

Chapter 2

Euro-Mediterranean Trade: Shallow Versus Deep Integration

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2.1 Introduction

In this chapter, we attempt to assess the impact of shallow versus deep integration between the SEMC¹ and the EU, and among the SEMC themselves. We used a dataset which included tariffs, as a proxy for shallow integration, and NTM,² as a proxy for deep integration. We included data to account for transport and logistics costs. We used an original dataset of maritime freight cost (Maersk 2007) and the WB LPI.

Section 2.2 provides an overview of trade protection in the SEMC as well as calculations of the magnitude of NTM in terms of AVE based on the research approach of Kee et al. (2009).

Section 2.3 estimates a gravity model based on new theoretical and empirical approaches. In it, we relied on trade costs, following Anderson and van Wincoop (2004). We estimated the specific impact of tariffs, NTM, and transport and logistics costs on the SEMC's trade with the EU. Section 2.4 presents conclusions and policy implications.

¹ Libya and Palestine have not been included in this analysis because of data unavailability.

² The term 'Non-Tariff Measures' (NTM) has recently tended to replace the term 'Non-Tariff Barriers' since some measures are not explicitly protectionist (e.g. some regulations or standards designed at increasing consumer safety – see Cadot et al. 2011).

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2.2 Tariff and NTM Between the SEMC and the EU

This section provides an estimation of trade costs, especially tariffs and NTM applied between the SEMC and the EU. This allows us to (i) have a better understanding of the level and magnitude of tariffs and NTM in the countries considered; (ii) use these estimations as inputs into the gravity model in order to assess the effects of tariffs and NTM in SEMC-EU trade. Figure 2.1 summarizes MFN tariffs applied by the SEMC. With the exception of Israel, Lebanon and Turkey, the SEMC still use significant tariff protection, especially Tunisia, Egypt, Morocco, and Algeria.

Table 2.1 shows the average tariffs that are effectively applied overall and at the bilateral level. Israel and Turkey have removed almost all tariffs on EU imports. Morocco and Lebanon have also made progress, with small average tariffs applied to EU imports. Tunisia, Syria, and Algeria have the highest tariffs (up to 18 % for Tunisia), whereas Jordan and Egypt are in an intermediate position. We don't understand why Tunisia maintains such a high level of tariffs. The shallow integration process between the SEMC and the EU is not complete, with the exception of Israel and Turkey. Algeria, and to a lesser extent Tunisia, exhibit high tariffs. This fact had implications when we assessed the impact of shallow versus deep integration using the gravity model.³

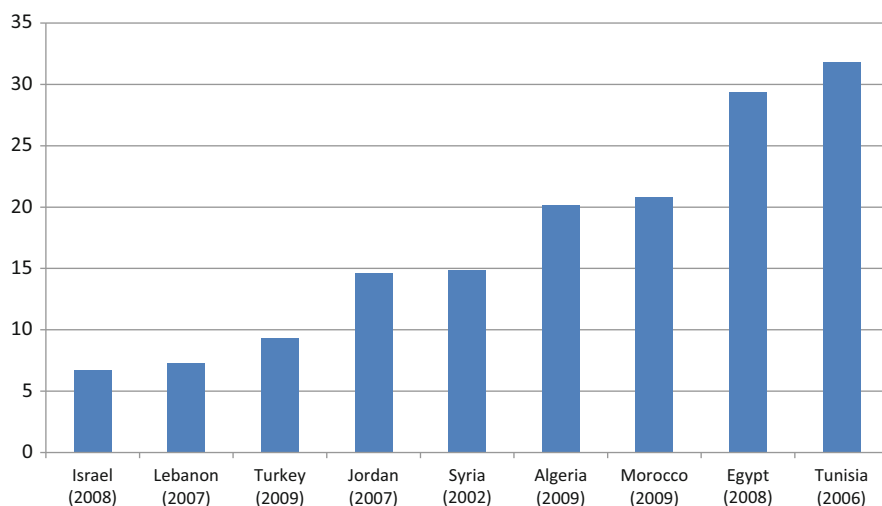


Fig. 2.1 Average MFN tariffs applied by SEMC, %, unweighted average (From Ghoneim et al 2012) (Note: Last year available in brackets. Libya and Palestine are excluded due to lack of data)

³ 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 SEMC and the EU for a

Table 2.1 Average tariffs applied by SEMC on their imports, unweighted average, % (From De Wulf et al. 2009)

Country	Tariffs with all countries	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.

