabia
Cyprus	Italy	Singapore
Czech Republic	Jordan	Slovakia
Germany	Japan	Slovenia
Denmark	Korea, Republic	Sweden
Algeria	Kuwait	Syria
Egypt	Lebanon	Thailand
Spain	Libya	Tunisia
Estonia	Lithuania	Turkey
Finland	Latvia	Ukraine
		United States

Table A.5. Data Description

Variables	Description	Measure	Data Source
Dependent Variable			
Imp, Exp (Manufactures)	Manufactured Imports / Exports (SITC.rev3)	In thousands of US dollars	COMTRADE (United Nations Commodity Trade Statistics Database)
Imp, Exp (Total)	Total imports less fuel (cod.3 SITC rev.3)		
Imp, Exp (Agricultural)	Agricultural exports SITC. rev3 (Product codes: 0, 1, 22 and 4		
Independent Variable			
FTAij,t	This variable takes a value of 1 when countries i and j are both member of the agreement (as describe in Table 1)	Dummy variable	WTO (www.wto.org)
lyp	Partner GDP	PPP current thousand US dollars	IMF and World Development Indicators dataset
lyr	Reporter GDP		
lycp	Partner GDP per capita		
lycr	Reporter GDP per capita		
ld	Distance from the countries' capital i and j	Kilometres	CEPII dataset
border	This variable takes a value of 1 when both countries have a common border, zero otherwise	Dummy variable	
lang	This variable takes a value of 1 when both countries have the same language, zero otherwise		
fta	This variable takes a value of 1 when both countries have a fta, zero otherwise		WTO (www.wto.org)
colony	This variable takes a value of 1 when both countries have colonial ties, zero otherwise		CEPII dataset
samereligion	This variable takes a value of 1 when both countries have the same religion, zero otherwise		

Table A.6. Panel gravity equations with bilateral fixed and country-and-time effects comparing with one lagged, two lagged and one lead variables of FTA, for manufactured trade.

