# PREFERENCE EROSION EFFECTS OF MULTILATERAL AND REGIONAL TRADE LIBERALISATION: SIMULATING EU'S TRADE AGREEMENTS WITH MEDITERRANEAN COUNTRIES

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***Abstract:*** Regional Trade Agreements (RTAs) have widely spread in recent years. The World Trade Organisation (WTO) notes that 546 RTAs were notified by January 2013, whereas only 380 were notified by 2007. RTAs have been considered as a stumbling block for the slow progress of the WTO Doha Round, and multilateral liberalisation is said to cause erosion of preferences enjoyed under bilateralism. That is, third country exporters that benefit from multilateral trade liberalization increase their exports, whereas the preferential suppliers in bilateral trade agreements face a decrease of their exports, given the substitutability between export products from different countries. Preference erosion also occurs when countries take up new bilateral trade agreements that can result in "old" trade partner countries losing their preferential treatment. The European Union (EU) has granted preferential market access to a large number of countries and is by far the main trading partner of its neighbouring countries, including Mediterranean partner countries (MED countries). Following the Association Agreements with the EU, there have been efforts of enhanced engagement and co-operation, especially after the Arab spring developments, but negotiations for so called free and comprehensive trade agreements (DCFTAs) are also under way with other partner countries. The objective of this paper is to look into possible preference erosion effects from the perspective of MED countries by depicting recent EU trade agreements as well as multilateral trade liberalisation in a simulation analysis. We apply the MAGNET (Modular Applied General Equilibrium Tool) model that builds upon the GTAP (Global Trade Analysis Project) model in a recursive dynamic general equilibrium framework, with a reference scenario that reflects the economic and population growth paths via most recent projections taken from the literature.

***Keywords:*** preference erosion, Mediterranean partner countries, trade liberalisation, DCFTAs, CGE modelling

# INTRODUCTION

This paper looks at preference erosion of multilateral and regional trade liberalisation for Mediterranean partner (MED) countries, more specifically Egypt, Morocco and Tunisia since these countries have seen special efforts by the European Union (EU) to establish trade relations with preferential market access. Following Association Agreements with the EU, the EU has emphasized its enhanced engagement and co-operation, especially after the Arab spring developments. In 2011, negotiations on deep and comprehensive free trade agreements (DCFTAs) were launched between the EU and Egypt, Morocco and Tunisia, respectively. The EU grants preferential market access to a large number of other EU neighbour countries. Negotiations on DCFTAs have started with some of them under the strategy of the EU neighbour policy. European Commission (2013) provides a comprehensive overview of the EU neighbour policy, including strategy and implementation. In addition to regional liberalisation efforts, the multilateral negotiations of the member of the World Trade Organisations (WTO) are still under way. Even though stagnating throughout the years, the multilateral trade liberalisation efforts will resume with the ministerial conference in Bali in December 2013.

Against this background, we analyse preference erosion effects by simulating multilateral and regional trade liberalisation from the perspective of the aforementioned MED countries. In general, preference erosion involves the reduction or elimination of tariffs for third countries that are initially not granted market access under better and preferred conditions. This means that third countries are given duty free access that was initially granted to the preferential suppliers only. Hence, the third country exporters would increase their exports, whereas the preferred suppliers would face a drop in their exports as high as the increase of the third country exports, given the substitution between export products from different countries. This in turn would result in a loss of the benefits the preferential supplier enjoys under the preferential treatment. Because high-income countries have granted preferential access to middle- and low-income countries, preference erosion effects are of concern the latter and are of the highest concern for those preferred suppliers which do not have a diversified trade portfolio but trade the most with their preferential partner.

The paper is structured as follows: First, we give a brief introduction on the situation of trade between the EU and the MED countries, specifically trade agreements including DCFTAs and trade measures (tariffs and non-tariff measures). This is followed by a chapter on the simulation analysis. In particular, we explain the modelling approach, data aggregation as well as the baseline and scenarios. Next, the results of the simulation analysis are presented whereby the focus is on trade in order to demonstrate the preference erosion effect. We end the paper with concluding remarks.

# 1. TRADE BETWEEN THE EU AND MEDITERRANEAN PARTNER COUNTRIES

## 1.1. Trade agreements

This section outlines the most relevant trade and partnership agreements between the EU and neighbour countries, in particular the MED countries: Egypt, Morocco and Tunisia. The emphasis is on DCFTAs for which negotiations have started in recent years. The trade liberalization foreseen within the DCFTAs will be depicted in simulation analysis of this paper, whereby the agreements between the EU and respective MED countries are analysed vis-à-vis those between the EU and other neighbour countries.

In 2011, the EU Foreign Affairs Council authorized the opening of new trade negotiations with Egypt, Morocco and Tunisia (as well as Jordan). This gave the European Commission the mandate to negotiate DCFTAs under the EU neighbour policy, which can be considered as being parallel to the partnership with MED countries. The relation between the EU and MED countries has been influenced by the Barcelona process, following EU Association Agreements that were respectively concluded with Tunisia in 1998, with Morocco in 2000 and with Egypt in 2004. Compared to the Association Agreements between the EU and the MED countries, the foreseen DCFTAs can be expected to go beyond removing tariffs, covering a range of regulatory "behind the border" issues. In general, DCFTAs contain provisions on the following three broad topics that are usually defined for both products and services:

- Tariff liberalization and tackling other traditional trade policy measures (at the boarder) to reciprocally improve market access for the EU and trade partner countries, whereby the aim is free trade (duty and quota free trade)
- Elimination of non-tariff measures (NTMs) that potentially hamper trade between partner countries, through "behind the border" protection. Aligning regulatory difference by either harmonization or mutual recognition of standards.
- Cooperation to deal with issues due to regulatory differences: Dispute settlement mechanisms, agreement on geographical indications, intellectual property rights as well as technical support for the adoption of standards, for example.

