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Comparative analysis of importance of technical barriers to trade (TBT) for Central and Eastern European Countries' and Mediterranean Partner Countries' exports to the EU

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Comparative analysis of importance of technical barriers to trade (TBT) for Central and Eastern European Countries' and Mediterranean Partner Countries' exports to the EU

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Summary

Chapter 1: WTO and EU Approaches to technical barriers to trade

The general aim of the WTO Technical Barriers to Trade (TBT) and Sanitary and Phyto-sanitary (SPS) Agreements is to ensure that mandatory technical regulations and voluntary standards, as well as testing and certification procedures, do not create unnecessary obstacles to international trade. However, it is recognized that countries have the right to establish protection, at levels they consider appropriate, for example for human, animal or plant life or for health or environment protection.

Therefore, the Agreements encourage countries to use international standards where these are appropriate, but they do not require them to change their levels of protection as a result of standardization. In the case of SPS Agreement members may maintain or introduce measures which result in "higher standards" if there is "scientific justification" or as a consequence of consistent risk decisions based on an appropriate risk assessment. Some of these issues cause trade disputes among the WTO members. The most controversial ones regard the appropriate level of standards, "avoiding unnecessary obstacles to international trade", and "scientific justification" of applied higher, technical regulations or standards.

The European Union, being one of the members, applies the rules, which have to be consistent with the provisions of the WTO. The EEC Treaty prohibits technical barriers to trade in general. However, there are some exceptions allowing for the existence of TBT on the grounds of consumer or environmental protection, public morality, public policy or security, or protection of health and life of humans.

According to reports from late 1980's the cost associated with existing TBT's was estimated to be as high as 2.2% of the EU GDP. The approach of the EU to the removal of TBT was and is twofold. It bases either on (i) Mutual Recognition (MR) Principle or on (ii) Harmonization. The MR Principle states that any product legally manufactured and marketed in one country of the EU must be allowed free entry in any other market of the EU. The harmonization approach is based on the legislative unification of standards and regulations among the Member States. Harmonization of standards is needed when the MRP principle

fails to remove TBT's, i.e. when the Member States do not want to recognize each other regulations and standards.

The traditional approach of the EU to harmonization is the so-called Old Approach (OA). It gives a very detailed instruction on the characteristics of a product as well as on the process of production. Since the mid-eighties, the EU is shifting slowly towards the New Approach (NA). With the NA, only essential requirements for the most important characteristics of the products are set. The data for 2003 show that more than 50% of intra-EU trade is covered by harmonized regulations and over 30% is covered by mutual recognition. Only 13% of intra-EU trade is not covered by any type of technical regulation. The success in removing TBT is not uniform across different sectors. In some sectors, like food products or chemical products technical regulations can be especially important and may create a trade barrier for other exporters.

The analysis of approaches from the point of view of exporters from Mediterranean countries shows that removal of TBT within the European Union should be beneficial. They do not have to focus on one market. Once they are allowed entry to one EU market, they would automatically have access to the whole EU market. On the other hand, if harmonization of the EU legislation moves towards making the standards more stringent, it could mean that the firms from Mediterranean countries would have to bear certain adjustment costs in order to be able to export to the EU.

Chapter 2: Surveys of Polish and Israeli companies:

In order to assess how TBT influence firms in their everyday activity, we conducted a market survey in three Polish and Israeli industries (food processing, chemical and electrical machinery). In all three industries in Poland, the EU accession has been beneficial. Additionally, the attitude of selected companies to technical regulations was either positive or neutral. In comparison, selected Israeli firms reported many more difficulties in exporting to the EU.

In both countries, the food sector showed the highest number of difficulties while the electrical industry occurred as the most successful one for exports to EU member states.

The necessity to redesign products is significantly lower in Poland than in Israel, but it is more costly for Polish firms. One of the main similarities between the two countries was the response to questions regarding harmonization and unification of standards, which were considered in both countries to be mostly beneficial. The Mutual Recognition principle was assessed positively by a majority of Polish firms.

The main problem of Israeli firms is the necessity to perform additional tests and certifications, which are costly. In particular, the food industry suffers most from the obligation to perform additional tests and complains about their complexity. In Poland, the question regarding testing and certifications related to the changes in costs after May 1, 2004. More than half of the firms reported increases in these costs.

However, based upon the results presented in this survey and in the surveys made prior to accession to the EU, we may conclude that major adjustments were already implemented before the 1st of May 2004 in Poland. In comparison, Israeli firms are at a disadvantage although they have already taken major steps to implement EU regulations.

In conclusion, from survey based questionnaires we can conclude that technical regulations and standards do play important informative role and therefore are in general positively assessed by exporting companies. But they can also create a barrier to trade, especially in the food sector. Long lasting certifications can make exports – in extreme cases - unprofitable. It seems that Polish companies do face smaller problems in exporting their goods to the EU market, but they also had to face larger investments in order to meet all EU technical regulations and standards requirements.

Chapter 3: The Economic Functions of Product Regulations

Regulations can provide significant benefits for societies by: (i) correcting information asymmetries between buyers and sellers, (ii) providing incentive schemes for quality (iii) product variety reduction, leading to benefits from economies of scale, (iv) compatibility /interoperability and (v) by reducing health, safety and environmental hazards.

On the other hand they cause *compliance costs* because firms may need to adapt product design, re-organize production systems, incur re-labeling costs and face the costs of multiple testing and certification. Compliance costs are seen as fixed costs, which can be more important for small firms. The second component of ongoing costs consists of periodic monitoring and testing. Since compliance costs in some sense measure an industry's response to regulation, high compliance costs could indicate an ineffective response.

Firm's ability to cope with a compliance cost depends on the level of technological innovation. Essentially, uncertainty related to the effect or the introduction of new regulations may create a potential difficulty in the decision to innovate.

In international trade analysis it is usually argued that technical regulations do not act as a trade impediment. What is believed to impede trade, is the differentiation of regulations

across countries. The compliance cost, in the case in which the level of harmonized regulations is higher than domestic regulations, can be regarded as comparative disadvantage, decreasing country's exports. In the literature, the general consensus is that internationally shared standards should be trade promoting. In the case of a country that faces upward harmonization, a lot depends on how much the cost disadvantage outweighs further trade opportunities.