	Manufactures (2)		Manufactures (3)		Manufactures (4)	
	Imports	Exports	Imports	Exports	Imports	Exports
EUMEDij,t	0.310***	-0.236*	0.299***	-0.233*	0.131	-0.330***
	(0.084)	(0.135)	(0.086)	(0.135)	(0.088)	(0.122)
EUMEDij,t-1	-0.043	-0.121	-0.028	0.043	-0.01	0.033
	(0.074)	(0.113)	(0.073)	(0.114)	(0.073)	(0.115)
EUMEDij,t-2			-0.026	-0.182*	-0.021	-0.243**
			(0.072)	(0.110)	(0.070)	(0.110)
EUMEDij,t+1					0.218**	0.061
					(0.084)	(0.143)
EFTAMEDij,t	0.056	-0.333*	0.005	-0.288	0.336	0.015
	(0.406)	(0.181)	(0.401)	(0.185)	(0.345)	(0.211)
EFTAMEDij,t-1	0.341	0.193	0.548	-0.320	0.593	-0.346
	(0.501)	(0.314)	(0.485)	(0.397)	(0.475)	(0.400)
EFTAMEDij,t-2			-0.263	0.602*	-0.272	**0.631***
			(0.275)	(0.325)	(0.206)	(0.324)
EFTAMEDij,t+1					-0.374	-0.332
					(0.269)	(0.218)
USAMEDij,t	-0.332	0.796	-0.370	0.852	0.003	0.678***
	(0.305)	(0.687)	(0.325)	(0.725)	(0.139)	(0.199)
USAMEDij,t-1	0.726	1.038**	0.718	0.158	0.681	0.154
	(0.480)	(0.491)	(0.732)	(0.407)	(0.702)	(0.404)
USAMEDij,t-2			-0.001	1.053***	0.029	1.176***
			(0.544)	(0.163)	(0.541)	(0.159)
USAMEDij,t+1					-0.404	0.242
					(0.333)	(0.672)
TURMEDij,t	0.252*	0.150	0.202	0.165	0.181	0.184
	(0.137)	(0.294)	(0.132)	(0.290)	(0.133)	(0.150)
TURMEDij,t-1	0.1	0.136	-0.021	0.112	-0.012	0.110
	(0.151)	(0.142)	(0.117)	(0.137)	(0.117)	(0.139)
TURMEDij,t-2			0.129	0.052	0.202	-0.021
			(0.169)	(0.219)	(0.163)	(0.196)
TURMEDij,t+1					0.044	-0.070
					(0.175)	(0.262)
GAFTAij,t	-0.126		0.036		-0.017	
	(0.257)		(0.224)		(0.274)	
GAFTAij,t-1	0.477*		0.003		0.011	
	(0.282)		(0.238)		(0.238)	
GAFTAij,t-2			0.435*		0.434*	
			(0.245)		(0.247)	
GAFTAij,t+1					0.103	
					(0.369)	
AGADIRij,t	-0.292		-0.151	-0.282	-0.069	-0.083
	(0.228)		(0.188)	(0.232)	(0.168)	(0.175)
AGADIRij,t-1	0.259		0.086	0.149	0.088	0.159
	(0.225)		(0.151)	(0.193)	(0.152)	(0.193)
AGADIRij,t-2			0.22	0.173	0.185	0.113
