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Spring May 2, 2012

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Inmaculada Martinez-Zarzoso
Felicitas Nowak-Lehmann
Florian Johannsen

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# FOREIGN AID, EXPORTS AND DEVELOPMENT IN EUROMED

**Inmaculada Martínez-Zarzoso**[*]

Department of Economics, University of Göttingen and Institute of International Economics, Universidad Jaume I (Spain)

**Felicitas Nowak-Lehmann D.**

Ibero-America Institute for Economic Research and Center for European, Governance and Economic Development Research at the University of Göttingen

**Florian Johannsen**

Department of Economics, University of Göttingen

**Abstract**

This paper investigates the link between foreign aid and exports between the two shores of the Mediterranean. The main hypothesis is that the Euro-Mediterranean Process should promote not only trade but also stronger links between the European Union (EU) and the Middle East and North Africa (MENA). Hence, we expect development aid to have a positive impact on exports, which could also intensify the aid-trade relationship. In particular, we expect to find higher trade volumes in both directions after the process started in 1995 and intensified in the late 1990s and early 2000s, when several bilateral free trade agreements were signed. A gravity model augmented with bilateral and multilateral aid and trade regime variables is estimated for exports and imports from recipient countries to donor countries for the period 1988 to 2007 using advanced panel data techniques. Our method addresses the endogeneity bias of the trade regime/economic integration agreement (EIA) variable, assuming that decisions to form or enlarge EIAs are slow-moving relative to trade flows.

Key Words: International Trade; Foreign Aid; Euro-mediterranean Process

JEL Classification: F10; F35

[*] Address for correspondence: Department of Economics, Georg-August Universitaet Goettingen, Platz der Goettinger Sieben 3, Goettingen (Germany). E-mail: martinei@eco.uji.es. The author acknowledges the support and collaboration of Project ECO2010-15863. We also would like to thank the Editor and an anonymous referee for their helpful comments and suggestions.

## FOREIGN AID, EXPORTS AND DEVELOPMENT IN EUROMED

### 1. Introduction

There has been a significant increase in the volume of foreign aid from developed to developing nations over recent decades. More specifically, bilateral aid increased from US$ 51 billion dollars in 1988 to USD 103.5 billion in 2007. These flows are expected to contribute to progress towards the Millennium Development Goals (MDGs). Although the effects of aid on recipient countries have been analysed quite extensively, most of the macro-literature has focused on the effects of aid on economic growth. More than a hundred studies have appeared in this field of research in the last 40 years. Evidence has been inconclusive for a long time, but more recent studies point to aid having an insignificant impact on growth (Rajan and Subramanian, 2008; Doucouliagos and Paldam, 2006 and 2008; Nowak-Lehmann D. et al., 2011). Fewer authors have investigated the channels through which aid is intended to influence economic development. In this sense, Griffin (1970), Griffin and Enos (1970), White (1992) and Doucouliagos and Paldam (2006) studied the savings channel, while Adam and Bevan (2006) analysed the investment-income channel and Rajan and Subramanian (2005 and 2009) took a close look at the real exchange rate channel.

More recent empirical studies find that the real exchange rate is negatively and significantly influenced by aid (it appreciates) (Rajan and Subramanian 2005 and 2009; Nowak-Lehmann D. et al. 2010). The impact of aid on domestic savings is found to be significant and negative implying that aid flows lead to a crowding out of domestic savings (most probably government savings in the form of taxes), whereas the impact of aid on investment is found to be small, but significant and positive (Nowak-Lehmann D. et al. 2010). Another possible transmission channel is international trade. This is the channel this paper studies and which has

also been the subject of the most recent empirical trade literature (Nilsson 1997; Wagner 2003; Nelson and Juhasz and Silva 2008; Johansson and Pettersson 2011).

Several explanations have been given to support the argument that aid leads to more trade. First, aid funds could be used to buy capital goods that are only available in developed countries and are necessary for the production of final goods. According to this reasoning, aid will generally promote exports from the donor country. Second, aid could contribute to higher volumes of trade because the relations between donors and recipients are usually long-lasting and generate a "good will" effect, increasing the ties between donor and recipient country representatives. Indeed, in the Paris and Accra Declarations the OECD's Development Assistance Committee (DAC) has recommended donors to address the issue of predictability. The Accra Agenda for Action (AAA) was drawn up in 2008 and builds on the commitments agreed in the Paris Declaration endorsed on March 2nd 2005. In order to avoid the high volatility of aid flows, the declaration states that *"donors will provide 3-5 year forward information on their planned aid to partner countries"*. Finally, aid could enhance trade through the tying of aid[1], a practice that has been used intensively –at least until 2005. This practice has been extensively criticised by development scholars and the DAC has recommended donors to avoid this practice, especially after the Paris and Accra Declarations, as the allocation of aid should be made on the basis of recipient need rather than donor self-interest. One of the main recommendations given from DAC to donor countries is that *"donors will relax restrictions that prevent developing countries from buying the goods and services they need from whomever and wherever they can get the best quality at the lowest price"*. The extent to which donors will commit themselves to this recommendation is still to be seen in the near future. Similar to the case of untying of aid, aid-trade relationships have also been altered over the years by many bilateral and regional trade

[1] Some donors have been adopting practices to formally and/or informally tie aid to procurement in the donor countries.

agreements, fluctuations in the business cycle, the strengthening of the EURO area (and the present decline) and changes in the exchange rate. All these factors will be weighted accordingly when studying the EUROMED aid-trade relationship. As regards the first factor, regional trade agreements, the related empirical evidence shows that some European Union (EU) trade preference regimes for developing countries, including the EuroMed agreements, have a positive effect on the exports of developing countries (Persson and Wilhelmsson, 2006; Blanes-Cristobal, Milgram-Baleix, 2010 and Bensassi et al, 2011). Indeed, Blanes-Cristobal and Milgram-Baleix (2010) show that the EuroMed trade liberalisation process has a positive effect on trade between Spain and Morocco and Bensassi et al (2011) generalise these results for exports from MENA to EU countries. However, other preference regimes, such as the Everything But Arms (EBA) regime, appear to have a non-significant or even negative effect on the exports of developing countries (Gradeva and Martínez-Zarzoso, 2009; Gamberoni, 2007). One of the explanations given is that the Rules of Origin (RoO) attached to the EBA are more restrictive than those in previous preference regimes applied to the eligible countries, the regime being underutilised as a result.

This paper intends to disentangle this mixture of factors, mainly by focusing on development aid and trade preferences, and evaluate how much each factor has contributed to EUROMED trade. In order to do so, the paper examines trends in trade and development aid since the late 1980s and attempts to quantify to what extent changes in trade flows between EU and MENA countries can be attributed to aid policies and/or trade policies and whether the link between trade and aid has become stronger since 1995 when the Barcelona Process started and weaker after the Paris Declaration of 2005. More specifically, we will estimate econometric models based on the gravity model of trade to quantify the effects of development aid and trade agreements on trade flows. As far as the authors of this paper are aware, this is the first time that

the effects of aid and trade policies on trade flows are studied jointly for South Mediterranean countries.

Section 2 presents the main trends in foreign aid to MENA countries over the past two decades. Section 3 revises the theories linking aid to trade and development. Section 4 outlines the empirical strategy and shows the main results. Section 5 presents a number of robustness checks and finally, Section 6 concludes and provides some policy recommendations.

## 2. Trade and Aid developments in MENA countries

In 1995, the European Union (EU) and fourteen countries in the Mediterranean basin committed to signing "new generation" integration agreements within the framework of the Barcelona Process. The Euro-Mediterranean Association Agreements cover three main areas of cooperation: security and stability, economy and finance and cultural, social and human cooperation. The goal of eliminating all trade restrictions, as envisaged in the second chapter of the partnership, would only be achieved through the establishment of a Euro-Mediterranean free-trade area (FTA), initially planned for 2010. Nevertheless, bilateral FTAs between each Mediterranean partner country and the EU were planned as intermediate steps towards achieving the goal. A maximum transition period of twelve years was established for the Mediterranean partner countries to abolish tariffs and non-tariff barriers, together with additional coordination and cooperation measures that involved institutional and financial assistance from the EU MEDA[2] program.

The process evolved differently over time in each country. On the one hand, Malta and Cyprus joined the EU in 2004 and Croatia and Turkey are candidates. Turkey had already implemented a Customs Union with the EU in 1996. On the other hand, most of the other countries implemented bilateral agreements in the late 1990s and early 2000s (Table 1), with the

[2] The MEDA programme supports the economic transition of Mediterranean non-member countries (MNCs) and the establishment of a Euro-Mediterranean free trade area by promoting economic and social reforms for the modernisation of enterprises and the development of the private sector.
http://europa.eu/legislation_summaries/external_relations/.

only exceptions of Mauritania and Syria. Libya joined the Barcelona process in 2000 and as in the case of Mauritania and Syria, bilateral agreements have not yet been signed. The detailed conditions of each FTA are negotiated through the bilateral Euro-Mediterranean Association Agreements, although the provisions are similar in all Association Agreements. Industrial and agricultural products are considered separately in each Agreement. As regards manufactures, the agreements established that duties already in force have to be removed immediately by the EU and the introduction of new customs duties is prohibited. Furthermore, the general rule for Mediterranean partner countries is that duties on all industrial products have to be abolished immediately, but there are exceptions defined in the Annexes[3]. The Agreements also provide for a gradual and reciprocal liberalisation of agricultural products. However this is prevented by EU Common Agricultural Policy (CAP). It is worth mentioning that the exclusion of agriculture from trade liberalisation is particularly damaging for the Mediterranean partner countries, as it is in this sector that they enjoy a comparative advantage[4]. It is also worth noting that the manufacturing industry represents nowadays an important share of total production and exports in MENA countries. Indeed, the Textile industry contributes the most to total exports in Morocco, Tunisia, Egypt and Turkey (See Table A.4), while Energy contributes the most in Algeria and also in Egypt in 2003. Hence, the potentially positive effects of an FTA on the manufacturing industry could possibly boost total trade.

