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Shallow versus deep integration between mediterranean countries and the EU and within the mediterranean region

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CASE Network Reports

Shallow versus Deep Integration between Mediterranean Countries and the EU and within the Mediterranean Region

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Abstract

The paper aims at assessing the specific impact of shallow versus deep integration between Mediterranean (MED) countries[1] and their partners in the European Union (EU) as well as between the MED countries themselves. It relies on dataset developed for this project concerning tariffs (as a proxy for shallow integration) and Non Tariff Measures (NTMs)[2] (as a proxy for deep integration). Additional data are also included in order to take into account other trade costs, especially transport costs and logistics costs. In this regard, an original dataset of maritime freight cost (Maersk, 2007) is introduced as well as the trade logistics performance (TLP) index produced by the World Bank. Such datasets are useful for providing additional insight into deep integration.

The paper starts by calculating the magnitude of NTMs in terms of ad valorem tariff equivalent (AVEs). The estimation of NTMs through ad valorem equivalents (AVEs) shows that Algeria and Jordan have the highest value of AVEs, whereas Tunisia, Morocco, and Egypt have the lowest value. A gravity model is then estimated with special emphasis on trade costs which are the crucial point in our research study. Given the limitation of data on NTMs, the gravity model is estimated for only one year (2001), and for each MED country. Trade costs are represented by tariffs, AVEs of NTMs, and transport and logistics costs. The idea is to test which of the three elements of trade costs are the most impeding to bilateral trade between MED countries and EU countries as well as amongst MED countries. The model shows that tariffs, NTMs, and trade and logistics costs have a significant impact on trade, but is highly vivid in countries suffering from high tariff rates, prevalence of NTMs, and trade costs.

A number of simulations are carried out trying to differentiate between the impact of partial liberalization and full liberalization on trade creation. The results obtained show that full liberalization has a significant effect whether it is only related to shallow integration (tariff removal) or deep integration (NTMs and trade and logistics). The effect is higher if trade costs and logistics are improved. The results are far less if only partial liberalization takes place and in several countries

[1] MED countries include Tunisia, Egypt, Morocco, Algeria, Syria, Jordan, Turkey, Lebanon, Libya, Palestinian territories, and Israel. Libya and Palestinian territories have not been included in this analysis because of data unavailability.

[2] The term “Non Tariff Measures” (NTMs) has recently gained acceptance. It now tends to replace the term “Non Tariff Barriers” (NTBs) since some measures do not always intend to be explicitly protectionist (e.g. some regulations or standards designed at increasing consumer safety (Cadot et al. 2011).

is insignificant implying that marginal reductions in NTMs or tariffs cannot always help to create trade.

Finally the study shows that there is a huge potential for enhancing trade amongst MED countries if trade costs are lowered, logistics is improved, and NTMs are abolished.

Executive summary

The paper aims at assessing the specific impact of shallow versus deep integration between Mediterranean (MED) countries[3] and their partners in the European Union (EU) as well as between the MED countries themselves. It relies on dataset developed for this project concerning tariffs (as a proxy for shallow integration) and Non Tariff Measures (NTMs)[4] (as a proxy for deep integration). Additional data are also included in order to take into account other trade costs, especially transport costs and logistics costs. In this regard, an original dataset of maritime freight cost (Maersk, 2007) is introduced as well as the trade logistics performance (TLP) index produced by the World Bank. Such datasets are useful for providing additional insight into deep integration.

The paper starts by calculating the magnitude of NTMs in terms of ad valorem tariff equivalent (AVEs). It relies on new research developments based on Kee et al. (2009). This makes it possible to get a first idea about the role of NTMs in Mediterranean trade and thus the cost of non-deep integration. The paper identified that despite different initiatives on the multilateral and regional levels the tariff levels remain relatively high in some MED countries as Tunisia and Algeria, and is lowest in Turkey and Israel. The estimation of NTMs through ad valorem equivalents (AVEs) shows that Algeria and Jordan have the highest value of AVEs, whereas Tunisia, Morocco, and Egypt have the lowest value. When adding the tariffs and AVEs we observe that Algeria exhibit the highest level of protection, followed by Tunisia, whereas Morocco has the lowest level of protection followed by Egypt. Lebanon and Jordan come in an intermediate position.

In Part 1, the study estimated a gravity model based on a modified version of the theoretical equation developed by Anderson and van Wincoop (2003 and 2004), with special emphasis on trade costs which are the crucial point in our research study. Given the limitation of data on NTMs, the gravity model is estimated for only one year (2001), and for each MED country. Trade costs are represented by tariffs, AVEs of NTMs, and transport and logistics costs. The idea is to test

[3] MED countries include Tunisia, Egypt, Morocco, Algeria, Syria, Jordan, Turkey, Lebanon, Libya, Palestinian territories, and Israel. Libya and Palestinian territories have not been included in this analysis because of data unavailability.

[4] The term “Non Tariff Measures” (NTMs) has recently gained acceptance. It now tends to replace the term “Non Tariff Barriers” (NTBs) since some measures do not always intend to be explicitly protectionist (e.g. some regulations or standards designed at increasing consumer safety (Cadot et al. 2011).

which of the three elements of trade costs are the most impeding to bilateral trade between MED countries and EU countries as well as amongst MED countries.

This provides a better understanding about the expected gains due to these cost reductions in the framework of shallow and deep integration. The gravity model applies a Heckman two-stage procedure. Sensitivity analysis is carried out by using a number of other estimators (fixed-effects vector decomposition (FEVD), Hausman and Taylor, Feasable GLS) as well an alternative proxy for transport costs). Estimations show that NTMs have a detrimental effect on trade in all MED countries. Algeria has the highest coefficient whereas Morocco has the lowest. Indeed, there is strong correlation between the magnitude of the AVEs and the trade effects of NTMs. NTMs significantly reduce bilateral trade in all Mediterranean countries. This means that whatever the past efforts of trade liberalization, both at multilateral and regional level, NTMs remain significant obstacles to trade. Transport coefficient is also significant showing that it acts as a major impediment to flow of trade if it is inefficient, yet the impact differs from one country to another with some countries not being affected as Egypt, Jordan, and Israel. The logistics coefficient is not always significant since it measures the impact of the EU partners logistics on flow of exports from MED countries, yet the logistics coefficient of MED countries is always significant implying that logistics affect negatively trade amongst MED countries. The gravity model results are robust after undertaking sensitivity analysis.

A number of conclusions can be deducted from the gravity models' results including: a) Trade costs significantly reduce imports to MED countries from their partners in the EU; Tariffs are import reducing, but mainly in the countries which showed the highest tariff levels (Algeria and Tunisia). This suggests that the shallow integration was not fully achieved in these countries. Despite further tariffs cuts since 2001, tariffs remain significant in these countries in the most recent years. As a result, significant gains can still be expected from shallow integration in these countries; c) NTMs are significantly trade-reducing in all countries, especially in Algeria. On the other hand, they are less trade-reducing in Morocco and Tunisia, though still significant. This means that eliminating NTMs in MED countries as a move towards deeper integration with the EU is expected to provide significant gains; d) Transport costs significantly reduce trade, especially in Maghreb countries, since these countries show the highest freight costs. More generally, it seems that any improvement of logistics performance in MED countries is expected to increase imports from their partners, since this contributes to reduce transport costs, inefficiency and time. As a result, any deep integration policy which could stimulate the improvement of LPIs in MED countries (but also in the EU) is expected to provide additional gains.

These results pave the way for simulations of trade creation due to shallow and deep integration which are carried out in Part 2 of the study. In Part 2, the study

tries to answer two main questions, namely what is the trade creation which can be expected for the completion of shallow integration between Mediterranean countries and their partners? This question is addressed by simulating the impact of tariff removal on trade flows; and is there additional trade creation if MED countries move to deep integration, including both NTM reduction and LPI improvement? This is tackled not only by simulating the impact of reduction in NTMs but also transport costs and LPI. The simulations differentiate between shallow and deep integration and trade creation is calculated in both cases between the MED countries on the one hand and the EU countries on the other hand as well as amongst the MED countries. Each simulation considers an optimistic scenario Full integration) where full abolishment of tariffs, NTMs, and transport and LPI takes place, and a pessimistic scenario (partial integration) where only marginal cuts take place. Trade creation is high and significant for shallow and deep integration when full integration (optimistic scenario) takes place. However, it differs from one country to another being the highest in the case of Algeria, intermediate in the case of Tunisia and Egypt and smaller in the case of Morocco, Lebanon and Jordan. Partial integration (pessimistic scenario) has a relatively insignificant impact on trade creation. However, the impact is much larger in the case of countries that had high tariff rates and AVEs of NTMs (namely Algeria and Tunisia), and less impact on countries that had relatively lower rates. The simulations also showed that trade gains due to deep integration can also been reinforced further through the improvement of logistics in MED countries. In the case of trade amongst MED countries, the optimistic scenario for deep integration shows very significant trade increases between the MED partners, both because of NTMs' removal and increase in LPI. Conversely, the shallow integration process is almost fully achieved through the GAFTA agreement. This is why trade increase is more limited.

The main findings of the study are the following:

1. Tariffs are trade reducing, mainly in the countries which showed the highest tariff levels (Algeria and Tunisia). This suggests that the shallow integration was not fully achieved in these countries.
2. NTMs are significantly trade-reducing in all countries, especially in Algeria. On the other hand, they are less trade-reducing in Morocco and Tunisia, though significant. This means that eliminating NTMs in Mediterranean countries as a move toward deeper integration in the Euromed area is expected to provide significant gains.
3. Transport costs significantly reduce trade in Mediterranean countries, as well as inefficiencies in logistics.
4. The calculation of trade creation due to shallow and deep integration reveals that:

a. Tariff removal is expected to produce moderate or limited gains, except in Algeria, and Tunisia (to a lesser extent), since both countries show higher tariffs than the other Mediterranean countries.
b. Elimination of NTMs is expected to lead to strong trade gains (while a marginal reduction in NTMs leads to much smaller gains because NTMs must be importantly reduced in order to provide significant gains).
c. Trade gains due to deep integration can also been reinforced further through the potential reduction in trade and logistics costs.

These results lead to the following policy implications:

5. Mediterranean countries should complete their shallow integration with their EU partners and across themselves as a means of capturing the remaining trade gains available. In particular, Algeria should take efforts to reduce its tariffs which currently remain at high levels.
6. Dealing with deep integration is a more difficult task. First, NTMs must be addressed altogether, since we have shown that the removal of a particular NTM while keeping the other ones provides very limited benefits. As a result, each Mediterranean country should identify precisely all NTMs for each product and decide whether to remove all NTMs for this product or not. Of course, the removal of all NTMs for all products is not necessarily the right solution, since some NTMs may be useful at product level for specific reasons (sanitary, etc.).
7. However, there are numerous NTMs in Mediterranean countries which strongly reduce trade. Some questions must be addressed with regard their removal for specific products, by eliminating para-tariff measures or moving towards mutual technical standard recognition. In any case, a cost-benefit analysis should be undertaken at product-level before embarking on NTMs elimination (especially in terms of short terms costs due to an increased competition with EU products).
8. A second aspect of deep integration relates to the efficiency of logistics. In this regard, significant additional gains can be achieved through the extension of the Euro-Mediterranean integration as a means of improving LPI (port infrastructures, logistics services, etc.). In this regard, an increased cooperation in infrastructure related projects is required. In addition, extending the financial cooperation between the EU and Mediterranean countries (through specific EIB loans) can also help improving logistics' performance.

The study ends with an annex on the main NTMs prevailing in MED countries.

Introduction

This paper aims at paving the way for assessing the specific impact of shallow versus deep integration[5] between Mediterranean (MED) countries[6] and their partners in the European Union (EU) as well as between the MED countries themselves. It relies on dataset developed for this project (Annex 3), concerning especially tariffs (as a proxy for shallow integration) and Non Tariff Measures (NTMs)[7] (as a proxy for deep integration). Additional data are also included in order to take into account other trade costs, especially transport costs and logistics costs. In this regard, an original dataset of maritime freight cost (Maersk, 2007) as well as the logistics performance index (LPI) produced by the World Bank will be introduced. Such datasets are useful for providing additional insight into deep integration.

Section 1 of Part 1 is dedicated to calculating the magnitude of NTMs in terms of ad valorem tariff equivalent (AVEs). It relies on new research developments based on Kee et al. (2009). This makes it possible to get a first idea about the role of NTMs in Mediterranean trade and thus the cost of non-deep integration.

Section 2 of Part 1 estimates a gravity model from new theoretical and empirical developments. This model strongly relies on trade costs, following the literature initiated by Anderson and van Wincoop (2004). Consequently, the gravity model implemented makes it possible to calculate the specific impact of tariffs, NTMs and transport and logistics costs on trade of Mediterranean countries with their partners in the EU. This provides a better understanding about the expected gains due to these cost reductions in the framework of shallow and deep integration. These results pave the way for simulations of trade creation due to shallow

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[5] This paper has been prepared within the agenda of FP7-SSH-2009-A funded project (Grant Agreement No. 244578) on "Prospective Analysis for the Mediterranean Region (MEDPRO)", workpackage 5 on "Economic development, trade and investment", Task 3 on "Integration with the EU: Deep versus shallow integration".

[6] MED countries include Tunisia, Egypt, Morocco, Algeria, Syria, Jordan, Turkey, Lebanon, Libya, Palestinian territories, and Israel. Libya and Palestinian territories have not been included in this analysis because of data unavailability.

[7] The term "Non Tariff Measures" (NTMs) has recently gained acceptance. It now tends to replace the term "Non Tariff Barriers" (NTBs) since some measures do not always intend to be explicitly protectionist (e.g. some regulations or standards designed at increasing consumer safety (Cadot et al. 2011).

and deep integration which are carried out in Part 2 of the study. The simulations differentiate between shallow and deep integration and trade creation is calculated in both cases between the MED countries on the one hand and the EU countries on the other hand as well as amongst the MED countries. Conclusions and policy implications follow.

PART 1. PRELIMINARY EVIDENCE FROM A GRAVITY MODEL WITH TRADE COSTS[8]

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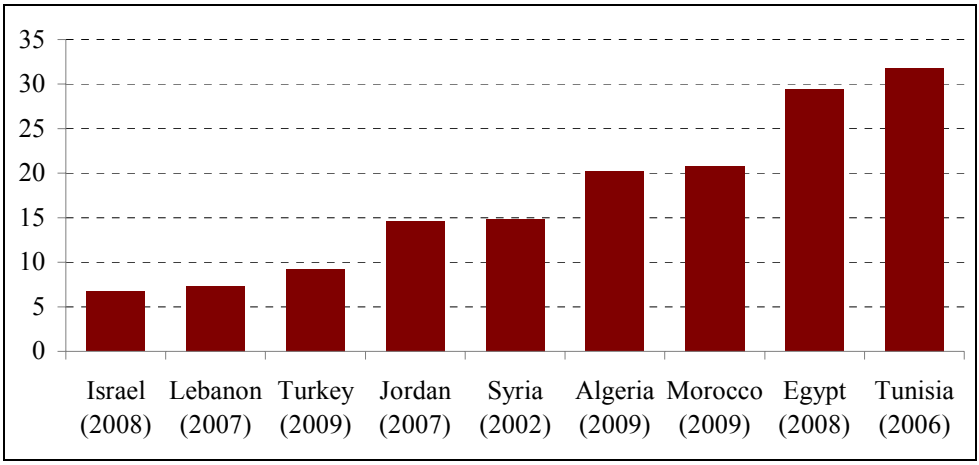
Section 1: An Estimation of Tariff and NTMs Protection between MED-11 and the EU

This section attempts to provide an estimation of trade costs, especially tariffs and NTMs applied between MED-11 and the EU (a review of the NTMs prevailing in MED countries is provided in Annex 1). This will make it possible to i) have a better understanding of the level and magnitude of tariffs and NTMs in the countries considered; ii) use these estimations as inputs in the gravity model in order to assess the effects of tariffs and NTMs in the MED-11/EU trade.

Starting with tariffs, where the database developed in this project (see Annex 3) provides bilateral tariffs at digit-2 level between MED countries and the EU. Figure 1 summarizes MFN tariffs applied by MED countries.

Figure 1. Average MFN tariffs applied by MED countries (unweighted average, %)



Note. Last year available in brackets. (Libya and Palestine are excluded due to lack of data).
Source: Lopez Gonzalez and Mendez Parra, 2010.

It shows that with the exception of Israel, Lebanon and Turkey, other countries still show significant tariff protection, especially Tunisia, Egypt, Morocco and Algeria.

Table 1 complements these results by showing the average tariffs which are effectively applied overall and at the bilateral level. It provides a slightly different picture by showing that Israel and Turkey have removed almost all tariff protection with regard to EU imports. Morocco and Lebanon have also made significant progress, with small average tariffs applied to EU imports. On the other hand, Tunisia, Syria and Algeria show the highest tariffs (up to 18% for Tunisia), whereas Jordan and Egypt are in intermediate position. It is however difficult to understand why Tunisia shows such a high level of tariffs with regards to EU imports, since this country has signed an Association Agreement including a free trade area very early with the EU in 1995 and has started dismantling tariffs relatively earlier than other South Mediterranean countries which signed with the EU similar agreements. Whatever the reliability of the data, Table 1 shows that the shallow integration process is not fully completed between MED countries and the EU, with the exception of Israel and Turkey. In particular, Algeria and Tunisia, to a lesser extent, exhibit relatively high tariffs. This remark will have significant implications when assessing the impact of shallow versus deep integration using a gravity model[9].

Table 1. Average tariffs applied by MED countries on their imports (%, unweighted average)

	Tariffs with all countris	Tariffs with EU	Share of Duty free EU lines
Algeria (2009)	14.1	12.9	n.a.
Morocco (2009)	8.2	3.9	51.0
Tunisia (2006)	22.2	18.0	39.2
Egypt (2008)	9.4	10.1	6.2
Lebanon (2007)	5.1	5.4	n.a.
Israel (2008)	2.1	0.1	95.0
Jordan (2007)	10.1	11.0	38.3
Syria (2002)	12.8	14.1	n.a.
Turkey (2009)	1.2	0.1	n.a.

Source: TRAINS; De Wulf and Maliszewska (eds.) (2009); n.a. non available.