			(0.146)	(0.219)	(0.144)	(0.217)
AGADIRij,t+1					-0.089	-0.245
					(0.230)	(0.274)
TUREUij,t	0.629***	0.458	0.559**	0.435	0.352	-0.054
	(0.186)	(0.304)	(0.224)	(0.347)	(0.324)	(0.263)
TUREUij,t-1	-0.287*	0.027	-0.337	0.128	-0.297	0.122
	(0.168)	(0.153)	(0.209)	(0.160)	(0.212)	(0.166)
TUREUij,t-2			0.037	-0.102	0.081	-0.116
			(0.176)	(0.157)	(0.173)	(0.161)
TUREUij,t+1					0.266	0.544**
					(0.284)	(0.270)
ISRCANij,t	0.502***	0.192	0.497**	0.320*	0.488**	0.310
	(0.176)	(0.219)	(0.246)	(0.193)	(0.244)	(0.193)
ISRCANij,t-1	-0.132	-0.096	-0.294*	-0.005	-0.290*	0.004
	(0.179)	(0.234)	(0.150)	(0.282)	(0.15)	(0.283)
ISRCANij,t-2			0.176	-0.099	0.222	-0.136
			(0.137)	(0.301)	(0.138)	(0.294)
ISRCANij,t+1					omitted	omitted
ISRMEXij,t	1.617***	-0.306	1.836***	-0.309	1.074***	-0.052
	(0.381)	(0.624)	(0.409)	(0.520)	(0.414)	(0.516)
ISRMEXij,t-1	-0.862*	-0.398	-0.372	-0.433*	-0.355	-0.432*
	(0.479)	(0.516)	(0.385)	(0.252)	(0.375)	(0.251)
ISRMEXij,t-2			-0.541	0.032	-0.548*	0.056
			(0.336)	(0.425)	(0.327)	(0.468)
ISRMEXij,t+1					0.986***	-0.391
					(0.320)	(0.307)
JORSGPij,t	0.024	-0.086	-0.008	0.068	-0.418***	0.329
	(0.201)	(0.416)	(0.192)	(0.389)	(0.130)	(0.214)
JORSGPij,t-1	-0.008	0.492*	0.400**	0.851***	0.417**	0.857***
	(0.191)	(0.297)	(0.167)	(0.322)	(0.166)	(0.320)
JORSGPij,t-2			-0.513**	-0.461	-0.479**	-0.403
			(0.205)	(0.430)	(0.221)	(0.398)
JORSGPij,t+1					0.454**	-0.301
					(0.222)	(0.388)
Nobs	8807	865	8319	8182	7759	7624
Within R2	0.461	0.282	0.462	0.275	0.447	0.267
rmse	0.694	1.022	0.681	1.008	0.67	0.995
ll	-8741.198	-11928.11	-8093.69	-11159.34	-7423.308	-10292.01

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below coefficients

Table A.7. Panel gravity equations with bilateral fixed and country-and-time effects comparing with one lagged, two lagged and one lead variables of FTA, for agricultural trade.