A number of important effects could be expected from the implementation of the FTAs in

[3] Table A.3 shows the gradual tariff reductions in different sectors for Moroccan imports from the EU.

[4] The 1978 agreements between the EU and the MENA countries excluded agricultural products and processed agricultural products from tariff reduction. The European Union still imposes tariffs and quotas on a number of important North African agricultural products today (tomatoes, olive oil, fruits and vegetables) (protocol 1, 2 and 3 of the Euro-Med agreements stipulates the exclusion of agricultural products from tariff liberalisation). It is only very recently that progress has been made with some partners. At the end of 2009, the EU and Morocco have concluded an agreement concerning the liberalisation of trade in agricultural products (European Commission COM (2010) 485). A similar agreement is currently under negotiation with Tunisia. Given that the advances concerning trade liberalisation in agricultural and processed food were scarce until very recently, this study focuses on manufactures and leaves these important issues for further research.

the manufacturing sector. First of all, free trade should lead to a more efficient allocation of resources and enhanced competition increasing local firm efficiency. Secondly, the possibility of importing intermediate products at lower prices should entail lower production costs for local producers and therefore more competitive final prices. Finally, the loss of tariff revenues for the public sector should be offset by the increase in indirect tax revenues once production and trade grow.

The main difficulty for Mediterranean partner countries is that the efficiency gains from free trade will only be achieved in the long-term, whereas short-term adjustment costs could be substantial. In particular, opening up their markets to EU exporters may lead to the elimination of inefficient small and medium-sized enterprises. The MEDA programme launched in 1996 (MEDA I) and amended in 2000 (MEDA II) will attempt to address the above mentioned difficulties during the transition period, although this may be insufficient. A total of 5,350 million Euros were allocated for the 2000-2006 period under the MEDA II programme. MEDA funds are used to support projects under all three chapters of the Barcelona Declaration, with 90% of the funds being allocated to bilateral programmes. Technical assistance, training, institution-building, information, seminars, studies and investment projects are some of the activities financed. Financing mainly takes the form of grants, but also risk capital and interest rate subsidies. In regard to the second argument, there is some evidence that the provision of cheaper imported inputs has positively affected the export performance of some countries. More specifically, the effect of regional cumulation of rules of origin in the enhancement of regional integration has been significant (Bensassi et al, 2011).

Concerning development aid, the EU, together with the United States, is the major provider of aid to the Mediterranean region. The MENA region houses some of the largest recipients of foreign aid per capita in the developing world (e. g. Egypt). Figure 1 shows the amount of total

official bilateral development aid (ODA) received[5] by MENA countries over the period 1988 to 2007. The average was around 32 billion US$ until 2002, but increased sharply between 2003 and 2005 to 71 billion US$. Figures 2 to 7 show the evolution of per capita ODA received by each country from EU and non-EU donors over the same period. It is worth indicating that the sharp increase mentioned previously is also observed in per capita terms for Algeria, Morocco and Tunisia, but not in the case of Egypt, Turkey or Libya.

Comparing the evolution of aid from EU countries to that from non-EU donors in the 2000s, ODA from the former has grown faster than ODA from the latter group of donors in all cases except Egypt.

## 3. Development aid and international trade: theory and evidence

### *3.1 Literature review*

Development aid is an international transfer from developed countries to developing countries. According to the theories of transfer paradoxes it is recognised that such transfers may, under certain conditions, have positive effects on the donors and adverse effects on the recipients in terms of welfare. This transfer "paradox" is possible only when the price effects of the transfer are strong enough (Kemp and Kojima, 1985, 1993). According to Lahiri and Raimondos (1995) changes in the terms of trade caused by aid could only lead to perverse results when there are distortions in place, such as tied aid. Receiving aid increases the amount of resources that can be spent on imports, but if aid is tied, import prices increase and goods can be partly substituted by national production. Assuming that untied aid produces less distortionary effects on prices, it might be preferable to grant unconditional aid.

In reference to recipient exports and the macroeconomic impact of aid, receiving aid should mainly produce an income effect. Aid can be used to improve infrastructures or build

[5] The figure shows aid disbursements.

export capacity through training programmes for entrepreneurs. In this case, a positive supply-side effect of aid on recipient exports could be expected. However, there could also be an indirect demand-side effect. Aid flows can lead –through an increase in income and demand- to an appreciation of the exchange rate and consequently have a negative effect on price competitiveness. Furthermore, aid, and particularly bilateral aid, can also have an effect on trade relations. It can enhance bilateral trade through reputation, mutual trust and support, goodwill and familiarity between trading partners in the North and the South (Arvin and Baum, 1997; Arvin and Choudry, 1997; Johansson and Pettersson, 2011) and could also facilitate the creation of customer relations, distribution channels and a better adaptation to the formal and informal market environment (Johansson and Pettersson, 2011).[6]

The empirical literature finds some evidence of aid causing trade in most cases, at least for some groups of countries (Osei et al., 2004; Lloid et al., 2000, Nilsson, 1997; Wagner, 2003; Nelson and Jujasz Silva, 2008; Johansson and Pettersson, 2011). While some authors focus on the effect of bilateral aid on donor bilateral exports (Nilsson, 1997; Wagner, 2003), others also include recipient exports in their studies and assume a common effect on trade in both directions (Johansson and Pettersson, 2011). Finally, there are only a few studies that focus exclusively on the effect of development aid on recipient exports (Nowak-Lehmann D. et al. 2010).

Considering the possible channels and assuming that it takes some time for aid to affect trade, this study focuses on a specific region and aims to extend the previous literature by concentrating on how trade liberalisation affects the aid-and-trade relationship.

*3.2 Testable hypotheses*

[6] Johansson and Pettersson (2011) argue that intense aid relations work towards reducing the effective cost of geographical distance thus reducing the 'distance' coefficient, whereas we argue that more intense aid relations make aid more efficient, thus increasing the 'bilateral aid' coefficient.

Free trade agreements tend to increase trade flows among the signing countries, as has been recently proved by the related literature (Baier and Berstrand, 2007). However, how these agreements influence other economic links, especially in North-South agreements, is not yet well established.

We hypothesize that the Euro-Mediterranean Agreements have increased trade and aid among their members and also intensified the aid-trade link, in comparison to other bilateral relations. In other words, the first hypothesis is that *increasing aid promotes trade, particularly trade with donor countries.* We expect increasing development aid to have a positive effect on donor exports, especially in the short-to-medium term, as donors will be able to rapidly expand their export capacity, whereas recipient countries will need some time to increase their production and export capacity and also to build up knowledge.

Likewise, trade liberalisation and the expected increase in trade could also have a positive effect on development aid. There could be a direct and indirect effect of the agreement on aid. On the one hand, simply signing an agreement implies a closer economic relationship with the implementation of several economic cooperation programmes (an FTA should be positive and significant in the aid equation). On the other hand, the liberalisation of exports from the EU to the other Mediterranean countries will allow the latter access to cheaper imported machinery. *This increase in recipients' imports (donors' exports) could eventually lead to increased willingness on behalf of the EU donors to eventually increase their aid*. This is our second hypothesis.

If this aid is used to produce final goods, exports could increase and will eventually foster economic development. In particular, *we hypothesize that the agreement will especially foster recipients' exports to the European Union* after a transition/adjustment period and help speed up the process of development in the area. This is the third hypothesis.

Finally, we hypothesize that *aid and trade links are interrelated and there is double causality that should be modelled*. This hypothesis can be tested with the help of instrumental variable and generalised method of moment techniques.

## 4. Data description, empirical strategy and main results

### *4.1 Data and variables*

The datasets used are the following: ODA data from 1988 to 2007 are from the OECD Development Database on Aid from DAC Members. We consider bilateral net ODA disbursements in current US$[7] instead of aid commitments because we are interested in the funds actually released to the recipient countries in a given year. Disbursements record the actual international transfer of financial resources, or the transfer of goods or services valued at the cost to the donor. We also consider imputed multilateral aid as a proxy for donors' total contributions to multilateral aid. The total net ODA disbursements come from the OECD statistics. It is calculated as the sum of grants, capital subscriptions, total net loans and other long-term capital. The grants include debt forgiveness and interest subsidies in associated financing packages. The capital subscriptions to multilateral organisations are made in the form of notes and similar instruments unconditionally redeemable on sight by the recipient institutions. The total net loans and other long-term capital represent the loans extended, minus repayment received and with the offsetting of entries for debt relief. Technical cooperation, development food aid and emergency aid are included in grants and gross loans.

The multilateral contributions of international agencies and organisations (also part of ODA) can be imputed back to the funders of those bodies. The OECD uses a specific methodology that we briefly explain. The approach will vary, depending upon whether the

[7] The net amount comprises total grants and loans extended (according to DAC).

intention is to show the share of the receipts of a given recipient attributable to a particular donor or the share of a given donor's outflows that can be assigned to an individual recipient. As DAC statistics are primarily designed to measure donor effort, the second approach is the one taken in DAC statistical information.

The original DAC member countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Sweden, Switzerland, the United Kingdom and the United States. Other countries are also included in the data, but they became donors many years later. Such countries include the Czech Republic (1998), Greece (1996), Hungary (2003), Iceland (1988), Korea (1989), Latvia (2002), Lithuania (2001), the Slovak Republic, Spain (1987) and Turkey (1990). The empirical estimations in this study included all original DAC countries plus Greece and Spain. Table A.2 in the Appendix lists the donors and recipients considered in this paper.

Bilateral exports are obtained from the UN COMTRADE database. Data on income and population variables are drawn from the World Bank (World Development Indicators Database, 2007). Bilateral exchange rates are from the IMF statistics. Distances between capitals have been computed as Great Circle distances using data on straight-line distances in kilometres, latitudes, and longitudes from the CIA World Fact Book. Other dummy variables included in the model are from CEPII.