DCFTAs in general aim to deepen market access by reducing tariff but most importantly by tackling NTM issues. Standards and other requirements that exporters have to comply with in order to supply foreign markets (including import bans due to disease outbreaks for example) are important categories of NTMs. It is usually distinguished between sanitary and phytosanitary (SPS) measures, which are implemented for human, animal and plant health reasons, and technical barriers to trade (TBT), which specify technical and information requirements. In order to reduce or entirely overcome trade barriers due to NTMs, the EU DCFTAs either follow the principle of mutually recognition or

attempt to align requirements by developing common requirements in a harmonisation process, as mentioned above. Furthermore, EU DCFTAs foresee co-operation and partnership. With regard to NTMs, cooperation is necessary to support compliance, especially if requirements cause compliance costs and a burden on trade partner countries, but co-operation in the EU DCFTAS may also be more general in terms of supporting economic development in general.

This paper considers the EU DCFTAs with MED countries as well as with other neighbour countries that have already obtained or will obtain preferential trade conditions with the EU. Table 1 provides an overview of the EU DCFTAs. It is interesting to note that the regional focus of the EU DCFTAs covers the MED countries and neighbour countries in the Southern Caucasus region as well as the Ukraine. The EU DCFTAs with these partner countries seem to involve that the respective partner countries approximate the EU standards and norm into their legislation. Thus the EU DCFTAs mean an orientation of these partner countries towards the EU but not lead to EU membership with complete market integration. DCFTA negotiations have been concluded with Ukraine (July 2012) and Georgia (July 2013).

*Table 1: Overview of DCFTAs between the EU, MED countries and other neighbour countries*

|  | *Country* | *Agreements* | *DCFTAs* |
|---|---|---|---|
| South Caucasus | Armenia | PCA (1999), negotiation on update towards AA started in July 2010 | Negotiations started in May 2012 |
| MED country | Egypt | Euro-Med AA (2004): Free trade for industrial products, concession for agri-food products (since June 2010), dispute settlement (November 2010) | EC authorized opening of negotiations in December 2011 |
| South Caucasus | Georgia | PCA (1999), negotiation on update towards AA started in November 2006 | Negotiations started in March 2012, concluded in July 2013 |
| South Caucasus | Moldova | PCA (1994), negotiation on update towards AA started in January 2010, unlimited and duty free access to the EU, except for certain agri-food products with tariff rate quotas (TRQs) | Negotiations started in Feb. 2012 |
| MED country | Morocco | Euro-Med AA (2000), free market access for agri-food products (October 2012), dispute settlement | Negotiations started in March 2013 |
| MED country | Tunisia | Euro-Med AA (1998), free trade with the EU | EC authorized opening of negotiations in December 2011 |
| CIS country | Ukraine | PCA (1998), AA agreed upon in December 2011 | Negotiations started in 2008, agreement in July 2012, signature possibly in November 2013 |

*Note: Year ofwhenthe agreements enteredintoforce is providedin brackets.AA:AssociationAgreement,PCA: PartnershipandCooperationAgreement,DCFTA:DeepandComprehensive TradeAgreement,Euro-Med:Euro-MediterraneanAssociationAgreement.*
*Source: own compilation based on the latest information provided by EC DG Trade*

## 1.2. Tariffs

This section describes the schedule of tariffs between the EU and the MED countries under review. The tariff data looked at is taken from the version 8 of the GTAP database (GTAPv8) and refers to the year 2007. More recent tariff data is not readily available for being used in the simulation analysis. Table 2 shows the 2007 tariff schedule for the EU and MED countries for agri-food products, as aggregated for the simulation analysis (see chapter 3). The tariffs are expressed in terms of ad valorem (adv) rates in percentages.