Accession of new members substantially increases the pressure on the internal market and stretches the abilities to ensure compliance with harmonized directives of the EU. The enlargement certainly improves economic capabilities of the CEEC countries, but there are also potential negative sides resulting from large compliance costs. The question is also whether CEEC, having lower R&D capacity, will be able to develop new technologies /products in response to new EU regulations? Thus, the capacity of CEEC's to face the compliance costs seems to be crucial. It is analyzed in the second chapter on the basis of questionnaire based analysis made among Polish companies, after the enlargement of the EU.

Chapter 4: Basic theory and empirics: overview

Before starting our trade analysis we discuss several analytical methods. In practice, it is very common to apply more than one analytical method within one analysis or paper.

The *price wedge* method aims at evaluating the protectionist effect of TBT by calculating their tariff equivalence. In this case we assume that we know the situation before the introduction of the regulation and we study the effects of this regulation on the level of both production and imports. But there are many practical problems in application of the price wedge method: (i) one cannot be sure, that the calculated price reveals only TBT and not other barriers to trade, (ii) it is difficult to find two identical products and (iii) price differences may arise from a market power of domestic and foreign suppliers.

In the *inventory based approach* one analyzes the frequency of TBT, treating this as an indicator of restrictiveness of such barriers. The most common measures of importance of TBT are (i) total number of regulations, (ii) frequency of TBT in operation, (iii) import coverage ratios and (iv) ratio of international to domestic standards. In our work we used the third method, based on a methodology used in Brenton, Sheehy and Vancauteren in order to compare the CEEC's with MPC's. This has been done in the sixth chapter.

The *surveys based analysis* among firms is also quite popular. Companies are asked to evaluate the restrictiveness of TBT's. It is frequently argued that only firms, that are active in

international markets, can properly assess the importance of TBTs. Therefore, using thorough surveys can reveal links that could otherwise remain hidden. They can also serve as a basis for further research. We conducted this sort of analysis in the fourth chapter of our report.

A very common approach to quantifying the effects of TBT relies on the estimation of the difference between actual and potential trade controlling for tariff and NTB's using different functional forms of the so called *gravity model*. The results obtained from such analysis seem valuable. Main problems associated with this approach lie in capturing the border effect that comprises not only of technical standards but also of fiscal and administrative barriers.

Assessing the risk (e.g. of an epidemic) can enable the *cost-benefit* calculations, and indirectly contribute to the measurement of the effect of NTBs. When technical or SPS regulations aim at correcting market failures, one difficulty is to identify the protectionist component of the regulation. If the cost associated with protectionism is larger than the benefit associated with reduction of market failure then one can say that the regulation is a TBT. Such analysis also enables an indirect assessment of such instrument. Some studies (e.g. Otsuki, Wilson, Shevadeh) reveal that in some cases the protectionist effect of more stringent sanitary regulations in the EU can have strong restrictive effect for exports of less developed countries.

The theory of *standardization union* has been elaborated mainly by Gandal and Shy. It provides an explanation why uniform technical regulations applied by the EU may provoke trade diversion, restrict imports from third countries and thus decrease the world welfare. It explains also why protective effect may be more powerful in some sectors (like food industry) in which the compliance costs are relatively high, whereas network effects are close to zero. On the other hand the restrictive effect of technical regulations in sectors exhibiting substantial network effects (like electric equipment) might be only very limited. We provide some empirical econometric verification of the standardization union theory in the fifth chapter.

A popular approach in assessing possible changes following policy shocks is based on simulation studies using *computable general or partial equilibrium models*. The starting point is to formulate a model that is assumed to reflect correctly the structure of the economy. The model is then calibrated to the data – the unknown parameters are either estimated or computed. Once the data is calibrated, the model can be used to simulate policy changes. A number of such models have been used to evaluate the effects of the European integration

process. Such a model – in the GTAP framework - has been used in the fifth chapter in order to evaluate the production, trade and welfare effects of the elimination of TBTs for new member states to the EU.

Chapter 5: The impact of TBT's on trade of the EU (Econometric and simulation analysis).

In this chapter, we quantify the effects of the EU standardization policy on the relative intra/extra EU trade. We have formulated a simple demand driven model based on CES utility functions and estimated the model for years 1995 and 1999 on highly disaggregated trade and tariff data for the EU. The model shows that harmonization (both old and new approach) has a positive and significant effect on the volume of intra-EU imports relative to the imports from outside EU. At the same time, mutual recognition has a slightly negative effect on intra-EU trade.

We conclude that the harmonization approaches are in fact restrictive for extra EU trade and the initial level of technical barriers to trade in sectors covered by harmonization was high. Thus, the demand for the EU products is shifting towards harmonized goods. At the same time, we do not believe that mutual recognition actually impedes intra-EU trade, but we suspect that the level of TBTs in sector where MR was introduced was low initially. Therefore, MR does not improve intra-EU trade in these sectors and at the same time intra-EU trade is shifting towards other sectors due to standardization union effects there.

The second piece of analysis we have provided is the assessment of possible effects of the CEEC accession to the European Union using the GTAP computable general equilibrium model. We model the accession to the single market and the removal of non-tariff barrier through a reduction in so-called iceberg transport costs.

The results of the simulation show that changes in trade volume are between -5 to 25%, depending on the sector and the country. The change in total export volume ranges from 0.8 to 1.6 percent. The export changes cause significant sectoral output changes which, in turn, result in the total changes in GDP. Our results suggest that the total change in GDP is higher in smaller countries (Lithuania and Latvia experience 1.7 and 1.8 percent growth) and lower in larger countries (Poland – 1 percent growth). We also expect, that the welfare change following the policy shock is between 0.5 to 1 percent of GDP value. These simulated changes are slightly higher when we evaluate the long-run scenario where capital accumulation is possible.

Chapter 6: Importance of TBTs for CEEC's and MPC's exports to the EU

From analyzing trade profiles of MPC and CEEC, we came to a conclusion that the pattern of inter-industry trade between these countries and "old" EU member states is generally in line with the neo-classical Heckscher-Ohlin theory, based on relative factor abundance. Majority of them reveal comparative advantage in group three of Neven's classification, i.e. in products requiring high inputs of unskilled labor and low inputs of physical capital. The notable exceptions, among MPC countries, are Algeria and Israel, that perform large exports of high human capital intensive products.

