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EUROPEAN AND EURO-MEDITERRANEAN AGREEMENTS: SOME SIMULATION ANALYSIS ON THE EFFECTS OF THE EU TRADE POLICY

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Abstract

This paper deals with the long term effects of several important trade policy initiatives implemented by the EU in the last decade: the European Agreements, the Euro-Mediterranean Agreements and the Customs Union with Turkey. The analytical tool is GTAP, a static and perfectly competitive CGE model whose database has been aggregated into 10 regions and 10 industries. On average, liberalisation of manufacturing industries turns out to be welfare creating for the subscribers and slightly damaging for the world economy; the eventual opening of agricultural markets by the EU would improve these results. Income distribution inside the involved areas is only weakly affected by integration; with regard to the EU, return to capital and wages – for both skilled and unskilled labour - tend to appreciate in real terms.

Introduction

In the last decade European Union firmly worked to deepen and intensify its commercial relationships with the neighbouring countries. In 1991 EU subscribed the first *European Agreements (EAs)* with Hungary and Poland; in 1995 the customs union with Turkey was ratified while EU, Tunisia and Morocco gave birth to the *Euro-Mediterranean Partnership (Euro-Med Agreements, EMAs).* Those bilateral agreements represented the basis for a wider integration process involving both the Eastern Europe and Mediterranean areas: at present, all the Countries between Bulgaria and the Baltic Republics participate in the EAs, while EMAs negotiations have been extended to Egypt, Algeria and Libya.

It's not worth listing the structural and historical differences separating these Countries: suffice it to say that Turkey and CEECs *(Central & Eastern European Countries)* aim at joining the EU, while such a target seems today absolutely unachievable for North African economies. In spite of these differences, all the mentioned agreements adopt a similar approach in the trade policy regulation. No significant reform is implemented with respect to the agriculture and services industries (in the former case, this depends on the EU decision to keep unchanged its protectionist *Common Agricultural Policy*); on the other hand, the complete dismantling of bilateral barriers between the EU and each of the subscribing Countries is set for the manufactures[1]. This liberalisation process spreads over a period ranging from 7-8 years (customs union with Turkey, EAs) to 12 years (EMAs) and embodies the "asymmetry principle": EU has to work it out faster than the partners.

The tool employed to analyse the agreements is *GTAP*, a computable general equilibrium (CGE) model developed by T.W. Hertel at Purdue University. The model lays on standard neo-classical hypothesis (perfect competition, constant returns to scale in production); the data are those of the *Version 4 GTAP Database* aggregated into 10 industries and 10 regions. Complete descriptions of the model and the database can be found, respectively, in Hertel 1997 and Mc Dougall *et al.* 1998.

The next section summarises the findings of some of the main empirical analysis concerned with the agreements. In paragraph 2 we set out our data aggregation and comment

[1] The agreements cover both tariff and non-tariff barriers; EAs also imply the preferential elimination of *NTBs* instituted by the *MFA*, while EMAs do not.

the output of 8 simulations. Paragraph 3 is devoted to the sensitivity analysis. The last section presents some conclusive remarks.

1 – Commercial relations between EU and neighbouring Countries: main empirical findings

The customs union between EU and Turkey and the EMAs have been studied up to now mainly by implementing CGE models: since the agreements are very recent, "retrospective" econometric analysis would necessarily be weak and problematic. Empirical literature about the EAs is much wider and less homogeneous. Obviously, a rich political and institutional research developed beside the empirical one[2]; this short review is only concerned with the latter.

Accessing a customs union with the EU represented for Turkey the last step of a long opening policy begun in the 80s. Turkey has now to grant free market access to European manufacturing imports; furthermore, it was forced to reduce its barriers on third countries imports thus adapting to the *Common External Tariff* applied by EU members. Harrison *et al.* (1996) and IEP (1999) analyse the impact of these reforms on the Turkish economy employing different CGE models[3] (tab. 1.1, 1.2). Harrison estimates an increase of +1.1% in Turkish GDP, crucially connected to the reduction in barriers imposed to third countries (+0.5%); in IEP 1999 the increase in real GDP ranges from +0.5% to +0.7%. No relevant *trade diversion* phenomena are generated; none of the papers, anyway, presents estimates relating to EU variables.

The EMA between EU and Tunisia represented a model for all the *Euro-Med* negotiations; the agreement stated the immediate elimination of bilateral quotas and the progressive reduction of the tariffs for all the manufacturing industries. Agricultural liberalisation is formally indicated as an important future target, but no substantial reform is designed. Important chapters are dedicated to financial co-operation and competition rules (Tunisia must harmonise his laws on collusion, state aids, etc. approximating European

[2] See for example Grilli and Manno 1998 (EMAs) or Grabbe *et al.* 1998 (EAs).
[3] Both the models are *single country* and fix public expenditure employing VAT as a substitute for tariffs; the former (54 industries benchmarked to 1993) keeps an exogenous trade balance and an endogenous real exchange rate, while the latter (20 industries benchmarked to 1990) has an endogenous trade balance.