*Table 2: Ad valorem import tariffs by source and destination country [%]*

|  | EU tariffs on imports from | | | Egyptian tariffs on imports from | | | Moroccan tariffs on imports from | | | Tunisian tariffs on imports from | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | Egypt | Morocco | Tunisia | EU27 | Morocco | Tunisia | EU27 | Egypt | Tunisia | EU27 | Egypt | Morocco |
| pdr | 9.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 93.5 | 0.0 | 0.0 | 31.8 | 0.0 | 0.0 |
| wht | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 37.0 | 0.0 | 0.0 | 67.7 | 0.0 | 0.0 |
| gro | 3.6 | 0.0 | 0.2 | 2.1 | 0.0 | 0.0 | 9.0 | 0.0 | 0.0 | 71.2 | 0.0 | 0.0 |
| c_b | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| osd | 0.0 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 48.1 | 0.0 | 0.0 | 27.6 | 0.0 | 0.0 |
| v_f | 6.3 | 9.5 | 4.6 | 0.8 | 0.0 | 0.0 | 27.1 | 5.1 | 0.0 | 73.1 | 0.0 | 0.0 |
| ocr | 0.4 | 0.4 | 0.7 | 13.3 | 0.0 | 0.0 | 5.6 | 0.8 | 0.9 | 28.5 | 0.0 | 0.0 |
| rmk | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| oap | 0.1 | 0.5 | 0.0 | 2.9 | 0.0 | 0.0 | 2.4 | 0.0 | 0.0 | 53.3 | 0.0 | 0.0 |
| ctl | 2.3 | 1.5 | 1.6 | 3.3 | 0.0 | 0.0 | 4.1 | 0.0 | 0.0 | 78.5 | 0.0 | 0.0 |
| frs | 0.0 | 0.5 | 0.4 | 1.2 | 0.0 | 0.0 | 3.6 | 0.0 | 0.0 | 5.1 | 0.0 | 0.0 |
| vof | 22.0 | 14.9 | 42.6 | 10.6 | 0.0 | 0.0 | 18.2 | 0.1 | 0.3 | 24.8 | 0.0 | 0.0 |
| FBT | 6.6 | 2.0 | 2.1 | 254.2 | 0.0 | 0.0 | 23.0 | 0.6 | 10.5 | 34.7 | 0.0 | 0.0 |
| sgr | 17.6 | 42.8 | 0.6 | 7.5 | 0.0 | 0.0 | 44.9 | 0.0 | 0.0 | 17.8 | 0.0 | 0.0 |
| mil | 2.3 | 4.5 | 4.6 | 7.5 | 0.0 | 0.0 | 37.8 | 0.2 | 0.0 | 61.8 | 0.0 | 0.0 |
| pfb | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| wol | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| CMT | 3.6 | 1.4 | 0.0 | 10.2 | 0.0 | 0.0 | 94.2 | 0.0 | 0.0 | 64.6 | 0.0 | 0.0 |
| fsh | 5.6 | 0.0 | 0.0 | 2.9 | 0.0 | 0.0 | 48.6 | 0.0 | 0.0 | 42.7 | 0.0 | 0.0 |
| pcr | 27.1 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 31.2 | 0.0 | 0.0 |
| TCL | 0.0 | 0.0 | 0.0 | 21.0 | 0.0 | 0.0 | 8.4 | 1.3 | 0.0 | 7.1 | 0.0 | 0.0 |
| p_c | 0.0 | 0.0 | 0.0 | 5.1 | 0.0 | 0.0 | 10.1 | 11.9 | 0.0 | 1.0 | 0.0 | 0.0 |
| MNF | 0.0 | 0.0 | 0.0 | 7.9 | 0.0 | 0.0 | 6.8 | 0.3 | 0.2 | 3.9 | 0.0 | 0.0 |
| SVC | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TRA | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

*Note: Pdr = Paddy rice, wht = Wheat, gro = cereal grains nec, v_f = Fruit and vegetables, osd = Oil seeds, c_b = Sugar cane, sugar beet, Pfb= Plant-based fibres, ocr= Crops nec, ctl= Cattle, sheep, goats, horses, oap = Animal products nec, rmk= raw milk, wol = Wool, silk-worm cocoons, frs = Forestry, fsh = Fishing, coa = Coal, oil = Crude oil, gas = Gas, cmt = Meat: cattle, sheep, goats, horse, omt = Meat products nec, vof = Vegetable oils and fats, mil = Dairy products, pcr = Processed rice, sgr = Sugar, FBT = Food, bev & tobacco prod nec. TCL = Textiles & clothing, p_c = Petroleum, coal products, MNF = other manufacturing, TRA = Trade & transport (services), SVC = other services*

*Source: GTAPv8 database.*

The EU imposes the highest ad valorem (adv) tariff rates on imports of vegetable oil and fats (abbreviated by vof) as well as and on imports of sugar (abbreviated by sgr) (see Table 1, second column). Sugar imports from Morocco face the highest EU tariff protection (adv tariff: 42.8%). EU tariffs for are also very high for vegetable oil and fats, specifically imports of vegetable oil from Tunisia (adv tariff: 42.6%). It should be noted that olive oil is part of the product category "vegetable oils and fat", and the high level of EU protection of olive oil (including tariff rate quotas) is reflected in the high tariff rate (Commission Regulation 1918/2006).

The MED countries impose tariffs on imports of meat products, fish and processed food and beverages from the EU. By far, Egypt imposes the most restrictive tariffs on EU products of food and beverages (adv tariff: 254.2%). Morocco mainly protects paddy rice (adv tariff: 93.5%) and beef meat (adv tariff: 94.2%), while Tunisia imposes high tariffs on wheat (adv tariff: 67.7%) and coarse grains (adv tariff: 71.2%), fruit and vegetables (adv tariff: 73.1%), live cattle animals (78.5%) as well as dairy (adv tariff: 61.8%) and beef (adv tariff: 64.6%). Overall, tariffs for trade across the MED countries (intra-MED trade) are very low, often zero which implies free trade. This could be because these countries may not have an interest for tariff protection of trade amongst each other. Overall, trade flows amongst these countries are limited (Eurostat, 2009). Note that Egypt, Morocco and Tunisia are part of further preferential agreements, in particular the Agadir Agreement of 2004 that foresees tariff liberalisation amongst other provision.

Looking at manufactures (abbreviated by MNF), the EU does not impose tariffs on manufacturing products from MED countries. On the other hand, MED countries however have tariffs on manufacturing products from the EU27. All three MED countries under review impose tariffs on EU textiles and clothes, petroleum and coal products and other manufactured products. With regard to intra-MED trade, only Morocco and Tunisia respectively impose tariffs but the tariff rates are comparably small (see Table 2, fourth and fifth column). In conclusion, tariff barriers amongst the MED countries can be considered as being rather minor.