Two additional variables, conflicts and natural disasters, are used as determinants of development aid. Conflicts are from the UCDP/PRIO Armed Conflict Dataset. The variable is a dummy that takes a value of one when an armed conflict took place in a given year. The

estimated total damage of natural disasters is from EM-DAT[8]: The registered figure corresponds to the value of damage in the year the disaster occurred.

Table 2 shows the summary statistics for the variables used.

**Table 2 about here**

*4.2 Empirical strategy*

We estimate three separate equations all based on the log-linear form of the gravity model to test the hypotheses outlined in section 3.2. The first equation uses bilateral donors' imports as the dependent variable, the second uses bilateral donors' exports and the third bilateral aid flows. Each equation will be estimated separately. The model specifications are given by,

$$LMdon_{ijt} = \gamma_{10} + \phi_{1t} + \delta_{1ij} + \alpha_{11}LY_{it} + \alpha_{12}LY_{jt} + \alpha_{13}LYH_{it} + \alpha_{14}LYH_{jt} + \alpha_{15}LDIST_{ij} + \alpha_{16}Loda_{ijt-1} + \alpha_{17}Lamulti_{ijt-1} + \\ + \alpha_{18}LEXCHR_{ijt} + \alpha_{19}CONTIG_{ij} + \alpha_{110}COMLANG_{ij} + \alpha_{111}COLONY_{ij} + \alpha_{112}FTA_{ijt-1} + \alpha_{113}CU_{ijt-1} + \eta_{1ijt} \quad (1)$$

$$LXdon_{ijt} = \gamma_{20} + \phi_{2t} + \delta_{2ij} + \alpha_{21}LY_{it} + \alpha_{22}LY_{jt} + \alpha_{23}LYH_{it} + \alpha_{24}LYH_{jt} + \alpha_{25}LDIST_{ij} + \alpha_{26}Loda_{ijt-1} + \alpha_{27}Lamulti_{ijt} + \\ + \alpha_{28}LEXCHR_{ijt} + \alpha_{29}CONTIG_{ij} + \alpha_{210}COMLANG_{ij} + \alpha_{211}COLONY_{ij} + \alpha_{212}FTA_{ijt-1} + \alpha_{213}CU_{ijt-1} + \eta_{2ijt} \quad (2)$$

$$Loda_{ijt} = \gamma_{30} + \phi_{3t} + \delta_{3ij} + \alpha_{31}LY_{it} + \alpha_{32}LY_{jt} + \alpha_{33}LYH_{it} + \alpha_{34}LYH_{jt} + \alpha_{35}LDIST_{ij} + \alpha_{36}LEXCHR_{ijt} + \\ + \alpha_{37}CONTIG_{ij} + \alpha_{38}COMLANG_{ij} + \alpha_{39}COLONY_{ij} + \alpha_{310}LX_{ijt-1} + \eta_{3ijt} \quad (3)$$

where L denotes variables in natural logs, $Mdon_{ijt}$ and $Xdon_{ijt}$ are respectively imports and exports to (from) donor *i* from (to) recipient *j* in period *t* in current US$; $Y_{it}$ ($Y_{jt}$) indicates the GDP of the exporter (importer) in period *t*, $YH_{it}$ ($YH_{jt}$) are exporter (importer) GDP per capita in period *t* and $DIST_{ij}$ is the geographical distance between countries *i* and *j*. $Oda_{ijt}$ is bilateral official net development aid from donor *i* to country *j* in current US$; and $Amulti_{ijt}$ is imputed multilateral

[8] EM-DAT.: The OFDA/CRED International Disaster Database –www.emdat.be – Université Catholique de Louvain – Brussels – Belgium.

development aid from donor *i* to country *j* in current US$; $EXCHR_{ijt}$ denotes the nominal bilateral exchange rate in units of the local currency of country *i* (donor) per unit of currency in country *j* (recipient) in year *t*. CONTIG, COMLANG, COLONY are dummies that take a value of 1 when countries share a border, have the same official language or have a colonial relationship, respectively and zero otherwise. $FTA_{ijt-1}$ and $CU_{ijt-1}$ are dummies that take a value of 1 when countries have a free trade agreement or a customs union respectively and zero otherwise.

$\phi_{kt}$ are specific time effects that control for omitted variables common to all trade flows but which vary over time. $\delta_{kij}$ are trading-partner unobservable effects that proxy multilateral resistance factors. When these effects are specified as fixed effects, the influence of the variables that are time invariant cannot be directly estimated. This is the case for distance, for which reason its effect is subsumed into the country dummies. Finally, $\eta_{kijt}$ are idiosyncratic error terms that are assumed to behave well. The models will be estimated for all donors.

In addition to these variables, we utilised some background variables that determine trade flows as well and which will be used in the selection equation of aid (see robustness section). $Confl_{ijt-1}$ is a dummy that takes a value of 1 when countries are involved in a common conflict in a given year and zero otherwise and will only be used as an identification variable. The same applied to Dumdiscos, which is a dummy that takes a value of 1 if there has been a natural disaster in a given year. A number of dummies are specified with a lag to avoid double causality.

We first estimate a fixed effect model (FE) in which autocorrelation and heteroskedasticity are also taken into consideration. Autocorrelation is taken care of by including an AR(1) term and heteroskedasticity-robust standard errors are calculated using Driscoll and Kraay (1998) standard errors. Second, we apply a Hausman-Taylor procedure that is more flexible than the FE estimator and allows us to estimate coefficients for the time invariant

variables and also to consider several regressors as endogenous and possibly correlated with the error term.

Third, we estimate the model using the GMM-system procedure proposed by Blundell and Bond that allows us to incorporate dynamics and relax the exogeneity assumption of the lagged dependent variables and also of some of the regressors, such as the free trade agreement variables.

*4.3 Main results*

Table 3 shows the main results of the three equations estimated. The first part of the table shows the fixed-effect estimates assuming autocorrelation of order one and with standard errors that are robust to cross-sectional correlations[9]. The second part shows the Hausman-Taylor estimates that consider several regressors as endogenous and possibly correlated with the time-invariant part of the error term. They are BAID, FTA and CU in both trade equations and exports in the aid equation. The advantage of the second technique is that coefficients for the time-invariant variables can be estimated directly.

First, we look at the coefficient obtained for bilateral aid. An increase in bilateral aid from donors to recipients has a positive effect on donors' imports and exports (H1), although the effect on donors' imports is weaker and smaller. The coefficient is higher for donors' exports (0.066) than for donors' imports (0.013), as predicted in H3.

Concerning the estimated coefficient for FTA, it is positive and statistically significant at the 5% and 1% level for donors' imports and exports, respectively. In particular, the effect is higher for donors' exports. MENA countries that signed a free trade agreement export 10% more to the EU than to the rest of developing countries, according to the results in column 1 of Table 3.

[9] For comparative purposes, Table A.1 in the appendix presents the OLS and plain FE results. In these specifications we used lagged values for trade and aid variables to avoid double causality issues.

EU exports to MENA countries are on average around 17 percent higher when an FTA has been implemented. The CU (customs union) coefficient is also positive and significant and higher than the FTA coefficient according to both sets of results. In addition, bilateral donors' exports also promote bilateral aid, according to the results obtained for equation (3). The estimated coefficient indicates that a 10% increase in donors' exports raises bilateral aid by 1.66 percent.

Table 4 presents the GMM-system results. Models (1) to (3) are specified in dynamic form adding two lagged terms of the dependent variable. The main idea is that both bilateral trade and bilateral aid are persistent series whereby past values influence present values. Dynamics seem to be important in modelling trade and aid as all the lagged variables register statistically significant coefficients. In regard to the effect of bilateral aid on trade, we find that when bilateral aid is considered as endogenously determined, the effect is stronger and almost equal in the short term for exports and imports. An increase of 10% in bilateral aid increases bilateral trade by about 0.5%. The effect of trade liberalisation is higher now for donors' exports, but barely significant for recipient exports, which was also expected. Finally, the positive effect of bilateral donors' exports on bilateral aid is confirmed with the dynamic specification.

In economic terms, it is true that aid flows from the EU to MENA countries are relatively small when computed as GDP shares of the recipient countries, but the EU is the main provider of aid to the Mediterranean region. The relative importance for the recipient countries of preferences associated to trade flows and development aid is difficult to establish. If we compare the economic effect of an increase in aid with the economic effect of preferences, the latter is clearly higher. But the most relevant question is whether we can attribute the increase in the value of trade to bilateral trade liberalisation. The Barcelona Process liberalises exports from the EU to MENA countries[10] and also establishes less restrictive rules of origin. As indicated previously in

[10] MENA countries had been exporting manufactured products duty free to the EU since 1978.

the paper, lower importing costs could also boost exports of final goods from MENA to EU countries.

Finally, we tested whether the bilateral aid coefficient was lower after 2005 (Paris declaration) in the model for donors' exports, and possibly higher in the model for recipients' exports. In order to do so, equations (2) and (3) are estimated with time-varying coefficients. The estimates obtained are used to test the null hypothesis that the average aid coefficient after 2005 is the same as the average coefficient before 2005. The results in Table 5 indicate that the aid coefficient is significantly lower after 2005 than before 2005 in the case of donors' exports. The interpretation of this result could be that after the Paris declaration, aid was implicitly less tied to donors' exports than in previous years. Otherwise, although the coefficient of aid is higher and statistically significant after 2005, we cannot reject the null hypothesis for donor imports, perhaps because it is still too early to detect any effect.