The analysis of the pattern of MPC and CEEC exports, subject to TBT's reveals significant differences. In general the CEEC have a pattern of exports being quite similar to intra-EU trade. It means that in CEEC much larger share of exports is covered by harmonization (OA and NA) approaches than in MPCs. The similar conclusions can be drawn form comparison of revealed comparative advantages in different sectors.

Certainly there are important discrepancies within each group of the countries. In the case of MPC the pattern of Israeli exports is very different from other countries. Israel has much larger share of exports falling into sectors covered by new approach of harmonization (up to 45%). These sectors are falling mainly to the second group of Neven's classification, i.e. products of high technology with large inputs of human capital. The next country having also quite differentiated structure of exports is Turkey. In this case large share of exports to the EU falls into MR approach. The remaining three MPC countries have much lower share of exports covered by harmonization approaches, in comparison with intra-EU trade. Especially, in the case of Algeria a very large part of exports (up to 40%) is subject to no regulation.

The differences within CEEC are less pronounced. Patterns of trade of Czech Republic, Hungary, Poland and Slovakia are very similar in terms of TBT coverage to intra EU-trade. More important differences exist in case of Baltic states, which have slightly lower share of OA sectors, falling mainly into fifth group of Neven's classification, characterized by high share of human and physical capital. In general, the pattern of trade between CEEC is reflecting relative factor endowment, but is not distorted by existence of technical regulations and standards. Nevertheless, it must be recognized that CEEC, possessing previously very distinct system of obligatory standards, made a great effort in adapting their technical regulations to the EU requirements and therefore are able now to benefit from the accession to the EU. The change in the recent years seems to be quite important.

The case of MPC is somewhat different. Three of the analyzed countries (Algeria, Tunisia and Morocco) have a much larger share of exports being subject to no regulations.

This situation reflects different factor endowments, but, at least to some extent, the inability to meet technical regulations or standards in the EU. We can make such a statement on the basis of Israeli and Turkish experience despite the lack of formal proof. The exporters, from these two successful countries (in terms of exporting goods subject to harmonization) do complain about technical barriers they have to face in exporting their goods to the EU. The last section of this chapter and the results of surveys among Israeli firms are quite convincing in showing the restrictive impact of some technical regulations of the EU. The similar conclusions can be drawn from our econometric analysis, presented in the fifth chapter. . In fact, we have concluded that they might be a highly trade divertive effect that is especially strong in the sectors covered by New and Old Approach. This is again especially important in the case of Israel and Turkey. There is also need for greater cooperation between MPC and the EU to avoid the distortion in trade and it also involves informational coordination – providing up to date information to exporters on future changes in regulations to allow them to adapt their products in advance. In the case of the MPC where trade is concentrated in the Mutual Recognition sectors, the obvious solution would be to allow for Mutual Recognition arrangements.

But the one crucial question remains open. Should MPC countries – being largely depended on EU export market - make an effort and approximate (or adapt fully) their regulations with those existing in the EU countries? The potential advantage is quite obvious, and was illustrated by our general equilibrium simulations, demonstrating welfare gains for CEEC countries. On the other hand the acceptance of EU technical regulations, as illustrated by our surveys, requires substantial compliance costs. These costs were unavoidable for CEEC becoming member of the EU. In case of MPC the decision, whether to accept the EU harmonization system, should be based on a more precise cost-benefit analysis.

Introduction

While international trade is becoming more and more liberalised in the sense of reducing tariffs and quantitative restrictions, technical barriers to trade (TBTs) start to attract main attention of international trade economists. Technical standards are often introduced to protect interest of consumers (for health, safety or environmental reasons etc.), but they can also restrict the volume of international trade, as foreign suppliers might not be able to comply with the country's regulatory framework. Such restrictions on foreign competition may decrease welfare by allowing domestic firms to charge higher prices and by reducing the volume of trade. International unification of standards (or their recognition) can have positive output and welfare effects. However, firms complying with national regulations might be required to bear certain costs of adjustment to the new regime. It seems that output, welfare and development implications of standards and TBTs are of crucial importance for modern analysis of international trade.

The recent European Union enlargement has important implications for the issue of technical barriers to trade. The acceding countries had to adopt the EU standardization policy. Removal of trade barriers between old and new members may have an impact on intra-EU trade flows but it can also have important effects for extra-EU trade. The Mediterranean Partner Countries (MPCs) that trade a lot with the European Union can be also affected by the EU policy. This can have important output and welfare effects both for Central and East European Countries (CEECs) and MPC. The main objective of this study is to identify the possible sources of gains and losses from the policy change for both groups of countries.

In the first chapter of our report we present the institutional background for our treatment of technical barriers to trade. We present the WTO regulations concerning technical regulations and standards. We also characterize European Union policy towards technical barriers to trade: mutual recognition and harmonization approaches

In chapter two we present the results of surveys that were completed in Polish and Israeli firms. The questions were mainly touching the subject of necessary adjustment to the European Union standardization Policy, the severity of costs and the extent of benefits that the EU policy gives.

Chapter three presents economic functions of product regulations. It describes the possible costs and benefits of standards and regulations, recognizes the importance of compliance costs and product innovation. It also gives a general view of product regulations in international

context and effects on intra and extra-regional trade. Some conclusions on the specific case of the European Regulations are drawn.

Chapter four gives an overview of the current state of literature on the subject. It includes both theoretical and empirical approaches to measuring technical barriers to trade.

Chapter five tries to evaluate the importance of the EU standardization policy on trade flows. A simple econometric analysis shows the impact of different EU approaches on relative intra-extra EU trade. A computable general equilibrium model in the GTAP framework is also used here to assess the effect of technical barriers to trade within the context of the EU enlargement.

Chapter six follows the methodology applied by Brenton, Sheehy and Vancauteren (2001). It calculates the trade coverage of various standardisation approaches for the Central and Eastern European Countries (CEECs) and Mediterranean Partner Countries (MPCs) trade with the European Union and relate this measure to trade structure of these countries. It analyzes trade flows with the EU of the following six CEEC's countries: Czech Republic, Estonia, Hungary, Poland, Slovenia and Slovakia. Our analysis covers the following MPCs countries, namely: Algieria, Israel, Morocco, Tunisia and Turkey. The analysis also shows the importance of TBTs in the context of revealed comparative advantage. And verifies an existence of a link between trade coverage and factor content of trade of both CEECs and MPCs.