### 1.3. Non-tariff measures (NTMs)

Non-tariff measures (NTMs) can cause barriers to trade, and we therefore simulate the abolishment of such measures in the simulation. There are many different types of NTMs; for a classification of NMTs commonly used see UNCTAD (2007). Tariff rate quotas (TRQs) are a relevant category of NTMs related to traditional trade policy measures. For the MED countries, TRQs are particularly relevant for access of fruit and vegetables but also processed products thereof, such as olive oil for example, to the EU market. Another

important category of NTMs are standards and other requirements that exporters have to comply with to supply foreign markets. It is usually distinguished between sanitary and phytosanitary (SPS) measures, which are implemented for human, animal and plant health reasons, and measures of technical barriers to trade (TBT), which specify technical and information requirements. In general, such requirements are behind the border measures and cause trade costs in terms of compliance costs. SPS and TBT issues between MED countries and the EU have been analysed in many case studies. For MED countries, issues of complying with SPS and technical requirement have been identified by ITC surveys in the respective countries (ITC, 2012a and 2012b). Exports of agri-food products seem to be particularly affected, with more than half of the NTM issues reported being linked to compliance with SPS and technical requirements. In summary, product-specific tolerance limits for residues (maximum residue levels, MRLs), hygiene measures, labelling and packaging have caused problems for exporting to the EU market. Exporters in MED countries consider the EU conformity assessment, involving testing and certification that products meet the requirements as demanded, as being particularly burdensome.

For the simulation, we use the estimates of value equivalents estimated by Kee et al (2009). In a gravity estimation, they determine the quantity effects of NTMs and subsequently transfer them into price effects that are essentially expressed in terms of average value equivalents. Table 3 presents the equivalent estimates of NTMs that the countries under review face when exporting to the respective trade partner country. With these estimates, we take the perspective of the exporting country. On the one hand, the barriers caused by the measures imposed by the trade partner countries are reflected, but on the other hand the specific situation prevailing in the exporting country, that results in difficulties for meeting the requirements demanded for example, is also considered. It should be noted that the estimates by Kees et al. (2009) are not specific to country pairs, and thus focusing on specific countries may overestimate or underestimate the NTM barrier. Further, the estimates for the EU27 only capture barriers between the EU Member States and third countries outside the EU (extra-EU trade). Another limitation of the estimates is the lack of detailed information about the specific barriers as well as about barriers for specific disaggregates products.

As shown, it can be differentiated between agri-food products and manufacturing products. The estimates for agri-food products are always larger than those for manufacturing, implying that trade with agri-food products is particularly hampered by NTMs. Furthermore, it is interesting to note that EU exporters seem to have relatively little problems of market access when considering trade of manufacturing. EU agri-food exports, however, do face market access barriers. The estimates for manufacturing products from Ukraine, Armenia and Georgia also show low values. While these countries may not face

problems on market access, the estimates may also reflect the issue of endogeneity, commonly known in trade analysis.

*Table 3: Ad valorem tariff equivalents of NTMs by country [%], 2009.*

| Country *(exporter)* | All products *(average)* | Agri-food products | Manufacturing |
|---|---|---|---|
| Albania | 13,0% | 25,5% | 12,5% |
| Armenia | 5,1% | 9,6% | 2,8% |
| Egypt | 10,0% | 19,7% | 8,7% |
| Georgia | 3,2% | 15,3% | 0,9% |
| Morocco | 15,9% | 32,5% | 10,1% |
| Tunisia | 10,4% | 25,1% | 9,1% |
| Ukraine | 5,1% | 11,8% | 3,2% |
| EU 27 (extra-EU trade) | 4,6% | 13,6% | 4,0% |

*Note: The estimates refer to the exporter perspective, thereby reflecting market access barrier. Estimates are not specific forcountry pairs such that focusing on exporting on certain importing countries potentially over/underestimates the NTM barrier.*

*Source: Kee et al (2009).*

## 2. MODELLING APPROACH

### 2.1. Magnet model

The MAGNET (Modular Applied General Equilibrium Tool) model is a general equilibrium model that builds upon the core of the GTAP (Global Trade Analysis Project) model. The main extension of the MAGNET model are a more sophisticated production and consumption structure, segmented factor markets as well as endogenous land supply. Like in other general equilibrium modelling frameworks, in the MAGNET model demand and supply are depicted in perfectly competitive markets that clear via price adjustments. Natural resources and land are assumed to adjust sluggishly between sectors.

Based on assumptions regarding labour, land and capital markets, the MAGNET modelling features extend the standard GTAP model as follows: more sophisticated production structure (to account for inherent differences in the degree of substitutability between land and non-land factors), a consumption structure that reflects changes in taste over time (preferences towards meats, dairy, fish, fruit and vegetables, and away from staple foods), segmented factor markets (agri-non, agri factors) and endogenous land supply (whereby land supplied to agriculture may respond to changes in the land rental rate). This extension makes the MAGNET model suitable for carrying out simulation analysis with a specific focus on agriculture and food-related topics.

## 2.2. Data and aggregation

The MAGNET model is calibrated using the GTAP v8 with base year 2007. For our modelling, the 129 countries and/or regions and 57 sectors available in the GTAP database are aggregated to regions, sectors and factors of production as shown in the appendix Table A1. Given the focus on MED countries, namely Egypt (egy), Morocco (mor) and Tunisia (tun), we separate them from other countries of the Middle East and North Africa (MENA) region (see Table A1, first column). The other neighbour countries relevant for the analysis are individually considered in the simulations, namely Albania (alb), Armenia (arm) and Georgia (geo), but grouped together as the South Caucasus region and Ukraine (ukr) for the reporting. The 27 EU member states are aggregated in one entity, namely EU27. The remaining countries or regions are summarized as geographical regional categories.