Tariffs applied to the SEMC exports by their partners in the Euro-Mediterranean area have been progressively removed, thanks to the Barcelona process and the South-South integration process, namely the PAFTA.⁴ The shallow integration is now complete for the SEMC exports. Algeria is an exception: despite its PAFTA membership it did not start the tariff liberalization process in 2005 (Peridy and Ghoneim 2009). Israel and Turkey are outside PAFTA.

There is room to remove NTM in the SEMC. We identified NTM related to standards, SPS measures, customs procedures, IPR, competition, and government procurement.

The SEMC have undertaken steps to harmonize their national standards with international ones and with those of the EU. All SEMC which have been engaged with the EU in AA have made progress on negotiating an ACCA of industrial products.

Despite the reforms the SEMC have undertaken, there is a lack of MRA signed between the SEMC 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 SEMC standardization procedures or the weak accreditation of domestic organizations, which have not been granted international recognition.

There is a lack of credible conformity assessment⁵ systems that create trust in the standards' systems in the SEMC. The lack of investments in related infrastructure,

given product. Tariffs are not necessarily equal to zero. Thus, this product must be removed if we wish to calculate average tariffs (weighted or unweighted) without such a bias. Then, as products are aggregated into two-digit level, MFN tariffs are not strictly comparable to applied ones since the product coverage is not exactly the same.

⁴ PAFTA is a free trade area between 18 Arab countries out of the 22 countries which are members of the League of Arab States. It has been fully implemented since 2005.

⁵ 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 requirements. Conformity assessment can cover testing, surveillance, inspection, auditing, certification, registration, and accreditation. See http://www.iso.org/iso/resources/conformity_assessment/what_is_conformity_assessment.htm.

including laboratories and necessary equipment is a major obstacle. The SEMC face problems with labeling and packaging requirements, testing procedures, and market surveillance.

The SEMC have been working on providing flexibility and harmonizing their SPS measures with international norms. Yet, despite the effort undertaken, there are a number of problems that affect exporters to the SEMC. The problems vary in their degrees of urgency, and include shelf life requirements, special religious requirements, product and country specific SPS measures, multiplicity of systems and documentation, weak national treatment, and high compliance costs. Problems prevail in custom procedures, IPR, competition, and government procurement.

Estimating NTM is difficult. The corresponding data are from the TRAINS database, with eight groups of measures, including specific charges and taxes, administered processes, financial measures, automatic licenses, non-automatic licenses and other quantitative restrictions, monopolistic measures, and technical or quality regulations. The TRAINS dataset is incomplete and available for 1 year only (1999 or 2001). Nevertheless, it provides an insight into NTM in the SEMC.

The available data do not indicate the number of NTM applied at the bilateral level. It does not provide any direct indication about the effectiveness of NTM as a protection tool. It is not possible to compare the magnitude of the protection due to NTM to that due to tariffs, since these two variables are not measured in the same way. This problem may be addressed by calculating the AVE of NTM using the methodology developed by Kee et al. (2009).

The Kee et al. (2009) methodology is applied in two stages. The first includes an estimation of the quantity impact of NTM on imports. This impact is then transformed into price effects, using import demand elasticities calculated in Kee et al. (2008).

Using the dataset completed by Lopez Gonzalez and Mendez Parra (see Ghoneim et al 2012, Annex 3), 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. Since preferential tariff data are often unavailable,⁶ this introduces two problems.

Lack of preferential tariff data increases the number of unavailable observations. It also introduces a bias in AHS measure. 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). The measure of the AHS is volatile in time since it sometimes captures MFN only. The MFN tariff seems to be the most reliable measure for the calculation of AVE. Therefore, the results presented below include only MFN tariffs.