It is worth noting that our empirical analysis enables us to address the effect of the Barcelona process only on the value of trade. It is true that there will also be composition and price effects[11], but disaggregated trade data would be required to address the former, while a proxy for prices, such as export unit values, would be needed in the case of the latter. As these variables are not present in our data, all we can say is that assuming that the entry into force of bilateral agreements reduces trade costs, composition effects will tend to favour exports of goods that benefit from this reduction in trade costs. In regard to exports from donor to recipient countries, given the gradual elimination of tariffs for manufactured products in MENA countries, a direct price effect (reduction) will increase imports in recipient countries due to having access to cheaper supplies from EU countries.

[11] We thank an anonymous referee for noting this point.

Our results concerning the effect of trade policy on recipient exports are in line with Bensassi et al (2011), who find a positive and significant effect of the new FTAs on exports from North African countries to their main European partners (e.g. estimated coefficient = 0.255 versus our estimate = 0.168). Our results are, however, not strictly comparable because the authors used manufactured exports from MENA countries to the four largest EU countries over the period 1995-2008. The authors indicate that the positive effect of the new FTAs on trade could be due to the new RoO agreed, the adoption of which has allowed the integration of better quality/less expensive intermediate goods in production processes in North African countries, consequently enhancing the demand for these goods in European markets.

As regards the effect of development aid on donors' exports and recipient imports, Johansson and Pettersson (2011) also found that development aid is positively correlated with trade in both directions. However, the authors argue that it is difficult to determine whether aid boosts exports or vice-versa or if both are influenced by other factors that make them co-vary. They point out that the available instruments are not sufficiently strong to identify exogenous variation and not even Granger causality tests help.

In this paper, while we do not assess the various transmission channels, our findings are consistent with the idea that bilateral aid favours overall trade between donors and recipients and promotes export-enhancing goodwill and exposure.

**5. Robustness checks**

In order to validate our results, we examine whether they are robust to a number of variations in the model specification. First of all, we took into account the presence of zero values in the sample and estimated the aid model (Equation 3) using the Heckman two-step procedure. The traditional log-linear specification of the gravity model disregards zero-valued bilateral flows, because the logarithm of zero is undefined. As some of the bilateral flows in our dataset are

recorded as zero or missing, not including those flows when they do not occur randomly could bias the empirical results. Zero aid observations could indeed contain important information when it comes to understanding the patterns of bilateral aid; they occur between very small or distant countries and should not be discarded a priori. According to Linders and Groot (2006) "The sample selection model offers a theoretically sound and econometrically elegant solution to include zero flows in the gravity model". Although a Tobit specification was used previously by some authors to model zero-valued bilateral flows, it is more appropriate to model the decision of whether or not to give aid as a Probit model, which is the first stage of the Heckman approach, rather than using a Tobit model. The latter is a censored regression model that applies to cases in which outcomes cannot be observed below or above a given threshold. However, this is not the case for aid flows. Taking into account these considerations, we estimated the aid model (Equation 3) using the Heckman two-step procedure.

The results for aid are reported in Table 6. Two additional variables are used as identification variables: the existence of natural disasters and the presence of a conflict in the recipient country involved in the bilateral relationship. The effect of exports on aid is positive and significant in both stages of the estimation and also larger, possibly indicating the presence of a downward bias in the estimations that disregard the presence of zeros in the sample[12].

Secondly, we add another set of FE (importer-time and exporter-time) in addition to the importer-exporter FE and the main results remained basically unchanged.

Thirdly, we examined whether there could be displacement effects in the aid allocation process. We add the aid given by other donors to each specific recipient as an explanatory

[12] Following the recommendation of an anonymous referee, we also estimated a two-step Heckman model for donors' exports and imports and the results indicate that the estimated effects of aid and preferences on trade remain almost unchanged. Indeed, the share of zero exports and imports in our sample is 6 percent and 10 percent respectively, whereas zero aid flows accounts for 32 percent.

variable in the two trade equations. In general this variable is not statistically significant when using system GMM. Moreover, when it was significant, as shown in Table 3, the coefficient was positive, indicating that there was no displacement effect.

## 6. Conclusions and policy implications

This article examines the bilateral relationship between trade and development aid. More specifically, it focuses on the effects of trade liberalisation processes and whether they help recipient countries speed up their development on the back of increasing trade and development aid.

A number of hypotheses are tested in this paper. As regards the first hypothesis, increasing aid boosts trade, particularly that of the donor countries. More specifically, the results indicate that a 10% increase in bilateral aid increases both donors' and recipients' exports by about 0.5 percent in the short run, whereas in the long run donors' exports rise by more (1.69) than on recipients' exports (1.22).

The second hypothesis states that an increase in recipients' imports from donors could eventually lead to an increased willingness on behalf of EU donors to eventually increase their aid. Our findings show that for every 10% increase in imports, aid increases by 1.73% in the short term and by 2.67% in the long term. We could interpret this result as indirect evidence of informal tying of aid to trade and the donors' benefit from giving aid.

We also hypothesize that bilateral trade agreements will foster recipients' exports to the European Union only after a transition/adjustment period and help speed up development in the area. As it will take some time for these agreements to have any (and largely indirect) effect on trade, we are possibly lacking sufficient data to identify them. More specifically, we find that the effect of trade liberalisation is positive and significant in statistical terms for donors' exports, but barely significant for recipient exports, when a dynamic model is considered. As regards the

economic significance of the effect, the amount of aid given to Mediterranean countries is remarkably small and so is the effect. The good news is that there is scope for increasing aid: a 10% increase in aid from the EU to the Middle East and North African countries included in our sample (an additional US$ 261 million in 2007) will lead to an increase in EU donor exports of around US$ 47 billion and an increase in Middle East and North African exports to the EU of around US$ 36 billion.

In summary, the empirical results of our study show that development aid and trade liberalisation have a direct and positive effect on bilateral trade and that trade liberalisation also has an indirect positive effect on development aid through an increase in trade. In comparison to recipient countries, we also found that donors reaped stronger benefits both from granting development aid and signing trade agreements. The result holds after different variations of the main model were evaluated and compared.

Future research will use the estimates obtained in this paper in order to assess aid and trade policy effectiveness in regard to specific industries and the effect of trade on income.

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## TABLES

### Table 1. Evolution of trade integration in the Euro-Mediterranean region

| Country | PTA Med to EU | Commitment to the Barcelona Process | Enforcement of bilateral Agreement | PTA EU to Med |
|---|---|---|---|---|
| **Algeria** | 1978 | 1995 | 2005 | 2017 |
| **Egypt** | 1978 | 1995 | 2004 | 2016 |
| **Israel** | - | 1995 | 2000 | 2012 |
| **Jordan** | 1978 | 1995 | 2002 | 2014 |
| **Lebanon** | 1978 | 1995 | 2006 | 2018 |
| **Libya** | 1978 | 2000 | no | no |
| **Mauritania** | 1978 | 1995 | no | no |
| **Morocco** | 1978 | 1995 | 2000 | 2012 |
| **Palestinian Territories** | - | 1995* | 1997* | 2001* |
| **Syria** | 1978 | 1995 | no | no |
| **Tunisia** | 1978 | 1995 | 1998 | 2008 |
| **Turkey** | 1978 | | | 1996** |

*The agreement with the Palestinian Authority is a transitory agreement which due to the political situation has not been applied.** Customs Union between the EU and Turkey.

### Table 2. Summary Statistics

| Variable | Obs. | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| **Lmdon** | 36843 | 15.460 | 3.424 | 0.000 | 25.575 |
| **Lxdon** | 48132 | 16.238 | 2.893 | 2.303 | 25.640 |
| **Loda** | 34921 | 14.497 | 2.492 | 9.210 | 23.142 |
| **Lamulti** | 44943 | -0.017 | 2.019 | -4.605 | 6.705 |
| **Lyd** | 51660 | 26.793 | 1.315 | 24.325 | 30.252 |
| **Lyr** | 49791 | 22.651 | 1.974 | 17.162 | 28.850 |
| **Lyhd** | 51660 | 10.058 | 0.303 | 9.136 | 10.886 |
| **Lyhr** | 47628 | 7.813 | 1.126 | 4.714 | 11.075 |
| **Lexchr** | 49476 | 4.683 | 1.123 | -4.345 | 14.988 |
| **Ld** | 51660 | 8.811 | 0.590 | 5.601 | 9.850 |

**Note:** The period considered is 1988-2007. L indicates natural logarithms; Mdon, Xdon denote bilateral donors' imports and exports at current prices, respectively. Oda is net bilateral aid from donor *i* to country *j*; and Amulti is imputed multilateral aid to country *j*. Yd and Yr are donors' and recipients' GDP, respectively; Yhd and Yhr and are donors' and recipients' GDP per capita, respectively; exchr denotes the bilateral exchange rate at current prices and d is the great circle distance between trading partners.