The broad product categories are agri-food products, manufacturing (MFN) and services (Services) (see Table A1, second column). Natural resources are considered as a separate group. The more detailed disaggregation of agri-food products follows the general logic of differentiating between primary and processed products on the one hand and between plant and animal products on the other hand. With regard to factors of production, we retain the standard GTAP categories of five production factors, which include skilled and unskilled labour, capital, land and natural resources (see Table A1, third column 3)

## 2.3. Baseline

In the simulation, we first generate a baseline in order to reflect the situation in the year 2025. We choose 2025 because we assume that the DCFTAs, which have already been established or for which negotiations started, will be implemented by then. While negotiating and eventually agreeing on the provisions takes time, transition periods are usually allowed for. Hence, the actual ratification and full implementation of agreements will be attained only after a certain period of time. The situation in the year 2025 serves as reference for the scenarios that simulate the DCFTAs (see chapter 3.4). More specifically, we compare the results of the DCFTA scenarios with the baseline of 2025. This is a comparative static approach for interpreting the simulation results.

The baseline presents the business as usual scenario, while taking into account the economic as well as population growth. For the baseline, we use information on the expected growth path of the economy (GDP) and endowments (productivity of capital, labour, land/yields and natural resources) for the aggregation of groups of countries or regions over time. The estimates of the GDP growth and population paths are taken from USDA (2012). Land productivity i.e. yield projections are taken over from the IMAGE database (see MNP, 2006); they are based on FAO projections up to 2030 (see Bruinsma,

2003). Furthermore, we account for the WTO membership of the Ukraine in 2008 and of Russia in 2012 by depicting corresponding tariff reductions. For WTO membership of Russia, we apply an average tariff cut by 50% in the accession year, as Tarr (2007) suggested. For WTO membership of the Ukraine, we assume a tariff cut by 15% in the accession year, with tariffs being already considerably reduced under a specific programme since 2001.

## 2.4. Scenarios

In the simulation analysis we consider three scenarios in order to investigate on preference erosion for MED countries. They are summarized in Table 4. In the scenarios about DCFTAs, namely S1 and S2, we depict the liberalization of tariffs and non-tariff barriers between the EU27 and the MED countries (Egypt, Morocco and Tunisia) on the one hand and between the EU27 and the respective other neighbour countries (Albania, Armenia and Georgia and Ukraine) on the other hand. The liberalisation will be reciprocal such that all countries involved bring down the obstacles to trade. Scenario 1 (S1) considers the EU-MED DCFTA and the resulting effect for the MED countries. Scenario 2 (S2) depicts the situation where other neighbour countries also sign DCFTAs with the EU. Comparing S1 and S2, we can provide insights on the possible preference erosion effects for MED countries due to the EU DCFTAs with other neighbour countries. Scenario 3 (S3) reveals the possible preference erosion effect in case of multilateral tariff liberalisation.

*Table 4: Overview of the simulation scenarios.*

| Scenarios | Shocks applied in the simulation |
|---|---|
| **Scenario 1 (S1):** DCFTAs between the EU and MED partner countries (Egypt, Morocco and Tunisia) | Full implementation of tariff liberalisation and elimination of non-tariff barriers between the EU and MED countries (reciprocal) |
| **Scenario 2 (S2):** DCFTAs between the EU and MED partner countries (Egypt, Morocco and Tunisia) DCFTAs between EU and other neighbour countries (Albania, Armenia and Georgia and Ukraine) | Full implementation of tariff liberalisation and elimination of non-tariff barriers between the EU and MED countries and between the EU and the respective other neighbour countries (reciprocal) |
| **Scenario 3 (S3):** Multilateral trade liberalisation (WTO) | Full implementation of tariff liberalisation and elimination of non-tariff barriers between the EU and MED countries (S1) as well as between EU and respective other neighbour countries (S2) Full tariff liberalisation among all WTO members, multilateral tariff liberalisation |

*Note: MED countries: Egypt (egy), Morocco (mor) and Tunisia (tun), other neighbour countries considered: countries in theSouth Caucasus region: Albania (alb), Armenia (arm) and Georgia (geo), and Ukraine (ukr)*

*Source: own illustration.*

As mentioned, the simulation of DCFTAs involves depicting liberalization of tariffs and non-tariff barriers. For the tariff liberalisation, we reciprocally remove tariffs between the respective countries; see section 2.2 for the tariffs imposed on trade between the MED countries and the EU27. In addition, we depict the liberalisation of NTMs by the standard modeling approach of "iceberg cost". "Iceberg costs" are considered real trade costs that use up resources of exporters. As such, "iceberg costs" melt away a fraction of the export value on the way from the exporting to the importing country, causing efficiency losses in the exporting country. Reducing "iceberg costs" means lower real trade costs, which boosts the efficiency of producing export products, and this in turn is reflected as a positive technological change in the production for the world market. For a stylist application of the "iceberg" costs approach see Fugazza and Maur (2008). For the size of this shock we apply the equivalent estimates of NTM barriers provided by Kee et al (2009) (compare chapter 2.3).