Several proxies are available for NTM. We aggregate all these NTM types (except the first category, which includes tariffs). We made a distinction in respect to the products and/or countries the NTM applies. Some NTM apply regardless of

⁶ This may be because of zero flows or because data are unavailable for a given product in a given country.

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 NTM, the latter have been aggregated, including country- and product-specific NTM as well as country and product non-specific NTM. As a final step, an NTM variable is transformed into a binary variable which takes the value of zero in case of no NTM and unity if there is at least one NTM.

The model is estimated with the TSHP and relies on the assumption that zero trade flows in the dataset do not occur randomly but are the outcome of a selection procedure. 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 the second stage, when exports occur, the effects of trade barriers and other variables can be estimated through the choice of an estimator (Heckman 1979; Greene 2006).

We tested various selection variables. The final specification assumes that the likelihood to export depends on the type of partner countries. Partner countries are classified into four groups according to the probability to export, which depends on political barriers. The four groups include the EU15, other SEMC, other EU countries, and Israel. The probability for the SEMC to export is greater towards the EU15 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. According to the new trade theory developed by Baldwin and Krugman (1989), a firm must bear sunk costs before entering the export market. A firm's probability to export depends on its ability to export in the past. This theory is based on hysteresis in international trade.

Results are presented in Table 2.2 and Fig. 2.2 (except Israel, Turkey, and Syria, for which data on NTM are unavailable). The estimation of the TSHP shows that the presence of NTM (i.e. when the NTM dummy is equal to unity) has a negative and significant impact on the dependent variable (imports net of tariffs) in the SEMC. There are differences across countries. Algeria records the greater coefficient related to NTM (-0.83). 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.

Looking at the other independent variables, the GDP per capita ratio is positive and significant. As the economic distance (measured by the gap in GDP per capita) increases between the SEMC and their partners, trade increases. Most trade between the SEMC and their partners involves inter-industry trade. The sum of GDP between the SEMC and their partners shows a positive and significant sign. Trade is expected to increase with the size of the two partners. The sign of the selection variable is negative and significant. The likelihood to trade depends on the type of partner (EU, other SEMC, or Israel).

The results presented in Table 2.2 are used to calculate AVE according to Kee et al. (2009) methodology and the variables described above. The lower the parameter estimate corresponding to NTM and the lower the import demand elasticity (in absolute value), the higher the AVE. The other variables are not directly introduced to the calculation of the AVE but they are necessary in the

Table 2.2 Parameter estimates used to calculate AVE. Dependent variable: imports net of tariffs (Eq. 1.2) (From the TSHP, own calculations; import demand elasticities from Kee et al. 2008)

Variable	Algeria	Egypt	Jordan	Lebanon	Morocco	Tunisia
<i>Independent:</i>						
NTM	-0.836***	-0.501***	-0.489***	-0.431***	-0.387***	-0.335***
Gdpcap GDP per capita	0.129**	0.145*	0.795***	-0070	1.191***	0.118
Distance	-0.0004***	-0.0001**	-0.0001**	-0.0004***	-0.0008***	-0.0010***
Sum gdp	0.939***	1.28***	1.060***	1.16***	1.59***	1.48***
Constant	6.249***	4.878***	4.725***	6.583***	6.911***	8.165***
<i>Selection:</i>						
Partner type	-0.334**	-0.511**	-0.489**	-0.476**	-0.541**	-0.414**
Number of obs.	1,727	2,039	1,618	2,002	1,821	1,985
Censored observations	341	815	286	396	428	455
Import demand elasticities	-1.59	-1.78	-1.16	-1.26	-1.45	-1.24

Note: ***significant at 1 %-level; **significant at 5 %-level; *significant at 10 %-level