## Table 3. Main results for the FE model with AR(1) and Hausman-Taylor estimates

| | FE with AR(1) | | | Hausman-Taylor | | |
|---|---|---|---|---|---|---|
| **Dep. Var.** | **Lmdon** | **Lxdon** | **Loda** | **Lmdon** | **Lxdon** | **Loda** |
| **Indep. Var.** | b/se | b/se | b/se | b/se | b/se | b/se |
| **Loda** | 0.014* | 0.058*** | | 0.010* | 0.058*** | |
| | 0.008 | 0.007 | | 0.006 | 0.004 | |
| **Lodaj** | 0.026 | 0.083*** | | 0.060*** | 0.084*** | |
| | 0.037 | 0.016 | | 0.014 | 0.009 | |
| **Lamulti** | -0.043*** | 0 | | -0.033*** | 0 | |
| | 0.011 | 0.01 | | 0.009 | 0.005 | |
| **Lyd** | 0.582*** | 0.253*** | 1.295*** | 0.853*** | 0.518*** | 0.853*** |
| | 0.105 | 0.058 | 0.11 | 0.056 | 0.031 | 0.036 |
| **Lyr** | 0.11 | 0.539*** | 0.151** | 0.514*** | 0.644*** | 0.381*** |
| | 0.074 | 0.053 | 0.075 | 0.029 | 0.018 | 0.023 |
| **Lyhd** | -0.921*** | -0.231** | -0.633*** | -0.567*** | -0.271*** | 2.561*** |
| | 0.19 | 0.104 | 0.142 | 0.146 | 0.085 | 0.121 |
| **Lyhr** | 1.599*** | 0.474*** | -0.565*** | 1.163*** | 0.387*** | -0.738*** |
| | 0.138 | 0.083 | 0.136 | 0.05 | 0.03 | 0.038 |
| **Lexchr** | 0.046*** | 0.003 | -0.015 | 0.026*** | 0.002 | -0.061*** |
| | 0.015 | 0.008 | 0.017 | 0.009 | 0.006 | 0.008 |
| **FTA** | 0.117** | 0.157*** | | 0.168** | 0.176*** | |
| | 0.053 | 0.022 | | 0.075 | 0.05 | |
| **CU** | 0.392*** | 0.387*** | | 0.399*** | 0.414*** | |
| | 0.148 | 0.073 | | 0.133 | 0.085 | |
| **Lxdon** | | | 0.165*** | | | 0.166*** |
| | | | 0.022 | | | 0.009 |
| **Ld** | | | | -0.737*** | -0.890*** | -0.327*** |
| | | | | 0.146 | 0.088 | 0.087 |
| **Contig** | | | | -0.852 | 0.694 | -0.001 |
| | | | | 2.5 | 1.343 | 1.32 |
| **Colony** | | | | 1.842*** | 1.527*** | 1.636*** |
| | | | | 0.408 | 0.255 | 0.25 |
| **Comlang** | | | | -0.077 | 0.211 | 0.557*** |
| | | | | 0.253 | 0.152 | 0.149 |
| **Nobs** | 25311 | 30819 | 31353 | 25311 | 30819 | 31353 |

Note: L indicates natural logarithms; Mdon, Xdon denote bilateral donors' imports and exports at current prices, respectively. Yd and Yr are donors' and recipients' GDP, respectively; Yhd and Yhr and are donors' and recipients' GDP per capita, respectively; d is distance; Oda is net bilateral aid from donor *i* to country *j*; Odaj is net bilateral aid from all donors but donor i to country *j* and Amulti is imputed multilateral aid to country *j*. Exchr denotes the bilateral exchange rate at current prices. FTA, CU, Contig, Comlang, and Colony are dummies that take a value of 1 when countries belong to the same free trade agreement (FTA), same customs union (CU), share a border or language or have a colonial relationship, respectively. Robust standard errors reported. *** p<0.01, ** p<0.05, * p<0.1.

**Table 4. GMM-System results**

| **Dep. Var.** | **Lmdon** | **Lxdon** | **Loda** | **Lmdon** | **Lxdon** | **Loda** |
|---|---|---|---|---|---|---|
| **Indep. Var.** | b/se | b/se | b/se | Long-run b | Long-run b | Long-run b |
| **Y(t-1)** | 0.457*** | 0.388* | 0.346*** | | | |
| | 0.025 | 0.215 | 0.023 | | | |
| **Y(t-2)** | 0.116*** | 0.311** | 0.006*** | | | |
| | 0.021 | 0.141 | 0.001 | | | |
| **Lyd** | 0.451*** | 0.252*** | 0.258*** | 1.056 | 0.837 | 0.398 |
| | 0.052 | 0.08 | 0.032 | | | |
| **Lyr** | 0.497*** | 0.277*** | 0.083*** | 1.164 | 0.920 | 0.128 |
| | 0.048 | 0.088 | 0.024 | | | |
| **Lyhd** | -0.571*** | -0.298*** | 1.572*** | -1.337 | -0.990 | 2.426 |
| | 0.15 | 0.11 | 0.162 | | | |
| **Lyhr** | 0.061 | 0.031** | -0.520*** | 0.143 | 0.103 | -0.802 |
| | 0.037 | 0.015 | 0.039 | | | |
| **Ld** | -0.287*** | -0.265*** | -0.038 | -0.672 | -0.880 | -0.059 |
| | 0.042 | 0.084 | 0.048 | | | |
| **Loda(t-1)** | 0.052*** | 0.051*** | | 0.122 | 0.169 | |
| | 0.01 | 0.02 | | | | |
| **Lamulti** | -0.059** | -0.034*** | | -0.138 | -0.113 | |
| | 0.023 | 0.011 | | | | |
| **Lexchr** | 0.027 | -0.007 | -0.048** | 0.063 | -0.023 | -0.074 |
| | 0.022 | 0.006 | 0.02 | | | |
| **FTA** | 0.157* | 0.269** | | 0.351 | 0.894 | |
| | 0.092 | 0.108 | | | | |
| **CU** | -0.225*** | -0.064 | | -0.956 | -0.213 | |
| | 0.228 | 0.128 | | | | |
| **Contig** | 0.176 | 0.341 | 0.209 | 0.412 | 1.133 | 0.323 |
| | 0.31 | 0.252 | 0.695 | | | |
| **Colony** | 0.494*** | 0.243*** | 0.821*** | 1.157 | 0.807 | 1.267 |
| | 0.101 | 0.086 | 0.11 | | | |
| **Comlang** | 0.073 | 0.057* | 0.043 | 0.171 | 0.189 | 0.066 |
| | 0.061 | 0.029 | 0.059 | | | |
| **Lxdon(t-1)** | | | 0.173*** | | | 0.267 |
| | | | 0.023 | | | |
| **Nobs** | 21353 | 26683 | 25684 | | | |
| **N of Inst.** | 71 | 57 | 48 | | | |
| **Ar1 (p)** | 0.000 | 0.082 | 0.000 | | | |
| **Ar2 (p)** | 0.054 | 0.266 | 0.199 | | | |
| **Sargan (p)** | 1.000 | 0.792 | 0.100 | | | |
| **Hansen (p)** | 0.627 | 0.090 | 0.000 | | | |

Note: Y denotes the endogenous variable in each model. L indicates natural logarithms; Mdon, Xdon denote bilateral donors' imports and exports at current prices, respectively. Yd and Yr are donors' and recipients' GDP, respectively;

Yhd and Yhr and are donors' and recipients' GDP per capita, respectively; Ld is distance; Oda is net bilateral aid from donor *i* to country *j*; $Oda_j$ is net bilateral aid from all donors but donor i to country *j* and Amulti is imputed multilateral aid to country *j*. . Exchr denotes the bilateral exchange rate at current prices. FTA, CU, Contig, Comlang, and Colony are dummies that take a value of 1 when countries belong to the same free trade agreement (FTA), same customs union (CU), share a border or language or have a colonial relationship, respectively. Robust standard errors reported. *** p<0.01, ** p<0.05, * p<0.1.

## Table 5. Time-varying coefficients for development aid

| Hausman-Taylor estimates | **Lmdon** | **Lxdon** |
|---|---|---|
| | b/se | b/se |
| Loda_before_2005 | 0.008 | 0.063*** |
| | 0.006 | 0.004 |
| Loda_after_2005 | 0.018** | 0.038*** |
| | 0.008 | 0.005 |
| | chi2( 1) = 2.15 | chi2( 1) = 32.87 |
| | Prob > chi2 = 0.1427 | Prob > chi2 = 0.0000 |

Note: Only the estimated coefficients for the variable official development aid are reported. Complete results are available upon request from the authors. Robust standard errors reported. *** p<0.01, ** p<0.05, * p<0.1.

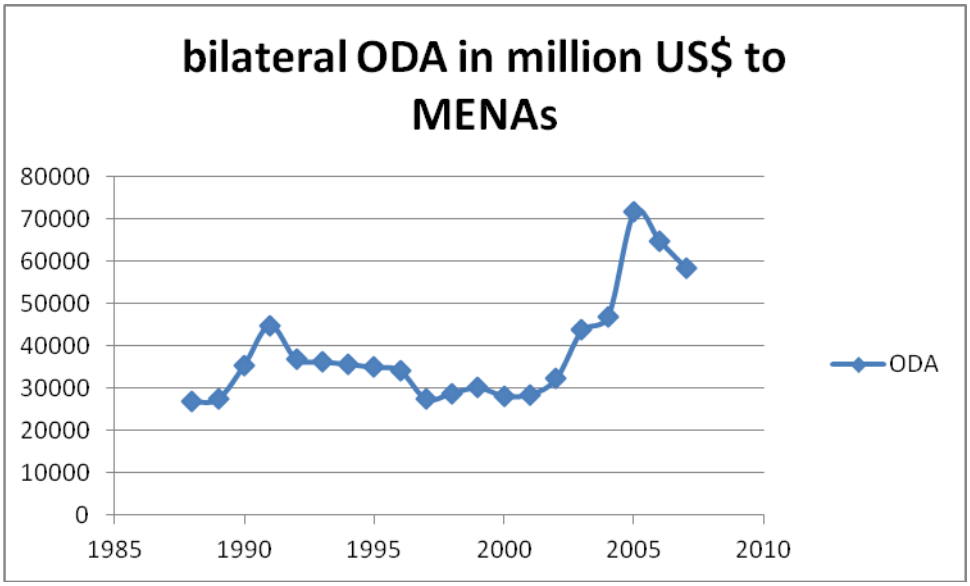
## Table 6. Bilateral aid determinants. Heckman 2-step estimation

| **Dep. Var.** | **Loda** | **Oda (selection equation)** |
|---|---|---|
| **Indep. Var.** | b/se | b/se |
| **Lyd** | 0.542*** | 0.188*** |
| | 0.012 | 0.009 |
| **Lyr** | 0.175*** | 0.099*** |
| | 0.01 | 0.007 |
| **Lyhd** | 2.842*** | 1.814*** |
| | 0.087 | 0.045 |
| **Lyhr** | -0.910*** | -0.657*** |
| | 0.02 | 0.009 |
| **Ld** | -0.119*** | -0.058*** |
| | 0.02 | 0.014 |
| **Colony** | 1.498*** | 0.347*** |
| | 0.05 | 0.055 |
| **Lexchr** | -0.049*** | -0.034*** |
| | 0.011 | 0.008 |
| **Contig** | -0.079 | -0.195 |
| | 0.281 | 0.219 |
| **Comlang** | 0.220*** | 0.674*** |
| | 0.032 | 0.028 |
| **Lxdon** | 0.324*** | 0.157*** |
| | 0.009 | 0.005 |
| **Conflict** | | -0.100*** |
| | | 0.022 |
| **Dumdiscos** | | 0.248*** |
| | | 0.019 |
| **Mills inverse ratio** | -0.180** | |
| | 0.08 | |
| **Constant** | -31.160*** | -22.091*** |
| | 0.996 | 0.492 |
| **Nobs** | 43312 | |
| **Number of Censured obs** | 11959 | |
| **Chi$^2$** | 7363.248 | |
| **P** | 0.000 | |