# 3. MAGNET RESULTS OF MAIN INDICATORS

This chapter presents key results of the simulation of the scenarios described. As mentioned, we take a comparative static approach for interpreting the simulation results and compare the results of the DCFTA scenarios with the baseline results of 2025. The key results are presented for the following indicators: MED trade with the EU27, MED trade with countries other than the EU member states and GDP as an indicator for the economic and welfare impact in terms of standard of living.
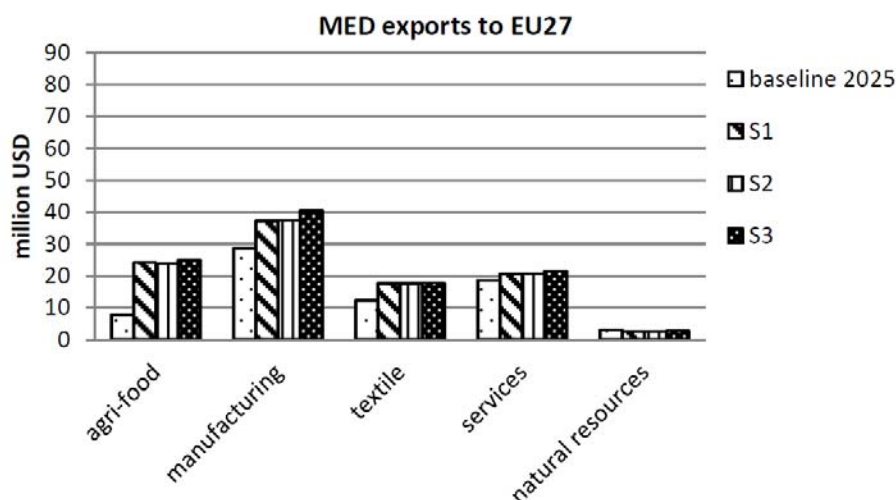
## 3.1. MED trade with the EU27

Figure 1 and 2 presents the simulation results on the effect on MED trade with the EU27. The trade effect is presented for the three scenarios, i.e. S1, S2, and S3, as well as the baseline, which reflects the situation without DCFTAs and other trade liberalization between the respective countries. The results refer to the situation in 2025 and thus take into account economic and population changes in the countries throughout the years.

In all three scenarios, the exports of the MED countries to the EU27 increase considerably (see Figure 1). In particular, agri-food exports to the EU27 increase, more than double in comparison to the baseline, and this increase mainly occurs for fruit and vegetables as well as for oil and vegetable fats, with the latter being part of the aggregate of processed food products. As Figure 1 illustrates, the largest increase is observed for tariff liberalization amongst WTO members (S3). For the MED countries, this points out the importance of multilateral trade liberalization as opposed to bilateral free trade agreements or DCFTAs with the EU27. The trade effect in S1 and S2 is almost identical. Looking at the details reveals that the MED countries export slightly more to the EU27 under S1 (MED-EU DCFTAs) than under S2 when other neighbour

countries also have DCFTAs with the EU27. It is interesting to note that the increase of exports is mainly due to the elimination of NTMs. Hence, reducing the NTM trade barrier seems to be more important than the tariff liberalisation, but the larger impact is not surprising given that the elimination of NTMs is depicted in terms of a productivity increase (not as "price wedges") in the simulation (compare 3.4).

*Figure 1: MED exports to EU27 (volume evaluated at market prices, million USD 2007)*
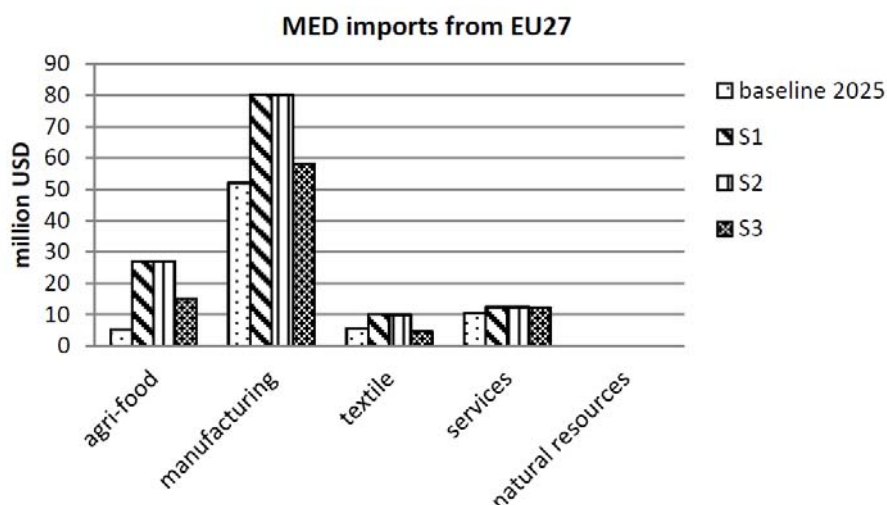


*Note: Scenario S1: EU-MED DCFTA (Tariffs and NTMs), Scenario S2: EU-MED DCFTA and DCFTA between EU and other neighbours (Tariffs and NTMs), Scenario S3: Multilateral trade liberalisation (tariff liberalisation), EU27: 27 EU member states, MED countries: Egypt (egy), Morocco (mor) and Tunisia (tun)*

*Source: MAGNET results.*

As shown in Figure 2, the MED imports from the EU27 also increase, except for textile under multilateral trade liberalization in S3. Here it seems that the EU27 loses its market share in MED countries (compare 5.2). The MED imports of agri-food products more than double. For agri-food products, this means that the MED countries turn from the position of a net exporter with the EU27 to the position of a net importer in S1 and S2 (see Figure A2 in the appendix). Note that, the MED agri-food exports to the EU27 remain larger than MED agri-food imports from the EU27 in S3. Looking at the disaggregated products, cereal imports from the EU27 (followed by meat imports) increase most, thereby causing the net importer position. MED countries continue to export fruit and vegetables to the EU27, and these exports actually grow according to the simulation results.