[9] It must be observed that MFN and applied tariffs are not strictly comparable, due to aggregation biases. For example, TRAINS reports an applied tariff equal to 0 if there is no trade between Mediterranean countries and the EU for a given product. This of course introduces a bias since tariffs for this product are not necessarily equal to zero. As a result, this product must be removed if we wish to calculate average tariffs (weighted or unweighted) without this bias. Then, as products are aggregated into digit 2, MFN tariffs are not strictly comparable to applied one since the product coverage is not exactly the same.

With regards to the tariffs applied to MED countries' exports by the partners considered in this study (i.e. all countries in the Euro-Mediterranean area), it must be reminded that they have been progressively removed both in the framework of the Barcelona process and in the framework of the South-South integration process (GAFTA agreement). As a result, the shallow integration is now completed with regard to MED countries' exports. Algeria is one exception since this country is a GAFTA member but has not started the tariff liberalization process in 2005 (Péridy and Ghoneim, 2009). Israel and Turkey are two other exceptions since these two countries are outside the GAFTA area.

The estimation of NTMs is a more difficult task. As explained in Annex 3, the corresponding data come from the TRAINS database, with eight groups of measures, including specific charges and taxes, administered process, financial measures, automatic licenses, non automatic licenses and other quantitative restrictions, monopolistic measures as well as technical or quality regulations (for a complete description, refer to Annex 3). One drawback with this dataset is that data are incomplete and available for one year only (generally 1999 or 2001). Nevertheless, it provides a first insight into NTMs in MED countries. Another drawback is that the available data do not indicate the number of NTMs applied at the bilateral level. Consequently, it does not provide any direct indication about the effectiveness of NTMs as a protection tool. In particular, it is not possible to compare the magnitude of the protection due to NTMs to that due to tariffs since these two variables are not measured in the same way. However, this major problem can be solved by calculating tariff ad valorem equivalents (AVEs) of NTMs. This can be achieved by using the recent methodology developed by Kee et al. (2009), which is sometimes referred to as KNO (2009).

The KNO methodology can be applied here in two stages. The first includes an estimation of the quantity impact of NTMs on imports. Then, this impact is transformed into price effects, using import demand elasticities calculated in Kee et al. (2008).

In the first stage, the basic equation to be estimated is the following:

$$\log(m_{n,c}) = \alpha_n + \sum_k \alpha_{n,k} C_c^k + \beta_{n,c}^{ntb} ntm_{n,c} + \varepsilon_{n,c} \log\left(1 + t_{n,c}\right) + \mu_{n,c}\,, \qquad (1.1)$$

where $m_{n,c}$ is the import value of good (or industry) n in country c (MED countries) from EU countries (i), $C^k{}_c$ denotes a vector of country characteristics vari-

ables in MED countries. They include relative factor endowment[10] and the sum of GDP (of the reporter and the partner country) which captures economic size. The geographic distance between MED countries and their Mediterranean partners is also included. $ntm_{n,c}$ is a dummy variable which reflects the existence of bilateral NTMs. $t_{n,c}$is the bilateral tariff on good n in country c (for imports from the EU) and $\mu_{n,c}$ corresponds to the import demand elasticity.

Using the dataset completed by Lopez Gonzalez and Mendez Parra (2010) (Annex 3), several proxies are available for tariffs, namely MFN, PREF (preferential) and AHS (effectively applied tariffs), which is the minimum between MFN and PREF. As a sensitivity analysis, all proxies have been tested. However, since preferential tariff data are often unavailable[11], this introduces two problems. The first is that it significantly increases the number of unavailable observations. Secondly, it introduces a bias in AHS measure. As a matter of fact, the measure of AHS will be correct when the preferential tariff is available, but when it is not, the AHS tariff takes the value of the MFN one (since in the formula, the minimum between MFN and unavailable PREF becomes MFN). Consequently, the measure of the AHS is very volatile in time since it sometimes captures MFN only. Given these problems, the MFN tariff seems to be the most reliable measure for the calculation of AVEs. Therefore, the results presented later include only MFN tariffs.

In the same way, several proxies are available for NTMs. As noticed earlier, eight groups of measures are available. For simplicity, we aggregate all these NTM types (except the first category which includes tariffs). In addition, a distinction is also made according to the products and/or countries the NTM applies to. Indeed, some NTMs apply regardless of the origin (e.g. sanitary requirement), some others regardless of the product whereas some others are product-specific or country-specific. In order to capture the full range of NTMs, the latter have also been aggregated, including country and product-specific NTMs as well as country and product non-specific NTMs. As a final step, this NTM variable is transformed into a binary variable which takes the value of zero in case of no NTM and unity if there are at least one NTM. This transformation is necessary to fit the model described in equation (1.1).[12] However, when testing the trade impact of NTMs in section 3, we will not use any longer a dummy variable.

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[10] Factor endowment is measured by a proxy which is the difference in GDP per capita between the reporter and the partner country. As a sensitivity analysis, calculations have also been implemented with the proxy developed by Antweiler and Trefler (2002), but the results are less relevant in this case.

[11] This may be because of zero flows or because data are unavailable for a given product in a given country.

[12] Some other proxies have also been tested as a sensitivity analysis. The first is a variable which only include product and country-specific NTMs, given that when NTMs apply to

The initial model is subsequently modified as follows. First, import-demand elasticities estimated in Kee et al. (2008) are substituted into (1.1). Second, the tariff term is moved to the left-hand side to address the endogeneity of tariffs. This introduces a new error term $k_{n,c}$. Third, a White correction is introduced in order to tackle heterosckedasticity of the error term. Fourth, product specific effects are also introduced so as to capture the variation of βs across tariff lines. Fifth, appropriate instrumental variables are included to address the endogeneity problem related to NTMs. Indeed, as shown in Lee and Swagel (1997), such endogeneity may lead to a downward bias for the estimated impact of NTMs on imports, which would result in underestimating AVEs. Sixth, a two-step estimation procedure is implemented to estimate the coefficients, following a Heckman two-stage procedure[13].

After these transformations, the final estimated equation becomes:

$$\log(m_{n,c}) - \varepsilon_{n,c}\log\left(1+t_{n,c}\right) = \alpha_n + \sum_k \alpha_{n,k} C_c^k + \left(-e^{\beta_{n,c}^{ntb} + \sum_k \beta_{n,c}^{ntb} C_c^k}\right) ntm_{n,c} + \kappa_{n,c} \,. \qquad (1.2)$$

The left hand side of this equation reflects the value of imports once tariffs have been taken into account. This value of imports depends on country characteristics as well as on the remaining barriers to trade, i.e. NTMs.

Estimating equation (1.2) with the two-step Heckman procedure (TSHP) relies on the following assumption. The basic idea is that zero trade flows in the dataset do not occur randomly but are the outcome of a selection procedure. As a result, the TSHP estimator makes it possible to correct for this selection bias. The first stage estimates a Probit model (test for the probability of country i to exports to country j). In a second stage, when exports occur, the effects of trade barriers and other variables can be estimated through the choice of an appropriate estimator (Heckman, 1979, Greene, 2006).

Basically, various selection variables have been tested. The final specification assumes that the likelihood to export depends on the type of partner countries. Indeed, the partner countries are classified into four groups according to the probability to export, which depends notably on political barriers. The four groups include the EU-15, other Mediterranean partners, other EU countries, and Israel. It is expected that the probability for Mediterranean countries to export is greater

all products and countries, there is no discrimination any longer across products and countries. As a second proxy, we use the total number of NTMs applying for each product and each country.

[13] For additional details, refer to Kee et al. (2009) p.177.

towards the EU-15 than towards other countries, especially Israel for political reasons. As a sensitivity analysis, it is assumed that the probability to export depends on the occurrence of exports in the past period. Indeed, according to the new trade theory developed by Baldwin and Krugman (1989), a firm must bear sunk costs before entering the export market. As a result, a firm's probability to export depends on its ability to export in the past period. This theory is based on hysteresis in international trade.

The last step consists of calculating the AVEs after the transformation of the quantity impact derived from equation 1.2 into price-equivalents. This leads to:

$$AVE = \frac{\partial \log P^d}{\partial NTM}, \tag{1.3}$$

where P_d denotes the domestic price. This equation defines AVEs as the effects of NTMs on prices. The introduction of the price variable is necessary since, like *ad-valorem* tariffs, NTM effects must be calculated on prices and not on quantities. After differentiation of equation (1.1), it is easy to obtain:

$$AVE_{n,c}^{ntb} = \frac{e^{\beta_{n,c}^{ntb}} - 1}{\varepsilon_{n,c}} \tag{1.4}$$

Results are presented in Table 2 and Figure 2 (except for Israel, Turkey and Syria for which data on NTMs are unavailable). The estimation of the TSHP shows that the presence of NTMs (i.e. when the NTM dummy is equal to unity) has a negative and significant impact on the dependent variable (imports nets of tariffs) in Mediterranean countries. However, there are significant differences across countries. As a matter of fact, Algeria is the country which faces the greater coefficient related to NTMs (-0.83). Conversely, Morocco and Tunisia exhibit the lowest coefficient in absolute value (-0.33 and -0.38 respectively). Lebanon, Jordan and Egypt are ranked in an intermediate position[14].

[14]At this stage, it is worth noting that the reliability of the calculation of these coefficients is limited by the restricted quality of the data concerning NTMs. As a matter of fact, results can be sensitive to the way the NTMs are measured. The final specification presents average results, where all NTMs are taken into account (country-specific, product-specific as well as NTMs applied to products regardless of their origin). Results are also limited by the restricted availability of the data for NTMs (only available for the year 1999 or 2001 and even non available for Turkey and Israel) or for trade and tariffs at product level.

Looking at the other independent variables, the GDP per capita ratio is positive and generally significant. This means that as the economic distance (measured by the gap in GDP per capita) increases between Mediterranean countries and their partners, trade also increases. This also suggests that most trade patterns between Mediterranean countries and their partners involve inter-industry trade. The sum of GDP between Mediterranean countries and their partners also show a positive and significant sign, as expected theoretically. Indeed, trade is expected to increase with the size of the two partners. Interestingly, the sign of the selection variable is negative and significant. This means that the likelihood to trade depends on the type of partner countries (EU, other Mediterranean countries or Israel).

Table 2. Parameter estimates used for the calculation of AVEs (from the two-step Heckman Procedure (TSHP))

	Algeria	Egypt	Jordan	Lebanon	Morocco	Tunisia
independent:						
ntb	-0.836***	-0.501***	-0.489***	-0.431***	-0.387***	-0.335***
gdpcap	0.129**	0.145*	0.795***	-0.070	1.191***	0.118
distance	-0.0004***	-0.0001**	-0.0001**	-0.0004***	-0.0008***	-0.0010***
sum gdp	0.939***	1.280***	1.060***	1.160***	1.590***	1.480***
constant	6.249***	4.878***	4.725***	6.583***	6.911***	8.165***
selection:						
partner type	-0.334**	-0.511**	-0.489**	-0.476**	-0.541**	-0.414**
nb obs.	1727	2039	1618	2002	1821	1985
censored obs	341	815	286	396	428	455
import demand elasticities	-1.59	-1.78	-1.16	-1.26	-1.45	-1.24

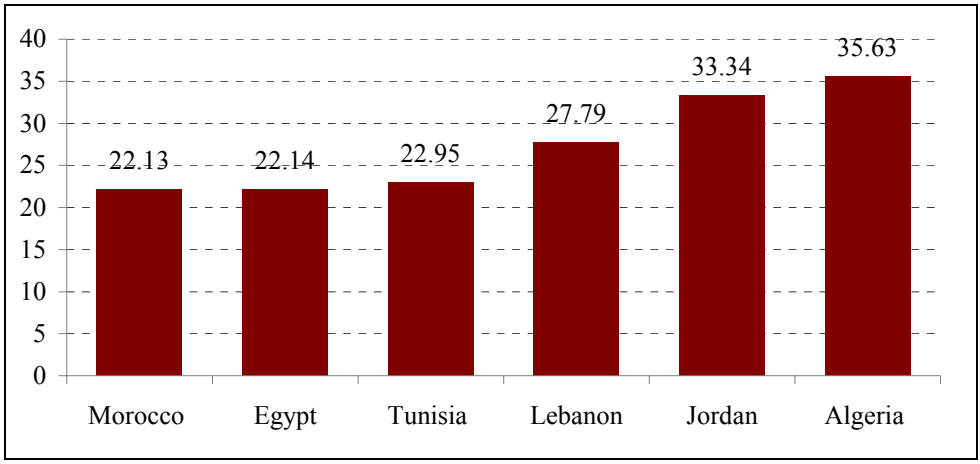
Note. Dependent variable: imports net of tariffs (see equation 1.2). *** significant at 1%-level; ** significant at 5%-level; * significant at 10%-level.
Source: own calculations. Import demand elasticities from Kee et al. (2008).

The results presented in Table 2 are used to calculate AVEs according to equation (1.4). The lower the parameter estimate corresponding to NTMs and the lower the import demand elasticity (in absolute value), the higher the AVE. The other variables are not directly introduced for the calculation of the AVE but they are necessary in the model in order to make sure that the NTM parameter estimate is not biased by omitted variables.

The calculations of the corresponding AVEs are reported in Figure 2. They provide a first picture about the magnitude of NTMs. In this regard, it can be observed that protection due to NTMs is very significant for Algeria but also for

Jordan (due to low import demand elasticity in absolute value)[15]. In these two countries, NTMs amount to more than 33% in tariff equivalent. It is striking to observe that these countries also show the highest number of NTMs in the database, up to 309,800 for Jordan). Conversely, Morocco, Tunisia but also Egypt (due to high import demand elasticity in absolute value) exhibit the lowest AVEs (less than 25%). Interestingly, these countries show the lowest number of NTMs in the database (about 20000 each).

Figure 2. An estimation of AVEs in Mediterranean countries (%)



Source: own calculation.

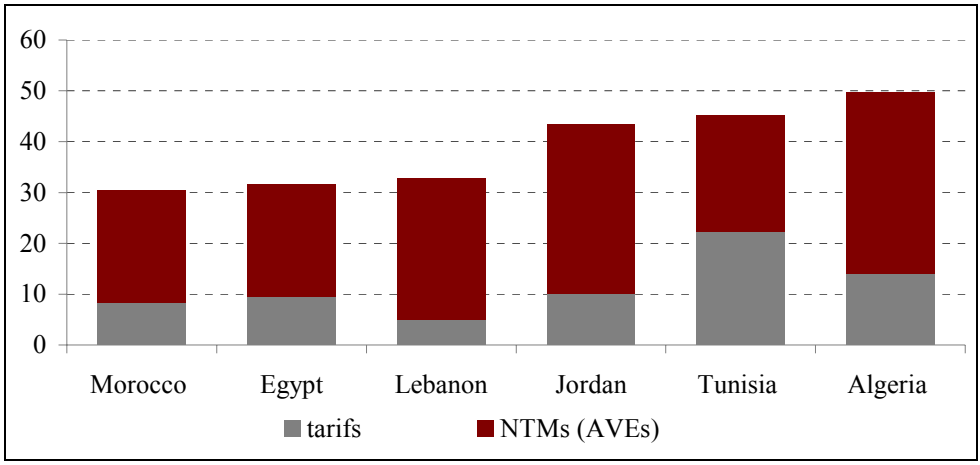
Summing tariffs and NTMs, the overall protection is presented in Figure 3. It is worth mentioning that all Mediterranean countries exhibit NTMs which are greater than tariffs. Overall, Algeria, and Jordan but also Tunisia (due to significant tariffs) show protection levels which range between 43% (Jordan) and 50% (Algeria). In the other countries, protection is also significant, but to a lesser extent (about 30% in Morocco, Egypt and Lebanon). Of course, adding tariffs and NTMs together provide levels of protection which are not fully reliable, as a quota might be binding and hence no tariff-equivalent effect will be shown. In other words, the impact is not necessarily in additive manner. Nevertheless, Figure 3 provides an illustrative picture of overall protection in Mediterranean countries.

In brief, whatever the method implemented and the quality of the data used for the calculation, it seems that the overall rate of protection remains significant in

[15] The import demand elasticity is equal to -1.16 in Jordan whereas it is -1.78 for Egypt. This explains that although these two countries exhibit similar parameter estimates, the AVE is greater for Jordan according to equation (1.4).

Mediterranean countries, especially due to great NTMs. This has been confirmed by a recent World Bank report on MENA countries which identified that NTMs remain a significant barrier to enhancing trade in general and exports in specific in this region (World Bank, 2011b).

Figure 3. Overall protection in Mediterranean countries: tariffs and NTMs (%)



Source: own calculation.

Given these high protection levels, it is expected that the trade impact of both tariffs and NTMs is significant on Mediterranean imports from their partners. The story is somehow different when looking at Mediterranean exports to their partners. In this regard, it must be observed that the EU has fully removed its tariff protection applied to these countries since the early 90s. In addition, the NTMs applied by the EU also seem to be of lower importance. For example, Kee et al. (2009) shows that the AVE applied by the EU to its imports is equal to 13.4%. This is much lower that AVEs applied by Mediterranean countries to their own imports. Consequently, the NTM removal between the EU and Mediterranean countries is expected to produce smaller effects with regard to Mediterranean exports than Mediterranean imports from the EU. This question will be investigated in the following section.

Section 2: The Application of a Specific Gravity Model with Trade Costs

i. Theoretical underpinning

The following gravity model can be implemented in order to provide a first glimpse about the impact of shallow versus deep integration. From a theoretical point of view, the gravity equation has been considerably renewed in recent years. Indeed, it has been increasingly recognized that this equation can be derived from various international trade theories, notably Ricardian, Heckscher-Ohlin and monopolistic competition models (Helpman and Krugman 1985, Bergstrand 1989, Markusen and Wigle 1990, Evenett and Keller 2002), but also the reciprocal-dumping model (Feenstra, Markusen and Rose, 2001).

The gravity equation proposed here is based on this renewal. It starts from a modified version of the theoretical equation developed by Anderson and van Wincoop (2003 and 2004), with special emphasis on trade costs which are the crucial point in our research study:

$$X_{ijt} = \left(\frac{Y_{it}^{\alpha} Y_{jt}^{\gamma}}{Y_{wt}^{\mu}} \right) \left(\frac{T_{ijt}}{P_{it} P_{jt}} \right)^{1-\sigma}, \tag{1.5}$$

X_{ijt} corresponds to country i's exports to country j at year t. The first term in brackets includes the mass variables, namely country i's GDP (Y_{it}), country j's GDP (Y_{jt}) as well as world GDP (Y_{wt}). The second term in brackets reflects trade costs. They include the bilateral trade cost (T_{ijt}) as well as implicit prices (P_{it} and P_{jt}) which measure multilateral trade costs (Anderson and van Wincoop, 2003).