Note: L indicates natural logarithms; Oda is net bilateral aid from donor *i* to country *j*. Xdon denote bilateral donors' exports at current prices. Yd and Yr are donors' and recipients' GDP, respectively; Yhd and Yhr and are donors' and recipients' GDP per capita, respectively; Ld is distance; Exchr denotes the bilateral exchange rate at current prices. FTA, CU, Contig, Comlang, and Colony are dummies that take a value of 1 when countries belong to the same free trade agreement (FTA), same customs union (CU), share a border or language or have a colonial relationship, respectively. Conflict is a dummy that takes a value of one when an armed conflict took place in a given year and Dumdiscos is a dummy that takes a value of one when a natural disaster took place in a given year. Robust standard errors reported. *** p<0.01, ** p<0.05, * p<0.1.

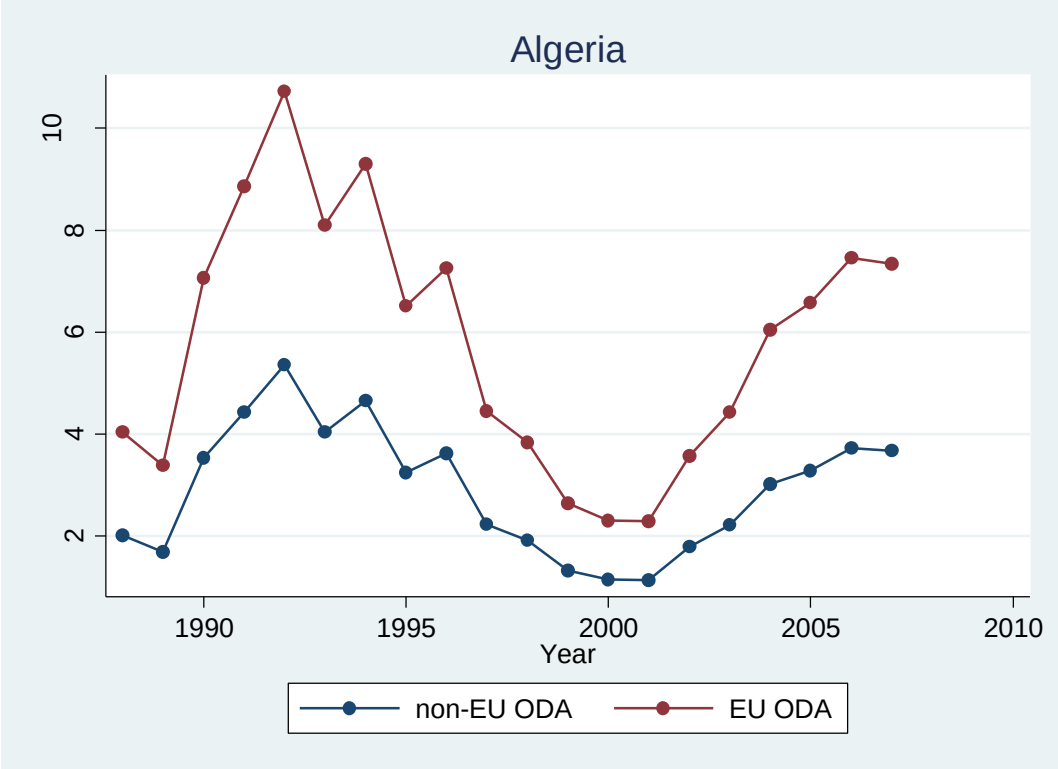
**FIGURES**

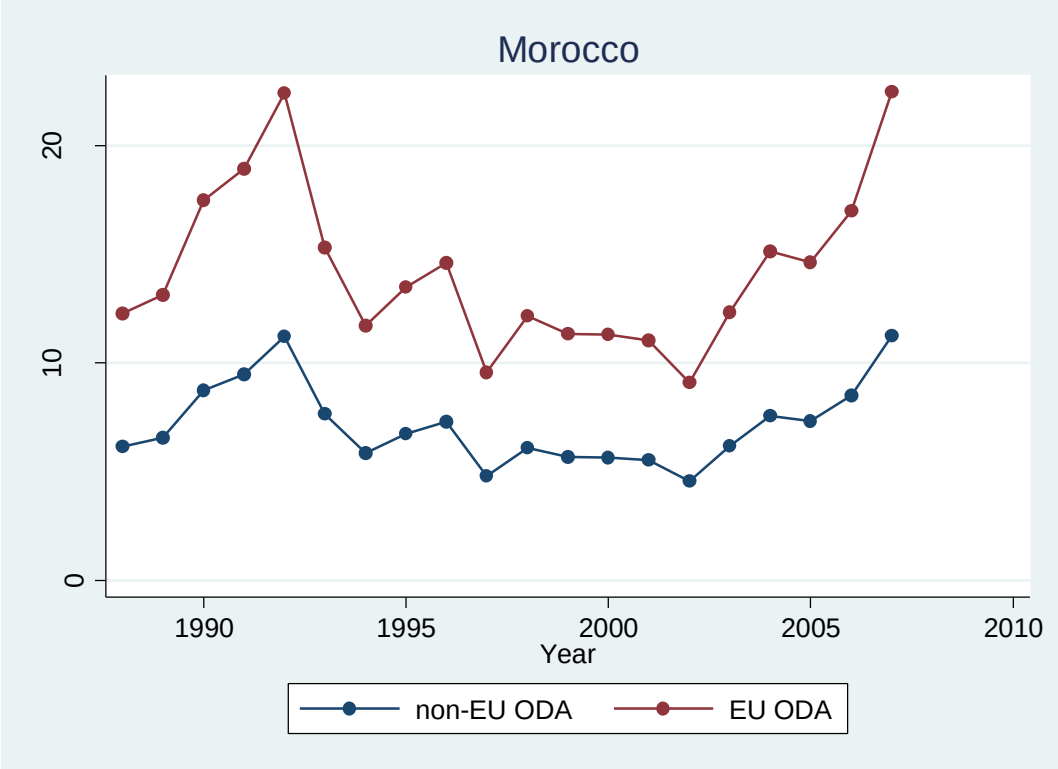
**Figure 1. Evolution over time of ODA in the MENA region**