standards). Table 1.3 reviews the main empirical CGE analysis of the EMAs, drawing on Stern (1999) and Deardorff (1999). The first four models are merely static and devoted to the analysis of *TBs* and *NTBs* elimination; the fifth model extends the analysis to a someway "dynamic" context; the last model considers the eventuality of a *deeper integration* between the involved Countries – i.e. an integration going beyond tariff elimination. In the first cases a commercial agreement with EU implies a welfare gain[4] ranging from +1.52% (Morocco in Rutherford *et al.* 1993) to 4.56% (Tunisia in Rutherford *et al.* 1995, scen. 6). Tunisia gain falls to +3.3% in scenario 2 of Brown *et al.* (1997): Brown's model captures the pro-competitive gains from trade but it does not allow for frictional barriers effects, that seem to be more relevant. In both the models the estimates strongly depend on the hypothesis on the inter-industry capital mobility: gains tend to be higher with perfectly mobile capital. Another important regularity comes out from the table: unilateral liberalisation directed to non-EU partners is welfare creating by itself and improves the effects of the EMA. Generally speaking, the indiscriminate unilateral liberalisation of all the imports seems to be the best policy option for North African Countries.

The model adopted in Dessus *et al.* (1998) lays on a *recursive dynamics* framework: the authors calculate a discrete succession of annual equilibria going from 1995 to 2010; each equilibrium is generated on the basis of the previous one through the capital accumulation mechanism[5]. The output is quite surprising: the mere liberalisation of trade between Egypt and EU implies a loss in the welfare level estimated for 2010, notwithstanding financial helps granted by the EU. Significant gains could be generated only by introducing a marshallian export-led externality, i.e. transforming the factor productivity in a positive function of total Egyptian export; in this case, a preferential agreement with EU brings a 5% increase in welfare (scen.4).

Hoekman and Konan (1999) study the *deeper integration* possibility. They capture barriers connected to administrative regulations, production standards, etc. by introducing in each industry "red tape costs". Furthermore, these barriers allow Egyptian firms to set a mark-up over the world price of each commodity (in the services industries this mark-up reaches 100%; on the other hand EU obstacles services import via similar barriers resulting in a 50%

[4] The welfare gain is measured by hicksian *Equivalent Variation (EV)*.
[5] In other words, capital in *t* is a function of aggregate savings in *t-1*; this relationship is of course completed by a set of hypothesis on the exogenous growth rates of population, factor productivity, etc reflecting the maintenance of the policies implemented by the government during the 90s.

tariff). Table 1.3 clearly shows that red tape costs matter; combining the elimination of these costs with the services liberalisation yields a +20% increase in welfare – an interesting result for a static CGE model.

European Agreements divide manufactures into two subsets respectively including *"normal"* and *"sensitive*" industries: for the second set (steel, coal, textiles and wearing apparel) the transition to free trade is slower, so as to avoid high social costs for the fragile CEECs economies. As in the EMAs case, the agreements contain competition rules and the commitment to a future agricultural liberalisation. EU-CEECs integration has been extensively analysed using gravity models. Faini and Portes (1995) present a wide survey of these studies. Neven, for example, compares actual and potential patterns for CEECs trade with EU in 1985-92: actual growth was 90% for imports and 46% for exports, while the corresponding potential growth estimates were 387% and 538%. Not only is the potential largely unexploited, but European export is supposed to expand more than import. Several contributions in Faini's book show that the whole EU would participate in this trade intensification, namely that the "south" would not be excluded (see Dimelis-Gatsios for Greece and Gual-Martin for Spain). Some general considerations about the eastward enlargement of the Union are also included in *Agenda 2000*, the programmatic document redacted by EU Commission in 1997. Besides any political question, the document underlines some important economic consequences of the enlargement: global market expansion (CEECs will bring 130 millions of new consumers) and the possibility for a larger returns to scale exploitation; more competition in primary factors markets (implying a fall in the labour cost); availability of cheap intermediate inputs.

The eastward enlargement has been extensively studied using computable equilibrium models (table 1.4). Baldwin *et al.* (1997) work with a 9 regions data aggregation, introducing monopolistic competition (fixed mark-ups and free entry) in 7 industries out of 13[6]. The benchmark is 1992, but protection variables have been updated to post-Uruguay Round levels. An important feature of the model is endogenous capital. The first scenario implies a complete market opening between EU15 and CEEC7 - including a 10% reduction in trade costs - and CEECs adoption of European *CET*; EU real GDP rises by 0.2%, while CEECs gain reaches 1.5%. In the second scenario a "risk premium effect" is introduced: the authors

[6] Armington's assumption is only applied to perfectly competitive industries, so avoiding any intersection between firm-level and Country-level product differentiation.

assume that the CEECs average country risk index moves down after the accession, reducing by 15% the relative return demanded by savers for investment in the region. EU gain remains almost unchanged, while CEECs obtain a +18.8% increase in real GDP.

Frandsen *et al.* (1998) operate with a modified version of the GTAP model including a more accurate description of EU agricultural policy: grains suppliers, for example, receive direct transfers from the government, while a quotas system regulates production in the milk industry. The model is benchmarked to 2005[7]. The enlargement brings a slightly positive world welfare variation (+0.5 $ bn); EU and CEECs equivalent variations (-15.6 and +15.8 $ bn respectively) show that CAP extension implies a clear welfare transfer by the Union.

Brown *et al.* (1995) implement the *Michigan CGE Trade Model*, with monopolistic competition in 6 industries out of 29 and benchmark to 1992; their scenarios only consider *TBs* and *NTBs* elimination, ignoring the CAP extension. This gives place to welfare gains for both EU and CEECs; with regard to the EU, the "northern" sub-region captures a big part of the gains. *NTBs* liberalisation turns out to be crucial in any case. There are no significant income distribution effects, since wages and returns to capital grow in every single region.