The final part of the report contains the summary and appendixes on trade profiles of CEECs and MPCs countries. The report was elaborated by "northern team" from Warsaw University in Poland (Jan Michalek, Jan Hagemejer and Jacek Rohert) and "southern team" from Hebrew University in Israel (Alfred Tovias and Victoria Roshal). Additional contributions were made by Agnieszka Pugacewicz (to chapter six) and by Katarzyna Sledziewska (to appendixes), both from Warsaw University. Chapter two was written by Mark Vancauteren from WHU-Koblenz in Germany.

I. Definitions of technical regulations and standards as TBT's

The multilateral regulation of technical barriers to trade (TBT's) in the GATT/WTO framework

Introduction

In this chapter we aim at describing international regulations regarding technical regulations and standards. We start with worldwide regulations, as embodied in the GTT/WTO framework and then describe specific European Union's regulations, being especially relevant for Mediterranean countries' exports. Then we will discuss the importance of TBT for production process. In the third chapter we will present different approaches how to measure the impact of TBT's on international trade and provide some empirical evidence. On the other hand we will not discuss all conceptual issues, which might arise in assessing the role of TBT's. These concepts were already discussed in other report submitted to FEMISE network.[1]

The background of WTO Agreements

The provisions of the GATT 1947 contained only a very general reference to technical regulations and standards in Articles III, XI and XX. During the Tokyo Round in 1979, 32 GATT members signed the plurilateral Agreement on TBT. The Standards Code, as the Agreement was called, was not compulsory and laid down the rules for preparation, adoption and application of technical regulations, standards and conformity assessment procedures. The idea of the code was to ensure that international trade would not be hampered by standards draw up to save health, safety and the environment. The economic importance of the code was quite limited.

The new WTO Agreement on Technical Barriers to Trade, or TBT Agreement, has been negotiated during the Uruguay Round (1986-1993). Both, the European Community and the US had the idea that the scope of previous code should be widened and its rules should be made more effective. The EC in particular proposed for negotiations a "code of good practice" for nongovernmental standardization bodies. The US argued for better transparency

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[1] Research no. FEM 21-21 (2005), page 154 and the following.

about bilateral and regional work and agreement on standards. On this basis, after relatively easy negotiations, the new agreement has been reached.[2] It has strengthened and clarified the provisions of the Tokyo Round Standards Code.

The general aim of the TBT Agreement is to ensure that technical regulations and standards, as well as testing and certification procedures, do not create unnecessary obstacles to international trade. However, it is recognized that countries have the right to establish protection, at levels they consider appropriate, for example for human, animal or plant life or for health or environment protection. Countries should not be prevented from taking measures necessary to ensure those levels of protection are met. Therefore, the Agreement encourages countries to use international standards where these are appropriate, but it does not require them to change their levels of protection as a result of standardization.

Basic rules of TBT and SPS Agreements

The WTO is somehow different from the old GATT code. In principle it covers processing and production methods related to the characteristics of the product itself. The coverage of conformity assessment procedures is enlarged and the discipline is more precise. The WTO members elaborated notification provisions applying to local governments and non-governmental organizations. A Code of Good Practice for the Preparation, Adoption and Application of Standards by standardizing bodies, which is open to acceptance, is included as an annex to the Agreement.

During the Uruguay Round the negotiating countries decided to conclude a separate agreement on Sanitary and Phyto-sanitary measures (SPS), being linked to agreement on Agriculture. In fact no country questioned the need for protecting human and plant life and health. The legitimacy of this goal was already expressed in the Article XX:(b) of the old GATT.[3] All countries do apply some sanitary and phyto-sanitary norms. But approaches to negotiations were fairly different. The U.S. argued that SPS measures should be scientifically justified, and should recognize other countries' standards, if these ensured substantially equivalent levels of safety. The European Communities wanted consultation and notification arrangements, similar to those for TBT standards code under the Tokyo Round. But on the other hand the EC argued, that because countries which have achieved high health standards, were appropriate, be allowed to apply SPS standards more stringent than those agreed

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[2] Croome (1995), p. 86-87.
[3] The Article states that measures „necessary to protect human, animal or plant life and heath" are justified.

internationally.[4] The Cairns Group, representing major exporters of agricultural products, stressed mainly that importing countries were responsible for justifying their SPS measures. The WTO SPS Agreement is a sort of a compromise between these different approaches.

In the WTO TBT Agreement the core notions are defined. <u>Technical regulations and standards</u> set out specific characteristics of a product - such as its size, shape, design, functions and performance, or the way it is labeled or packaged before it is put on sale. In certain cases, technical regulations and standards are expressed in terms of a product's process and production methods rather than its characteristics per se. The difference between a standard and a technical regulation lies in compliance. While technical regulations are mandatory, conformity with standards is only voluntary. [5] Therefore, technical regulations and standards, despite many similarities, have different impact on international trade. If an imported product does not fulfill the requirements of a technical regulation, it will not be allowed to be put on sale. In case of standards, non-complying imported products will be allowed on the market, but then volume of sales may be affected if consumers prefer products that meet local standards.

Another crucial notion existing in the TBT and SPS agreements is the <u>conformity assessment procedures</u>. These are technical procedures - such as testing, verification, inspection and certification - which confirm that products fulfill the requirements laid down in regulations and standards. Generally, exporters bear the cost, if any, of these procedures. Non-transparent and discriminatory conformity assessment procedures can become effective protectionist tools.

The <u>TBT</u> agreement contains the following basic principles.

- Avoidance of unnecessary obstacles to trade

- Non-discrimination and national treatment

- Harmonization

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[4] Croome (1995), p. 236-237.
[5] A more precise definition of technical regulation was provided the Appellate Body in
In the EC – Asbestos case. It was clarified that "… a 'technical regulation' is a 'document' which must 'lay down' – that is, set forth, stipulate or provide – 'product characteristics'. The word 'characteristic' of a product include, in their view, any objectively definable 'features', 'qualities', 'attributes', or other 'distinguishing mark' of a product. Such 'characteristics' might relate, inter alia, to a product's composition, size, shape, colour, texture, hardness, tensile strength, flammability, conductivity, density, or viscosity. These examples indicate that 'product characteristics' include, not only features and qualities intrinsic to the product itself, but also related 'characteristics', such as the means of identification, the presentation and the appearance of a product.