*Figure 2: MED imports from EU27 (volume evaluated at market prices, million USD 2007)*



*Note: Scenario S1: EU-MED DCFTA (Tariffs and NTMs), Scenario S2: EU-MED DCFTA and DCFTA between EU and other neighbours (Tariffs and NTMs), Scenario S3: Multilateral trade liberalisation (tariff liberalisation), EU27: 27 EU member states, MED countries: Egypt (egy), Morocco (mor) and Tunisia (tun).*

*Source: MAGNET results*

Overall, comparing the simulations results of S1 and S2 provides insights about whether there is preference erosion for MED countries when the EU completes DCFTAs with other neighbour countries. As shown in Figure 1 and 2, the results of MED exports to the EU27 in S1 and S2 do not significantly differ but the MED imports from the EU27 increase slightly less in S2 than in S3. This is further investigated in section 5.2.

### 3.2. Trade with other countries

Table 5 presents the share of MED imports and exports in total MED exports and imports, respectively. The focus is on the aggregates of regional groups of other countries rather than on EU27. However, the shares for the EU27 are also reported for readily compare the results.

For MED exports, the results show no preference erosion. Clearly, MED exports to the EU27 increase with the EU DCFTA under S1 as well as with the EU DCFTA with other neighbour countries. For all product aggregates, the EU27 remains the most important trade partner of MED countries in all scenarios. The DCFTA between the EU27 and other neighbour countries does not affect the MED trade relation as the MED countries and the other neighbour countries essentially trade different products.

Looking at MED imports, the EU seems to face preference erosion in the case of multilateral trade liberalization (S3). The EU27 share for textile imports falls in MED countries while the share of textile imports from Asia increase. A similar observation can be made for manifesting products. This result indicates the competition situation between imports from EU27 and Asia in a free trade scenario, whereby the EU27 loses out in favour of Asia. Please note that for agri-food products, the competition seems to be between the EU27 and the US, and the EU27 only just remains the main trading partner in S3.

*Table 5: MED trade with other countries, shares in total MED exports and imports [%]*

| | Agri-food | | | | Manufacturing | | | | Textile | | | | Services | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MED EXPORTS to** | BS | S1 | S2 | S3 | BS | S1 | S2 | S3 | BS | S1 | S2 | S3 | BS | S1 | S2 | S3 |
| EU27 | 50 | 80 | 80 | 79 | 52 | 63 | 63 | 62 | 82 | 89 | 89 | 84 | 37 | 44 | 44 | 44 |
| other neighbours with DCFTAs | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| Americas | 7 | 2 | 2 | 3 | 6 | 5 | 5 | 5 | 11 | 6 | 6 | 10 | 22 | 20 | 20 | 20 |
| Asia | 7 | 3 | 3 | 3 | 12 | 10 | 10 | 12 | 3 | 2 | 2 | 3 | 23 | 21 | 21 | 21 |
| CIS countries | 3 | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 3 | 3 | 3 |
| Sub-Sahara Africa | 10 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| | Agri-food | | | | Manufacturing | | | | Textile | | | | Services | | | |
| **MED IMPORTS from** | BS | S1 | S2 | S3 | BS | S1 | S2 | S3 | BS | S1 | S2 | S3 | BS | S1 | S2 | S3 |
| EU27 | 20 | 64 | 64 | 26 | 41 | 57 | 57 | 38 | 28 | 44 | 44 | 15 | 44 | 47 | 47 | 47 |
| other neighbours with DCFTAs | 4 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 |
| Americas | 28 | 12 | 13 | 26 | 6 | 4 | 4 | 4 | 1 | 1 | 1 | 3 | 21 | 20 | 20 | 19 |
| Asia | 6 | 2 | 2 | 3 | 11 | 7 | 7 | 14 | 62 | 49 | 49 | 76 | 15 | 15 | 15 | 14 |
| CIS countries | 14 | 7 | 7 | 4 | 3 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 4 | 4 | 4 | 4 |
| Sub-Sahara Africa | 4 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 |

*Note: BS: baseline 2015, Scenario S1: EU-MED DCFTA (Tariffs and NTMs), Scenario S2: EU-MED DCFTA and DCFTAbetween EU and other neighbours (Tariffs and NTMs), Scenario S3: Multilateral trade liberalisation (tariff liberalisation), EU27: 27 EU member states, MED countries: Egypt (egy), Morocco (mor) and Tunisia (tun), other neighbours with DCFTAs: Albania (alb), Armenia (arm), Georgia (geo) and Ukraine (ukr)*

*Source: MAGNET results*

### 3.3. Effect of gross domestic product (GDP)

This section presents the effect of the trade liberalization scenarios on GDP. The GDP effect reflects the economic impact but also points towards the welfare impact in terms of the standard of living (for example considering GDP per capita). As shown in Table 6, GDP increases for MED countries with the largest increase reported in S3, and hence multilateral trade liberalisation could again be considered as a superior option for MED countries than DCFTAs with the EU27. Here, it is important to remember that we only model the trade-related part of DCFTAs, leaving aside investment cooperation, technical support and other measures usually covered in such agreements.

It is interesting to note that the GDP increase for other neighbour countries with
DCFTAs is less pronounced. They do not seem to benefit to the same degree
from DCFTAs (as depicted in S2) and/or from multilateral trade liberalisation
(as depicted in S3). This may reflect the need to enhance their competiveness in
the EU27 and worldwide.

The GDP for the EU27 only marginally increases. Under multilateral trade
liberalisation in S3, the GDP increase is slightly larger, which may be due to the
improved trade opportunities with trade partner countries where demand and
purchasing power is potentially more favourable than the one in the partner
countries in DCFTAs.