In the same way, implicit prices can be written as[16]:

$$P_{jt}^{(1-\sigma)} = \sum_{i} P_{it}^{\sigma-1} \theta_{it} t_{ijt}^{1-\sigma}, \forall j, \tag{1.6}$$

[16] See Anderson and van Wincoop (2003) for the complete derivation of the model.

$$P_{it}^{(1-\sigma)} = \sum_j P_{jt}^{\sigma-1} \theta_{jt} t_{ijt}^{1-\sigma}, \forall i, \tag{1.7}$$

with θ_i and θ_j denoting country i and j's income shares.

Since prices depend on the trade barriers applied to all countries, they reflect multilateral trade resistance, i.e. the trade barriers that an exporter faces with all importing countries, not only its bilateral partner *j*. As a result, a rise in the trade costs vis-à-vis all its partners leads country i to trade more with its bilateral partner *j*.

ii. Model specification, data and sources

This theoretical framework makes it possible to derive the following empirical equation which will be tested for the Mediterranean countries' trade relationships:

$$\begin{aligned} \ln X_{jk} &= \alpha_0 + \alpha_1 \ln SUMGDP_j + \alpha_2 \ln TAR_{jk} + \alpha_3 NTMs_{ijk} + \\ &+ \alpha_4 \ln TRANSCOST_j + \alpha_5 \ln LANG_j + \alpha_6 \ln COL_j + \phi_j + \varphi_k + \varepsilon_{ijt} \end{aligned} \tag{1.8}$$

Given that data for NTMs are only available for one year (generally 2001), the gravity equation will only be estimated for this year. This is why the temporal pattern of the equation is disregarded. In addition, the equation is estimated for each Mediterranean country *i*. As a result, the equation does not include the GDP of the origin and destination country separately, but the sum of the GDP (SUMGDP) of each Mediterranean country with its partner *j*[17]. This particular specification is frequently used both in the theoretical and the empirical literature based on the new trade theory (NTT) (Helpman and Krugman, 1985). Finally, subscript k denotes the product decomposition level (digit 2).

Interestingly, bilateral trade costs are considered with three variables. The first corresponds to bilateral tariffs (TAR_j). This variable will be used as a proxy for the shallow integration whose process has been initiated in the Barcelona process and its related Association Agreements. As in section 1, the MFN tariffs have been used for the estimation of the model, given the possible biases related to the use of the AHS tariffs. Data are derived from the UNCTAD TRAINS database (see Annex 3 for complete description of these variables).

[17] As in Anderson and van Wincoop (2003), world GDP is passed on to the intercept α_0.

NTMs will be considered as a proxy for deep integration. We will use the same proxy as in section 1, i.e. a binary variable which takes the value of unity in case of NTMs and 0 otherwise.

TRANSCOST is an original measure of transportation costs. It is based on statistics developed by Maersk, which is one of the leading liner shipping companies in the world. It must also be reminded that maritime transport accounts for about 80% of world trade. The variable used in the model corresponds to the freight costs in US dollar for a standard container (20 foot long) from a port of origin to a port of destination (year 2007). Table 3 shows some freight costs for a selection of importing (mport) and exporting (xport) ports

Table 3. Freight costs for a selection of countries in the Euro-Mediterranean area (US dollar for a standard container, 2007)

mport	xport	Freight	mport	xport	freight
Algeria	France	1872.62	Morocco	France	1431.07
Algeria	Germany	1914.56	Morocco	Germany	1439.73
Algeria	Italy	1709.09	Morocco	Italy	1515.20
Algeria	Netherlands	1858.30	Morocco	Netherlands	1350.19
Algeria	Spain	1940.52	Morocco	Spain	1265.98
Algeria	UK	1906.98	Morocco	UK	1552.95
Egypt	France	1574.17	Tunisia	France	1394.65
Egypt	Germany	1216.68	Tunisia	Germany	1436.59
Egypt	Italy	859.46	Tunisia	Italy	879.65
Egypt	Netherlands	1160.43	Tunisia	Netherlands	1252.19
Egypt	Spain	1409.07	Tunisia	Spain	1296.13
Egypt	UK	1348.61	Tunisia	UK	1464.54
Israel	France	1639.68	Turkey	France	1521.23
Israel	Germany	1281.62	Turkey	Germany	1363.46
Israel	Italy	1277.46	Turkey	Italy	1473.55
Israel	Netherlands	1225.37	Turkey	Netherlands	1307.20
Israel	Spain	1430.59	Turkey	Spain	1422.70
Israel	UK	1273.00	Turkey	UK	1442.40

Source: Maersk Line (2007).

Since data are not available for all reporter and partner countries, missing data have been simulated from the following panel data model:

$$\ln TRANSCOST_{ij} = \alpha_0 + \gamma_i + \gamma_j + \lambda \ln DIST_{ij} + \varepsilon_{ijt} . \qquad (1.9)$$

In equation (1.9), the relationship between freight costs (TRANSCOST) and distance is estimated with available data. A fixed-effects model is implemented

with γ_i and γ_j as country-specific effects. Results show that a_0=1292.8 and γ=0.071 which is significant at 5% level.

In a second step, freight costs can be simulated for the missing importing or exporting countries by the use of the estimated results (including the estimated fixed effects).

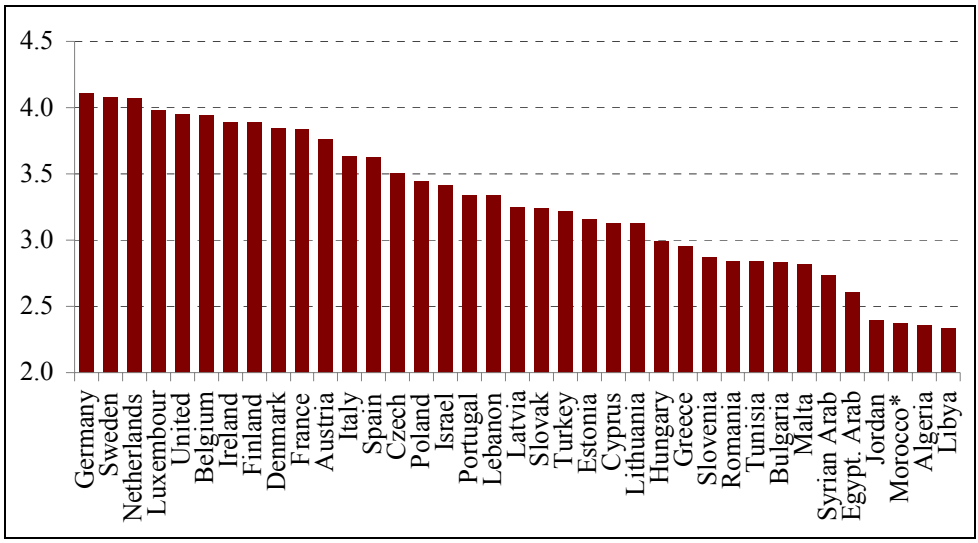
As a sensitivity analysis, alternative variables are also used for transport costs. The most interesting one is related to the logistics performance index (LPI) (World Bank, 2011a). This indicator is built from information gathered in a worldwide survey of the companies involved in logistics services. Seven areas are covered by this index, namely: efficiency of the clearance process by customs and other border agencies, quality of transport and information technology infrastructure for logistics, ease of arranging international shipments, competence of the local logistics industry, ability to trace and check international shipments, domestic logistics costs as well as timeliness of shipments in reaching destination. The LPI is a weighted average of these variables. It ranges between 1 (worst) to 5 (best). Overall, the LPI is particularly relevant for our study since it measures not only transport costs, but more generally the efficiency of logistics in a given country. It is expected that countries with the best LPI score trade more than other countries (everything being equal).

Figures 4a and 4b show respectively the score and country ranking of for the countries included in the present study. The most striking feature is the gap between the EU and MENA countries. As a matter of fact, 11 EU countries are ranked in the world top-20 countries. In particular, Germany, Sweden and the Netherlands are respectively ranked at the first, second and fourth place in the world for their logistics performance (Singapore is at the second place). These three EU countries are major global transport and logistics hubs which are very efficient. These countries are followed by most Northern EU countries. On the other hand, MED countries are ranked well behind, except Israel, Lebanon and Turkey (ranked 31, 33 and 39 respectively) which are close to Southern and Eastern EU countries.

In particular, Algeria and Libya are placed at the bottom of the country ranking (respectively 130 and 132). This reveals major inefficiency problems for transport and logistics in these two countries. Syria, Egypt, Jordan and Morocco also show poor results in terms of LPI. However, Tunisia, ranking 61 shows significant progress. In this regard, the World Bank (2007) noted that the difference in country ranking between Tunisia and Morocco may be explained by the fact that Tunisia has implemented the core reforms earlier than Morocco and has just reaped the benefits of these reforms. Nevertheless, Morocco has recently implemented exemplary customs and port reforms which should significantly improve its ranking in

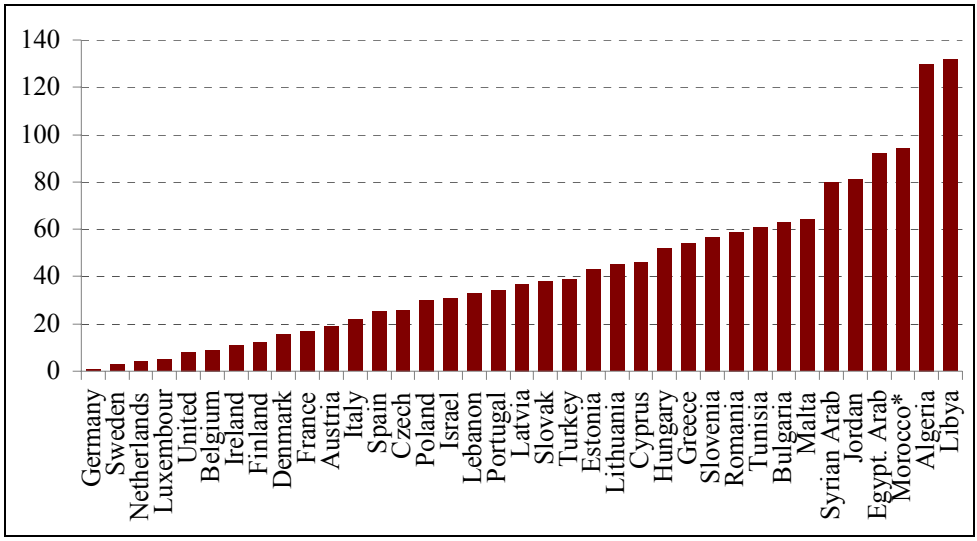
the coming years. It must also be noticed that data for 2010 are unavailable for Morocco.

Figure 4a. The Logistics Performance Index in the Euromed area (scores, 2010*)



Note. *year 2007 concerning Morocco.
Source: World Bank (2011a).

Figure 4b. Country ranking for LPI (rank 2010* over 155 countries)



Note. *year 2007 concerning Morocco.
Source: World Bank (2011a).

Although the LPI is a very interesting indicator, its relevance for the present study is limited by the fact that data are provided at country level, not at bilateral level. In addition, since the estimation of the model is implemented for each MED country, it is not possible to test the impact of each MED country's logistics efficiency on their imports. Given this limitation, two alternative solutions are proposed. The first consists in testing the impact of partner's LPI on MENA countries' imports. In this case, the estimation results will reflect to what extend logistics efficiency of MED's partners (mainly EU countries) increases the imports from these partners. A second possibility consists in testing the LPI impact on all (not each) MED countries' exports, in order to increase the number of available observations.

As a last alternative proxy for transport costs, the distance between MED countries and their EU partners will also be used. It is measured by a weighted index which takes into account the spatial distribution of the population within each country (CEPII, 2007a).

$LANG_{ij}$ is a dummy variable which takes the value of 1 if a common language is spoken by at least 10% of the population in each country pair (exporter and importer) and 0 otherwise (source: CEPII, 2007b).

COL_{ij} reflects colonial relationships over a long period of time with substantial participation in the colonized country's governance (CEPII, 2007b). This variable is equal to 1 in case of colonial links and 0 otherwise. This variable accounts for cultural and historical relationships which are expected to increase trade flows between some EU countries and Mediterranean countries.

Finally, specific country and product effects are introduced in the model (ϕ_j and φ_k). These effects make it possible to capture the heterogeneity of the data. They also capture the effects of potential omitted variables (Egger, 2004). In particular, the price effects included in equation (1.5) are captured by the country-specific effect(ϕ_j)[18].In addition, the product effect φ_k takes into account potential omitted variables at product level. All these specific effects can be considered as fixed or random depending on the specification of the model.

[18] As there are no reliable cross-country price indicators, the use of the country-specific effects is the most commonly used in the empirical literature since Anderson and van Wincoop (2003).

iii. Choice of the estimators and sensitivity analysis

The estimation of equation (1.8) requires specific econometric analysis in order to address several potential biases. The first bias to be considered is heterogeneity across countries and products. It requires the use of fixed-effects (FE) or random effects (RE) estimators. However, the problem with standard FE models is that they cannot estimate parameters which are product invariant, such as freight costs, language and colonization in equation (1.9). On the other hand, standard RE model may be biased because of endogeneity problems due to the potential correlation between one or several independent variables and the residuals.

One recent and interesting estimator can be used for addressing these problems. This is the fixed-effects vector decomposition (FEVD) estimator developed by Plümper and Troeger (2007). This three stage fixed-effects model can estimate the parameters of the product invariant variables while addressing the endogeneity problem. Basically, the first stage estimates a pure fixed effects model to obtain an estimate of the unit effects. The second step implements an instrumental regression of the fixed effects vector on the product invariant variables. This makes it possible to decompose the fixed effects vector into a first component explained by the product-invariant variables and a second component, namely the unexplainable part (the error term). In the last stage, the model is re-estimated by pooled OLS, including all explanatory variables, the product-invariant variables and the error term. This third step ensures the control for collinearity between product-varying and invariant right hand side variables.

As a sensitivity analysis, another estimator corrected for endogeneity is presented. It is based on a random-effects estimator with instrumental variables, namely the Hausman and Taylor (HT) estimator, described in Egger (2004).

An additional potential bias is due to zero observations. This problem is potentially important since the database includes bilateral and disaggregated trade flows (by industries at digit-2). This problem can be addressed by several alternative methods. The first consists of transforming all trade values in non zero flows, as follows:

$$\ln X'_{jk} = \ln(X_{jk} + 1)\,. \qquad (1.10)$$

This method is commonly used in the empirical literature. However, it does not specifically address the question of why some firms export while some others don't (selection bias). A second possible estimator is the Poisson Pseudo Maximum Likelihood (PPML) (Santos Silva and Tenreyro, 2006). This estimator makes is possible to simultaneously solve the bias due to missing zero flows and

heteroskedasticity. However, it does not address the selection bias due to zero observations.

A third interesting method is the Two-Stage Heckman Procedure (TSHP). As shown previously, the basic idea is that zero trade flows in the dataset do not occur randomly but are the outcome of a selection procedure. As a result, the TSHP estimator provides a correction for this selection bias. The first stage estimates a Probit model (test for the probability of country i to exports to country j). In a second stage, provided that exports occur, the effects of trade barriers and other variables can be estimated though the choice of an appropriate estimator (Heckman, 1979, Greene, 2006). This method seems particularly interesting in the present research study because it specifically takes into account the information contained in the zero or missing data, which are potentially numerous in case of econometric modelling at disaggregated product data level.

The main problem is to choose the appropriate selection variable. Recent research at firm level (Melitz, 2003) suggests that in case of different productivity levels between firms, the existence of fixed costs produces a selection of the firms. As a result, only the most productive ones succeed in exporting whereas the others remain in the domestic market. This suggests that productivity at firm level can be used as the selection variable in this kind of model. Unfortunately, in the present research, data are not available at firm level so that this selection variable cannot be implemented.

However, as already explained in section 1, it can also be considered that political problems between countries also influence the decision of firms to export. Consequently, it will be assumed that Mediterranean countries are more likely to trade with traditional partners (EU-15) whereas the probability to export will be low with Israel, for political reasons. As a sensitivity analysis, the lagged export variable will also be used as the selection variable. As already explained in section 1, this can be justified by considering hysteresis in international trade (Baldwin and Krugman, 1989).

Finally, as an additional sensitivity analysis, the estimators are also controlled for cross-sectional heteroskedascticity as well as serial correlation of the error term by using appropriate Feasable GLS.

iv. Estimation and results

Equation (1.8) is estimated for the imports of the nine MED countries described above. However, data for Syria proved to be of poor quality so that this

country has eventually been removed. As already mentioned, the estimation is implemented at the year for which NTMs are available (generally 1999 or 2001). The partner countries include the whole Euromed area (i.e. the EU-15, Central and Eastern EU countries (CEECs) as well as the eight Mediterranean countries described above, after Syria is excluded, besides Libya and Palestine, due to the lack of data in the trade, transport and other databases). Thus, 33 partner countries are included. The dataset also includes a product decomposition level at digit-2.

Estimations are presented in Table 4 for the Heckman two-stage procedure. Table 5 provides a sensitivity analysis by showing alternative estimators (Fixed-effects vector decomposition, Hausman and Taylor, Feasable GLS) as well an alternative proxy for transport costs, i.e. distance.

Table 4 clearly shows that NTMs have a detrimental effect on trade in all Mediterranean countries. As a matter of fact, all parameter estimates are significant at the 1% level. Interestingly, Algeria exhibits the highest coefficient in absolute value (-0.694). Jordan and Egypt show intermediate levels for the parameter estimates (about -0.5) whereas Morocco, Tunisia and Lebanon present the lowest coefficients (from -0.31 to 0.38). These results can be compared to those corresponding to AVEs (Figure 2). Indeed, there is generally a correlation between the magnitude of the AVEs and the trade effects of NTMs. As a matter of fact, Algeria shows the highest AVE and the greatest trade impact of NTMs. Conversely, Morocco and Tunisia exhibit the lowest AVEs and the smaller trade impact of NTMs.

To sum up, NTMs significantly reduce bilateral trade in all Mediterranean countries. This means that whatever the past efforts of trade liberalization, both at multilateral and regional level, NTMs remain significant obstacles to trade. However, this impact differs depending on the country considered, i.e. with a more detrimental impact in the case of Algeria and a less detrimental impact for Morocco and Tunisia. This reflects pretty well the difference in the openness of these countries.