- Equivalence of technical regulations

- Mutual recognition of conformity assessment procedures

- Transparency

The first principle is perfectly in line with general objectives of trade liberalization, within the GATT/WTO framework. The Preamble to the Agreement states that "no country should be prevented from taking measures necessary to ensure the quality of its exports, or for the protection of human, animal, and plant life or health, of the environment, or for the prevention of deceptive practices, at the levels it considers appropriate". However, "Members shall ensure that technical regulations are not prepared, adopted or applied with a view to, or with the effect of, creating <u>unnecessary obstacles to trade</u>." (Article 2.2).[6] Therefore the flexibility in introducing more restrictive measures is - in principle - limited.

Avoiding unnecessary obstacles to trade should mean that when it is preparing a technical regulation to achieve a certain policy objective - whether protection of human health, safety, the environment, etc - the regulations shall not be more trade-restrictive than necessary to fulfill the legitimate objective. According to the TBT Agreement, specifying, "whenever appropriate, Members shall specify technical based on product regulations in terms of performance rather than design or descriptive characteristics."[7] This approach should help in avoiding unnecessary obstacles to international trade.[8]

In principle <u>unnecessary obstacles</u> to trade can result when (i) a regulation is more restrictive than necessary to achieve a given policy objective, or (ii) when it does not fulfill a legitimate objective. A regulation is more restrictive than necessary when the objective pursued can be achieved through alternative measures, which have less trade-restricting effects, taking account of the risks non-fulfillment of the objective would create.[9] The obligation to avoid unnecessary obstacles to trade applies also to conformity assessment procedures (Article 5.1.2). An unnecessary obstacle to trade could result from stricter or more time-consuming procedures than are necessary to assess that a product complies with the domestic laws and regulations of the importing country. For instance, information requirements should be no

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[6] Results (The) of the Uruguay Round (1994), TBT Agreement, p. 139. All other citations of TBT Agreement come from the same source.
[7] (Article 2.8) of the TBT Agreement.
[8] For example "the door must be fire resistant with a 30-minute burn through time"; it should not specify how the product must be made, e.g., that the door must be made of steel, one inch thick etc...
[9] Articles 2.3 and 2.4 of TBT Agreement.

greater than needed, and the selection of samples should not create unnecessary inconvenience to the agents (Articles 5.2.3 and 5.2.6).

The principle of <u>non-discrimination</u> was crucial for liberal, market-oriented concept of the GATT. It was enclosed in the Article I (Most Favored Nation: MFN) and Article III (National Clause) of the GATT[10]. The same basic principles are found in the TBT Agreement, which contains MFN and national treatment obligations. Article 2.1 of the Agreement states that "in respect of their technical regulations, products imported from the territory of any Member be accorded treatment no less favorable than that accorded to like products of national origin and to like products originating in any other country". These general rules also apply to conformity assessment procedures. Procedures for conformity assessment shall be applied to products imported from other WTO Members "in a manner no less favorable then that accorded to like products of national origin and to like products originating in any other country" (Article 5.1.1).

The Agreement encourages Members to use existing <u>"international standards</u> or relevant parts of them" for their national regulations, unless "their use would be ineffective or inappropriate" to fulfill a given policy objective. As explained previously, technical regulations in accordance with relevant international standards "shall be rebuttably presumed not to create an unnecessary obstacle to international trade" (Article 2.5). Similar provisions apply to conformity assessment procedures: international guides or recommendations issued by international standardizing bodies, are to be used for national procedures for conformity assessment unless they are "inappropriate for the Members concerned for, *inter alia*, such reasons as national security requirements, … protection of human health or safety, animal or plant life or health, or protection of the environment, … fundamental technological or infrastructural problems"[11].

Widespread participation in <u>international standardizing bodies</u> can ensure that international standards reflect country-specific production and trade interests. The TBT Agreement encourages Members to participate, within the limits of their resources, in the work of international bodies for the preparation of standards (Article 2.6) and guides or recommendations for conformity assessment procedures (Article 5.5). Implementing and enforcing international standards may require technical and financial resources exceeding the capabilities of developing countries. The TBT Agreement eases the impact of certain

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[10] See e.g.: Hoekman, Kostecki (2001), p. 29-31.
[11] (Article 5.4)

provisions whose full application would not be compatible with developing country Members' development, financial and trade needs. Moreover, in view of their particular technological and socio-economic conditions, developing country Members may adopt technical regulations, standards or test methods aimed at preserving indigenous technologies and production methods and processes compatible with their development needs (Article 12.4).

The process leading to the preparation of an international standard can be lengthy and costly. Reaching consensus on technical details can take several years. There is also the time gap between the adoption of an international standard and its implementation by national regulators. Therefore, "Members shall give positive consideration to accepting as <u>equivalent</u> technical regulations of other Members, even if (they) differ from their own, … provided that (they) adequately fulfill the same policy objectives..", even if through different means. This method, known as equivalence, is based on the *European Community's 1985* "<u>new approach</u>" to standardization. (Article 2.7). This issue is analyzed in detail in a subsequent chapter.

<u>The SPS agreement</u> is very similar to the TBT one and concerns the application of sanitary and phytosanitary measures[12]. It is directly linked to the WTO Agreement on Agriculture. The agreement recognizes that governments have the right to take sanitary and phytosanitary measures but that they should be applied only to the extent necessary to protect human, animal or plant life or health and should not arbitrarily or unjustifiably discriminate between Members where identical or similar conditions prevail (article 2.2.).

In order to <u>harmonize sanitary and phytosanitary measures</u> on as wide a basis as possible, Members are encouraged to base their measures on international standards, guidelines and recommendations where they exist (article 3.1). However, Members may maintain or introduce measures which result in "<u>higher standards</u>" if there is "<u>scientific justification</u>" or as a consequence of consistent risk decisions based on an appropriate risk assessment.[13] The Agreement spells out procedures and criteria for the assessment of risk and the determination of appropriate levels of SPS protection. It is expected that Members would accept the SPS measures of others as equivalent[14] if the exporting country demonstrates to the importing country that its measures achieve the importing country's appropriate level of health protection. The agreement includes provisions on control, inspection and approval procedures.

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[12] Results (The) of the Uruguay Round (1994), SPS Agreement, p. 69. All other citations of SPS Agreement come from the same source.
[13] Article 3.3.
[14] Article 4.