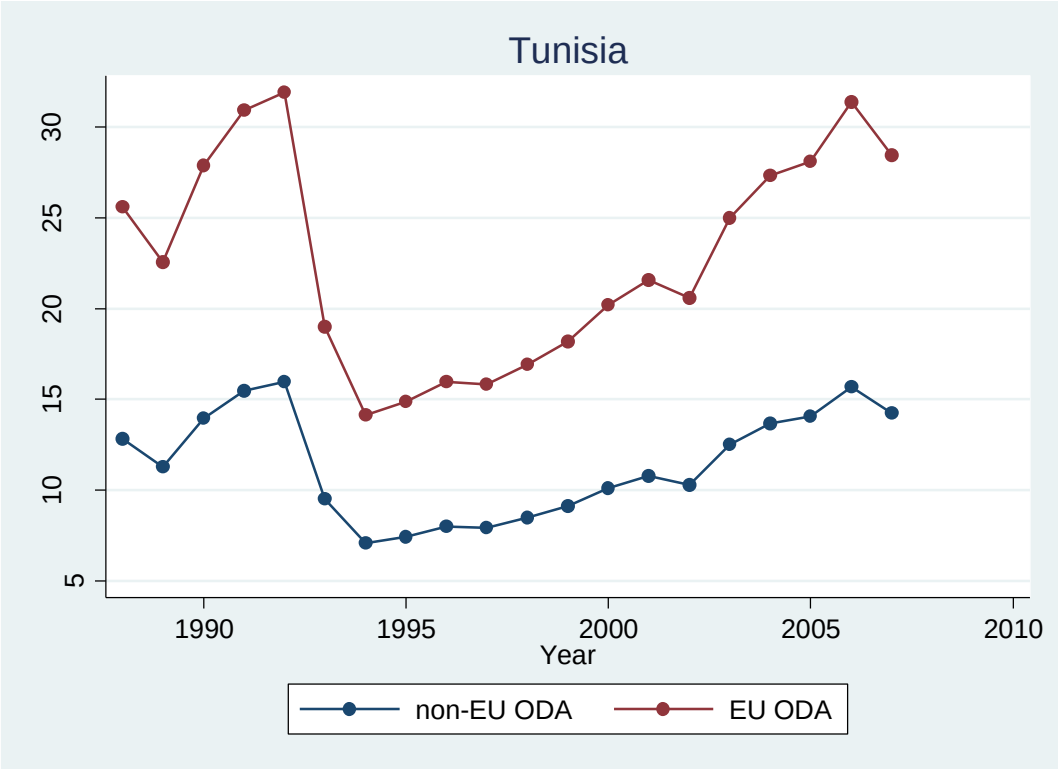


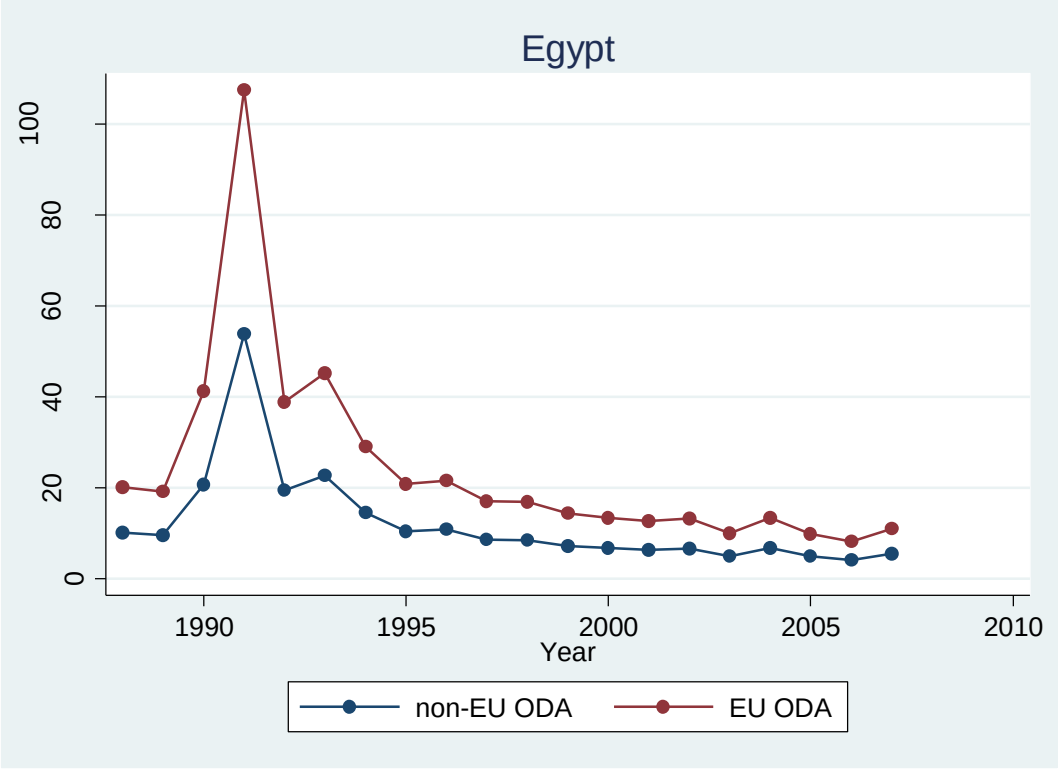

Note: ODA denotes Official Development Aid. MENA region refers to Morocco, Tunisia, Algeria, Libya and Egypt. Own elaboration using data from the OECD.

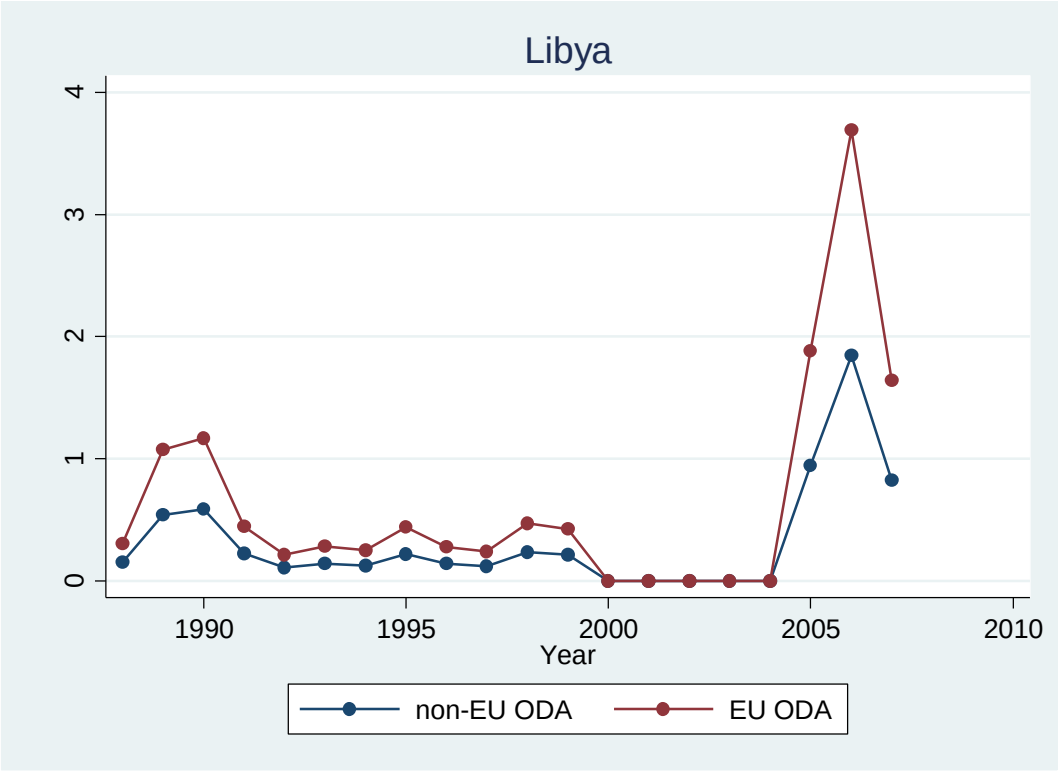
**Figure 2. ODA per capita by recipient countries from EU and non-EU donors**

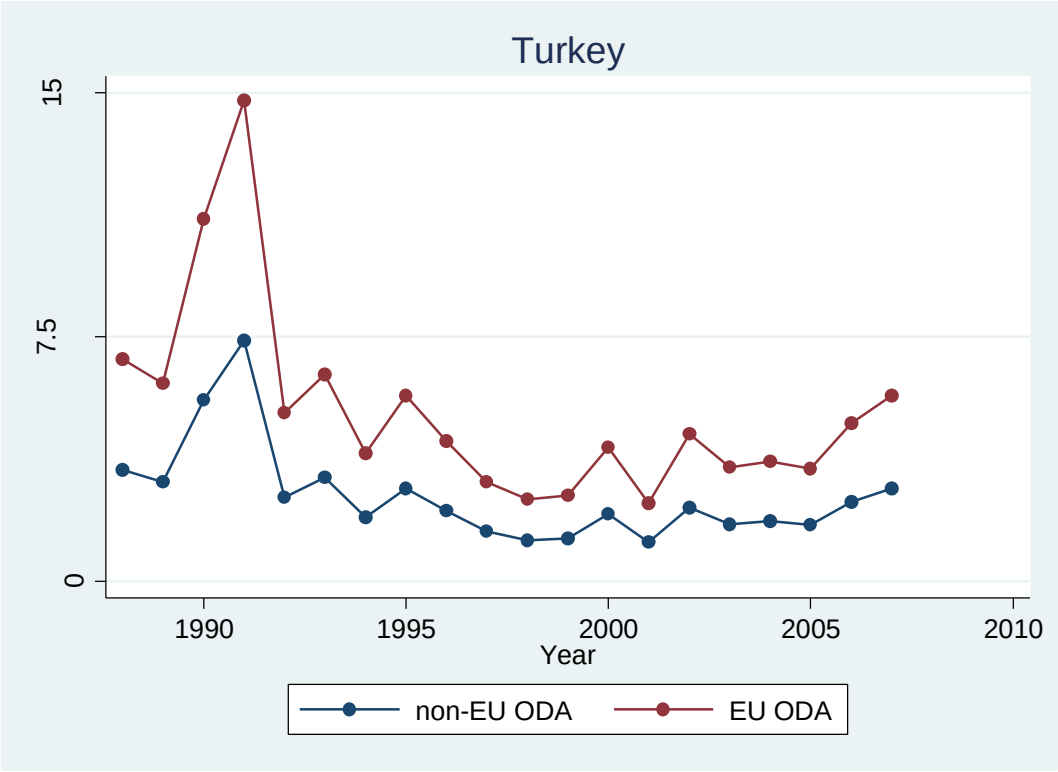



Tunisia
5
10
15
20
25
30
1990
1995
2000
2005
2010
Year
non-EU ODA
EU ODA


Egypt
0
20
40
60
80
100
1990
1995
2000
2005
2010
Year
non-EU ODA
EU ODA


Libya
0
1
2
3
4
1990
1995
2000
2005
2010
Year
non-EU ODA
EU ODA


Turkey
0
7.5
15
1990
1995
2000
2005
2010
Year
non-EU ODA
EU ODA

Note: Own elaboration using data from the OECD aid dataset. ODA p.c. denotes Official Development Aid in US$ per person. EU donors: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and the United Kingdom. Non-EU donors: Australia, Japan, Canada, New Zealand, Norway, Switzerland and the United States.