It must also be noticed that it is the existence of NTMs which is trade-reducing, given that NTMs are measured as a dummy variable. As a sensitivity analysis, the model has been estimated by using another proxy which includes the number of NTMs for each product. Results, although significant, are less relevant. This means that a marginal increase in the number of NTMs (let us say from 19 to 20 NTMs in a given product) has much less trade-reducing effects than when we move from no NTM to the existence of NTMs (which is captured by the dummy variable). Additional discussion will be provided in Part 2 when simulating the effects of NTM reduction or elimination.

Table 4 also shows that tariffs reduce trade significantly in Algeria and Tunisia. Again, this result can be related to the fact that these two countries exhibit the

highest tariff protection levels in 2001. On the other hand, Lebanon presents the lowest coefficient (-0.055). Turkey, Jordan, Morocco and Israel also show a low coefficient.

At this stage, it must be noticed that the differences in the magnitude of the parameter estimates related to tariffs and NTMs cannot be strictly compared, since both variables are not measured identically. In other words, the fact the tariff coefficient is lower than the NTM one in Algeria does not necessarily mean that tariffs are more trade-reducing than NTMs since tariffs are measured ad-valorem and NTMs are measured as a dummy variable which takes the value of 0 in case of no NTMs and 1 in case of the presence of at least one NTM. This question will be fully addressed in Part 2 when comparing together the trade impact of all trade costs (tariffs, NTMs and transport costs).

The transport coefficient also provides interesting information in Tables 4 and 5. In this regard, it must be observed that all countries show a negative coefficient. This coefficient is significant for all countries except Egypt, and possibly Israel and Jordan (refer to sensitivity analysis in Table 5). By and large, this result suggests that transport costs are generally trade reducing in the Euromed area (EU 15, other EU countries and Mediterranean countries).

Turkey and Maghreb countries exhibit the largest effects contrary to Mashrek countries, which show lower or even insignificant effects. This result can be mainly explained by the fact that average freight costs are lower in Egypt and Israel than in Maghreb countries. As a matter of fact, Table 6 shows the unweighted average of freight costs for each Mediterranean country towards 6 EU countries (France, Germany, Italy, the Netherlands, Spain and the UK). Interestingly, Egypt and Israel show the lowest trade costs, i.e. below 1300 US$ for each container. Conversely, Maghreb countries and Turkey have the highest freight costs to the EU (up to 1867 US$ in Algeria). This means that it is more costly to ship goods from Maghreb countries to Europe than from Mashrek. This result may appear as counterintuitive at first sight since Maghreb countries are closer to Europe than Mashrek countries. However, transport costs do not depend only on distance between two countries but also on many other factors, such as port efficiency. In any case, the fact that Egypt and Israel show lower transport costs than Maghreb countries is helpful to explain why the negative impact of transport costs on trade is smaller in Mashrek countries[19].

[19]Results should be interpreted cautiously for some countries where transport costs are not directly available, like Jordan. In this case, the coefficient can be biased. For this country, the sensitivity analysis implemented in Table 5 provides significant and negative results by using distance instead of the estimated transport costs.

Interestingly, estimation parameters for partner's LPI are always positive but significant only for Turkey and Israel. However, the relevance of this variable is limited by the fact that it does not test the impact of logistics efficiency in each MENA country considered, but rather the impact of partners' LPI. Since most partner countries are EU countries and since there are no major significant differences in LPI across EU countries, it is not so surprising that the parameter estimates are not always significant.

More interestingly, the estimation of MED countries' LPI is positive and significant[20]. This suggests that any improvement of logistics in MED countries is expected to increase trade with their partners, especially because this improvement will contribute to reducing transport cost, inefficiency and time. As a matter of fact, 1% decrease in LPI makes it possible to increase MED countries imports by 1.95%. An extension to MED countries' exports show that 1% decrease in LPI leads to an export increase by 2.96%

The other variables are generally significant while showing the expected sign. For example, the size of the market (measured by the sum of GDPs) is always positive and significant. This shows that trade always increase with the market size of the origin and destination countries. The existence of past colonial links is also trade creating, especially for Algeria, Morocco and Tunisia. The variable corresponding to common language is also significant in Morocco, Tunisia as well as Jordan and Lebanon[21].

Overall, the robustness of these results is checked by the sensitivity analysis presented in Table 5. It is striking to observe that the parameter estimates related to NTMs and tariffs are fairly stable whatever the estimator applied. The transport coefficient is also stable, except for some countries for which direct data are unavailable (Jordan and Lebanon). This is why the parameter estimates calculated with transport costs must be cross-checked with those calculated with distance.

At the stage of the analysis, the overall conclusions are the following (these results must still be interpreted cautiously since they sometimes rely on old data, especially NTMs):

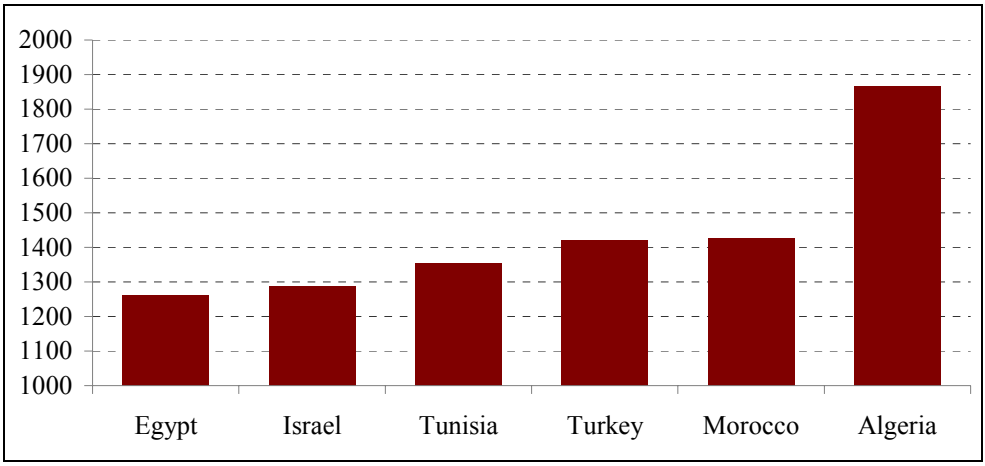
1. Trade costs significantly reduce imports to Mediterranean countries from their partners in the EU.

[20] It must be reminded that the corresponding parameter estimate has been calculated for all MED countries taken together as a means of increasing the number of observations.

[21] With regard to Turkey, it must be observed that there is no colonial link and no common language with other countries in the EU. This explains the lack of parameter estimates corresponding to these variables.

2. Tariffs are import reducing, but mainly in the countries which showed the highest tariff levels (Algeria and Tunisia). This suggests that the shallow integration was not fully achieved in these countries. Despite further tariffs cuts since 2001, tariffs remain significant in these countries in the most recent years. As a result, significant gains can still be expected from shallow integration in these countries.
3. NTMs are significantly trade-reducing in all countries, especially in Algeria. On the other hand, they are less trade-reducing in Morocco and Tunisia, though still significant. This means that eliminating NTMs in Mediterranean countries as a move towards deeper integration with the EU is expected to provide significant gains.
4. Transport costs significantly reduce trade, especially in Maghreb countries, since these countries show the highest freight costs (Figure 5). More generally, it seems that any improvement of logistics performance in MED countries is expected to increase imports from their partners, since this contributes to reduce transport costs, inefficiency and time. As a result, any deep integration policy which could stimulate the improvement of LPIs in MED countries (but also in the EU) is expected to provide additional gains

Figure 5. Average freight costs to EU markets (US dollars, unweighted average)



Source: calculations from Source: Maersk Line (2007).

5. A similar analysis for MED country exports shows that tariffs have no impact, since the MED countries' partners inside the Euromed area have removed their tariffs. However, it seems reasonable to believe that

NTMs applied by the EU has an impact on MED countries exports, although this impact is limited by the fact that the AVE applied by the EU is lower than that applied by MED countries. Finally, it seems that the most important impact may be found in logistics since we have shown that MED countries' exports are significantly reduced by their low LPI. In this regard, any improvement of logistics in MED countries should significantly increase their exports towards the EU.

These results pave the way for additional research left in Part 2 of this study. The main questions which will be investigated will be the following:

- What is the trade creation which can be expected for the completion of shallow integration between Mediterranean countries and their partners? This question will be addressed by simulating the impact of tariff removal on trade flows.
- Is there additional trade creation if Mediterranean countries move to deep integration, including both NTM reduction and LPI improvement? This will be tackled not only by simulating the impact of reduction in NTMs but also transport costs and LPI.

These questions will be investigated in Part 2 by appropriate trade modeling which takes into account the results already obtained.

Table 4. Estimation Results: the impact of tariffs, NTMs, transports and other variables on MED countries' imports

Heckman Twostep	Algeria	Egypt	Jordan	Lebanon	Morocco	Tunisia	Israel	Turkey
independent:								
NTMs	-0.694***	-0.525***	-0.499***	-0.383***	-0.315***	-0.336***	-	-
tariffs	-1.060***	-0.678***	-0.237***	-0.055**	-0.322***	-1.137***	-0.521***	-0.340***
transport	-3.044***	-0.239	-0.201	-1.375***	-4.696***	-2.398***	-1.568***	-4.126***
sum gdp	0.677***	0.704***	0.260***	0.303***	0.906***	1.097***	1.177***	1.977***
colony	1.409***	0.386**	0.106***	0.295***	0.830***	0.799**	0.045	-
common language	0.191	-0.160	0.470***	0.204***	0.811***	0.686***	0.209	-
constant	17.409**	1.345***	-0.488	8.032***	1.543***	6.979**	1.057	8.789**
selection:								
partner type	-0.264**	-0.414**	-0.361***	-0.398***	-0.372**	-0.295**	-0.455***	-0.366***
nb obs.	1544	1655	1533	1984	1820	1944	1937	2740
censored obs	68	451	172	203	328	275	395	722

Source: own estimation.

Table 5. Sensitivity Analysis (imports' determinants using alternative variables and estimators)

	Algeria	Egypt	Jordan	Leba-non	Moroc-co	Tunisia	Israel	Turkey
Heckman Twostep								
distance	*-0.606****	*-0.127*	*-0.238****	*-0.278****	*-1.168****	*-0.899****	*-0.074*	*-0.741****
partner's LPI	*-1.566*	*-1.871*	*-1.422*	*-1.631*	*-1.327*	*-1.666*	*2.819****	*3.932****
MENA countries' LPI	*1.95***	*1.95***	*1.95***	*1.95***	*1.95***	*1.95***	*1.95***	*1.95***
Fixed-effects vector decomposition (FEVD, product-invariant and endogeneity)								
NTMs	-0.699***	-0.511***	-0.519***	-0.386***	-0.298***	-0.345***	-	-
tariffs	-1.119***	-0.679***	-0.240***	-0.051**	-0.314***	-1.183***	-0.476***	-0.349***
transport	-3.039***	-0.236	-0.197	-1.355***	-3.937***	-2.399***	-1.607***	-3.954***
Hausman-Taylor (endogeneity)								
NTMs	-0.699***	-0.510***	-0.519***	-0.387***	-0.298***	-0.345***	-	-
tariffs	-1.117***	-0.679***	-0.240***	-0.051**	-0.314***	-1.183***	-0.475***	-0.349***
transport	-3.730***	-3.024	-2.538	-1.264***	-5.210***	-2.524***	-1.439***	-4.555***
FGLS (panel heteroskedasticity and autocorrelation)								
NTMs	-0.680***	-0.471***	-0.497***	-0.402***	-0.307***	-0,282**	-	-
tariffs	-1.145***	-0.665***	-0.252***	-0.053**	-0.315***	-1.125***	-0.501***	-0.373***
transport	-2.895***	-0.131	-0.218	-1.307***	-3,528***	-2.492***	-1.611***	-3.702***

Source: own estimation.

PART 2: INTEGRATION WITH THE EU AND WITHIN THE REGION: SIMULATIONS OF SCENARIOS OF SHALLOW VERSUS DEEP INTEGRATION[22]

[22] By Nicolas Péridy

Section 3: Shallow Versus Deep Integration: Definition of the Scenarios

According to the trade modeling developed in Part 1 and given the data available, Table 6 shows the various simulations and scenarios which will be implemented. In each case, we will distinguish between a partial move towards shallow and deep integration (pessimistic scenario), and full integration (optimistic scenario).

Table 6. Simulations used for Shallow and Deep Integration

Shallow Integration			Deep Integration		
Partial (pessimistic scenario)	Full (optimistic scenario)	Partial (Pessimistic)		Full (Optimistic)	
Tariffs	Tariffs	NTMs	LPI	NTMs	LPI
Marginal cut	Complete removal	Marginal cut	Marginal cut	Complete removal	increase to 3.05

Source: own proposal.

As stated previously, the tariff liberalization process in Mediterranean countries is not completed (see Table 1 in Part 1). As a matter of fact, the latest data available show that MFN tariffs range from 6% (Israel) to 32% (Tunisia). In the same way, applied tariffs (i.e. including preferential tariffs) range from 1.2% (Turkey) to 18% (Tunisia). Consequently, the simulations for shallow integration will consider the marginal effect of tariff reductions as the pessimistic scenario (partial liberalization) as well as their complete removal as the optimistic scenario (full liberalization).

Deep integration includes two tools. The first is NTMs. As mentioned previously, NTMs are still highly significant in Mediterranean countries according to the dataset used. Indeed, Figure 2 shows that the tariff equivalent of NTMs can be scaled from 22.1% (Morocco and Egypt) to 35.6% (Algeria). Again, two types of simulations can be performed: marginal effects in the reduction of NTMs and a complete removal (pessimistic and optimistic scenarios).

In addition, transport costs or more generally logistics inefficiencies can also be considered as trade barriers, although they are not product-specific. In this regard, it has been shown previously that the average transport costs differ greatly across Mediterranean countries (from less than 1300 US dollars for Egypt and Israel to almost 1900 US dollars for Algeria concerning imports from EU countries). In addition, the average freight costs faced by Mediterranean countries which import from Europe is 1436 US dollars. This is much greater than the average costs corresponding to EU countries' imports (1235 dollars). This difference amounts to 15% (Table 7). This means that transport costs not only depend on oil prices, but also on many other variables which can have trade-reducing effects. These are especially port efficiency (port infrastructure and services), scale economies, market structures (competition for trade routes) as well as directional traffic imbalance (Figueiredo, 2010). This means that a reduction in these trade-related costs can be viewed as a further step toward deep integration in Mediterranean countries.

Given that LPI is a wider concept than transport costs, it will be used as the reference variable for the scenarios. In the simulations, the pessimistic scenario will be built up on the assumption of a marginal increase in LPI whereas in the optimistic scenario, it will be assumed that LPI improves to the level reached in middle income countries, such as Mexico, Argentina and Central and Eastern European countries (i.e. 3.05). This level also corresponds to the case where countries reach the 66% of highest performers (World Bank, 2011a).

Table 7. A comparison of freight costs between EU countries and Mediterranean countries (in US dollars, average costs, 2007)

Mediterranean Average	**1436**
Egypt	1261
Israel	1287
Tunisia	1354
Turkey	1422
Morocco	1426
Algeria	1867
Europe Average	**1235**
Netherlands	1109
Spain	1129
Germany	1213
UK	1286
France	1462

Source: own calculations from Maersk (2007).

Before presenting the results of these simulations, the methodology implemented for them must be carefully described which is undertaken in Section 4.

Section 4: The Implementation of the Simulations: Calculating Trade Creation Effect of Shallow Versus Deep Integration

In this section, we distinguish partial integration and full integration from a methodological viewpoint. As mentioned previously, partial integration can be captured by the marginal effects shown directly by the parameter estimates corresponding to tariffs, NTMs and LPI. Simulation can thus be derived directly from Tables 4 and 5, since the model has been estimated on a log-log basis. In this case, the parameter estimates show directly the effects of a 1% decrease in trade costs on trade in Mediterranean countries[23]. These marginal effects will be reported in the next section as the trade creation due to partial shallow or deep integration (pessimistic scenario).

One the other hand, full integration cannot be grasped by the marginal effects, since it corresponds to a 100% reduction in trade costs (except logistics) or at least to a very significant reduction, i.e. towards levels reached in middle income countries. Consequently, a specific methodology must be implemented in order to capture the full effects of tariffs and NTMs removal. The methodology proposed here has been commonly used in the literature for the calculation of trade creation due to regional integration from a standard dummy variable (refer for instance to Péridy, 2005). This methodology is refined here by considering specific variables corresponding to tariffs and NTMs.

Basically, the gross trade creation due to the full removal of tariffs (shallow integration) or NTMs (deep integration) is defined by replacing equation (1.8) by:

[23] The only change which must be made is the replacement of the binary variable corresponding to NTMs by a variable which shows the number of NTMs. The corresponding parameter shows the percentage change in trade due to the 1% reduction in the number of NTMs.

$$\ln X_{jk} = \ln HX_{jk} + \alpha_2 \ln TAR_{jk} \,, \tag{2.1a}$$

or:

$$\ln X_{jk} = \ln HX_{jk} + \alpha_3 NTMs_{ijk} \,, \tag{2.1b}$$

where $lnHX_{jk}$ reflects the hypothetical exports to Mediterranean countries, assuming no tariff (equation 2.1a) or no NTM (equation 2.1b). Indeed, $lnHX_{jk}$ is equal to:

$$\begin{aligned} \ln HX_{jk} &= \alpha_0 + \alpha_1 \ln SUMGDP_j + \alpha_3 \ln NTM_{jk} + \alpha_4 \ln TRANSCOST_j + \\ &+ \alpha_5 \ln LANG_j + \alpha_6 \ln COL_j + \phi_j + \varphi_k + \varepsilon_{ijt} \end{aligned} \,, \tag{2.2a}$$

or:

$$\begin{aligned} \ln HX_{jk} &= \alpha_0 + \alpha_1 \ln SUMGDP_j + \alpha_2 \ln TAR_{jk} + \alpha_4 \ln TRANSCOST_j + \\ &+ \alpha_5 \ln LANG_j + \alpha_6 \ln COL_j + \phi_j + \varphi_k + \varepsilon_{ijt} \end{aligned} \,. \tag{2.2b}$$

On the other hand, the specific effects of tariffs and NTMs are captured by the *TAR* and *NTM* variables in the right hand side of equations (2.1a) and (2.1b).These variables must be defined as dummies which take the value of unity in case of no tariff (or NTMs) and zero otherwise (in log terms). Defined like this, these variables show the impact of the presence or the absence of tariff (NTMs) and will be used for simulating the impact of full integration versus the current situation.