The SPS Agreement stresses that Members have the right to adopt SPS measures to achieve their self-determined health protection level. This level, called the appropriate level of protection or the acceptable level of risk, represents a key feature of the SPS Agreement (Article 5). The right to adopt SPS measures to achieve a given appropriate level of protection is accompanied by basic obligations. Essentially, countries may adopt SPS measures provided that the measures:

- are applied only to the extent necessary to protect life or health

- are based on scientific principles and not maintained without sufficient scientific evidence (except emergency or provisional measures); and

- do not unjustifiably discriminate between national and foreign, or among foreign sources of supply (non-discrimination).

Members have two options to show that their measures are based on science. They may either: (i) base their measures on international standards; or (ii) base their measures on scientific risk assessment. The latter provisions are can be interpreted in a different way and may lead to WTO trade disputes.

Finally, both Agreements require appropriate level of transparency. Members of TBT Agreement shall set up "enquiry points" providing information on technical regulations. WTO Members should also notify any new technical regulation, standards and conformity assessment procedures to the WTO Secretariat and inform it about international agreement involving these issues. The number of relevant notifications is several hundred each year, and a large share of them (about 25 per cent) is done by the European Union. The relevant data are presented in Figure I-2 and Figure I-3.

Figure I-1: Number of modified TBT measures, 1995-2001
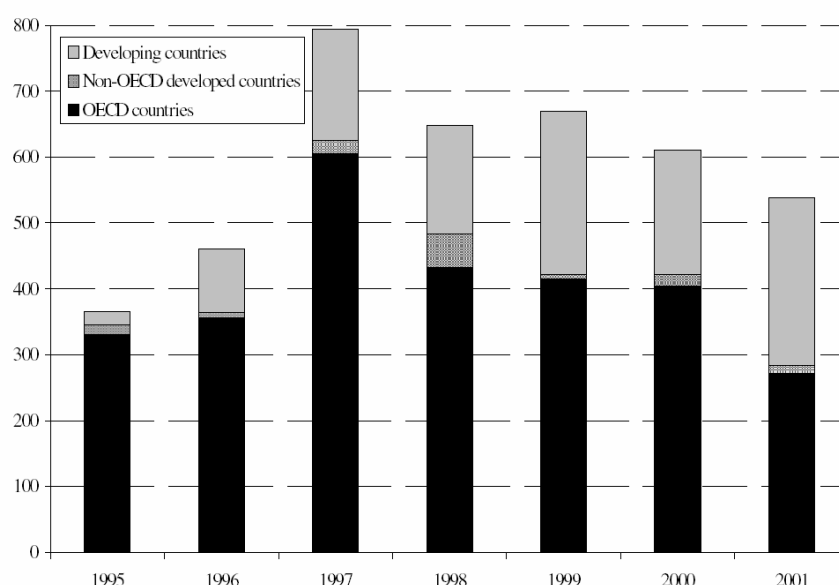
Source : OECD Secretariat based on WTO information (document G/TBT/11). Quoted from: OECD (2003)

Figure I-2: TBT notifications of technical regulations and standards (by major notifying countries), 1995-2000

	1995	1996	1997	1998	1999	2000
Argentina	0	1	0	1	16	37
Australia	20	18	26	12	35	10
Brazil	1	9	35	43	17	12
Canada	29	20	30	115	24	26
Czech Republic	12	14	1	6	28	52
European Union[a]	123	123	437	276	185	156
Japan	50	41	35	28	30	56
Korea, Rep. of	13	9	14	8	22	27
Malaysia	1	19	12	28	98	3
Mexico	29	27	29	35	34	28
Switzerland	4	12	21	7	22	9
Thailand	7	13	22	34	22	9
United States	33	40	33	35	49	32
Total	365	460	795	648	672	611

Source: WTO Annual Report (2002), p. 37

The similar transparency provisions are included in the SPS Agreement. Here, the number of notifications initially was smaller but by year 2000 is equally large.

Figure I-3. Number of notified SPS measures 1995-2002
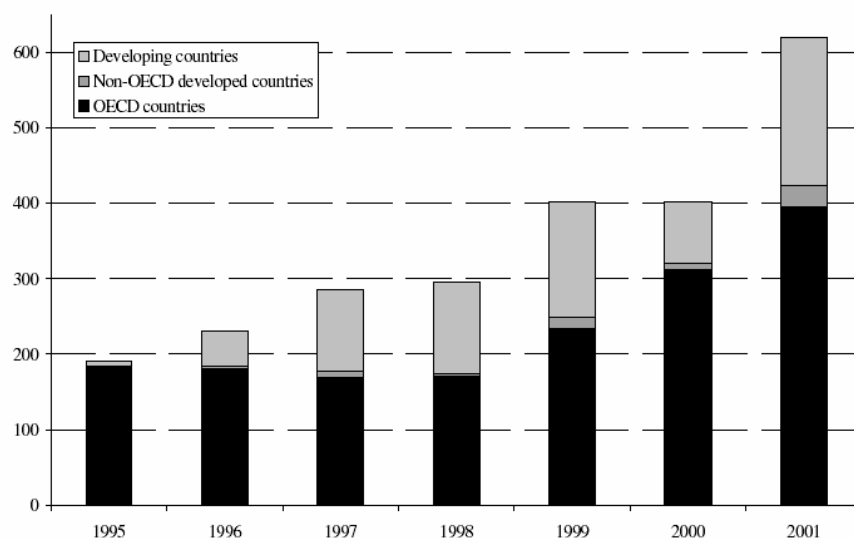
Note: Corrections, revisions, and addenda to previous notifications of SPS measures are not included.
Source: OECD Secretariat based on WTO information (documents G/SPS/N). Quoted from OECD (2003), p. 31.

WTO trade disputes

As we pointed out there are some issues regulated by both Agreements which cause trade disputes among the WTO members. The most controversial ones regard the appropriate level of standards, "avoiding unnecessary obstacles to international trade", and "scientific justification" of applied higher, technical regulations or standards. The two famous cases, against EU importers, involve "measures affecting meat" /hormones/(WT/DS 26) and "trade description of scallops" (WT/DS 7, 12, 14).