	Agricultural (2)		Agricultural (3)		Agricultural (4)	
	Imports	Exports	Imports	Exports	Imports	Exports
EUMEDij,t	-0.267**	-0.141	-0.250*	-0.171	-0.373***	-0.13
	(0.129)	(0.138)	(0.131)	(0.143)	(0.132)	(0.14)
EUMEDij,t-1	0.081	-0.050	0.108	0.078	0.121	0.065
	(0.128)	(0.137)	(0.154)	(0.145)	(0.155)	(0.145)
EUMEDij,t-2			-0.042	-0.173	-0.010	-0.123
			(0.141)	(0.145)	(0.142)	-0.142
EUMEDij,t+1					0.170	-0.023
					(0.14)	(0.138)
EFTAMEDij,t	0.318	-0.004	0.258	-0.006	0.052	-0.128
	(0.322)	(0.285)	(0.326)	(0.294)	(0.348)	(0.312)
EFTAMEDij,t-1	0.016	-0.123	0.221	0.086	0.283	0.115
	(0.216)	(0.189)	(0.263)	(0.251)	(0.261)	(0.258)
EFTAMEDij,t-2			-0.281	-0.239	-0.315	-0.242
			(0.276)	(0.331)	(0.300)	(0.357)
EFTAMEDij,t+1					0.235	0.125
					(0.398)	(0.292)
USAMEDij,t	0.743***	0.133	0.768***	0.188	0.496***	0.361
	(0.255)	(0.493)	(0.232)	(0.536)	(0.178)	(0.376)
USAMEDij,t-1	-0.422	0.439**	-0.358	0.223	-0.373	0.217
	(0.280)	(0.204)	(0.243)	(0.205)	(0.257)	(0.207)
USAMEDij,t-2			-0.060	0.275	-0.156	0.263
			(0.179)	(0.229)	(0.181)	(0.229)
USAMEDij,t+1					0.304	-0.187
					(0.257)	(0.301)
TURMEDij,t	-0.277	0.523	-0.350*	0.532	-0.157	0.641*
	(0.181)	(0.593)	(0.203)	(0.546)	(0.129)	(0.369)
TURMEDij,t-1	0.02	0.024	-0.050	-0.294	-0.034	-0.324
	(0.334)	(0.289)	(0.307)	(0.43)	(0.299)	(0.422)
TURMEDij,t-2			0.033	0.501	0.010	0.307
			(0.208)	(0.445)	(0.238)	(0.372)
TURMEDij,t+1					-0.283	-0.130
					(0.283)	(0.682)
GAFTAij,t	-0.233		-0.193		-0.276	
	(0.479)		(0.484)		(0.568)	
GAFTAij,t-1	0.817**		-0.088		-0.084	
	(0.391)		(0.398)		(0.399)	
GAFTAij,t-2			0.914***		0.919***	
			(0.317)		(0.319)	
GAFTAij,t+1					0.115	
					(0.475)	
AGADIRij,t	0.457		-0.234	0.286	-0.031	0.406
	(0.418)		(0.396)	(0.43)	(0.274)	(0.384)
AGADIRij,t-1	0.075		-0.027	0.131	-0.03	0.126
	(0.411)		(0.236)	(0.31)	(0.237)	(0.31)
AGADIRij,t-2			0.613***	-0.063	0.623***	0.117
			(0.183)	(0.351)	(0.18)	(0.34)
AGADIRij,t+1					-0.191	-0.147
					(0.350)	(0.393)
TUREUij,t	1.220***	-0.081	1.490***	-0.185	0.822	-0.283
	(0.354)	(0.215)	(0.395)	(0.244)	(0.527)	(0.239)
TUREUij,t-1	-0.552*	-0.068	-0.613	0.02	-0.682	0.016
	(0.327)	(0.183)	(0.497)	(0.181)	(0.508)	(0.189)
TUREUij,t-2			0.132	-0.133	0.105	-0.103
			(0.473)	(0.187)	(0.479)	(0.184)
TUREUij,t+1					0.65	0.122
					(0.399)	(0.217)
ISRCANij,t	-0.967***	-0.215	-1.780***	-0.142	-1.798***	-0.141
	(0.227)	(0.226)	(0.376)	(0.233)	(0.381)	(0.235)
ISRCANij,t-1	1.193***	-0.322	1.268***	-0.149	1.256***	-0.150
	(0.402)	(0.239)	(0.339)	(0.193)	(0.340)	(0.193)
ISRCANij,t-2			-0.112	-0.184	-0.048	-0.197
			(0.376)	(0.292)	(0.374)	(0.295)
ISRCANij,t+1					omitted	omitted
ISRMEXij,t	-0.784	-0.233	-0.391	-0.410*	-1.024**	-0.417**
	(0.601)	(0.237)	(0.559)	(0.240)	(0.455)	(0.194)
ISRMEXij,t-1	0.714*	0.424	-0.037	-0.581*	-0.033	-0.615**
	(0.426)	(0.336)	(0.497)	(0.315)	(0.494)	(0.301)
ISRMEXij,t-2			0.826**	1.121***	0.801**	1.106***
			(0.372)	(0.308)	(0.367)	(0.290)
ISRMEXij,t+1					0.816	0.039
					(0.626)	(0.294)
JORSGPij,t	1.809***	-0.559	1.784***	-0.389	0.526*	0.325
	(0.340)	(0.806)	(0.347)	(0.822)	(0.301)	(0.677)
JORSGPij,t-1	-0.476	-1.845**	-0.370	-0.504	-0.358	-0.496
	(0.290)	(0.817)	(0.313)	(0.702)	(0.318)	(0.700)
JORSGPij,t-2			-0.147	-1.679**	-0.152	-1.324*
			(0.219)	(0.679)	(0.239)	(0.759)
JORSGPij,t+1					1.412***	-0.813**
					(0.315)	(0.353)
Nobs	8165	7570	7726	7175	7196	6668
Within R2	0.329	0.258	0.331	0.259	0.307	0.24
rmse	1.022	1.048	1.018	1.038	1.01	1.019
ll	-11218.4	-10546.98	-10581.36	-9924.116	-9798.668	-9093.102