Indeed, the gross trade creation due to the removal of tariffs and NTMs can now be defined as the difference between observed and hypothetical trade to Mediterranean countries:

$$G = X_{jk} - HX_{jk} \,. \tag{2.3}$$

Replacing HX_{jk} from equation (2.3) into equations (2.1a) and (2.1b) and giving TAR_{jk} and NTM_{jk} the value corresponding to full integration ($lnTAR_{jk}$=1 and $lnNTM_{jk}$=1), it comes:

$$\ln X_{jk} = \ln(X_{jk} - G) + \alpha_2 \ln e \,, \tag{2.4a}$$

or:

$$\ln X_{jk} = \ln(X_{jk} - G) + \alpha_3 \ln e \,. \tag{2.4b}$$

This makes it possible to derive G as follows:

$$G = X_{jk}\left(1 - \frac{1}{e^{\alpha_2}}\right), \tag{2.5a}$$

in case of full shallow integration (tariff removal), or:

$$G = X_{jk}\left(1 - \frac{1}{e^{\alpha_3}}\right), \tag{2.5b}$$

in case of full deep integration (NTM removal). In equations 2.5a and 2.5b, the term in brackets corresponds to the trade creation as a percentage of observed exports. It ranges from 0 to 1, i.e. from 0% to 100%. It equals zero when there is no trade effects of tariffs (or NTMs). In this case, $\alpha_2(\alpha_3)$ is insignificant. Conversely, as α increases towards infinity, the gross trade creation increases exponentially towards 100%.

The model can also be solved in order to calculate simultaneously the impact of shallow and deep integration. In this case, it is easy to show that the gross trade creation is equal to:

$$G = X_{jk}\left(1 - \frac{1}{e^{\alpha_2 + \alpha_3}}\right), \tag{2.6}$$

Please note that the trade creation is not an additive function. This means that the gross trade creation calculated separately for tariffs and NTMs in equations 2.5a and 2.5b do not add together to that calculated simultaneously in equation 2.6. This is due the mathematical properties of the trade creation function.

With regard to LPI, as already mentioned, it is expected that MED countries reached the level of middle-income country. The parameter estimate is that used in Tables 4 and 5.

Tables 8 and 9 exhibit the estimation results and the sensitivity analysis of the gravity model specially estimated for the simulations. The sensitivity analysis provides estimation results using alternative estimators and/or alternative independent variables (e.g. LPI instead of transport costs). As already mentioned, this model requires some changes in the measurement of the tariffs and the NTM variables. The econometric methodology is the same as that used previously. It thus presents the Heckman two-step procedure as the main estimator. In addition, a sensitivity analysis is included through the use of alternative estimators, i.e. the

FEVD, the Hausman and Taylor as well as the FGLS. As expected, results are very close to those already found previously, but the parameter estimates corresponding to tariffs and NTMs are more appropriate for the simulations which will be presented and discussed in the following section[24].

Table 8. Parameter estimates used for full liberalization (dependent variables: MED countries' imports)

Heckman Twostep	Algeria	Egypt	Jordan	Leba-non	Moroc-co	Tunisia	Israel	Turkey
independent:								
no ntm	0.906***	0.510***	0.496***	0.382***	0.277***	0.335***	-	-
no tariffs	0.848**	0.490	0.071	0.072	0.281	0.564*	0.001	0.029
transport	-3.100***	0.030	-0.125	-1.382***	-4.722***	-2.483***	-1.758***	-3.671***
sum gdp	0.650***	0.676***	0.252***	0.304***	0.912***	1.047***	1.157***	1.929***
Colony	1.447***	0.340*	0.079	0.296***	0.830***	0.900***	0.077	-
common language	0.082	-0,137	0.445***	0.26***	0.811***	0.593***	0.310	-
constant	19.041**	-3.939	-0.449	8.260***	1.555***	8.933**	1.060	6.984*
selection:								
partner type	-0.264**	-0.415**	-0.345***	-0.398***	-0.372**	-0.291**	-0.440***	-0.353***
nb obs.	1560	1657	1606	1984	1820	1959	2232	2930
Censored obs	68	451	172	203	328	275	395	722
sentitivity analysis:								
Heckman Twostep								
partner's LPI	0.413	0.947	1.096	1.625	1.173	1.141	2.177**	3.885***
MENA countries' LPI	1.95**	1.95**	1.95**	1.95**	1.95**	1.95**	1.95**	1.95**
Fixed-effects vector decomposition (FEVD, product-invariant and endogeneity)								
no ntm	0.919***	0.498***	0.514***	0.383***	0.262**	0.341**	-	-
no tariffs	0.867**	0.424	0.101	0.081	0.410	0.512	0.001	0.023
transport	-3.099***	-0.234	-0.130	-1.362***	-3.903***	-2.491***	-1.685***	-3.481***
Hausman-Taylor (endogeneity)								
no ntm	0.947***	0.498***	0.514***	0.384***	0.262***	0.341***	-	-
no tariffs	0.919*	0.424	0.101	0.082	0.411	0.512	0.001	0.023
transport	-3.221***	-1.041	-2.597	-1.264***	-5.085***	-2.214***	-1.374***	-4.580***

[24] Please note that the parameters corresponding to tariffs and NTMs are positive in Table 2. This is expected since these parameters are calculated as dummies which take the value of zero in case of positive tariffs (or NTMs) and 1 otherwise. These dummies will be used for the calculation of trade creation following equation 2.5a and 2.5b.

Heckman Twostep	**Algeria**	**Egypt**	**Jordan**	**Leba-non**	**Moroc-co**	**Tunisia**	**Israel**	**Turkey**
FGLS (panel heteroskedasticity and autocorrelation)								
no ntm	0.915***	0.485***	0.489***	-0.401***	0.281***	0.279**	-	-
no tariffs	0.810*	0.418	0.070	0.080	0.187	0.556	0.001	0.045
transport	-2.917***	-0.160	-0.143	-1.317***	-3.475***	-2.567***	-1.637***	-3.359***

Source: own estimation.

Table 9. Parameter estimates used for partial liberalization (marginal effects) (dependent variable: MED countries' imports)

Heckman Twostep	**Algeria**	**Egypt**	**Jordan**	**Leba-non**	**Moroc-co**	**Tunisia**	**Israel**	**Turkey**
independent:								
NTMs	-0.115***	-0.012*	0.01	-0.046***	-0.0033*	-0.014***	-	-
Tariffs	-1.076***	-0.679***	-0.240***	-0.060**	-0.300***	-0.907***	-0.052***	-0.034***
Transport	-3.124***	-0.266	-0.224	-1.397***	-4.688***	-2.404***	-1.568***	-4.126***
Sum gdp	0.675***	0.704***	0.261***	0.304***	0.908***	1.099***	1.177***	1.977***
Colony	1.403***	0.394**	0.118	0.295***	0.833***	0.802**	0.045	-
Common language	0.190	-0.188	0.485***	0.210***	0.807***	0.684***	0.209	-
Constant	17.162**	-2.612	-0.111	8.228***	1.081***	6.992**	1.057	8.789**
selection:								
Partner type	-0.264**	-0.414**	-0.361***	-0.398***	-0.372**	-0.296***	-0.455***	-0.366***
nb obs.	1544	1655	1533	1984	1820	1944	1937	2740
Censored obs	68	451	172	203	328	275	395	722
sentitivity analysis:								
Heckman Twostep								
partner's LPI	1.663	1.870	1.203	1.612	1.293	1.704	2.818***	3.932***
MENA co-untries' LPI	1.95**	1.95**	1.95**	1.95**	1.95**	1.95**	1.95**	1.95**
Fixed-effects vector decomposition (FEVD, product-invariant and endogeneity)								
NTMs	-0.115***	-0.023***	0.01	-0.046***	-0.0033*	-0.014***	-	-
Tariffs	-1.056***	-0.681***	-0.241***	-0.055**	-0.292***	-0.824***	-0.047***	-0.034***
transport	-3.124***	-0.266	-0.224	-1.376***	-3.921***	-2.406***	-1.607***	-3.954***
Hausman-Taylor (endogeneity)								
NTMs	-0.115***	-0.012*	0.01	-0.047***	-0.009**	-0.014***	-	-
Tariffs	-1.066***	-0.681***	-0.241***	-0.055**	-0.292***	-0.824***	-0.047***	-0.035***
transport	-3.821***	-0.648	-0.984	-1.264***	-5.010***	-2.256***	-1.439***	-4.555***
FGLS (panel heteroskedasticity and autocorrelation)								
NTMs	-0.115***	-0.012*	0.01	-0.048***	-0.0033*	-0.014***	-	-
Tariffs	-1.069***	-0.667***	-0.256***	-0.059**	-0.295***	-0.872***	-0.050***	-0.037***
transport	-2.921***	-0.168	-0.251	-1.331***	-3.515***	-2.519***	-1.611***	-3.702***

Source: own estimation.

Section 5: Estimation Results: The Calculation of Trade Creation Effects of Shallow and Deep Integration

Using the parameters corresponding to tariffs, NTMs and transport costs in Table 8, this section will first present the trade creation effects due to full integration corresponding to shallow and deep integration (optimistic scenario). Thereafter, it will also present the marginal effects expected from partial integration (pessimistic scenario), using parameters from Table 9.

i. Trade creation due to shallow and deep integration (full removal of tariffs and NTMs): the optimistic scenario

Table 10 and Figure 6 show the results of trade creation as a percentage of Mediterranean imports corresponding to equations 2.5a, 2.5b and 2.6. For each country, three columns are presented first. They correspond to the trade creation due to the removal of tariffs, NTMs and both, respectively. As already explained previously, the trade creation due to tariffs and NTMs cannot be strictly added. This is why the trade creation presented in the last column is not equal to the sum of that calculated in the first two columns. When the parameter estimates corresponding to tariffs are statistically insignificant, we assume that trade creation due to shallow integration (tariff removal) is also insignificant. In this case, the overall effect is the same as that corresponding to the removal of NTMs (deep integration). Besides, a fourth column is introduced to take into account additional trade creation due to improvement of logistics. In the optimistic scenario, it is assumed that MED countries improve their LPI toward the 66% of highest performers, i.e. an LPI index equal to 3.05. This level is recorded in several middle-income countries, such as Mexico, Argentina, Chile as well as some Central and Eastern EU countries.

In addition, three lines are presented for each country. They reflect the minimum, maximum and average trade creation. These are calculated from Table 8 by taking respectively the lowest, highest and average parameter estimates amongst the four available estimators (Heckman two-step, FEVD, Hausman and Taylor as well as FGLS). This makes it possible to define margins of errors in the calculation of trade creation. In this regard, it can be observed that this margin is generally very thin. This is an indication about the fair robustness of the econometric results. Concerning the column related to LPI, the minimum and maximum are calculated by taking -10% or +10% from the average scenario.

A first crucial result is that **trade creation due to deep integration** (removal of NTMs) is very significant in all countries. In particular, the trade creation for Algeria amounts to 60.4% of its current imports (we remind that the maximum is 100%). Egypt, Jordan and Lebanon also exhibit high potentials of import increases if they remove their NTMs (from 32% in Lebanon to 39% in Egypt). Tunisia and Morocco show the lowest trade creation (about 25%), although this percentage is still very significant.

Overall, these results can interestingly be related to the calculation of AVEs and the results of the gravity model presented in Tables 2 and 4. Indeed, it has been shown that the most trade-reducing impact of NTMs concerned Algeria and the smaller impact involved Morocco and Tunisia. Hence, the results for trade creation strongly correlate with our previous conclusions. However, these results go further since they make it possible to quantify and scale from 0% to 100% the specific impact of deep integration (NTM reduction). In particular, it shows that this impact is very huge for Algeria.

These results are also consistent with those found in De Wulf and Maliszewska (2009) which state that deep integration could lead to significant trade gains.

The gains due to deep integration can also be increased by logistics improvement. As a matter of fact, Table 10a and Figure 6a show that these gains are very significant for Algeria (+57%). This is due to the fact that this country faces a very poor logistics performance (the LPI is currently equal to 2.36). Consequently, an improvement towards middle income countries' LPI (3.05) would lead to very significant import increases. Significant trade gains are also expected for Morocco (44%). However, it must be reminded that this gain is based on LPI data from 2007 and does not take into account the efforts of the Moroccan authorities to increase their logistics performance in the very recent years. As a result, the gain expected in Table 10a may be overestimated compared to the other countries for which LPI data are updated. Egypt and Jordan also show significant effects expected from logistics improvement (increase in imports by 32% and 21% respectively), whereas gains for Tunisia are smaller (14%) since this country is already

close to the LPI level equal to 3.05. No gain is expected for Turkey, Israel and Lebanon, which have already outpassed this LPI level.

To sum up, deep integration is expected to lead to significant import increases in MED countries, both because of removal of NTMs and logistics' improvement. This result is in line with World Bank (2011b) which identified that market access for MED countries' exports remains a major problem, which is mainly due to high prevalence of NTMs.

Table 10a. Percentage change in Mediterranean countries' imports (optimistic scenario) (from significant parameter estimates only)

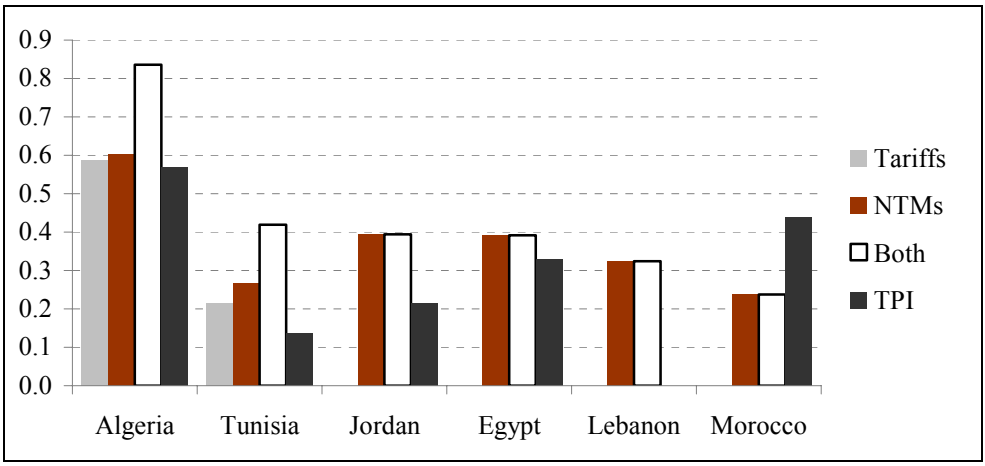
		Tariffs	NTMs	Both	TPI
Algeria	Min	57.2%	59.6%	82.7%	51.2%
	Max	60.1%	61.2%	84.5%	62.6%
	average	*58.6%*	*60.4%*	*83.6%*	*56.9%*
Egypt	Min	ns	38.4%	38.4%	29.5%
	Max	ns	40.0%	40.0%	36.1%
	average	*ns*	*39.2%*	*39.2%*	*32.8%*
Jordan	Min	ns	38.7%	38.7%	18.9%
	Max	ns	40.2%	40.2%	23.1%
	average	*ns*	*39.4%*	*39.4%*	*21.0%*
Lebanon	Min	ns	31.8%	31.8%	0.0%
	Max	ns	33.0%	33.0%	0.0%
	average	*ns*	*32.4%*	*32.4%*	*0.0%*
Tunisia	Min	ns	24.3%	24.3%	12.3%
	Max	43.1%	28.9%	59.5%	15.1%
	average	*21.5%*	*26.6%*	*41.9%*	*13.7%*
Morocco	Min	ns	23.0%	23.0%	39.7%
	Max	ns	24.5%	24.5%	48.5%
	average	*ns*	*23.8%*	*23.8%*	*44.1%*
Israel	Min	ns	-	-	0.0%
	Max	ns	-	-	0.0%
	average	*ns*	-	-	*0.0%*
Turkey	Min	ns	-	-	0.0%
	Max	ns	-	-	0.0%
	average	*ns*	-	-	*0.0%*

Note. ns – insignificant parameter estimate.
Source: own estimation.

A second interesting result is related to **shallow integration**, through tariff removal. In this regard, the trade creation is very significant for Algeria, i.e. 59%. Again, there is a strong correlation between this result and the fact that Algeria still applies very high tariffs, as shown in Section 1 Results for Tunisia are very sensitive to the estimator used in Table 8. As a matter of fact, Tunisia is a country

which still showed significant tariffs, but to a lesser extent than Algeria. As a result, the parameter estimates are not always significant. This is why the calculation of trade creation exhibits a minimum of 0% (this corresponds to insignificant parameters in Part 1) and the maximum is 43% (for the highest significant parameters). For the other countries, parameter estimates related to tariffs show the expected sign, but are insignificant. This suggests that the complete tariff removal is not expected to add a significant trade creation. This is an expected result since we showed that these countries have already strongly reduced their tariff protection (Part 1). As a result, no significant additional trade creation is expected. However, these results do not say that marginal effects of further reduction in tariffs are insignificant, as will be shown in sub-section b).

Figure 6a. Percentage change in Mediterranean countries' imports (optimistic scenario) (average from significant parameter estimates only)



Source: own estimation.

In other words, tariffs do not have such a significant effect when compared to NTMs because parameter estimates are often insignificant. This reflects the fact that tariffs have been reduced in most MED countries, except mainly in Algeria.

Finally, the combination of both tariffs and NTMs' removal provides an overall trade creation which is huge for Algeria (83%), intermediate for Egypt, Jordan, Lebanon as well as Tunisia (from 32% to 42%) and smaller for Morocco (24%). Again, these results reflect pretty well the overall liberalization level reached by Mediterranean countries. This will have important policy implications, as developed later.

At this stage, it must however be noticed that we considered that positive, but statistically insignificant parameters corresponding to tariffs lead to insignificant

trade effects. However, the results are affected by the threshold below which parameter become statistically insignificant.

In Table 8 for example, the parameter corresponding to tariffs is statistically significant down to 0.564 (Tunisia) but becomes statistically insignificant below this threshold. In the case of Egypt the value of the parameter is 0.490 (below the threshold). Consequently, we assumed above that trade creation due to tariff removal is insignificant for Egypt, even if the parameter estimate is not equal to zero.