In 1996, the United States requested consultations with the European Communities claiming that measures taken by the EC under the Council Directive Prohibiting the Use in Livestock Farming of Certain Substances Having a Hormonal Action restrict or prohibit imports of meat and meat products from the United States, and are apparently inconsistent with GATT Articles III or XI, SPS Agreement Articles 2, 3 and 5, TBT Agreement Article 2 and the Agreement on Agriculture Article 4. The EC totally banned the usage of hormones promoting the meat growth, while some level of hormones application is allowed by international standards (*Codex Alimentarius*). After examination and appeals, in 1996 the WTO Appellate Body supported the finding that the EC import prohibition was inconsistent with Articles 3.3 and 5.1 of the SPS Agreement. Therefore, the Dispute Settlement Body (DSB) recommended that the EC bring the measures into conformity with WTO rules within a "reasonable period of time". Because it did not happen in 1999, Canada obtained from the DSB the authorization

to suspend obligations up. The EC refusal to accept panel findings was based on the risk analyses carried out, by EC experts. They concluded that the avoidance of intake of oestradiol 17ß is crucial to human health and that, consequently, their usage should be prohibited. With respect to other hormones, and on the basis of the available pertinent scientific information reflected in the above-mentioned risk analyses, the European Communities provisionally prohibited the placing on the market of meat containing these substances because the relevant scientific evidence was insufficient. This dispute raised the crucial question of having the right to take SPS measures necessary to protect human health and life and of providing appropriate scientific justification.

In the second case Canada, Peru and Chile complained against French Government Order laying down the official name and trade description of scallops. Complainants claimed that this Order will reduce competitiveness on the French market as their product will no longer be able to be sold as "*Coquille Saint-Jacques*" although there is no difference between their scallops and French scallops in terms of colour, size, texture, appearance and use, i.e. it is claimed they are "like products". Violations of GATT Articles I and III and TBT Article 2 were alleged. The two panels concluded their substantive work, but suspended the proceedings in May 1996 because the parties reached – via consultations - a mutually agreed solution. The dispute was settled by the implementation of a French new order. Scallops are henceforth to be marketed in France under the name "*Coquilles Saint Jacques*" or "*Noix de St. Jacques*", followed by the scientific name of the species. Moreover, the country of origin must be indicated on the label. The "scallops case" demonstrated that the labeling requirements and description of products might have negative consequences for other countries' exports.

The description of worldwide WTO regulations and presentation of those two cases demonstrate that technical regulations can create a technical barrier to international trade. That is why the member states of the European Union made a great effort in eliminating TBT's within the Internal Market. The governing principle is quite straightforward; a free movement of goods requires that a producer legally manufacturing a good in one member country should also be able to commercialize it in all other EU states. But there are diversified approaches in solving this problem.

Importance of technical standards in the European Union

The European Union defines technical barrier to trade as a situation when a producer from one Member State who wants to sell his/her product in another Member State must meet different technical regulations (or standards). A situation when a product needs additional testing or certification procedure before it is allowed to be marketed in another country is also considered a technical barrier to trade (TBT)[15].

The European Union, being member of the World Trade Organization, applies the rules, which have to be consistent with the WTO provisions. Therefore, all above described rules do apply to the EU as well. In particular, the Union distinguishes between mandatory technical regulations and voluntary standards. Technical regulations are imposed by the government or other law-setting bodies and apply to technical characteristics, testing and certification procedures. Standards are imposed by other institutions – consumers associations, industry chambers, insurance companies and other non-government organizations. It happens quite often that a producer who wants to sell the product in a particular market must meet also the non-obligatory standards. In such cases, a standard would be considered a TBT. Moreover, standards that are *de jure* not mandatory may be *de facto* obligatory. For example, a pressure vessel has to be insured. The insurer however, may require that the product meet certain safety standards. In such a case a standard becomes obligatory (in practice).

Article 30 of the EEC Treaty prohibits technical barriers to trade. However, as with many other rules, there are some exceptions – Article 36 of the Treaty allows the existence of technical barriers to trade on the grounds of consumer or environmental protection, public morality, public policy or security, protection of health and life of humans, animals or plants, protection of national treasures or the protection of industrial and commercial property[16].

Since TBTs restrict trade in a similar way a tariff does while not generating tariff revenues, the existence of TBTs between the Member States may reduce welfare in the EU. According to the famous Cecchini Report (Cecchini, 1998; Emmerson et al. 1988) the cost associated with existing technical barriers to trade was estimated to be as high as 2–2.4% of the EU GDP. One can list a number of sources of additional costs associated with technical regulations that differ between the countries. The examples could be:

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[15] European Commission (1998), p. 17.
[16] European Commission (1998), p. 1.

- The cost of research, design, technical documentation needed for the manufacturing of the same product adjusted to different regulations in another market;

- The cost of additional marking and labeling of the product in order to sell it in another market (due to, say, language differences);

- The cost of lowering the scale of production, which results from necessity of producing a number of different varieties of the same product;

- The cost of additional testing and certification procedures;

- The cost of training of production staff so that the employees know different technical regulations and standards.

These costs may turn out to be quite significant. The existence of these costs made the Member States of the EU introduce a Single Market Program (SMP). The purpose of the Single Market Act was to make the EU a single market where no technical and other barriers to trade remain. If a product is supposed to meet certain technical regulations, these regulations should be the same in all EU countries or each Member State's regulation should be treated as an equivalent of any other Member State's regulation. Next section will present in a more detailed way the EU approaches to removal of TBT.

Different approaches to standardization in the European Union

The approach of the European Union to the removal of TBT is twofold. It bases either on (i) Mutual Recognition (MR) Principle or on (ii) Harmonization. The MR Principle states that any product legally manufactured and marketed in one country of the EU must be allowed free entry in any other market of the EU. The Harmonization approach applies when the MR Principle fails to work. It is based on the unification of standards and regulations among the Member States.

Mutual Recognition

The simplest and most convenient form of removal of TBTs is mutual recognition of national standards and regulations. Under Mutual Recognition Principle (MRP) "goods lawfully manufactured and marketed in one Member State must be allowed free entry into other Member States."[17] The MR policy has been developing since the late 1970s, mostly by

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[17] European Commission (1998), p. 2.

precedence. The case that is most often cited in the literature is the decision of the European Court of Justice, dated 20 February 1979, about liquor *Cassis de Dijon*. The Court decided that the liquor lawfully manufactured in France must be allowed free entry into German market.