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below coefficients

Table A.8. Panel gravity equations with bilateral fixed and country-and-time effects comparing with one lagged, two lagged and one lead variables of FTA, for total nonoil trade.

	Total (2)		Total (3)		Total (4)	
	Imports	Exports	Imports	Exports	Imports	Exports
EUMEDij,t	0.206***	-0.159	0.198***	-0.145	0.11	-0.239**
	(0.073)	(0.123)	(0.075)	(0.125)	(0.068)	(0.117)
EUMEDij,t-1	0.002	-0.113	0.006	0.040	0.019	0.045
	(0.066)	(0.095)	(0.066)	(0.095)	(0.065)	(0.097)
EUMEDij,t-2			-0.014	-0.170*	-0.003	-0.204**
			(0.068)	(0.099)	(0.068)	(0.100)
EUMEDij,t+1					0.117*	0.082
					(0.063)	(0.146)
EFTAMEDij,t	0.066	-0.266	0.030	-0.193	0.200	0.019
	(0.462)	(0.219)	(0.454)	(0.198)	(0.439)	(0.202)
EFTAMEDij,t-1	0.134	0.160	0.323	-0.095	0.322	-0.113
	(0.535)	(0.266)	(0.481)	(0.245)	(0.480)	(0.250)
EFTAMEDij,t-2			-0.234	0.328*	-0.220	0.327*
			(0.214)	(0.190)	(0.153)	(0.198)
EFTAMEDij,t+1					-0.164	-0.231
					(0.271)	(0.206)
USAMEDij,t	-0.072	0.715	-0.076	0.732	0.102	0.558**
	(0.138)	(0.586)	(0.148)	(0.605)	(0.094)	(0.255)
USAMEDij,t-1	0.225*	0.954**	0.095	0.146	0.088	0.139
	(0.121)	(0.391)	(0.106)	(0.363)	(0.104)	(0.362)
USAMEDij,t-2			0.152	0.965***	0.134	1.054***
			(0.141)	(0.150)	(0.125)	(0.149)
USAMEDij,t+1					-0.213	0.239
					(0.159)	(0.467)
TURMEDij,t	0.219*	-0.087	0.163	-0.046	0.167	0.124
	(0.124)	(0.329)	(0.122)	(0.288)	(0.111)	(0.114)
TURMEDij,t-1	0.129	0.136	0.014	0.181	0.020	0.187
	(0.141)	(0.144)	(0.097)	(0.128)	(0.099)	(0.124)
TURMEDij,t-2			0.120	-0.046	0.173	-0.029
			(0.152)	(0.18)	(0.15)	(0.225)
TURMEDij,t+1					0.008	-0.217
					(0.168)	(0.308)
GAFTAij,t	-0.205		-0.183		-0.238	
	(0.257)		(0.223)		(0.233)	
GAFTAij,t-1	0.399		-0.135		-0.129	
	(0.284)		(0.246)		(0.247)	
GAFTAij,t-2			0.516**		0.506**	
			(0.234)		(0.24)	
GAFTAij,t+1					0.116	
					(0.249)	
AGADIRij,t	-0.049		-0.068	-0.103	-0.119	0.013
	(0.195)		(0.182)	(0.198)	(0.107)	(0.143)
AGADIRij,t-1	0.232		0.120	0.010	0.119	0.015
	(0.165)		(0.094)	(0.131)	(0.094)	(0.13)
AGADIRij,t-2			0.243**	0.32	0.262**	0.329
			(0.12)	(0.216)	(0.121)	(0.205)
AGADIRij,t+1					0.064	-0.142
					(0.171)	(0.207)
TUREUij,t	0.555***	0.299	0.531**	0.255	0.519	-0.160
	(0.193)	(0.296)	(0.232)	(0.340)	(0.321)	(0.302)
TUREUij,t-1	-0.158	0.008	-0.29	-0.084	-0.281	-0.087
	(0.16)	(0.139)	(0.200)	(0.122)	(0.201)	(0.129)
TUREUij,t-2			0.134	0.120	0.145	0.122
			(0.167)	(0.145)	(0.172)	(0.147)
TUREUij,t+1					0.019	0.458*
					(0.355)	(0.250)
ISRCANij,t	-0.004	0.152	-0.028	0.218	-0.042	0.211
	(0.130)	(0.143)	(0.180)	(0.156)	(0.180)	(0.157)
ISRCANij,t-1	0.288	-0.085	0.046	0.038	0.05	0.044
	(0.242)	(0.227)	(0.139)	(0.107)	(0.139)	(0.107)
ISRCANij,t-2			0.259	-0.135	0.302	-0.144
			(0.206)	(0.248)	(0.202)	(0.245)
ISRCANij,t+1						
ISRMEXij,t	0.893*	-0.231	1.066**	-0.143	0.511	-0.281
	(0.481)	(0.581)	(0.525)	(0.511)	(0.508)	(0.511)
ISRMEXij,t-1	-0.458	0.067	-0.743	-0.209	-0.735	-0.208
	(0.523)	(0.502)	(0.640)	(0.287)	(0.640)	(0.286)
ISRMEXij,t-2			0.319	0.302	0.292	0.395
			(0.237)	(0.395)	(0.232)	(0.420)
ISRMEXij,t+1					0.714**	0.142
					(0.312)	(0.202)
JORSGPij,t	0.159	-0.298	0.121	-0.144	-0.256**	0.040
	(0.199)	(0.406)	(0.190)	(0.381)	(0.118)	(0.179)
JORSGPij,t-1	-0.067	0.864**	0.214	0.867***	0.219	0.870***
	(0.195)	(0.363)	(0.154)	(0.187)	(0.155)	(0.189)
JORSGPij,t-2			-0.356*	-0.024	-0.310	0.084
			(0.200)	(0.357)	(0.212)	(0.350)
JORSGPij,t+1					0.427**	-0.221
					(0.193)	(0.432)
Nobs	8.877	8743	8385	8262	7823	7701
Within R2	0.501	0.276	0.508	0.272	0.488	0.256
rmse	0.629	0.951	0.613	0.941	0.606	0.933
ll	-7.940.895	-11423.93	-7290.687	-10704.77	-6702.115	-9906.745