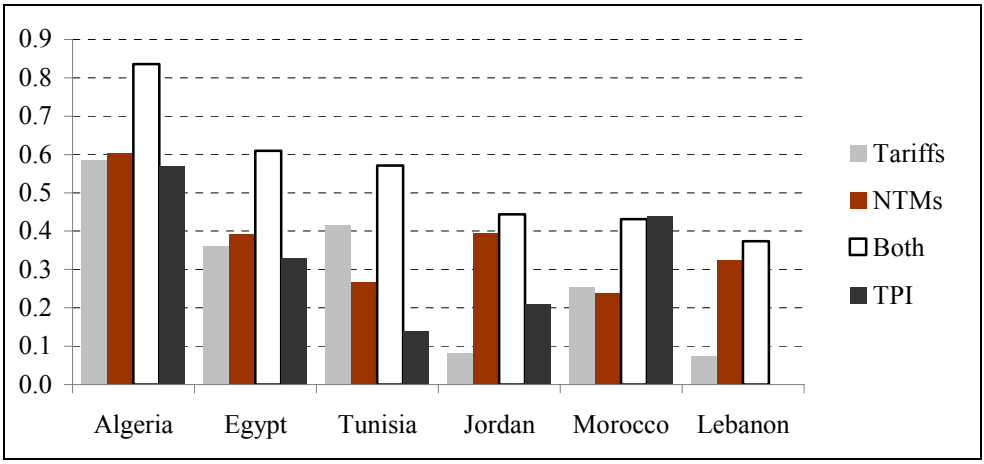
Table 10b and Figure 6b provide the results by using the value of all parameter estimates, even if they are not significant. This has the advantage of solving the problem of the threshold significance. On the other hand, the drawback is that we consider that a trade creation can be positive even if the corresponding parameter estimate is insignificant.

Table 10b. Percentage change in Mediterranean countries' imports (optimistic scenario) (from all parameter estimates)

		Tariffs	NTMs	Both	TPI
Algeria	Min	57.2%	59.6%	82.7%	51.2%
	Max	60.1%	61.2%	84.5%	62.6%
	average	*58.6%*	*60.4%*	*83.6%*	*56.9%*
Egypt	Min	33.9%	38.4%	59.3%	29.5%
	Max	38.7%	40.0%	63.2%	36.1%
	average	*36.3%*	*39.2%*	*61.3%*	*32.8%*
Tunisia	Min	40.1%	24.3%	54.7%	12.3%
	Max	43.1%	28.9%	59.5%	15.1%
	average	*41.6%*	*26.6%*	*57.1%*	*13.7%*
Jordan	Min	6.8%	38.7%	42.8%	18.9%
	Max	9.6%	40.2%	45.9%	23.1%
	average	*8.2%*	*39.4%*	*44.4%*	*21.0%*
Morocco	Min	17.1%	23.0%	36.2%	39.7%
	Max	33.7%	24.5%	49.9%	48.5%
	average	*25.4%*	*23.8%*	*43.1%*	*44.1%*
Lebanon	Min	6.9%	31.8%	36.5%	0.0%
	Max	7.9%	33.0%	38.3%	0.0%
	average	*7.4%*	*32.4%*	*37.4%*	*0.0%*
Israel	Min	0.1%	-	-	0.0%
	Max	0.1%	-	-	0.0%
	average	*0.1%*	-	-	*0.0%*
Turkey	Min	2.3%	-	-	0.0%
	Max	4.4%	-	-	0.0%
	average	*0.1%*	-	-	*0.0%*

Source: own estimation.

Figure 6b. Percentage change in Mediterranean countries' imports (optimistic scenario) (average from all parameter estimates)



Source: own estimation.

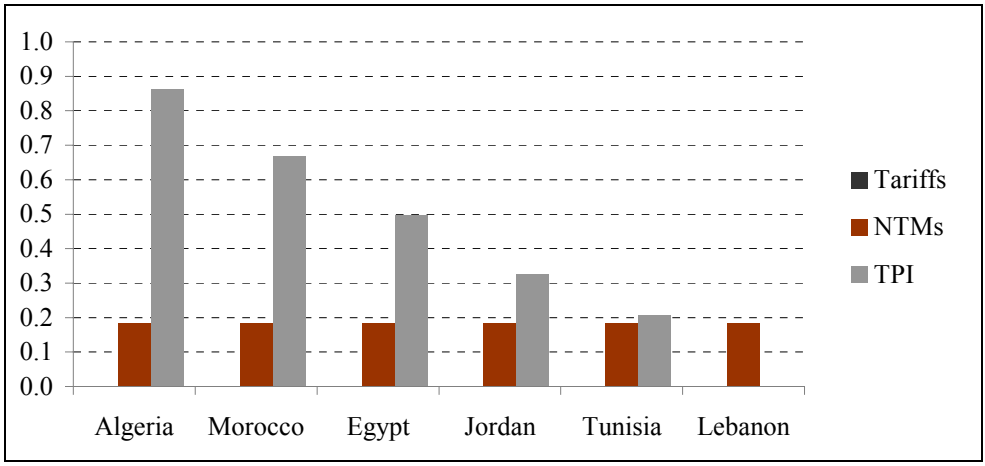
The results are slightly different to those presented in Table 10a and Figure 6a since shallow integration provides positive gains not only for Algeria and Tunisia, but also for Egypt and Morocco (which are slightly below the statistically significant threshold). However, results for Jordan, Lebanon as well as Israel and Turkey are similar to the previous ones with very small gains. Again, the country distribution of trade gains due to shallow integration is closely linked to the tariff levels applied by the countries concerned. This means that the gains are higher for countries like Algeria and Tunisia which show the highest tariff levels.

Results for deep integration are identical as those presented above since all the corresponding parameter estimates are significant. Overall, trade creation due to shallow and deep integration is very high for Algeria. It is intermediate for Tunisia and Egypt and smaller for Morocco, Lebanon and Jordan.

A last set of results can be provided concerning MED countries' exports. Figure 7 summarizes the export increases expected from shallow and deep integration. As expected, tariffs have no impact on MED countries' exports since the EU has already removed its tariffs applied to the exports of the MED countries. This means that the shallow integration is already completed on the EU side. The export increases due to the removal of NTMs in the EU are significant (18.5%) but limited by the fact that the AVE in the EU (13.4%) is much lower than the AVEs in MED countries, as shown previously. This suggests that the removal of NTMs in MED countries and in the EU is expected to lead to a more important increase

in MED countries' imports than exports[25]. However, considerable export increase is expected from the improvement of MED countries LPI toward middle-income countries level. In this regard, the export effects shown in Figure 7 are greater that the import effects calculated previously, because the parameter estimate corresponding to LPI is equal to 2.96 for exports and only 1.95 for imports. In other words, the logistics improvement in MED countries should help them increase their exports more than their imports.

Figure 7. Percentage change in Mediterranean countries' exports (optimistic scenario) (average from all parameter estimates)



Source: own estimation.

ii. Marginal effects of shallow and deep integration (partial integration): The pessimistic scenario

Table 11 shows the marginal effects of shallow and deep integration, directly based on the parameter estimates derived in Section 4. It provides the percentage effects on exports to Mediterranean countries due to i) a 1% tariff cut; ii) a 1% reduction in the number of NTMs and iii) a 1% increase in LPI. In this regard, the magnitude of the parameters corresponding to tariffs, NTMs and LPI are not

[25] Due to a lack of data concerning NTBs in all EU countries, we rely on the AVE calculated by Kee et al. (2009). Moreover, the export increase has been estimated assuming that trade effects for a given AVE is the same for all countries. For example, since the AVE in the EU is roughly half of the AVE calculated for MENA countries, it is expected that trade effects for EU imports are half of that calculated for EU exports.

strictly comparable across themselves, since the measurement of these variables is not similar (percentage for tariffs, numbers for NTMs and value index for LPI). In addition, the results cannot be strictly compared to those presented in sub-section a), not only because the methodology is different, but also because the proxy variables for tariffs and NTMs are also different, due to methodological requirement. However, Tables 10 and 11 provide complementary results.

Table 11. The pessimistic scenario: Percentage change in trade due to: 1% reduction in tariffs rates, 1% reduction in the number of NTMs and 1% increase in LPI)

		MENA countries' imports			MENA countries' exports		
		Tarifs	**NTMs**	**LPI**	**Tarifs**	**NTMs**	**LPI**
Algeria	Min	1.06	0.12	1.75	0.00	0.06	2.66
	Max	1.08	0.12	2.05	0.00	0.06	2.26
	Average	*1.07*	*0.12*	*1.95*	*0.00*	*0.06*	*2.96*
Egypt	Min	0.67	0.01	1.75	0.00	0.01	2.66
	Max	0.68	0.02	2.05	0.00	0.01	3.26
	Average	*0.68*	*0.02*	*1.95*	*0.00*	*0.01*	*2.96*
Jordan	Min	0.24	0.01	1.75	0.00	0.01	2.66
	Max	0.26	0.01	2.05	0.00	0.01	3.26
	Average	*0.25*	*0.01*	*1.95*	*0.00*	*0.01*	*2.96*
Lebanon	Min	0.06	0.05	1.75	0.00	0.03	2.66
	Max	0.06	0.05	2.05	0.00	0.02	3.26
	Average	*0.06*	*0.05*	*1.95*	*0.00*	*0.02*	*2.96*
Tunisia	Min	0.87	0.01	1.75	0.00	0.01	2.66
	Max	0.92	0.01	2.05	0.00	0.01	3.26
	Average	*0.90*	*0.01*	*1.95*	*0.00*	*0.01*	*2.96*
Morocco	Min	0.29	0.01	1.75	0.00	0.01	2.66
	Max	0.30	0.01	2.05	0.00	0.01	3.26
	Average	*0.30*	*0.01*	*1.95*	*0.00*	*0.01*	*2.96*
Israel	Min	0.04	-	1.75	0.00	-	2.66
	Max	0.05	-	2.05	0.00	-	3.26
	Average	*0.05*	-	*1.95*	*0.00*	-	*2.96*
Turkey	Min	0.03	-	1.75	0.00	-	2.66
	Max	0.04	-	2.05	0.00	-	3.26
	Average	*0.04*	-	*1.95*	*0.00*	-	*2.96*

Source: own estimation.

First, a 1% reduction in the number of NTMs does not increase trade very much (the maximum increase is 0.12% for Algeria and the minimum is insignificant for Jordan). This result does not contradict the one developed in sub-section a). It only suggests that a marginal (1%) reduction in the number of NTMs (for example from 20 to 19.8 barriers) does not strongly improve trade. This means that trade is less sensitive to the intensity of NTMs than to their existence. In other words, a signifi-

cant trade creation is expected to occur provided that a significant amount of NTMs are removed whatever their initial number. Having said that, the country-scaling shown in Table 11 is consistent with that found previously. Indeed, the greatest effects are found for Algeria whereas the smallest ones involve Morocco, Tunisia (and Jordan). Again, this result will have strong policy implications.

As a second result, a 1% tariff reduction on MED countries' imports has significant effects for Algeria, and Tunisia to a lesser extent, since it increases imports by 1.06% and 0.9% respectively. This is not surprising since these countries have the highest tariff levels. A moderate impact is expected for Egypt (0.68%) as well as Morocco, and Jordan to a lesser extent (about 0.3%). Conversely, these effects are less important in the other countries, especially Israel, Turkey and Lebanon (0.06%). These results can be compared to those found in sub-section a). In fact, the country scaling is very similar. Besides, as already mentioned, no gain is expected for MED countries exports, since the EU has already removed its tariffs for imports from MED countries.

Finally, trade gains due to deep integration can also been reinforced further through the improvement of logistics in MED countries. As already mentioned, since the parameter estimates is greater for exports than for imports, MED countries are expected to increase their exports more than their imports due to logistics improvements.

Section 6: The Case of South-South Integration

This section provides specific insights into integration between MED countries. For that purpose, the model is estimated from a restricted country sample, which only includes MED countries as reporters and partner countries. This makes it possible to appraise the impact of tariffs, NTMs and transport costs within the MED countries' area. As has been shown in Part 1, tariffs across MED countries have been phased out during the GAFTA integration process (except Algeria). Consequently, all tariffs have been eliminated since 2005. However, some recent surveys indicate that the previous tariff protection has sometimes been replaced by additional NTM for specific products (Péridy and Ghoneim, 2009). As a result, trade liberalization across MED countries is still not yet fully completed.

Figure 8 provides the simulation results due to full and marginal liberalization with regard to MED countries' imports. Since bilateral tariffs across MED countries have been removed since 2005, there is no effect of tariffs on trade[26]. There are however three exceptions: the first is Algeria which has joined the GATFA area but has not started removing its tariffs in 2005. The other exceptions concern Israel and Turkey which are outside the GAFTA area.

The results concerning trade effects of NTMs are similar to those found in Section 5. For example, in the case of full liberalization, all MED countries show a significant impact of NTMs' reduction. In the same way, as in Section 5 and for the same reasons, NTMs' limited reductions provide smaller marginal gains because as already discussed, marginal cuts in NTMs are not enough to increase trade.

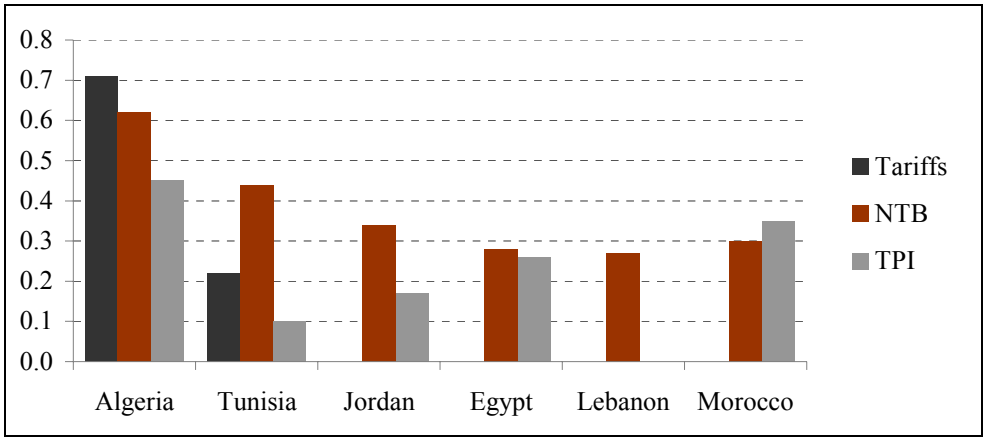
In addition, improvement in LPI leads to significant import increases, especially in Algeria due to its poor logistics performance. As in section 5, the import effects for Morocco may be over-estimated because estimation is based on data from 2007. This means that the recent improvement in LPI is not taken into ac-

[26] Preliminary results which use MFN tariffs as an independent variable show that although bilateral tariffs have been removed across MED countries, MFN tariffs are still import-reducing in some countries which are GAFTA members. This unexpected result can be explained by the fact that the MFN tariff variable may capture some non tariff protection. However, for consistency of the estimations, we used the zero tariff for all countries except Algeria, Turkey and Israel.

count in the simulations. The same applies to Egypt which has undertaken significant logistics' improvement at the ports, though might be less than Morocco.

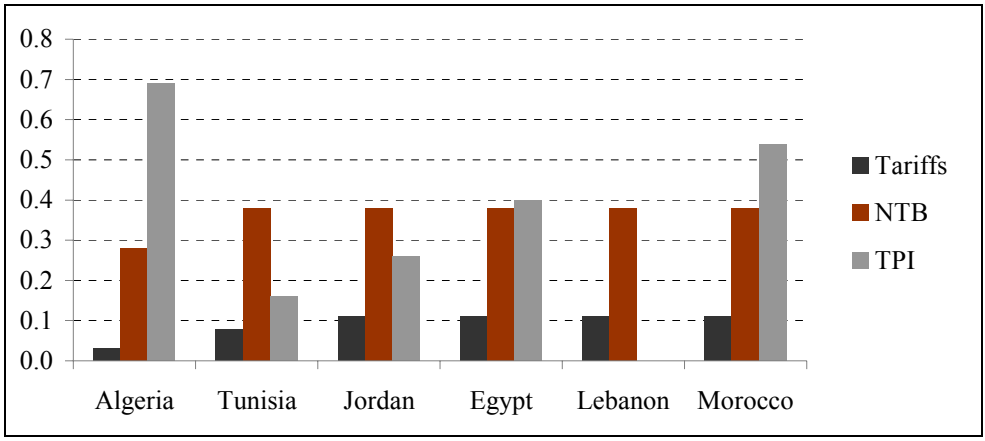
Results concerning exports clearly indicate that in case of full liberalization, the removal of NTMs provides significant export increases, generally about 35% (Figure 9). This means that MED countries can take advantage of the NTMs' removal across themselves in order to increase their exports. Interestingly, Algeria shows smaller gains, because the other MED countries apply lower NTMs than Algeria. This means that the remaining export potential is a bit smaller for Algeria, i.e. less than 30%.

Figure 8. Percentage change in Mediterranean countries' imports (pessimistic scenario)



Source: own estimation.

Figure 9. Percentage change in Mediterranean countries' exports (pessimistic scenario)



Source: own estimation.

These gains must be added to those corresponding to LPI improvement. Given the high export elasticity corresponding to LPI (2.39), the export increases are particularly significant, especially for the countries which show the lowest logistics performance. As a matter of fact, the expected export increase is equal to about 70% for Algeria, 50% for Morocco and 40% for Egypt.

To sum up, the optimistic scenario for deep integration shows very significant trade increases between the MED partners, both because of NTMs' removal and increase in LPI. Conversely, the shallow integration process is almost fully achieved through the GAFTA agreement. This is why trade increase is more limited. With regard to imports, only Algeria is expected to enjoy significant import increases, since this country has not applied the GAFTA agreement. Tunisia shows more limited gains, whereas in the other countries, no import increases are expected since their have already removed all tariffs on imports originating from the GAFTA area. Turning to exports, gains are also limited. Most countries are expected to increase their export by about 10%. This is due to the effects of the expected tariff liberalization in Algeria.

Turning to the pessimistic scenario (Table 12), marginal effects of both tariffs and NTMs' reduction are limited, as in the previous section. However, LPI improvement is expected to provide significant gains for most of the countries.