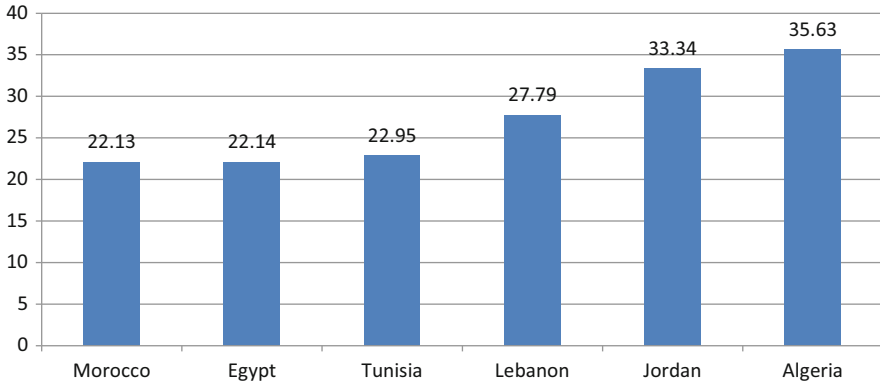


Fig. 2.2 NTM AVE in the SEMC, % (From authors' estimation)

model to make sure that the NTM parameter estimate is not biased by omitted variables.

The calculation of the corresponding AVE is reported in Fig. 2.2. It provides a first picture of the magnitude of NTM: They are high in Algeria and in Jordan (due to low import demand elasticity in absolute value).⁷ In these two countries, NTM amount to more than 33 % in terms of AVE. They show the highest number of NTM in the database, up to 309,800 in Jordan). Morocco, Tunisia, and Egypt (due to high import demand elasticity in absolute value) exhibit the lowest AVE (less than 25 %). These countries show the lowest number of NTM in the database (about 20,000 each).

By adding tariffs and NTM, the protection level is presented in Fig. 2.3. All SEMC exhibit NTM that are greater than tariffs. For Algeria, Jordan, and Tunisia (due to high tariffs) the protection level ranges from 43 % (Jordan) to 50 % (Algeria). In Morocco, Egypt, and Lebanon it amounts to about 30 %. Adding tariffs and NTM together provides levels of protection that are not reliable, as a quota might be binding and hence no tariff-equivalent effect will be shown. The impact is not necessarily cumulative. Figure 2.3 provides a picture of protection in the SEMC.

Whatever the method implemented and the quality of the data used for the calculation, the rate of protection remains high in the SEMC, especially due to great NTM.

Given these high protection levels, one can expect their impact on SEMC imports to be significant. The story is different when one looks at SEMC exports to their partners. Since the early 1990s, the EU has removed its tariff protection applied to the SEMC. The NTM applied by the EU seem to be of lower importance.

⁷ 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.

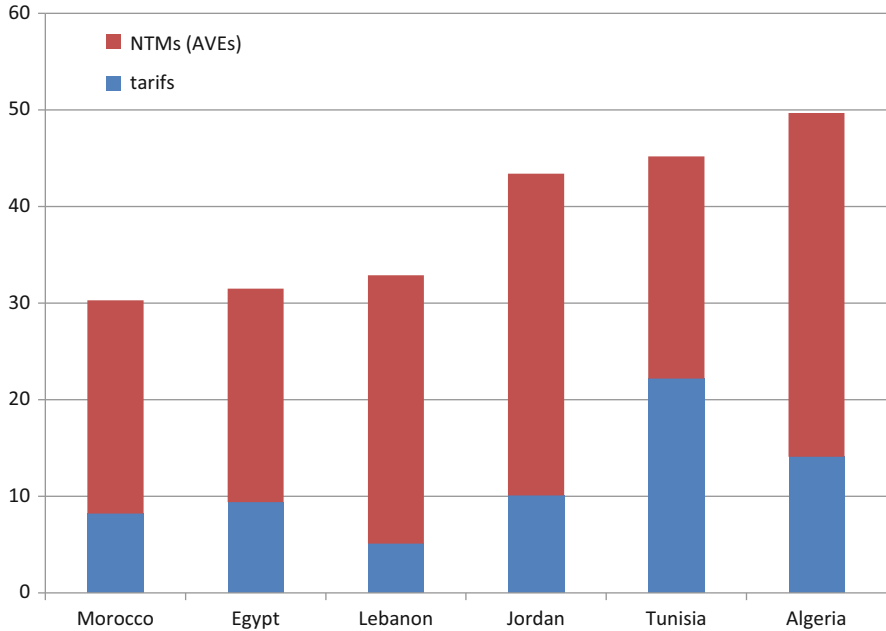


Fig. 2.3 Overall protection in the SEMC: tariffs and NTM (From authors' estimation)

For example, Kee et al. (2009) show that the AVE applied by the EU to its imports is equal to 13.4 %. This is lower than AVE applied by the SEMC to their own imports. The NTM removal between the EU and SEMC is expected to produce smaller effects with regard to SEMC exports than SEMC imports from the EU.