## APPENDIX

## A.1. OLS and FE estimations

| | MD_OLS | XD_OLS | AID_OLS | MD_FE | XD_FE | AID_FE |
|---|---|---|---|---|---|---|
| | b/se | b/se | b/se | b/se | b/se | b/se |
| **Loda (t-1)** | 0.104*** | 0.175*** | | 0.006 | 0.045*** | |
| | 0.018 | 0.013 | | 0.01 | 0.006 | |
| **Lyd** | 1.028*** | 0.793*** | 0.546*** | 0.565*** | 0.072 | 0.943*** |
| | 0.043 | 0.027 | 0.038 | 0.13 | 0.077 | 0.125 |
| **Lyr** | 1.143*** | 0.854*** | 0.194*** | 0.11 | 0.559*** | 0.385*** |
| | 0.024 | 0.017 | 0.032 | 0.069 | 0.037 | 0.067 |
| **Lyhd** | -1.236*** | -0.997*** | 3.003*** | -0.297 | 0.404* | 2.198*** |
| | 0.29 | 0.201 | 0.214 | 0.375 | 0.213 | 0.29 |
| **Lyhr** | 0.251*** | 0.234*** | -0.942*** | 1.706*** | 0.491*** | -0.372*** |
| | 0.05 | 0.035 | 0.036 | 0.126 | 0.071 | 0.117 |
| **Lexchr** | 0.046 | -0.018 | -0.059** | 0.042* | 0.005 | -0.071*** |
| | 0.031 | 0.019 | 0.029 | 0.025 | 0.013 | 0.018 |
| **Ld** | -0.657*** | -0.883*** | -0.146** | | | |
| | 0.067 | 0.045 | 0.066 | | | |
| **Contig** | -0.089 | 0.514 | 0.064 | | | |
| | 0.759 | 0.808 | 1.263 | | | |
| **Colony** | 1.136*** | 0.781*** | 1.517*** | | | |
| | 0.185 | 0.138 | 0.147 | | | |
| **Comlang** | 0.325*** | 0.303*** | 0.249*** | | | |
| | 0.126 | 0.093 | 0.094 | | | |
| **FTA** | 0.192 | 0.482*** | | 0.114 | 0.149*** | -3.430*** |
| | 0.168 | 0.107 | | 0.11 | 0.049 | 1.07 |
| **CU** | -0.490** | -0.153 | | 0.282* | 0.349*** | 3.581 |
| | 0.239 | 0.166 | | 0.146 | 0.094 | 4.82 |
| **Lxdon(t-1)** | | | 0.326*** | | | 0.122*** |
| | | | 0.025 | | | 0.015 |
| **Nobs** | 24561 | 30002 | 29944 | 24561 | 30002 | 29944 |
| **R2** | 0.6581458 | 0.7365593 | 0.457356 | 0.1404898 | 0.2383756 | 0.0859537 |
| **AIC** | 100974 | 102494.1 | 120947 | 66874.65 | 58470.45 | 85836.35 |
| **BIC** | 101225.3 | 102751.7 | 121221.1 | 67085.49 | 58686.49 | 86068.94 |
| **RMSE** | 1.888921 | 1.334647 | 1.822235 | 0.9436047 | 0.6408804 | 1.013989 |

Note: L indicates natural logarithms; Oda is net bilateral aid from donor *i* to country *j*. Xdon denote bilateral donors' exports at current prices. Yd and Yr are donors' and recipients' GDP, respectively; Yhd and Yhr and are donors' and recipients' GDP per capita, respectively; Ld is distance; Exchr denotes the bilateral exchange rate at current prices. FTA, CU, Contig, Comlang, and Colony are dummies that take a value of 1 when countries belong to the same free trade agreement (FTA), same customs union (CU), share a border or language or have a colonial relationship, respectively. Robust standard errors reported. *** p<0.01, ** p<0.05, * p<0.1.

## A.2 List of donors and recipients

| **List of donors (21)** | **List of recipient countries (132)** | | | |
|---|---|---|---|---|
| Australia | Afghanistan | Comoros | Kazakhstan | Qatar |
| Austria | Albania | Congo, Dem. Rep. | Kenya | Rwanda |
| Belgium | Algeria | Congo, Rep. | Kiribati | Samoa |
| Canada | Angola | Costa Rica | Kuwait | Saudi Arabia |
| Denmark | Argentina | Croatia | Laos | Senegal |
| Finland | Armenia | Côte d'Ivoire | Lebanon | Seychelles |
| France | Aruba | Djibouti | Lesotho | Sierra Leone |
| Germany | Azerbaijan | Dominica | Liberia | South Africa |
| Greece | Bahamas | Dominican Republic | Libya | Sri Lanka |
| Ireland | Bahrain | Egypt | Madagascar | Sudan |
| Italy | Bangladesh | El Salvador | Malawi | Suriname |
| Japan | Barbados | Eritrea | Malaysia | Swaziland |
| Netherlands | Belarus | Ethiopia | Mali | Syria |
| New Zealand | Belize | Fiji | Mauritania | Tanzania |
| Norway | Benin | Gabon | Mauritius | Thailand |
| Portugal | Bermuda | Gambia | Mexico | Togo |
| Spain | Bhutan | Georgia | Moldova | Tonga |
| Sweden | Bolivia | Ghana | Mongolia | Trinidad and Tobago |
| Switzerland | Bosnia-Herzegovina | Grenada | Morocco | Tunisia |
| United Kingdom | Botswana | Guatemala | Mozambique | Turkey |
| United States | Brazil | Guinea | Myanmar | Uganda |
| | Brunei | Guinea-Bissau | Namibia | United Arab Emirates |
| | Burkina Faso | Guyana | Nepal | Uruguay |
| | Burundi | Haiti | Nicaragua | Venezuela |
| | Cambodia | Honduras | Niger | Vietnam |
| | Cameroon | India | Nigeria | Yemen |
| | Cape Verde | Indonesia | Oman | Zambia |
| | Central African Rep. | Iran | Pakistan | |
| | Chad | Iraq | Panama | |
| | Chile | Israel | Paraguay | |
| | China | Jamaica | Peru | |
| | Colombia | Jordan | Philippines | |

## Table A.3 Moroccan Tariffs for products imported from the EU during the transition period

| (Add-valorem tariffs in percent) | 2000 | 2001 | 2002 | 2004 | 2006 | 2008 | 2010 | 2012 |
|---|---|---|---|---|---|---|---|---|
| **Agriculture** | 41,3 | 41,0 | 40,6 | 40,2 | 40,2 | 40,1 | 40,1 | 40,1 |
| **Energy** | 9,7 | 7,5 | 5,2 | 2,3 | 1,7 | 1,2 | 0,6 | 0,0 |
| **Food, beverages and Tobacco** | 41,7 | 41,1 | 40,6 | 38,7 | 37,4 | 36,0 | 34,7 | 33,4 |
| **Textiles and footwear** | 37,2 | 36,7 | 36,1 | 28,5 | 21,4 | 14,2 | 7,1 | 0,0 |
| **Wood and cork** | 40,6 | 40,3 | 40,0 | 31,7 | 23,8 | 15,9 | 7,9 | 0,0 |
| **Paper** | 33,0 | 31,8 | 30,6 | 23,6 | 17,7 | 11,8 | 5,9 | 0,0 |
| **Chemicals** | 17,8 | 14,7 | 11,6 | 6,8 | 5,1 | 3,4 | 1,7 | 0,0 |
| **Plastic** | 37,9 | 37,5 | 37,1 | 29,5 | 22,2 | 14,9 | 7,6 | 0,3 |
| **non metallic minerals** | 30,7 | 27,8 | 24,8 | 17,5 | 13,2 | 8,8 | 4,4 | 0,0 |
| **Metallurgy and metal products** | 23,7 | 20,2 | 16,8 | 10,7 | 8,0 | 5,4 | 2,7 | 0,0 |
| **Machinery** | 5,1 | 4,7 | 4,3 | 3,1 | 2,3 | 1,6 | 0,8 | 0,0 |
| **Electronic equipment** | 7,0 | 5,7 | 4,3 | 2,3 | 1,8 | 1,2 | 0,6 | 0,0 |
| **Vehicles** | 14,5 | 11,8 | 9,0 | 5,0 | 3,7 | 2,5 | 1,2 | 0,0 |
| **Other manufactures** | 25,8 | 17,7 | 9,6 | 1,2 | 0,9 | 0,6 | 0,3 | 0,0 |
| **All** | 25,81 | – | 21,71 | 16,76 | 13,86 | 10,96 | 8,07 | 5,17 |

Source: TRAINS (UNCTAD) and own calculations.

## A.4 Sector-by-Sector Contribution to Total Exports of MENA Countries to Europe

| | Algeria | | Egypt | | Morocco | | Tunisia | | Turkey | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1993 | 2003 | 1993 | 2003 | 1993 | 2003 | 1993 | 2003 | 1993 | 2003 |
| **Energy** | 98.18 | 97.67 | 37.47 | 49.27 | 3.17 | 1.7 | 13.47 | 9.15 | 1.27 | 0.92 |
| **Food and Agriculture** | 0.28 | 0.23 | 9.17 | 10.47 | 29.4 | 19.97 | 10.82 | 5.38 | 20.2 | 9.18 |
| **Textiles** | 0.16 | 0.1 | 34.63 | 12.92 | 37.22 | 46.55 | 55.74 | 55.65 | 57.47 | 40.77 |
| **Wood and paper** | 0.1 | 0.09 | 0.42 | 0.52 | 2.04 | 1.95 | 1.11 | 2.18 | 1.46 | 1.85 |
| **Chemicals** | 0.82 | 1.24 | 5.35 | 14.91 | 17.42 | 7.67 | 5.44 | 6.23 | 8.07 | 7.56 |
| **Iron steel** | 0.34 | 0.21 | 2.99 | 6.18 | 0.63 | 0.65 | 0.16 | 0.26 | 0.83 | 3.98 |
| **Non ferrous** | 0.09 | 0.33 | 8.59 | 3.63 | 4.06 | 1.66 | 0.29 | 0.46 | 1.12 | 1.18 |
| **Mechanical** | 0.01 | 0.1 | 1.24 | 1.97 | 0.82 | 1.19 | 3.63 | 2.38 | 3.18 | 8.64 |
| **Vehicles** | 0 | 0 | 0.03 | 0.04 | 0.63 | 0.58 | 0.36 | 2.2 | 1.32 | 14.34 |
| **Electrical** | 0.01 | 0 | 0.05 | 0.07 | 2.72 | 7.79 | 6.94 | 13.66 | 3.26 | 4.83 |
| **Electronic** | 0 | 0.01 | 0.07 | 0.03 | 1.89 | 10.29 | 2.05 | 2.44 | 1.83 | 6.75 |

*Source*: CHELEM Database (CEPII, 2011) and own calculations.