Table 12. The pessimistic scenario: Percentage change in trade due to: 1% reduction in tariffs rates, 1% reduction in the number of NTMs and 1% increase in LPI)

		MENA countries' imports			MENA countries' exports		
		Tarifs	**NTMs**	**LPI**	**Tarifs**	**NTMs**	**LPI**
Algeria	min	1.05	0.06	1.40	0.01	0.01	2.15
	max	1.10	0.06	1.70	0.01	0.01	2.63
	average	*1.08*	*0.06*	*1.55*	*0.01*	*0.03*	*2.39*
Egypt	min	0.00	0.02	1.40	0.00	0.01	2.15
	max	0.00	0.03	1.70	0.00	0.01	2.63
	average	*0.00*	*0.03*	*1.55*	*0.02*	*0.03*	*2.39*
Jordan	min	0.00	0.01	1.40	0.00	0.01	2.15
	max	0.00	0.01	1.70	0.00	0.01	2.63
	average	*0.00*	*0.01*	*1.55*	*0.02*	*0.03*	*2.39*
Lebanon	min	0.00	0.03	1.40	0.00	0.01	2.15
	max	0.00	0.04	1.70	0.00	0.01	2.63
	average	*0.00*	*0.04*	*1.55*	*0.02*	*0.03*	*2.39*
Tunisia	min	0.00	0.01	1.40	0.00	0.01	2.15
	max	0.00	0.01	1.70	0.00	0.01	2.63
	average	*0.00*	*0.01*	*1.55*	*0.02*	*0.03*	*2.39*
Morocco	min	0.00	0.01	1.40	0.00	0.01	2.15
	max	0.00	0.04	1.70	0.00	0.01	2.63
	average	*0.00*	*0.03*	*1.55*	*0.02*	*0.03*	*2.39*

		MENA countries' imports			MENA countries' exports		
		Tarifs	**NTMs**	**LPI**	**Tarifs**	**NTMs**	**LPI**
Israel	Min	0.17	-	1.40	0.17	0.01	2.15
	Max	0.18	-	1.70	0.18	0.01	2.63
	average	*0.18*	-	*1.55*	*0.25*	*0.03*	*2.39*
Turkey	Min	0.15	-	1.40	0.15	0.01	2.15
	Max	0.19	-	1.70	0.19	0.01	2.63
	average	*0.17*	-	*1.55*	*0.19*	*0.03*	*2.39*

Source: own estimation.

Part 3: Conclusions and Policy Implications

The main findings of this paper are the following:

1. The analysis of tariffs in Mediterranean countries shows that they are still significant in Algeria and Tunisia (to a lesser extent). In the other countries, tariffs are much lower, especially in Israel and Turkey which have almost completed their tariff liberalization.
2. Protection due to NTMs is generally much greater than that due to tariffs (except for Algeria and Tunisia). In addition, the calculation of AVEs shows high tariff-equivalents for Algeria but also Jordan. Conversely, Morocco, Tunisia but also Egypt exhibit the lowest AVEs (less than 25%).
3. The implementation of a specific gravity model shows that trade costs significantly reduce MED countries' imports from their partners in the Euromed area. In particular:
    a. Tariffs are trade reducing, mainly in the countries which showed the highest tariff levels (Algeria and Tunisia). This suggests that the shallow integration was not fully achieved in these countries.
    b. NTMs are significantly trade-reducing in all countries, especially in Algeria. On the other hand, they are less trade-reducing in Morocco and Tunisia, though significant. This means that eliminating NTMs in Mediterranean countries as a move toward deeper integration in the Euromed area is expected to provide significant gains.
    c. Transport costs significantly reduce trade in Mediterranean countries, as well as inefficiencies in logistics.
4. In the same way, trade costs significantly reduce exports from MED countries to their partners in the Euromed area. In particular:
    a. Transport costs and logistics inefficiencies are particularly trade reducing. This is due to the gap between LPI in most MED countries on the one hand and the EU on the other hand.

b. NTMs are also export reducing but to a lesser extent than for imports. This can mainly be explained by the fact that NTMs applied to MED countries exports (especially by the EU) are lower than those applied to MED countries imports (by themselves).
c. Tariffs have small effects on exports, mainly because they have been removed in most countries in the Euromed area.

5. The calculation of trade creation due to shallow and deep integration reveals that:
   a. Tariff removal is expected to produce moderate or limited gains, except in Algeria, and Tunisia (to a lesser extent), since both countries show higher tariffs than the other Mediterranean countries. Import increases are estimated to amount to 59% in Algeria and 42% in Tunisia. Egypt and Morocco show moderate import increases due to tariff removal (about 30%). For the other countries (Lebanon, Jordan, Israel and Turkey), only a limited import increase can be expected from further shallow integration, since the potential gains have been almost fully achieved due to past tariff liberalization, both multilaterally (GATT) and regionally (Barcelona agreement). The effects of tariff removal concerning exports of MED countries are also small, because most of their partners in the Euromed area have already removed their tariffs.
   b. Conversely, the elimination of NTMs is expected to lead to strong trade gains (while a marginal reduction in NTMs leads to much smaller gains because NTMs must be importantly reduced in order to provide significant gains). With regard to imports, the expected increase range from about 25% in Morocco and Tunisia to 60% in Algeria. The other countries are in intermediate positions, showing imports increase which scales from 32% (Lebanon) to 39% (Egypt and Jordan). Exports increases, although significant (35%) are, however, smaller than import increases, because the NTMs applied by the EU to exports of the MED countries' are lower than those applied by MED countries to their own imports. Overall, a strong trade creation is expected from deep integration. This result is consistent with that found in De Wulf and Maliszewska (2009). The main reason is that almost no progress has been made so far concerning the reduction in NTMs.
   c. Trade gains due to deep integration can also been reinforced further through the potential reduction in trade and logistics costs: as a matter of fact, import increases are expected to amount to up to 30% for Morocco and 45% for Algeria. Export increases are even

more important due to higher export elasticities to LPI than import elasticities. In any case, the trade gains are particularly significant for the countries which show the greatest inefficiencies in their logistics, i.e. Algeria, Egypt and Morocco.

d. The particular case of South-South integration provides similar results, i.e. gains from deep integration (NTMs and logistics) are important, whereas gains due to shallow integration are moderate (except in Algeria which has not started its tariff liberalization process vis-a-vis the other GAFTA members)

These results lead to the following policy implications[27]:

6. Mediterranean countries should complete their shallow integration with their EU partners and across themselves as a means of capturing the remaining trade gains available. In particular, Algeria should take efforts to reduce its tariffs which currently remain at high levels.
7. Dealing with deep integration is a more difficult task. First, NTMs must be addressed altogether, since we have shown that the removal of a particular NTM while keeping the other ones provides very limited benefits. As a result, each Mediterranean country should identify precisely all NTMs for each product and decide whether to remove all NTMs for this product or not. Of course, the removal of all NTMs for all products is not necessarily the right solution, since some NTMs may be useful at product level for specific reasons (sanitary, etc.).
8. However, there are numerous NTMs in Mediterranean countries which strongly reduce trade. Some questions must be addressed with regard their removal for specific products, by eliminating para-tariff measures or moving towards mutual technical standard recognition. In any case, a cost-benefit analysis should be undertaken at product-level before embarking on NTMs elimination (especially in terms of short terms costs due to an increased competition with EU products).

A second aspect of deep integration relates to the efficiency of logistics. In this regard, significant additional gains can be achieved through the extension of the Euro-Mediterranean integration as a means of improving LPI (port infrastructures, logistics services, etc.). In this regard, an increased cooperation in infrastructure related projects is required. In addition, extending the financial cooperation between the EU and Mediterranean countries (through specific EIB loans) can also help improving logistics' performance.

[27] A broader analysis about policy implication of border management may also be found in McLinden, G. et al. (2011).

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ANNEXES

Annex 1: A Note on the MEDPRO Scenarios and their Relations with the Simulations Undertaken in This Study[28]

The four MEDPRO scenarios consist of 1) *the reference scenario* which entails continued partial cooperation through bilateral agreements among the EU members and the MED countries with a failure to achieve sustainable development; 2) *The Euro-Mediterranean as one global player* scenario where common EU-MED frameworks of action on key topics including trade are set. In this case sustainability is achieved via common targets and strategies; 3) *The EU and the MED as regional players on the global stage* is a scenario where multilateral agreements between the EU and the MED countries are undertaken to enhance cooperation on key topics. In this case the sustainability is achieved with separate pathways; and 4) *The Euro-Mediterranean area is under threat* is a scenario where weakening and failure of cooperation schemes lead to possible disruption of EU institutions with the rising of regional conflicts in the MED area and certainly sustainability is not achieved. In fact, such scenarios coincide with the analysis undertaken in this study, yet not in a complete way. For example the reference scenario of MEDPRO is similar to the optimistic scenario in which only abolishment of tariffs takes place (shallow integration). In this case the gains from trade in terms of higher exports and imports between EU and MED countries or between MED countries are not high. The second and third scenarios dealing with *The euro-Mediterranean as one global player and The EU and the MED as regional players on the global stage* are similar to the optimistic scenario concerning deep integration where trade gains are likely to be high especially if NTMs are abolished as well logistics related problems are solved. The improvement of logistics seems to have a significant impact on trade creation and thus should be paid due attention from a policy-making perspective. The fourth scenario of *The euro-Mediterranean area is under threat* is similar to the pessimistic scenario in which piecemeal measures (insignificant reductions or increases in tariffs as well as NTMs) are not likely to en-

[28] By Ahmed Farouk Ghoneim

hance (or reduce) trade in a significant manner whether between EU and MED countries or amongst MED countries themselves.

Annex 2: NTMs in the MED Countries Affecting Their Trade in the Euromed Area, and How EU Can Help[29]

Despite significant efforts undertaken to tackle NTMs in the MED countries, still there is a room for further actions to enhance trade between MED countries and the EU as well as amongst MED countries. This short review provides an overview of the efforts undertaken in the MED countries to combat NTMs and the remaining problems that require further actions, where EU can provide help. We identify the NTMs related to standards, sanitary and phytosanitary measures, customs procedures, intellectual property rights, competition, and government procurement issues.

Regarding standards, MED countries have undertaken several steps to harmonize their national standards with the international ones and with those of the EU. MED countries are at different stages in terms of harmonizing their standards with the EU, but all have been progressing in an impressive manner. All MED countries which have been engaged with the EU in Association Agreements have made progress to negotiate an Agreement on Conformity Assessment and Acceptance of Industrial Products (ACAA). Despite the significant developments undertaken by MED countries in this regard, there is still a lack of mutual recognition agreements (MRAs) signed between MED countries and the EU or amongst themselves, with the exception of Israel (which has such an agreement with the EU). This situation reflects the absence of trust in the standards' procedures adopted in MED countries or the weak accreditation of domestic organizations, which have not been granted international recognition yet. In other words, there is a lack of credible comprehensive conformity assessment[30] systems that allow trust in the standards' systems

[29] By Ahmed Farouk Ghoneim. This part is based on Ghoneim, Ahmed F. (2009), "Analysis of NTBs in Euro-Med Zone", in Luc De Wulf and Maryla Maliszewska (eds.) Economic Integration in the Euro-Mediterranean Region, CASE Network Report No. 89/2009 available at http://ssrn.com/abstract=1526992

[30] Conformity assessment is the name given to the processes that are used to demonstrate that a product (tangible) or a service or a management system or body meets specified

in MED countries. A major dimension of the conformity assessment problem is associated with the lack of investments in related infrastructure including laboratories and needed equipments. This situation could be improved with technical, and financial assistance from the EU so as to give greater confidence on the conformity assessment systems.

Despite the progress made by the MED countries to harmonize their standards with international norms, several problems remain open, namely:

- Labeling and packaging requirements for a wide array of imported goods seem to be the major NTMs identified in all MED countries as reported by the US in USTR reports or by the EU in different databases (market access databases). The specific labeling and packaging measures are strict when dealing with some items including foodstuffs, pharmaceuticals and textiles. Such measures result in increasing costs for exporters to MED countries including Egypt, Israel, Morocco, Jordan, and Tunisia. Available information identify that such measures also impeded an intraregional trade among MED countries themselves in the context of Agadir agreement.
- Testing procedures at the borders differ depending on product and its sensitivity and between individual MED countries. The testing procedures often lack uniformity and transparency.
- Inadequately staffed and poorly equipped laboratories often yield faulty test results and cause lengthy delays.
- Application of market surveillance systems which in most countries, except for Israel and, to a lesser extent, Jordan, is still in its infancy.
- The flexibility identified in choosing among different international standards as in the case of Israel and Egypt is not fully implemented which creates a large room for uncertainty among exporters to those countries. In Tunisia there is huge complexity for the application of import technical regulations, which affects negatively the clearance of goods from customs and has negative effect on the competitiveness of Tunisian firms.

As in the case of standards, MED countries have been working on providing flexibility and harmonizing their SPS measures with international norms. For example, in Egypt, a program was completed to identify mandatory and optional requirements in each new product standard. The new standards follow CODEX guidelines for safety and the protection of human health. A new National Food

requirements. Conformity assessment can cover testing, surveillance, inspecting, auditing, certification, registration, and accreditation. See http://www.iso.org/iso/resources/conformity_assessment/what_is_conformity_assessment.htm.

Safety Authority is expected to be established in the near future following the American model of FDA. Jordan has the majority of its announced SPS regulations WTO consistent. Moreover, the Jordan Food and Drug Administration (JFDA) has applied a risk-based system for inspection of imported food consignments. Moreover, JFDA applies a risk-based assessment for domestic produced products as well. Other MED countries have undertaken similar measures to those adopted in Egypt and Jordan.

Despite the efforts in SPS aspects there are a number of general problems that affect exporters to MED countries though they differ in the degree of their urgency as follows:

- The issue of shelf-life and the ad hoc application of shelf life procedures for imported products is a major concern for food products exporters to MED countries. Jordan has undertaken positive developments in this regard and has replaced the shelf life system with "best before".
- Special religious requirements as the case of Halal meat and Kosher regulations cause several complications for specific food stuff exporters to MED countries regarding the procedures and certification requirements.
- There are also a number of specific products that have been subject to SPS measures applied by MED countries on imports from the EU. For example bans on importation of live birds, their meat and product have been applied by Egypt, Jordan, Morocco, and Israel.
- Moreover, there are a number of SPS measures that are country specific with no clear scientific basis, and is often cumbersome to fulfill.
- MED countries face major problems in accessing each other markets due to the multiplicity of systems and documentations required in each country. Lack of transparency on SPS requirements and vague application has resulted in denial of market access for intra-Agadir exports, where imposition of ad hoc fees or simply denial of market access for a wide array of agricultural and processed food products has been the case.
- Moreover, it is not clear to what extent national treatment is applied regarding SPS measures. Several incidents of non-complying with international rules (e.g. Codex) are reported on the borders with no clear information on whether the same treatment is applied to domestically produced goods.
- Exporters from MED countries face high compliance costs associated with EU SPS standards, certificates, and measures as HACCP, EUREPGAP, and BRC. Though complying with such measures provides exporters with access to the EU markets, small producers and exporters have a difficult time to satisfy all these requirements. The traceability system has certainly

added extra compliance costs for exporters from MED countries to EU. All such additional costs when combined with EU agricultural production and export subsidies and erosion of preferences for MED countries due to the proliferation of EU regional trade agreements undermine the competitiveness of MED countries' exports to the EU market.

As for customs procedures, we observe that all MED countries have undertaken significant developments by including automated systems and reducing the number of procedures and steps needed for customs' clearance. Yet, as in the case of standards and SPS measures several NTMs still prevail. The EU support is needed in this area to ensure that deep integration materializes, and especially in the following areas:

- Streamlining customs procedures for intra MED countries' trade would boost such trade that is still below its apparent potential. This might require establishing a monitoring mechanism to ensure compliance of MED countries with customs valuation. Also the EU could use its influence to persuade MED countries to eliminate extra charges and surcharges imposed on the intra MED trade especially in the context of Agadir agreement.
- Ensuring proper adoption of post-clearance audit which does not seem to be applied by all MED countries, and even when applied by some of them as Jordan, information indicate that the process is still in its infancy.
- Provide assistance to correctly implement the WTO Customs Valuation Agreement
- Assist with putting effective post clearance audit capacity in place including training to improve technical procedures and capacity building. This could greatly contribute to faster release of imports.

In the field of *intellectual property rights (IPRs)*, all MED countries have adopted legislations that are in compliance with TRIPS. However, all MED countries have problems with the enforcement of IPR laws and regulations and/or weak provisions in some of their legislation that at times make them non-compliant with TRIPS. The reports of main trading partners (US and EU) indicate there are some loopholes in the laws. Moreover, not all MED countries have adhered to TRIPS plus type international agreements to which most of the EU countries have signed. The EU could assist MED countries in reducing the circulation and trafficking of counterfeit/pirated goods and improve their compliance with TRIPS; this could involve:

- Providing technical assistance to strengthen the capacity of MED countries to monitor violations of TRIPS provisions, and enhance their enforcement capabilities including upgrading of courts and judges responsi-

ble for handling TRIPS related cases, while ensuring that strengthening such measures will not have negative repercussions for social situation of MED countries such as increasing prices of medicines or basic educational copyright products.

- Providing technical assistance to ensure compatibility with TRIPS in areas where MED countries still adopt non-complying measures. For example, the review of the US and EU reports identified that some MED countries still have loopholes in their national laws regarding their conformity with TRIPS including, for example, pharmaceuticals data in Israel, and patents and trade marks in Jordan. EU assistance in amending national laws is certainly needed, especially that foreign assistance in this field has been dominated so far by the US.
- Initiating or improving cooperation between the various national bodies in MED countries responsible for IPR enforcement. Such initiatives can be undertaken in a regional context as problems faced by individual countries in fighting counterfeit and pirated products are similar.

In areas related to competition and government procurement, it is worth noting that MED countries are not so much advanced. For example, the competition legislation in most MED countries is new and weakly applied, whereas the issue of liberalization of government procurement is still in its infancy. In this regard, what is needed from the EU is providing technical assistance to upgrade the institutions responsible for such issues, without emphasis on the need of harmonization with EU norms and regulations.

In fostering greater competition the EU could support MED countries through:

- Seek for an agreed upon definition of state aid that takes into account the differences in economic development, social and political structures between the MED countries and the EU. For example, the flexibility regarding block exemptions for regulations currently adopted by the European Commission should be extended to MED countries and could cover issues as basic education, mass transportation, and other areas of concern to MED countries.
- Enhance the capacity building of competition authorities in MED countries and the information databases they can use to ensure effective implementation of competition laws and regulations (in terms of data, human capital, and means of fast and accurate investigations).
- Ensure that *de minimis* regulation applied by the EU fits the developmental considerations of MED countries. Such agreement would enhance the chances of compliance.