Francois (1998) conducts the analysis in three different theoretical contexts: perfect competition and exogenous capital, perfect competition and endogenous capital, monopolistic competition (7 industries out of 13) and exogenous capital. Both accumulation and pro-competitive effects seem to dominate mere resources reallocation; furthermore, welfare gains are relevant for CEECs (+22% in scenario 3) but insignificant for the EU (+0.2%).

In Nielsen (1999) the main target is not estimating enlargement impact but testing estimates dependence on the model specification and closure: laying on the GTAP model, the author performs a set of simulation ranging from partial to general equilibrium and including two different CAP specifications[8]. The set of hypothesis embedded in the model strongly determine simulations output: this remarks that CGE results always have to be read with caution.

[7] See table 1.4 for details.

[8] Switching from partial to general equilibrium implies the progressive introduction of (a) more markets and (b) market clearing conditions for primary factors; "stylised" CAP refers to standard GTAP model, while "complete" CAP draws on Jensen's extension (Jensen *et al.* 1998).

Table 1.1: Harrison *et al.*, 1996 (Turkey)

	PIL	*VAT*[1]	*Real exchange rate*
TAR	+0.1%	+24.6	+3.0%
RECIP	+0.5%	-3.3	-1.8%
FULL	+1.1%	+16.2	+0.5%

Scenarios:

TAR: elimination of TBs on import from EU;
barriers reduction to European (CET) levels;
RECIP: better access to third Countries markets (rise in the export prices: +4.2%);
FULL: *TAR*; *RECIP;*
better access to EU markets and standard harmonisation (rise in the export prices: +11% in textiles and steel, +1% others);
reduction in trading costs with EU (-0.3%);
export subsidies elimination for manufactures directed to EU.

[1] Percentage change in "ad valorem" incidence.

Table 1.2: IEP 1997 (Turkey)

	GDP (EV)	*VAT*[1]	*Deficit vs. EU*
UNION^{flex}	*+0.5% (+0.4%)*	*+45*	*+131.1%*
UNION^{fix}	*+0.7% (+0.8%)*	*+45*	*+127.3%*

Scenarios:

UNION: reciprocal TBs elimination in manufacturing and extractive industries between EU and Turkey;
abrogation of Turkish VER on textiles;
financial help by the EU (ECU 1.4 bn).
flex (fix): flexible (fixed) real wages.

[1] Percentage change in "ad valorem" incidence.

Table 1.3: some CGE analysis of the *EMAs*[9]

Morocco

Rutherford *et al*. (1993): 39 industries, constant returns to scale; Armington assumption, fixed terms of trade ratio; VAT substitutes for TBs; S.A.M. referring to 1980 adjusted with 1991 tariff levels. Each simulation is replicated introducing high (H), medium (M) and low (L) elasticities for primary factors supplies.

Scenarios:	**% change in welfare**		
	H	**M**	**L**
1) complete unilateral liberalisation of imports	+3.12	+2.37	+2.06
2) F.T.A. with the EU, including an exogenous rise for some of the export prices.	+2.28	+1.52	+1.20

Tunisia

Rutherford *et al*. (1995): 19 industries, constant returns to scale; Armington assumption; VAT substitutes for TBs; 1990 input-output data with 1993 protection data. Each simulation is replicated in the "short term" (fixed capital) and in the "long term" (intersectorally mobile capital).

Scenarios (partner = EU):	**% change in welfare**	
	short t.	**long t.**
1) TBs elimination	+0.50	+1.56
2) NTBs elimination	+0.08	+0.15
3) Better access to EU agricultural markets	+0.20	+0.14
4) Standards harmonisation	+1.14	+1.31
5) Rationalisation of trade-related activities	+1.20	+1.33
6) F.T.A. (=1,...,5)	+3.11	+4.65
7) = 6 + elimination of TBs on third Countries imports	+3.71	+5.33

Tunisia

Brown *et al*. (1997): 29 industries and 8 regions (EU split into Greece-Portugal-Spain, Italy-France and "rest of EU"); perfect competition in agriculture, monopolistic competition with free entry in manufacturing and services industries; firm-level product differentiation, endogenous scale economies; 1990 input-output data and official pre-Uruguay Round tariff levels; tariff income is transferred to consumers.

	% changes			
Scenario: free trade with EU	terms of trade	welfare	real wage	real return to capital
1) fixed capital	-5.0	-0.2	+2.5	+6.6
2) cap. moves through industries	-4.9	+3.3	-1.7	+6.5
3) cap. moves through industries and regions (FDI)	-7.0	-0.1	+4.6	+7.1
4) cap. moves through regions (FDI)	-5.1	+0.9	+3.5	+6.6
5) = 4 + tax on capital	-5.1	+1.0	+3.6	+6.6

[9] The table is adapted from Stern (1999), pag.29.

[tab. 1.3 – cont.]