2.3 The Application of a Specific Gravity Model with Trade Costs

This section aims to estimate the impact of the trade costs related to the lack of shallow integration (tariffs) or deep integration (NTM and transport costs) through the use of new gravity models.

2.3.1 Model Specification, Data and Sources

Based on the theoretical equation developed by Anderson and van Wincoop (2003, 2004), we derive our empirical equations which will be tested for the SEMC's trade relationships:

$$\ln X_{jk} = \alpha_0 + \alpha_1 \ln SUMGDP_j + \alpha_2 \ln TAR_{jk} + \alpha_3 NTMs_{ijk} + \alpha_4 \ln TRANSCOST_j + \alpha_5 \ln LANG_j + \alpha_6 \ln COL_j + \phi_j + \varphi_k + \varepsilon_{ijt} \quad (2.1)$$

Given that data for NTM are only available for 1 year (2001), the gravity equation will be estimated for this year. The temporal pattern of the equation is disregarded. The equation is estimated for each country i . The equation does not include GDP of the origin and destination country separately, but the sum of the GDP (SUMGDP) of each SEMC with its partner j .⁸ This specification is used both in the theoretical and the empirical literature based on the new trade theory (Helpman and Krugman 1985). Subscript k denotes the product decomposition level (digit 2).

Bilateral trade costs are considered using three variables. The first corresponds to bilateral tariffs (TAR_j). This variable will be used as a proxy for the shallow integration which has been initiated in the Barcelona Process and its related AA. As in Sect. 2.2, the MFN tariffs have been used for the estimation of the model. Data are derived from the UNCTAD TRAINS database.

NTM will be considered as a proxy for deep integration. We will use the same proxy as in Sect. 2.2, i.e. a binary variable which takes the value of one in case of NTM and 0 otherwise.

TRANSCOST is an original measure of transportation costs. It is based on statistics developed by Maersk, a shipping liner company. Maritime transport accounts for 80 % of world trade. The variable used in the model corresponds to the freight costs in USD for a standard container (20 ft long) from a port of origin to a port of destination (year 2007). Table 2.3 shows some freight costs for a selection of importing (mport) and exporting (xport) ports.

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

$$\ln TRANSCOST_{ij} = \alpha_0 + \gamma_i + \gamma_j + \lambda \ln DIST_{ij} + \varepsilon_{ijt} \quad (2.2)$$

In Eq. 2.2, 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 $\alpha_0 = 1292.8$ and $\gamma = 0.071$ which is significant at 5 % level.

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 used for transport costs, including the LPI (World Bank 2011). It ranges from 1 (worst) to 5 (best). The LPI is relevant for our analysis since it measures both transport costs and the efficiency of logistics in a given country. Countries with the best LPI score trade more than other countries (other things being equal).

⁸ As in Anderson and van Wincoop (2003), world GDP is passed on to the intercept α_0 .

Table 2.3 Freight costs for a selection of countries in the Euro-Mediterranean area, USD for a standard container in 2007 (From Maersk Line 2007)

Mport	Xport	Freight	Mport	Xport	Freight
Algeria	France	1,872.62	Morocco	France	1,431.07
Algeria	Germany	1,914.56	Morocco	Germany	1,439.73
Algeria	Italy	1,709.09	Morocco	Italy	1,515.2
Algeria	Netherlands	1,858.3	Morocco	Netherlands	1,350.19
Algeria	Spain	1,940.52	Morocco	Spain	1,265.98
Algeria	UK	1,906.98	Morocco	UK	1,552.95
Egypt	France	1,574.17	Tunisia	France	1,394.65
Egypt	Germany	1,216.68	Tunisia	Germany	1,436.59
Egypt	Italy	859.46	Tunisia	Italy	879.65
Egypt	Netherlands	1,160.43	Tunisia	Netherlands	1,252.19
Egypt	Spain	1,409.07	Tunisia	Spain	1,296.13
Egypt	UK	1,348.61	Tunisia	UK	1,464.54
Israel	France	1,639.68	Turkey	France	1,521.23
Israel	Germany	1,281.62	Turkey	Germany	1,363.46
Israel	Italy	1,277.46	Turkey	Italy	1,473.55
Israel	Netherlands	1,225.37	Turkey	Netherlands	1,307.2
Israel	Spain	1,430.59	Turkey	Spain	1,422.7
Israel	UK	1,273	Turkey	UK	1,442.4