*Table 6: Effect of trade liberalisation scenarios on GDP, % changes
to baseline in 2025.*

| Country | S1 | S2 | S3 |
|---|---|---|---|
| MED countries (egy, mor, tun) | 1.831 | 1.830 | 2.867 |
| Ukraine | 0.003 | 0.786 | 0.810 |
| South Caucasus (alb, arm, geo) | -0.007 | 1.592 | 1.478 |
| EU27 | 0.047 | 0.055 | 0.113 |

*Note: Scenario S1: EU-MED DCFTA (Tariffs and NTMs), Scenario S2: EU-MED
DCFTA and DCFTA between EU andother neighbours (Tariffs and NTMs), Scenario
S3: Multilateral trade liberalisation (tariff liberalisation)*

*Source: MAGNET results.*

## CONCLUDING REMARKS

This paper looks at preference erosion of multilateral and regional trade
liberalisation for Mediterranean partner (MED) countries, more specifically
Egypt, Morocco and Tunisia, by applying the general equilibrium model
MAGNET model (based on GTAP). In particular, we simulate the DCFTA
between the EU27 and the MED countries (S1), the DCFTA between eh EU27
and other neighbour countries (Albania, Armenia and Georgia and Ukraine) (S2)
as well as multilateral trade liberalisation (S3). Note that simulating the
DCFTAs in S1 and S2 includes the liberalisation of NTMs, and this is model
with the standard approach of "iceberg costs".
The simulation results show that MED imports and MED exports increase in all
scenarios for all products. MED exports, in particular exports of agri-food
products, increase most in S3, thus multilateral trade liberalisation could be
considered as a superior option for MED countries than DCFTAs with the EU27.
Here it is important to note that the modelling of DCFTAs implies reduced trade
costs (iceberg modelling approach). Hence, the trade effect due to DCFTA is per

se more pronounced. Given the set-up of the scenarios, it could be argued that modelling DCFTAs could foster the clear benefit from multilateral trade liberalisation in S3.

The simulation results show preference erosion for MED exports of agri-food products to the EU27 in the situation when the EU also completes DCFTAS with other neighbour countries (Albania, Armenia and Georgia and Ukraine). Looking at the disaggregated product level, processed agri-food products are particularly subject to the preference erosion; some preference erosion can also be identified for meat and milk products but to a limited degree. Overall, the preference erosion appears to be small, which is not surprising as MED countries and the other neighbour countries essentially trade different products. For all product aggregates, the EU27 remains the most important trade partner of MED countries in all scenarios. In case of multilateral trade liberalisation (S3), the MED countries do not seem to face preference erosion for their agri-food exports to the EU27.

The trade effect in S3 is most prominent for MED countries. In addition, GDP in the MED countries increases most in S3, while increasing in all scenarios. Overall, multilateral trade liberalisation could thus be considered favourable for MED countries. Here, it is however important to remember that we only model the trade-related part of DCFTAs, leaving aside investment cooperation, technical support and other measures usually covered in such agreements.

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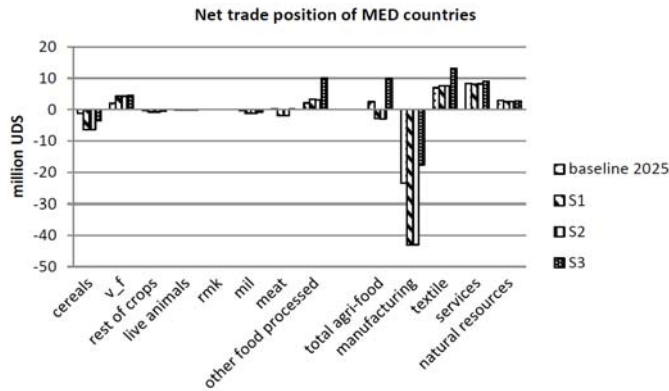USDA (2012). *International Macroeconomic Dataset*. Economic Research Service (ERS); United States Department of Agriculture: http://www.ers.usda.gov/data-products/international-macroeconomic-data-set.aspx, accessed 21/01/2012.

# APPENDIX

*Table A1: Region, sector and factor aggregation*

| Countries, Regions | | Sectors | |
|---|---|---|---|
| egy | Egypt | cereals | Paddy rice |
| mor | Morocco | | Wheat |
| tun | Tunisia | | Cereal grains nec |
| MENA | Rest of Middle East and North Africa | v_f | fruit & veg |
| CIS | Russia and other countries of former Soviet Union | rest of crops | Oil seeds |
| Ukraine | Ukraine | | Sugar cane, sugar beet |
| South Caucasus | Albania (alb), Armenia (arm), | | Plant-based fibers |
| | Georgia (geo) | | Crops nec |
| | European Free Trade Association | live animals | Cattle, sheep, goats, horses |
| EU27 | 27 EU member states | | Animal products nec |
| EFTA | European Free Trade Association | meat | Meat: cattle, sheep, goats, horse |
| US | United States of America | | Meat products nec |
| NAM | Rest of North America | mil | Dairy products |
| CSA | Central and South America | rmk | Raw milk |
| OCE | Australia, New Zealand and Rest of Oceania | other food processed | Vegetable oils and fats |
| ASIA | Asia | | Processed rice |
| SSA | Sub Saharan Africa | | Sugar |
| Rest | Rest of the world | | Food, bev & tobacco prod |
| | | textile | Textiles & clothing |
| | | | Wool, silk-worm cocoons |
| | | Manufacturing (mfn) | Petroleum, coal products |
| | | | Other manufacturing |
| | | | Petroleum, coal products |
| | | | Other manufacturing |
| | | forestry | Forestry, wood |
| | | fishing | Fish |
| | | services | Trade & transport (services) |
| | | | Other services |
| | | | Coal |
| | | natural resources | Crude oil |
| | | | Gas |

*Source: MAGNET aggregation*

*Figure A1: Net trade position of MED countries*



*Source: MAGNET results*