Egypt				
Konan, Maskus (1997): 38 industries, 5 regions (Egypt, EU, USA, MENAs[1], RoW.), 3 primary factors (capital, production labour, non-prod. labour); several taxes substitute for TBs; Armington assumption; 1990 input-output data, 1994 trade and protection data. Trading implies "red-tape" costs.				
		% changes		
Scenarios:	welfare	prod. real wage	non-prod. real wage	real return to capital
1) unilateral import liberalisation and fall in red-tape costs on imports	+2.7	+8.1	+10.4	+9.0
2) red-tape costs reduction for both import and export	+1.9	+4.7	+5.7	+5.5
3) FTA with the EU	+1.9	+6.5	+8.1	+7.3
4) FTA involving EU, USA and MENAs; an homogeneous 10% tariff is imposed on RoW imports	+2.4	+7.1	+9.0	+8.0

[1] *Middle East and North African Countries.*

Egypt	
Dessus, Suwa-Eisenmann (1998): 30 industries, 5 regions (Egypt, EU, NAFTA, "South-Mediterranean Rim", RoW) and 4 primary factors including 2 *sector-specific* varieties of capital; S.A.M. referring to 1995. The model rests on a *recursive dynamics* mechanism (see text) running from 1995 to 2010. The column below reports for each scenario the welfare deviation from the benchmark growth pattern.	
Scenarios:	**% change in welfare**
1) *benchmark*: no trade policy reform	--
2) reduction of TBs on EU manufacturing imports	-0.18
3) (2) + financial aid by the EU and better access to European markets for manufacturing exports	-0.49
4) (3) + *export-led* externality implying a growing factor productivity rate	+5.24
5) (4) + unilateral liberalisation vs RoW	+4.60

Egypt		
Hoekman, Konan (1999): 38 industries and 5 regions (Egypt, USA, EU, MENAs, RoW); 1990 S.A.M. updated to 1994; perfect competition in all but services industries (see text); Armington assumption; flexible real exchange rate. VAT substitutes for TBs; capital is perfectly mobile in all but 7 industries (e.g. agriculture and mining). The model accounts for several trading costs, including "*red-tape*" (see text).		
Scenarios (partner = EU):	**% changes***	
	welfare	**exchange rate**
1) imports tariff elimination	-0.1 (+0.7)	+1.2 (+0.7)
2) moderate *deep integration*	+4.1 (+5.3)	+3.4 (+2.4)
3) complete *deep integration*	+5.6 (+7.1)	+3.4 (+0.5)
4) 2 + better access to EU services markets	+13.4 (+16.7)	+4.1 (-3.8)
5) 2 + free entry into the EU services markets	+20.6 (+21.1)	-11.8 (-11.8)
* Data in brackets report on the replication of each scenario if the 1997 agreement between Egypt and the Arab League (MENAs) is considered; the agreement establishes reciprocal TBs liberalisation.		

Table 1.4: some CGE analysis of the *EAs*

Baldwin *et al.* (1997): 13 industries, 9 regions; monopolistic competition in 7 industries (fixed mark-ups and free entry); Armington assumption limited to perfectly competitive industries; endogenous capital; benchmark 1992 with post-Uruguay Round protection data.

scenario 1 – complete markets opening between EU15 and CEEC7; CEEC7 adoption of *Common External Tariff*; 10% reduction in EU-CEEC trade costs.

scenario 2 – scenario 1; 15% reduction in the relative return demanded to invest in CEECs.

	changes in real GDP (1992 ECUbn)	
	scen.1	**scen.2**
CEEC7	2.5 (1.5%)	30.1 (18.8%)
EU15	9.8 (0.2%)	11.2 (0.2%)
EFTA	0.2 (0.1%)	0.1 (0.1%)
Ex-USSR	1.1 (0.3%)	2.1 (0.6%)

CEEC7: Czech Republic, Hungary, Poland, Slovak Republic, Slovenia, Bulgaria, Romania

Frandsen *et al.* (1998): GTAP model and database; data aggregation includes 16 regions and 19 industries (15 industries belong to the agriculture/food area). The standard model has been modified so as to provide a better description of the CAP, introducing direct transfers to suppliers (e.g. grain), quotas (e.g. milk), etc. Benchmark year is 2005, resulting from (a) complete Uruguay Round implementation (b) free trade inside the CEECs group and (c) CAP reform along the lines of "Agenda 2000".

Scenario: elimination of TBs and NTBs between EU and CEECs; harmonisation of CEECs barriers to EU levels; CAP extension to the CEECs.

	EV (bn$)	***t.o.trade (bn$)*[1]**
EU15	-15.6	-1.2
CEECs	15.8	1.3
Australia	-0.0	-0.0
New Zealand	-0.0	-0.0
Japan	0.3	0.1
Asia Pacific	-0.0	-0.0
China	0.0	-0.0
Rest of Asia	-0.0	-0.0
USA	-0.0	-0.1
Latin America	0.0	0.0
South America	-0.0	-0.0
Former USSR	-0.1	-0.1
EFTA	0.1	0.0
Middle East & North Africa	0.3	0.2
Sub-Saharan Africa	0.0	-0.0
RoW	-0.0	-0.0
	(tot.: 0.5)	(tot.: -0.0)

[1] Portion of *EV* generated by terms of trade effects.

[tab. 1.4 – cont.]

Brown *et al.* (1995): *Michigan CGE Trade Model*; 8 regions, 29 industries (23 belonging to the agricultural area); monopolistic competition in manufacturing and services industries (free entry with firm-level product differentiation). Each region has a fixed trade balance and a flexible exchange rate. Data are benchmarked to 1992.