Figure 2.4 shows the gap between the EU and the SEMC: 11 EU countries are ranked in the world top-20 group while the SEMC fall well behind, except Israel, Lebanon, and Turkey which are ranked 31, 33, and 39, respectively, close to the Southern and Eastern part of the EU.

Algeria and Libya are at the bottom of the ranking (respectively 130 and 132). This reveals major transport and logistics inefficiency in these two countries. Syria, Egypt, Jordan, and Morocco show poor results. Tunisia, ranked at 61, shows significant progress.

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

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

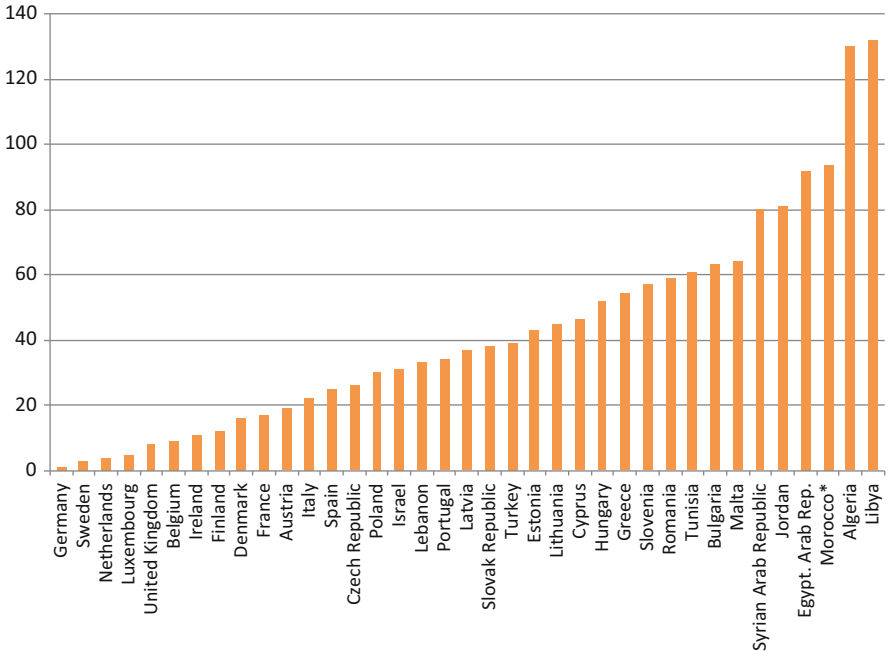


Fig. 2.4 Country ranking for LPI, rank 2010 over 155 countries (From World Bank 2011) (Note: *year 2007 concerning Morocco)

$LANG_{ij}$ 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 (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 that are expected to increase trade flows between some EU countries and the SEMC.

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 capture the effects of potential omitted variables (Egger 2004). The price effects included in Eq. 1.5 are captured by the country-specific effect (ϕ_j).⁹ 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.

⁹ As there are no reliable cross-country price indicators, the country-specific effects are the most commonly used in the empirical literature since Anderson and van Wincoop (2003).

2.3.2 *Choice of the Estimators and Sensitivity Analysis*

The estimation of the equation requires econometric analysis in order to address potential biases. The first bias to be considered is heterogeneity across countries and products. It requires the use of FE or RE estimators.

The problem with standard FE models is that they cannot estimate parameters that are product invariant, such as freight costs, language, and colonization. The standard RE model may be biased because of endogeneity problems due to the potential correlation between one or several independent variables and the residuals.