Notes: ***, **, * indicate significance at 1%, 5% and 10%, respectively. Robust standard errors are presented below coefficients

[1] FEMISE (2011)

[2] North-South FTA are EUROMED, EFTAMED, USAMED, TUREU, ISRCAN and South-South FTA are TURMED, GAFTA, AGADIR, ISRMEX and JORSGP.

[3] See Femise (2009), and Montanari (2007) for more details about the regional integration process the in Euro-Mediterranean area.

[4] See Ruebner (2000),Awad (2011), Rosen (2004) and Nugent and Abdel-Latif (2010) for more detail of the FTA and QIZ between Jordan and US.

[5] It is worth mentioning that an FTA between Israel and US came into force in 1985, however our period of analysis starts in 1990. Therefore, we cannot estimate the effect of this agreement.

[6] See Hufbauer and Brunel (2009) chapter 8, and Abdelmalki (2011) for more detail of the FTA between Morocco and US.

[7] See Table A.1 in the Annex for more details about the liberalisation process of each agreement.

[8] See Romagnoli, and Mengoni (2009) and FEMISE (2005; 2006; 2008; 2009) for a historical review of the MENA integration.

[9] 1950, Treaty for Joint Defense and Economic Cooperation; 1953, Convention on the Facilitation of Trade Exchange and the Regulation of Transit Trade; 1957, Economic Council that approved the text of the Arab Economic Unity Agreement (AEUA) and creation in 1964 of the Council of Arab Economic Unity (CAEU) that promoted the creation of the Arab Common Market (ACM).

[10] The GCC include Saudi Arabia, United Arab Emirates, Oman, Kuwait, Qatar and Bahrain. We do not analyse this FTA because we only include FTAs concluded by the 10 countries selected. Some authors that analyse the impact of the GCC are Boughanmi (2008), Insel and Tekce (2011) and Abdmoulah (2011).

[11] The state members are Algeria, Libya, Mauritania, Morocco, and Tunisia and despite that the agreement has not yet taken off, the members have recently created an investment bank, which starting capital amounts to $100 millions , to finance infrastructure projects in the region. Nouakchott (2013, 9 January) Reuters.

[12] Jordan, Morocco, Kuwait, United Arab Emirates, Syria, Tunis, Bahrain, Lebanon, Libya, Saudi Arabia, Iraq, Sudan, Oman, Egypt, Yemen, Qatar, Palestine.

[13] See Zorob (2008) and Zarrouk (2000) for more details about the GAFTA agreement.

[14] See Wippel (2005) and Abedini and Peridy (2008) for more detail about the Agadir agreement.

[15] In order to compare the robustness of our results, we use two different variables separately that affect the decision to export but not the amount exported. First we use an index of corruption for country i and j and we also use a dummy variable, namely "same religion", which takes a value of 1 when both countries have the same religion and zero otherwise. Results are presented using the last variable.

[16] Calculated from the density and the distribution functions of a standard normal variable that determines whether the unobservable characteristics in the selection model are correlated with the amount of trade.

[17] Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia and Turkey.

[18] the period has been chosen taking into account the entry into force of the agreements and avoiding having a lot of zeros choosing years before 1994.

[19] See Table A.5 for data description.

[20] $(e^{0.282})-1=0.326$

[21] $(e^{0,203})-1=0,225$ and $(e^{0,320})-1=0,377$