Scenario "B"

(elimination of TBs and NTBs inside the CEECs group; TBs elimination between CEECs and EU)

	EV (mld$)	*t.o.trade (%)*
Cecoslovacchia	2.22	-0.6
Hungary	1.42	-0.5
Poland	2.49	-0.9
NAFTA	-0.27	0.0
EFTA	2.03	0.0
EU-South[1]	0.28	0.0
EU-North[2]	6.60	0.0
RoW	-0.33	0.0

Scenario "D"

(elimination of TBs and NTBs inside the CEECs group *and* between CEECs and EU)

	EV (mld$)	*t.o.trade (%)*
Cecoslovacchia	4.12	+0.8
Hungary	2.43	+1.7
Poland	4.40	+1.3
NAFTA	-0.93	0.0
EFTA	4.22	0.0
EU-South[1]	1.03	0.0
EU-North[2]	16.11	0.0
R.o.W.	-0.59	0.0

[1] Greece, Spain, Portugal.
[2] Belgium, Luxembourg, Denmark, France, Germany, Ireland, Italy, Netherlands, UK.

Francois (1998): 9 regions and 13 industries; "large group" monopolistic competition in 7 industries including textiles, metals and chemical (firm-level product differentiation, fixed markups, free entry). Armington assumption and frictional – i.e. resource wasting – costs in international trading. Data generally come from the *GTAP Version 3 Database*. Stylised CAP: endogenous subsidies keep the EU agricultural output level constant.

Basic scenario: elimination of TBs and NTBs between EU and CEECs; harmonisation of CEECs barriers to EU levels; fall in frictional costs (-10%); investment risk reduction in CEECs. This scenario is replicated with three different sets of hypothesis:
(1) perfect competition and fixed capital endowments;
(2) perfect competition and endogenous capital;
(3) monopolistic competition and fixed capital endowments;

	% change in GDP			
	(1)	**(2)**	**(3)**	**tot.**
NAFTA	0.0	0.1	-0.2	-0.1
EU15	0.0	0.0	0.2	0.2
EFTA3	0.0	0.2	-0.1	0.1
Asia Pacific	-0.0	-0.0	-0.1	-0.2
North Africa	0.0	-2.0	2.0	0.1
Sub-Saharan Africa	-0.0	2.6	-2.6	-0.1
CEECs	1.0	9.7	11.5	22.2
Former USSR	0.0	-0.1	0.7	0.6
RoW	-0.0	0.8	- 1.1	-0.4

[tab. 1.4 – cont.]

Nielsen (1999): GTAP model and database; data aggregation includes 3 regions (EU15, CEECs, RoW) and 19 industries (15 belonging to the agricultural area).

Basic scenario: elimination of TBs and NTBs between EU and CEECs; harmonisation of CEECs barriers to EU levels; CAP extension to the CEECs. This scenario is replicated adopting several model specifications and closures[1]:

Stylised CAP = CEECs merely adapt output and export subsidies to EU standards.
Complete CAP= Stylised CAP + explicit introduction of input subsidies (grains), direct transfers to producers (bovine cattle), quotas rents (milk, sugar beets).
Partial eq. = 1 industry; no market clearing in primary factor markets; exogenous regional income.
General eq. = 19 industries; market clearing in primary factor markets; endogenous regional income.

	% change in output (CEECs)	
benchmark: 2005[2]	*grains*	*bovine cattle*
1) Complete CAP; Partial eq	192.6	147.2
2) Complete CAP; General eq	84.5	70.0
benchmark: 1995		
3) Complete CAP; General eq	67.4	112.7
4) Stylised CAP; General eq	70.4	121.4

[1] This table only reports on 4 scenarios (out of 8 performed by the author) and 2 representative industries.
[2] See Frandsen *et al*. 1998.

2 – Benchmark equilibrium and scenarios

Our simulations rest on a 10 regions-10 industries aggregation of the database. Regions are EU15, EFTA[10], Turkey *(TUR)*, Morocco *(MOR)*, Rest of North Africa[11] *(RNF)*, Central European Associates[12] *(CEA)*, NAFTA, Japan *(JPN)*, Rapidly Developing Countries[13] *(RDC)* and Rest of the World *(WWW)*. We distinguish 2 agricultural industries (crops *CRO* and other agricultural products *AGR*), mining *(MIN)* and 5 manufactures: chemical *(CHE)*, food products *(FDP)*, textiles *(TEX)*, electronic and mechanical equipment *(E_M)*, other manufactures *(OTH)*. Services industries are grouped into "transports, finance and recreational services" *(T_F)* and "other services" *(SVS)*. Appendix I offers a rough description of the initial equilibrium (values are in 1995 US dollars). Two aspects need attention. First of

[10] EFTA: Iceland, Liechtenstein, Norway, Svalbard & Jan Mayen Isl., Switzerland.
[11] RNF: Algeria, Egypt, Libya, Tunisia.
[12] CEA: Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Slovenia.
[13] RDC: Korea, Indonesia, Malaysia, Singapore, Thailand, China, Hong Kong, Taiwan.

all, subscribing Countries are quite small with respect to the EU: Turkey is the biggest partner, with a GDP reaching 2% of EU GDP. Furthermore, they strongly depend on EU markets for both imports and exports: European import on total import ranges from 48% (Turkey) to 61% (CEA). Table 1.3 overviews the scenarios. Simulations 1 to 4 independently analyse each of the agreements (EMAs have been divided into EU-Morocco agreement and EU-RNF agreement). In scenario 5 all the agreements are contextually considered: this scenario should give the best - i.e. most realistic - approximation of the *real* future equilibrium in the involved areas. Scenarios 6 to 8 deal with some hypothetical extensions of the ongoing liberalisation process: agriculture inclusion into the EAs and reciprocal market opening inside MENAs and CEAs groups.