The FEVD estimator developed by Plumper and Troeger (2007) can be used to address these problems. This three stage FE model can estimate the parameters of the product invariant variables while addressing the endogeneity problem.

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

A potential bias is caused by zero observations. As in the previous section, the TSHP has been selected. Zero trade flows in the dataset do not occur randomly but are the outcome of a selection procedure. The TSHP estimator provides a correction for this selection bias. Political problems between countries influence the decision of firms to export. The SEMC are more likely to trade with traditional partners (EU15) whereas the probability to export will be low with Israel, for political reasons. As a sensitivity analysis, the lagged export variable will be used as the selection variable. This can be justified by considering hysteresis in international trade (Baldwin and Krugman 1989).

As a sensitivity analysis, the estimators are controlled for cross-sectional heteroskedasticity as well as serial correlation of the error term by using Feasible GLS.

2.3.3 *Estimation and Results*

The model is estimated for the imports of the nine SEMC described above. Data for Syria proved to be of poor quality so this country was removed. The estimation is implemented at the year for which NTM are available (1999 or 2001). The 33 partner countries cover the whole Euro-Med area, i.e., the EU15, CEE, and eight SEMC described above. The dataset includes a product decomposition level at digit-2.

Estimations are presented in Table 2.4 for the TSHP. Table 2.5 provides a sensitivity analysis by showing alternative estimators (FEVD, Hausman and Taylor, Feasible GLS) as well an alternative proxy for transport costs, i.e. distance.

Table 2.4 shows that NTM have a detrimental effect on trade in all SEMC. All parameter estimates are negative and significant at the 1 % level. Algeria exhibits

Table 2.4 Estimation results: the impact of tariffs, NTM, transports, and other variables on SEMC imports (From own estimation)

TSHP	Algeria	Egypt	Jordan	Lebanon	Morocco	Tunisia	Israel	Turkey
<i>Independent:</i>								
NTM	-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**
<i>Selection:</i>								
Partner type	-0.264**	-0.414**	-0.361***	-0.398***	-0.372**	-0.295**	-0.455***	-0.366***
Nb obs.	1,544	1,655	1,533	1,984	1,820	1,944	1,937	2,740
Censored obs	68	451	172	203	328	275	395	722

Note: ***significant at 1 %-level; **significant at 5 %-level; *significant at 10 %-level

Table 2.5 Sensitivity analysis (imports' determinants using alternative variables and estimators)

	Algeria	Egypt	Jordan	Lebanon	Morocco	Tunisia	Israel	Turkey
<i>TSHP</i>								
<i>Distance</i>	-0.606***	-0.127	-0.238***	-0.278***	-1.168***	-0.899***	-0.074	-0.741***
<i>Partner's LPI</i>	-1.566	-1.871	-1.422	-1.631	-1.327	-1.666	2.819***	3.932***
<i>MENA countries' LPI</i>	1.95**	1.95**	1.95**	1.95**	1.95**	1.95**	1.95**	1.95**
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)								
NTM	-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***
Feasible GLS (panel heteroskedasticity and autocorrelation)								
NTM	-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***

Note: ***significant at 1 %-level; **significant at 5 %-level; *significant at 10 %-level

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 AVE (Fig. 2.2). There is a correlation between the magnitude of the AVE and the trade effects of NTM. Algeria shows the highest AVE and the greatest trade impact of NTM. Morocco and Tunisia exhibit the lowest AVE and the smaller trade impact of NTM.

NTM reduce bilateral trade in all the SEMC. This impact differs depending on the country, i.e. with a more detrimental impact in the case of Algeria and a less detrimental impact for Morocco and Tunisia. This reflects the difference in the openness of these countries.

It is the existence of NTM that is trade-reducing, given that NTM are measured as a dummy variable. As a sensitivity analysis, the model has been estimated by using another proxy which includes the number of NTM for each product. Results, although significant, are less relevant. A marginal increase in the number of NTM (let us say from 19 to 20 NTM in a given product) has far fewer trade-reducing effects than when we move from no NTM to the existence of NTM (which is captured by the dummy variable).