- Introduce new forms of cooperation (positive and negative comity agreements among EU and MED countries competition authorities).
- Ensure that there is progress made by MED countries to implement the competition related articles in the Association Agreements.
- Investigate new potential for cooperation among sectoral regulators between the EU and MED countries and among MED countries themselves.
- Finally, among the areas that do not appear extensively in the EU documents (action plans and progress reports) and that should receive more attention is the cooperation among sectoral regulators in areas such as public utilities and telecommunications. In this regard cooperation in terms of twining projects (currently some of them are already in place) could be expanded. The main emphasis here could be on the transfer of EU knowledge and expertise in managing such sectors (e.g. electricity, water, and telecommunications) to MED countries.

In the area of government procurement, the EU can help as follows:

- An alternative to reaching a regional agreement with respect to government procurement would be to aim at sectoral and bilateral agreements between the EU and the MED countries. This could take into account the sensitivity of some sectors in particular countries.
- Transparency could be enhanced by clarifying the criteria for using exceptions to open tenders; defining a time limit to take procurement decisions.
- The EU could strive to obtain the same rights as granted to American firms under the different FTAs, memoranda of understandings, and offset agreements in their trade negotiations with MED countries.

This review of NTMs prevailing between EU and MED countries identified main areas for intervention and support by the EU to MED countries. The nature of support differs where in some cases technical and financial assistance is highly needed to strengthen the capacity of MED countries as in the area of standards and SPS measures. Areas of standards and SPS measures require more technical and financial assistance to upgrade the level of conformity assessment procedures and infrastructure. This will enable MRAs to be concluded and hence will enhance the market access of MED countries' products in the EU with a higher degree of trust.

In some areas there is a need of EU assistance to enhance South-South trade among MED countries. The assistance can take the shape of ensuring that MED countries comply with policies and regulations that are in line with their WTO obligations or EU Association Agreements when trading with each other. EU can assist by helping MED countries establish some monitoring mechanisms for NTMs affecting their intra-regional trade.

Annex 3: Description of Mediterranean Trade and Protection Database[31]

The Annex 3 intends to serve as a reference source for the trade and protection database. This annex presents and details the major variables in the database by explaining the source and the main assumptions considered at the time of the construction.

Trade data

Trade data comes from UN Comtrade database. The database reports, in its standard form, exports and imports at HS 6 digit level. Since this classification is standard to all countries, it is possible to make comparisons between products in different countries. The data reported in this database has been aggregated into HS 2 digits or chapter level.

The database only considered bilateral exports and imports reported by each of the 10 Mediterranean countries analyzed within them and to the 27 countries of the European Union.

The Harmonized System has been started to be gradually implemented in 1988. This implies that it is impossible to get trade data under a common classification system before that year. However, the implementation has been slow and the earliest data at the required classification do not go beyond 1990. However, this data was not available for all countries. Excluding Syria, the earliest year with trade data for all reporters is 1997. Table 13 presents the value of trade by country and year and it also shows the trade data availability.

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Table 13. Exports in millions of USD dollars by reporter and year

	Algeria	Egypt	Israel	Jordan	Leba-non	Moroc-co	Syria	Tunisia	Turkey
1990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8282.1
1991	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3028.7	8846.7
1992	7935.9	0.0	0.0	0.0	0.0	0.0	0.0	3328.4	9490.6
1993	6697.5	0.0	0.0	0.0	0.0	2587.6	0.0	3164.8	9256.8
1994	5932.5	2035.0	0.0	277.4	0.0	2775.3	0.0	3779.3	10600.0
1995	6374.9	2061.5	5705.0	337.0	0.0	3180.6	0.0	4501.8	13700.0
1996	7209.8	2332.9	6209.5	0.0	0.0	3144.7	0.0	4472.0	14100.0
1997	9359.3	2280.3	6560.2	315.0	283.5	3002.5	0.0	4478.8	15000.0
1998	6616.7	1668.8	7010.4	265.3	293.9	5307.1	0.0	4659.0	16900.0
1999	8850.4	1745.8	8801.3	391.4	301.5	5789.7	0.0	5116.1	18100.0
2000	15500.0	2526.2	9745.4	337.2	283.3	5839.5	0.0	5101.8	17900.0
2001	13700.0	1883.2	8694.5	400.5	344.3	5443.1	4121.2	5779.6	20300.0
2002	13600.0	1863.6	8373.3	576.9	390.0	6056.6	5055.8	5994.2	23100.0
2003	16300.0	2810.2	9652.7	496.1	452.9	6956.3	4566.7	7140.1	31100.0
2004	19600.0	3938.7	11900.0	627.4	598.4	7683.7	3797.9	8737.9	41400.0
2005	28300.0	4863.4	13600.0	737.5	697.5	8592.1	4998.1	9349.3	47100.0
2006	31600.0	6082.1	14100.0	829.3	718.8	9585.7	6497.3	10100.0	54500.0
2007	29400.0	6573.2	13500.0	999.9	1029.5	11000.0	7713.5	13500.0	68100.0
2008	46400.0	13300.0	19400.0	1281.3	1263.2	12800.0	0.0	15900.0	73900.0
2009	26500.0	0.0	13800.0	1076.3	0.0	9820.0	0.0	12500.0	58800.0

Gravity variables

Typical gravity variables come from CEPII gravity database. These dataset includes several variables to measure different issues that explain trade between countries such as distance, common language, legal system, etc. It also includes mass variables such as GDP and population. We have supplemented these mass variables by including World Bank's World Development Indicators (WDI) GDP (different definitions) and population.

Tariff data

Tariff data comes from UNCTAD Trains database. The data was extracted a HS 2 digits in order to make it compatible with the trade database. Table 14 presents the average MFN tariff applied by country and year. It also shows the tariff data availability. Three different types of tariffs are provided by TRAINS:

- MFN (Most Favourable Nation) tariff. It is the standard, non-discriminatory tariff applied to any WTO member. It is, in general, the highest tariff applied to any WTO member.
- AHS (Effectively applied tariff): If preferential tariffs exist for a pair reporter-partner, TRAINS reports as the effectively applied tariffs as the lower of the two. Therefore, the AHS is the minimum between the preferential (if it is available) and the MFN tariff.
- PRF (Preferential tariff): It is the tariff applied in a bilateral agreement. It is generally lower than the MFN tariffs.

It is important to remark that the tariffs reported by TRAINS are compositional. This implies that in calculations (averages, standard deviations, etc.) only tariff lines where imports are available were considered. Therefore the average tariff at 2 HS digits, for example, only considers those tariffs where trade flows are available.

Table 14. Mean MFN tariff applied by country and year

	Algeria	Egypt	Israel	Jordan	Lebanon	Morocco	Syria	Tunisia	Turkey
1990									
1991									
1992								29.58	
1993	23.44					67.05			9.41
1994									
1995		28.36						31.19	10.07
1996									
1997	25.78					23.6			9.84
1998	25.01	24.53						31.98	
1999					13.05				11.73
2000				25.82	19.58	34.84			
2001	23.14			18.48	9.42	35.07			
2002	20.52	45.88		18.04	8.33	34.09	14.92	36.72	
2003	19.78			16.31		33.3		32.19	8.51
2004		35.82	7.19		8.19			32.25	
2005	20.39	31.12	7.31	17.11	8.38	30.48		31.35	8.46
2006	20.4		7.08	14.67	8.35	27.9		31.78	7.27
2007	20.18		6.59	14.56	7.34	26.27			9.08
2008	20.36	29.4	6.69			24.04			8.29
2009	20.19					20.79			9.31

Non-tariff measures

By definition, a non-tariff measure (NTM) is any other measure that does not adopt the form of a tax on the value or quantity imported. This constitutes a major problem to quantify and analyse this type of measures. NTMs can adopt a very wide range of forms; from sanitary measures (requirement of certificates) until price control measures. The final effect is to restrict imports by making trade operations costly and cumbersome.

NTMs can be applied to the whole universe of products regardless of their origin. Typical types of measures are the requirements of labeling the product with its origin or that the agents involved in any trade operation must be registered in the imported country. This type of measure, in principle, has the effect of reducing a general level of imports. However, their effects tend to be minimal.

Specific products may be also subjected to NTMs regardless of the origin. This type of measure addresses some risks or potential dangers associated with the trade of a particular product. Typical examples are the sanitary requirements to be met in order to import food products such as certificates, quarantines, mandatory inspections, etc. However, this type of measures is very effective to control the inflow of particular type of products that could be in competition with local producers. Therefore, it is often argued that true health concerns are used to disguise market protection measures.

NTMs, on the other hand, can be applied to specific products and specific origins. This type of measures is used when a risk has been identified in a particular origin for a particular product. For example, bans of imports of chilled or frozen beef from countries with outbreaks of food and mouth disease. Also, they are applied when a disloyal practice is suspected or identified in a particular origin for a particular product. In this case, antidumping duties or retaliation measures are applied to correct this distortion. The trade distortion effect of scu a measure is very high and it is applied both to address true concerns and with intention to protect the domestic market from competitive suppliers.

NTMs could be applied to a particular country in respect to all products. These measures are forbidden by the WTO given its discriminatory nature, but they have been applied in the past in traumatic situations. The example is a trade embargo.

Finally, the effect of NTMs is not limited to the main parties involved. Third countries may be affected by the introduction of restriction to a competitor, for example. In this case, trade will be diverted away from the NTBs affected country towards the country not affected by the measure. Therefore, it is convenient also to analyse if NTBs have been applied to other partners.

As we have seen, NTMs can adopt a wide variety of forms. TRAINS have an extensive list of all type of either tariff or para-tariffs measures applied. Its codification assigns a 4 digit code to each measure. However, it is possible to distinguish eight groups of them:

1. Tariffs. All different type of tariff and taxes applied exclusively to imported products. MFN and preferential tariffs are included in this group but also special tariffs levied due to safeguards or retaliation.
2. Different type of charges and taxes applied to finance specific services such as inspections or statistical services. It also includes taxes applied to goods regardless their origin (either domestic or imported) such as general sales tax.
3. Administered prices. Here are included all different type of measures that affect the price at which product is imported. Within this category it is possible to find price controls, minimum import price requirements, price undertaking, etc. Some safeguards and antidumping duties are applied through this channel.
4. Financial measures. These are measures that affect the finances of import operations. Among these types of measures it is possible to find refundable deposits to be made before the operation or advance payments of custom duties. It is possible to find some restrictions on the operation of foreign exchange such as multiple exchange rates, restrictions on the operation in foreign currency.
5. Automatic licenses: Licenses are administrative procedures that require the submission of an application or other documentation (besides those required for custom purposes) as a prior condition for the importation of goods. When the license is granted automatically, the required administrative procedure fulfils some non-protection objective such as statistical data collection. The approval of the application is granted in all cases. It also includes, without restricting imports, surveillance of some sensitive products (chemicals, food, etc.).
6. Non-automatic licenses and other quantitative restrictions: When licenses are non-automatic, some government body must authorize the operation. This licenses or permits are required to control the trade on very sensitive and dangerous products (arms, potentially dangerous chemicals, etc.). However, non-automatic licenses could act as a protection measure that makes imports operation subject to discretion and risk.

   Quotas and other type of quantitative restrictions are included in this group. Quotas basically limit the amount of a particular product to be imported. It may adopt the form of a tariff rate quota, where a deter-

mined amount of good is subject to a given rate but any additional quantity are taxed at higher (frequently prohibitive rate).

In this group it is also possible to find other types of administered trade such as agreements between countries to restrict or control movement of some products such as the Multifibre agreement or voluntary export restraint agreements. Finally, products that are prohibited in the importing country such as alcoholic beverages are included in this group.

7. Monopolistic measures: In this group it is possible to find measures that try to preserve some monopolistic power in the importing country. Typical here are operations that must be done by government trading companies or agencies. Also, it is possible to find products that must be imported through single channels either public or private. Moreover, requirements of using or contracting national services such as transport or insurance in the import operation are typical in this group and may increase the price of the imported good.
8. Technical or quality regulations: these are measures aimed to assure some minimum levels of quality of the product or that the imported product meets the same specification as the domestic product. In general, these measures are implemented in order to satisfy the domestic technical regulations by the imported products. Regulations on packaging and labeling (including quality assurance in product information) belong to this group.

   Sometimes, products are also required to pass some technical tests to find if they meet the domestic regulations.

These types of measures can be also used to protect domestic production. Labeling requirements may preclude the possibility of using some description because the domestic regulations are not met. Countries may have, for example, different criteria to establish the amount of cocoa that a chocolate bar may contain in order to be labeled as “chocolate”.

We have considered these eight types of measures separately in the database by distinguishing the scope of the measure (general measures, product specific, country-product specific). Within each chapter we present the number of measures of each type applied. The number of measures applied may be a poor proxy of the effectiveness of a NTM. A single measure could be sufficient to stop imports, making the rest of the measures redundant. However, it is very hard to measure the effectiveness of a single NTM. Since we are considering aggregated data, chapters with a higher number of measures applied will reveal some intention of control the flow of this type of products. Therefore, the measure chosen may be a good approximation to the restrictions in place.

Finally, we have also reported the number of measures by type applied to third countries not included in the database since it could be a very interesting variable to analyze.

Unfortunately, it was not possible to find series of NTMs applied. It was possible to identify only one year of data available for each country. The NTMs data is included in the database in the corresponding year.

Database Key

Reporter: 3 letter code for the reporter. Only Mediterranean countries were considered as reporters.

Partner: 3 letter code for the partner. Partners are considered each of the 10 Mediterranean countries plus the 27 EU countries.

Product: 2 digits HS heading.

Val000M. Imports declared by reporters in thousands of USD dollars imported from partner

Val000X. Exports declared by reporters in thousands of USD dollars exported to partners.

CEPII gravity database

Contig. It takes value 1 if the pair reporter-partner shares a common border.

Comlang_off. It takes value 1 if the pair reporter-partner shares a common official language.

Comlag_ethno: It takes value 1 if the pair reporter-partner shares a language spoken by at least 9% of the population.

Comcol: It takes values 1 if the pair reporter-partner had a common colonizer before 1945. For example, Algeria and Tunisia.

Distw: It is the weighted distance. It is the distance between the main cities of both reporter and partner weighted by the share of each city in total country population.

Pop_o: Origin (reporter) country population in mn. Source: CEPII

Gdp_o: Origin (reporter) current GDP in mn in USD. Source: CEPII

Gdpcap_o: Origin (reporter) current GDP per capita in USD. Source: CEPII

Area_o: Origin (reporter) area in square kilometres.

Pop_d: Destination (partner) country population in mn. Source: CEPII

Gdp_d: Destination (partner) current GDP in mn in USD. Source: CEPII

Gdpcap_d: Destination (partner) current GDP per capita in USD. Source: CEPII

Area_d: Destination (partner) area in square kilometres.

Tdiff: Number of hour difference between reporter and partner

Heg_d: Destination (partner) is current of former hegemon of origin (reporter)

Conflict: Takes value one if war

Indepdate: Independece date if colony variable==1

Heg_o: Origin (reporter) is current of former hegemon of destination (partner)

Col_to: takes 1 for trade from heg_o to colony

Col_fr: takes 1 for trade from colony to heg_d

Colony: takes 1 for pair ever in colonial relationship

Curcol: takes 1 for pair currently in colonial relationship

Empire: Indicates the empire reporter used to be part

Gatt_o: takes 1 if origin (reporter) is GATT/WTO member

Gatt_d: takes 1 if destination (partner) is GATT/WTO member

Rta: takes 1 if a regional trade agreement exists between reporter and partner

Leg_o: Indicates the legal regime in the origin (reporter)

Leg_d: Indicates the legal regime in the destination (partner)

Comleg: Indicates if the reporter and partner share the legal regime

Comrelig: Indicates if the reporter and partner share the religion

Entry_cost_o: Cost of business start-up procedures (% of GNI per capita) in the origin (reporter)

Entry_tp_o: Days and procedures to start a business in the origin (reporter)

Entry_cost_d: Cost of business start-up procedures (% of GNI per capita) in the destination (partner)

Entry_tp_d: Days and procedures to start a business in the destination (partner)

Comcur: If partner and reporter have a common currency

Gsp: If the partner grants GSP preference to reporter

World Bank's World Development Indicators database

GDPcnst2000_o: Origin's (reporter) GDP in constant 2000 USD. Source: WDI

GDPPPP05_o: Origin's (reporter) GDP in purchasing power parity 2005 USD. Source: WDI

GDPcurr_o: Origin's (reporter) GDP in current USD. Source: WDI

GDPcurrPPP_o: Origin's (reporter) GDP PPP current in USD: Source: WDI

Population_o: Origin's (reporter) population. Source: WDI

GDPcnst2000_d: Destination's (partner) GDP in constant 2000 USD. Source: WDI

GDPPPP05_d: Destination's (partner) GDP in purchasing power parity 2005 USD. Source: WDI

GDPcurr_d: Destination's (partner) GDP in current USD. Source: WDI

GDPcurrPPP_d: Destination's (partner) GDP PPP current in USD: Source: WDI

Population_d: Destination's (partner) population. Source: WDI

Trains Tariffs database

Tar_savgAHS: Origin's Effectively applied simple average tariff

Tar_wavgAHS: Origin's Effectively applied weighted average tariff

Tar_sdAHS: Standard Deviation of the effectively applied tariff in the origin country

Tar_minAHS: Minimum effectively applied tariff in the origin country

Tar_maxAHS: Maximum effectively applied tariffs in the origin country

Tar_nbrlinesAHS: Number of lines in the chapter in the origin country

Tar_intlpeakAHS: Effectively applied tariff number of International Peaks in the origin country

Tar_savgMFN: Origin's MFN applied simple average tariff

Tar_wavgMFN: Origin's MFN applied weighted average tariff

Tar_sdMFN: Standard Deviation of the MFN tariff in the origin country

Tar_minMFN: Minimum MFN tariff in the origin country

Tar_maxMFN: Maximum MFN tariffs in the origin country

Tar_nbrlinesMFN: Number of lines in the chapter in the origin country

Tar_intlpeakMFN: Effectively MFN number of International Peaks in the origin country

Tar_savgPRF: Origin's preferential applied simple average tariff

Tar_wavgPRF: Origin's preferential applied weighted average tariff

Tar_sdPRF: Standard Deviation of the preferential tariff in the origin country

Tar_minPRF: Minimum preferential tariff in the origin country

Tar_maxPRF: Maximum preferential tariffs in the origin country

Tar_nbrlinesPRF: Number of lines in the chapter in the origin country

Tar_intlpeakPRF: Effectively preferential number of International Peaks in the origin country