The agreements are globally welfare creating for the EU (table 3.3); only the customs union with Turkey brings a slight welfare loss, due to the terms of trade deterioration. Furthermore, estimates from scenario 5 are bigger than the sum of estimates generated by scenarios 1 – 4 for both GDP and welfare *(EV)*: the implementation of a "network" of bilateral agreements involving Eastern and Southern neighbours seems to imply some positive synergies for the EU. Anyway the global gain is not so big: + $ 3.3 bn, corresponding to a +0.3% increase in nominal GDP. Imports from extra-european Countries increase by $ 29 bn

Table 2.3 – Scenarios

	regions involved	***shocks***
(1)	EU, Turkey	- reciprocal elimination of TBs on manufactures; reduction of turkish barriers to CET levels
(2)	EU, Morocco	- reciprocal elimination of TBs on manufactures;
(3)	EU, Rest of N. Africa	- reciprocal elimination of TBs on manufactures;
(4)	EU, Cent. Eur. Associates	- reciprocal elimination of TBs on manufactures;
(5)	EU, Turkey, Morocco, R. of N. Africa, C. E. Associates	- (1) + (2) + (3) + (4);
(6)	"	- (5) + agricultural TBs elimination between EU e CEA;
(7)	"	- (5) + agricultural TBs and NTBs elimination between EU e CEA;
(8)	"	- (5) + elimination of TBs and NTBs inside the Morocco-RNF group and the CEA group (inter-groups barriers remani unchanged)

(+1.25%). This growth spreads over the whole manufacturing area; textiles and food show the biggest relative increase, while chemical and mechanic-electronic quotas on total import decrease. Export expands by $ 30.8 (+1.34%), following an opposite trend: *CHI* and *M_E* are the leading industries and *FOD-TEX* lag behind[14]. Income distribution is only weakly affected by liberalisation: perfectly mobile factors - unskilled labour, skilled labour and capital - show similar variations in real per-unit retributions, with ±0.005% differences. Notably, not only unskilled workers are not hurt by market opening, but in scenario 5 they gain relatively more than the other factors.

These findings generally hold in scenarios 6 – 8 (tab.3.4). Including agricultural industries into the EAs improves welfare results for the EU, especially if TBs are dismantled but NTBs – i.e. output and export subsidies – remain unchanged (scen.6). At the contrary, a deepening in intra-*MENAs* and intra-*CEAs* commercial relationships would compress EU gains from 3.3 to 2.6 billion dollars (scen.8). This result suggests that the actual agreements – due to their bilateral nature – tend to create a *core-periphery system*; the EU captures bigger gains because it is the only subscriber able to freely access all the involved national

Table 2.4 – Simulations results (EU)

	scenarios:				
	(1)	(2)	(3)	(4)	(5)
Aggregated impact:					
EV[1] (bn$)	-0.9	+0.4	+2.4	+1.3	+3.3
Terms of trade (%)	-0.02	+0.01	+0.09	+0.03	+0.12
Nominal GDP (bn$)	-2.5	+2.4	+15.0	+9.0	+24.3
(%)	-0.03	+0.02	+0.18	+0.11	+0.29
Trade balance (bn$)	-0.21	+0.23	+1.01	+0.18	+1.62
Distributive impact:					
W_r^2 *unskL*	+0.005	+0.010	-0.161	-0.093	+0.114
W_r^2 *skL*	+0.006	+0.009	-0.162	-0.093	+0.107
W_r^2 *Cap*	+0.008	+0.009	-0.162	-0.093	+0.104

[1] *Hicksian equivalent variation.*
[2] Percentage change in real per-unit retribution.
unskL = unskilled labour; *skL* = skilled labour; *Cap* = capital.
Source: GTAP calculations.

[14] Variations in *(industry export/total export)* are: +0.11% (CHE), +0.5% (M_E), -0.07% (FDP), -0.34% (TEX).

markets. The impact on the partners is somehow more ambiguous (tab.3.4[15]). In scenario 5 CEA, Turkey and Morocco better off – in the latter case GDP expands by more than 3% - while RNF does not. For Algeria, Egypt, Libya and Tunisia the EMAs imply a fall in public expenditure (TBs still represent an important fiscal resource) and a slight terms of trade deterioration. This is not surprising: in the initial equilibrium these Countries mainly export mining products (50% of total exports to the EU) and import *M_E* products, so the agreements have a stronger impact on European suppliers. RNF obtains a slightly positive *EV* only if an "internal" liberalisation process completes the EMA (scen.8); more generally, scenario 8 represents the *first best* for both Eastern Europe and North African Countries.

Table 3.4 – Simulations results (EU and partners)

	scenarios:			
	(5)	(6)	(7)	(8)
EV[1] (bn$):				
EU	+3.31	+3.44	+3.43	+2.68
Turkey	+0.82	+0.82	+0.82	+0.81
Morocco	+0.39	+0.38	+0.38	+0.47
Rest of N. Africa	-0.24	-0.23	-0.23	+0.06
CentralEuropean Ass.	+1.23	+1.63	+1.67	+1.90
Nominal GDP (%):				
EU	+0.29	+0.28	+0.28	+0.28
Turkey	+1.63	+1.63	+1.63	+1.64
Morocco	+3.27	+3.24	+3.25	+4.04
Rest of N. Africa	-1.15	-1.16	-1.16	-0.55
CentralEuropean Ass.	+1.27	+2.14	+2.03	+1.90

[1] *Hicksian equivalent variation.*
Source: GTAP calculations.