The transport coefficient was found to be positive for all countries, with the exception of Egypt, and to a lesser extent Israel and Turkey.

Estimation parameters for partners' LPI are always positive but significant only for Turkey and Israel. The relevance of this variable is limited by the fact that it does not test the impact of logistics efficiency in each SEMC considered, but rather the impact of partners' LPI.

The estimation of LPI in the SEMC is positive and significant.¹⁰ Any improvement of logistics in the SEMC is expected to increase trade with their partners, because this improvement will contribute to reducing transport cost, inefficiency, and time. A 1 % decrease in LPI makes it possible to increase SEMC imports by 1.95 % and SEMC exports by 2.96 %.

The other variables are significant while showing the expected sign of the corresponding parameter estimate. For example, the size of the market (measured by the sum of GDP) is always positive and significant. Trade always increases with the market size of the origin and destination countries. The existence of past colonial links is trade-creating, especially for Algeria, Morocco, and Tunisia. The variable corresponding to a common language is significant in Morocco, Tunisia, Jordan, and Lebanon.¹¹

The robustness of these results has been checked by sensitivity analysis. The parameter estimates related to NTM and tariffs are stable whatever the estimator applied. The transport coefficient is stable, except for some countries for which

¹⁰ The corresponding parameter estimate has been calculated for all SEMC taken together as a means of increasing the number of observations.

¹¹ There is no colonial link and no common language between Turkey and other countries in the EU. This explains the lack of parameter estimates corresponding to these variables.

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.

2.4 Conclusions and Policy Implications

These results must still be interpreted cautiously since they sometimes rely on old data, especially NTM:

1. Trade costs reduce imports to the SEMC from the EU.
2. Tariffs are import-reducing, but mainly in the countries which showed the highest tariff levels (Algeria and Tunisia). Shallow integration was not complete in these countries. Despite tariff cuts since 2001, tariffs remain significant. Gains can still be expected from shallow integration in these countries.
3. NTM are trade-reducing in all countries, especially Algeria. They are less trade-reducing in Morocco and Tunisia, though still significant. Eliminating NTM in the SEMC as a move towards deeper integration with the EU is expected to provide significant gains.
4. Transport costs reduce trade, especially in Maghreb countries, since they record the highest freight costs. Any improvement of logistics performance in the SEMC is expected to increase imports from their partners, since this cuts down transport costs, inefficiency, and time. Improvement of LPI in the SEMC and the EU is expected to provide gains.
5. Tariffs have no impact on SEMC exports, since the EU has removed its tariffs. NTM applied by the EU have an impact on SEMC exports, although it is limited. The AVE applied by the EU is lower than that applied by the SEMC. The biggest impact may be found in logistics because SEMC exports are reduced by their low LPI. Any improvement of logistics in the SEMC should increase their exports towards the EU.

These results lead to the following policy implications:

1. The SEMC should complete their shallow integration with their EU partners and across themselves to capture trade gains. Algeria should make efforts to reduce its tariffs, which currently remain at high levels.
2. Dealing with deep integration is a more difficult task. First, NTM must be addressed altogether, since the removal of one NTM while keeping others provides limited benefits. Each SEMC should identify all NTM for each product and decide whether to remove them or not. The removal of all NTM for all products is not necessarily the right solution, since some NTM may be useful for specific reasons (sanitary, etc.).
3. There are numerous NTM in the SEMC that reduce trade. Their removal for specific products can be done by eliminating para-tariff measures or moving towards mutual technical standard recognition. A cost-benefit analysis should be

undertaken at product-level before embarking on NTM elimination (especially in terms of short-term costs due to increased competition from EU products).

4. Gains can be achieved through improving LPI (port infrastructures, logistics services, etc.). Increased Euro-Mediterranean cooperation in infrastructure-related projects is required. Extending financial cooperation between the EU and the SEMC (through specific EIB loans) can improve the performance of logistics.

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Economic and Social Development of the Southern and
Eastern Mediterranean Countries

Ayadi, R.; Dabrowski, M.; De Wulf, L. (Eds.)

2015, XXVII, 339 p. 30 illus., 28 illus. in color., Hardcover

ISBN: 978-3-319-11121-6