[15] Space constraints force us to focus only on scenarios 5-8.

Agricultural liberalisation would of course improve the agreements from the CEAs point of view, but CEAs gain more in scen.7, where NTBs are dismantled together with tariffs. As in the EU case, income distribution inside these Countries does not depend on the trade policy reform; variations in per-unit real returns to primary factors usually have the same sign and similar dimensions, and no *Stolper-Samuelson* effect is discernible.

The agreements have no relevant world-wide implications. The world *EV* (i.e. the sum of regional *EVs*) ranges from –0.6 bn in scen.5 to –0.2 bn in scen.7, revealing the existence of *trade diversion* phenomena well known in "second best" analysis. These costs are for a big part sustained by the "rest of the World". WWW indeed includes areas traditionally linked to EAs and EMAs subscribers - such as former USSR and Middle East - that are going to suffer a loss in competitivity if the EU opens its markets (subscribers substitute EU for non-EU imports).

3 – Sensitivity analysis

Sensitivity analysis represents an important step in every research founded on CGE tools; it aims at testing the robustness of results by replicating the simulations with different parameters values: results too strongly dependent on exogenous estimates are not much interesting, of course. Our analysis is limited to scenario 5. Furthermore, it simply implies ±50% changes in some key parameters, confronting "high" (H) and "low" (L) values with standard GTAP values (M); in other words, we do not conduct a "systematic" analysis but we try to identify an interval for endogenous variables fluctuations.

The first test involves the so-called "Armington elasticities", i.e. parameters *ESUBM* and *ESUBD* (tab. 4.1). For each industry, the former represents the elasticity of substitution between domestic good and imported good and the latter the elasticity of substitution *at the border* between different import varieties. The second test is implemented on the elasticity of substitution between primary factors ESUBVA (tab. 4.2).

Both the tests generally support our original findings. Table 4.1 presents two interesting exceptions. The first one is RNF switch from negative to positive welfare variation when "low" elasticities are introduced. This is probably due to a different relative prices behaviour: if imports are not a good substitute for internal products, RNF undergoes an appreciation in real terms of trade. With regard to the second part of the table, the exception is represented by the textile industry: in this case a low substitution between imported and

domestic commodities grants a higher output level inside the EU. Table 4.2 strongly confirms our basic results: the sign of each variation is constant and there are no changes in absolute values up to the second decimal place.

Table 4.1 – Armington elasticities

(I) world equilibrium

	Welfare (bn$)			*terms of trade (%)*		
	H	M	L	H	M	L
EU	2.259	3.319	4.219	0.09	0.12	0.14
EFTA	-0.081	-0.219	-0.567	-0.14	-0.16	-0.24
TUR	0.863	0.820	1.155	1.02	1.07	1.72
MOR	0.490	0.389	0.708	0.68	0.98	4.32
RNF	-0.456	-0.238	3.830	-1.41	-0.80	6.39
CEA	0.860	1.229	2.588	1.02	1.07	2.01
NAFTA	-0.634	-0.986	-2.909	-0.03	-0.05	-0.16
JPN	-0.939	-1.501	-5.719	-0.07	-0.12	-0.46
RDC	-1.246	-1.154	-1.142	-0.06	-0.06	-0.06
WWW	-2.377	-2.313	-2.542	-0.14	-0.15	-0.17
World	-1.261	-0.655	-0.378	-	-	-

(II) EU equilibrium

	Output (%)			*market price (%)*		
	H	M	L	H	M	L
CRO	0.05	0.02	0.12	1.16	0.92	1.37
AGR	0.30	0.21	0.19	0.32	0.37	0.59
MIN	-0.20	-0.16	0.06	0.31	0.36	0.58
T_F	-0.03	-0.03	-0.03	0.31	0.36	0.58
SVS	-0.06	-0.04	-0.04	-0.36	-0.22	1.23
CHE	0.32	0.22	0.17	0.33	0.37	0.63
FDP	0.44	0.33	0.23	0.35	0.38	0.62
TEX	-1.62	-0.73	0.22	-0.05	0.05	0.66
M_E	0.14	0.08	0.00	0.29	0.34	0.56
OTH	0.22	0.13	0.06	0.28	0.33	0.57

M = medium values (GTAP standard)
H = high values (GTAP standard +50%)
L = low values (GTAP standard –50%)

Source: GTAP calculations.

Table 4.2 – Substitution elasticity between primary factors

(I) world equilibrium

	welfare (bn$)			*terms of trade (%)*		
	H	M	L	H	M	L
EU	3.307	3.319	3.321	0.11	0.12	0.12
EFTA	-0.207	-0.219	-0.250	-0.16	-0.16	-0.17
TUR	0.814	0.820	0.827	1.05	1.07	1.10
MAR	0.394	0.389	0.372	0.99	0.98	0.90
RNF	-0.235	-0.238	-0.260	-0.80	-0.80	-0.82
CEA	1.229	1.229	1.216	1.08	1.07	1.06
NAFTA	-0.995	-0.986	-0.945	-0.05	-0.05	-0.05
JPN	-1.528	-1.501	-1.396	-0.12	-0.12	-0.11
RDC	-1.156	-1.154	-1.141	-0.06	-0.06	-0.06
WWW	-2.258	-2.313	-2.435	-0.14	-0.15	-0.16
World	-0.635	-0.655	-0.691	-	-	-

(II) EU equilibrium

	output (%)			*market price (%)*		
	H	M	L	H	M	L
CRO	0.02	0.02	0.00	0.75	0.92	1.34
AGR	0.21	0.21	0.20	0.37	0.37	0.37
MIN	-0.20	-0.16	-0.10	0.36	0.36	0.36
T_F	-0.03	-0.03	-0.03	0.36	0.36	0.35
SVS	-0.04	-0.04	-0.04	-0.18	-0.22	-0.25
CHE	0.22	0.22	0.22	0.35	0.37	0.39
FDP	0.33	0.33	0.33	0.36	0.38	0.43
TEX	-0.73	-0.73	-0.72	0.10	0.05	-0.03
M_E	0.08	0.08	0.08	0.34	0.34	0.33
OTH	0.14	0.13	0.13	0.34	0.33	0.33

M = medium values (GTAP standard)
H = high values (GTAP standard +50%)
L = low values (GTAP standard –50%)

Source: GTAP calculations.

4 – Conclusions

We analyse the trade policy implemented by the EU in the Mediterranean and Eastern Europe areas during the 90s, studying the implications of the customs union with Turkey, the Euro-Med Agreements *(EMAs)* and the European Agreements *(EAs)*. Each of these new bilateral partnerships aims at creating a *free trade area* for the manufacturing sectors, while for services and agriculture trade barriers will remain generally unchanged.

A first indication deriving from the analysis is that, generally speaking, these agreements represent a good deal: besides any consideration on their political stabilisation consequences, they generate on average a welfare gain for both the EU and its partners. The gains are not big, but they are equally distributed between the subscribing Countries and – inside each Country – between the primary factors owners. Furthermore the *trade diversion* costs for the world economy are not relevant. We point out once again that the standard GTAP model, due to its static and perfectly competitive nature, captures only a part of the story. The empirical literature shows that pro-competitive and dynamic effects play an important role in EAs and EMAs, usually dominating the mere resource reallocation and bringing to more relevant gains in a big part of cases.

Further conclusions relate on the other hand to the *perfectibility* of the agreements. We explored two possible lines of future development: EAs extensions to agricultural markets and internal integration between EU partners. They both proved to have a significant impact on simulations results: the former enhances EU and CEA gains, while the latter is crucially welfare-improving for North-African Countries. According to the literature, more attention should be paid also to the "deeper integration" issue. Technical, financial and administrative harmonisation represents a necessary support to the institution of a free market regime, but the agreements seem not very value-adding in this direction. The global picture emerging from the analysis suggests that the agreements should be considered a step in an ongoing integration process and not its ultimate output.

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Appendix I – benchmark equilibrium data

(A) Regional GDPs, 1995

	Consumption	*Investment*	*Public Exp.*	*Export*	*Import*	*Tot.*
EU	5006.6	1564.7	1599.2	2336.0	-2296.8	8209.7
EFTA	255.2	101.2	74.6	166.2	-146.3	450.9
TUR	115.0	38.9	16.3	39.4	-40.1	169.6
MOR	23.0	7.1	5.0	8.7	-12.4	31.5
RNF	88.5	29.4	17.8	39.0	-44.8	130.0
CEA	199.5	53.5	48.6	111.9	-118.2	295.5
NAFTA	5461.8	1343.5	1265.0	1043.5	-1133.9	7980.0
JPN	3072.9	1453.4	498.2	502.1	-435.2	5091.6
RDC	1103.4	706.7	232.4	910.2	-883.7	2069.2
WWW	2559.6	770.1	601.7	733.2	-778.8	3885.9
Tot.	17886.0	6069.0	4359.2	5890.5	-5890.5	28314.3

Numbers in 1995 US$ billion.
Source: GTAP calculations.

(B) Distribution of exports, 1995

	EU	*EFTA*	*TUR*	*MOR*	*RNF*	*CEA*	*NAFTA*	*JPN*	*RDC*	*WWW*
EU	0.615	0.768	0.488	0.571	0.532	0.615	0.192	0.138	0.164	0.342
EFTA	0.045	0.008	0.027	0.014	0.019	0.029	0.013	0.016	0.013	0.023
TUR	0.009	0.003	0.000	0.007	0.021	0.011	0.002	0.002	0.002	0.009
MOR	0.002	0.001	0.002	0.000	0.008	0.001	0.000	0.001	0.000	0.002
RNF	0.011	0.005	0.023	0.030	0.027	0.004	0.003	0.002	0.002	0.005
CEA	0.027	0.011	0.033	0.029	0.020	0.108	0.005	0.012	0.008	0.019
NAFTA	0.097	0.068	0.092	0.076	0.128	0.049	0.352	0.243	0.161	0.183
JPN	0.036	0.030	0.036	0.010	0.032	0.016	0.131	0.000	0.225	0.079
RDC	0.066	0.046	0.076	0.045	0.081	0.051	0.184	0.340	0.299	0.157
WWW	0.091	0.059	0.223	0.217	0.133	0.118	0.117	0.246	0.126	0.181
Tot.	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*

Each column disentangles regional total exports by destination.

Source: GTAP calculations.