In practice the mere fact that a product is lawfully manufactured in one market does not guarantee a free entry into other market. Authorities and/or consumers of the importing country quite often require a formal proof that particular product actually does meet the source country's standards. These standards in turn are expected to meet health and safety objectives of the importing country. The MRP therefore often requires cooperation between attestation and certification bodies in Member States or the so-called Mutual Recognition Arrangement (MRA) between these bodies.

One can distinguish three levels of mutual recognition[18]:

High level, when different national regulations are considered equivalent without any further procedure;

Medium level, when countries mutually recognize accreditation systems for testing and certifying bodies (i.e. countries recognize the competence of bodies);

Low level, when the mutual recognition between certain bodies applies only to testing and certifying of certain products.

In order to foster the dissemination of information about technical regulations and standards the Member States are obliged to inform European Commission (and other Member States) about any changes in legislation. Moreover, before the changes take place, a country that wants to change its legislation, should take into account possible comments from the notified Member States. We can see that the system here, in line with transparency rule, is quite similar to the WTO notification requirements in TBT and SPS Agreements.

The effectiveness of MRP in removing TBTs in the European Union varies. For example in case of electric cables, there are some mutually recognized standards and an MRA between the Member States exists. The barriers that remain are relatively unimportant. On the other hand, in case of prepared food and drinks there are still strong regulatory barriers as well as high compliance costs and the MRP does not work.[19]

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[18] European Commission (1998), p. 3.
[19] European Commission (1998), p. 3.

The MRP may fail to work, i.e. countries may not want to recognize each other standards for a number of reasons. The reasons can be legitimate (one country is really more strict about some issues and does not want to let in products that do not meet high enough standards), illegitimate or simply the countries can be unable to determine whether the product actually does meet the source country standards.

If the countries cannot agree to mutually recognize each other standards a solution can be to make the countries apply common standards, i.e. to harmonize regulations between the Member States. Such harmonization of standards rules out technical barriers to trade (countries have same regulations). Firms can take advantage of economies of scale. In some sectors, harmonization of standards allows firms to benefit from the so-called network effects[20]. We will discuss this approach below.

Harmonization

Harmonization of standards is needed when the MRP fails to remove technical barriers to trade, i.e. when the Member States do not want to recognize each other standards and regulations. The evolution of harmonized regulations is quite impressive. In 1975 there were 20 EU-wide (i.e. common for all states) regulations. In 1999 – almost 5.5 thousand. The institution that plays the key role in harmonizing technical regulations and standards is European Standardization Institute (Comite Europeen de Normalisation – CEN). The members of the EU participate in the proceedings of CEN.[21] In principle, harmonization relies on the superiority of the EU law over national law. There are two approaches to harmonization in the European Union. The traditional, Old Approach and the more recent, New Approach. Both will be discussed below.

Old approach

The traditional approach of the EU to harmonization is often called the Old Approach (OA). It gives a very detailed instruction on the characteristics of a product as well as on the process of production. Most of the Old Approach directives apply only to narrow product groups and to specific health, environmental and safety characteristics.

One problem with the OA is that it is time consuming. It is very difficult for all members states to reach a compromise on the final shape of the legislation. In order to reach a common set of standards, some (usually all) countries must change their legislations. This can be costly

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[20] This issue will be discussed in a more detailed way in Chapter 4.
[21] This means that other non-member states (like MPC) can not influence the content of negotiated technical regulations or standards.

for the firms from those countries. Therefore each country would like to have common standards as similar as possible to their own standards in order to minimize adjustment costs for their domestic firms.

Some authors argue that such detailed legislation can also be an obstacle to technological progress (see the third chapter). The argument is that the firms must meet detailed requirements specifying also the technology of production. Then, any changes in the technology of production that were supposed to make the production process more efficient, must be in accordance with the law. If the legislation is too detailed (everything is regulated) then changes in the technology of production take place less smoothly and technological progress can be slowed down.

At the moment the OA directives are applied mostly in sectors such as: chemicals, pharmaceuticals, food processing, labeling and motor vehicles. Health and safety requirements are especially important in these sectors. In other sectors the OA is replaced by the New Approach directives. .

New approach

Since mid-eighties of XX century the EU is shifting slowly towards the so-called New Approach (NA) to harmonization, which was initiated by the Council of Resolution in 1985[22]. It bases on setting only essential requirements for the most important characteristics of the products. NA directives apply to groups of products with similar characteristics, when national legislations differ.

The first directive that is associated with the New Approach is the Low Voltage Directive[23] (LVD: 73/23/EEC). It dates back to 1973[24] so formally it actually precedes the New Approach by 12 years. It applies to all electrical equipment except for high-voltage machinery and power plant equipment. The harmonization in this sector was possible, because the largest firms in the industry became multinationals and were interested in the agreements that would allow them to benefit from economies of scale. In effect, main European producers supported by CENELEC[25] agreed to apply common standards concerning safety issues. They also agreed to recognize each other testing and certification procedures.

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[22] 85/C 136/01
[23] Sometimes this directive is treated as a third approach to harmonization (European Commission, 1998, p. 4.).
[24] 73/23/EEC
[25] Comité Européen de Normalisation Electro-technique

LVD gives a clear instruction of what is needed for a NA directive to be effective. The conditions would be: industrial interest in removing TBTs (like the existence of multinational companies) and MR arrangements for certification and testing.

New Approach (comparing to OA) makes it easier for the producers to declare conformity with the EU technical regulations. Therefore it improves the efficiency of the European standardization bodies. For practical purposes, NA requires the appointment of Notified Bodies for testing and certification. The role of these bodies is defined by each NA directive. This leads to greater cooperation between the testing and certifying bodies established in each country. The visible effect of the New Approach is the CE-marking of products. Every product that meets all relevant requirements and conforms all relevant directives is affixed the CE-mark by either manufacturer or importer established in the European Union.

A number of sectors are now covered with the NA directives. The examples are (directive symbol in brackets): simple pressure vessels (87/404), toy safety (88/373), construction products (89/106), electro-magnetic compatibility (89/336).

New Approach seems to be quite effective in removing technical barriers to trade. In case of many sectors either no barriers remain (fully functioning Simple Pressure Vessels Directive – 87/404/EEC – for air reservoirs) or the remaining barriers are not significant (like in case of cardiac pacemakers, regulated by fully functioning Active Implantable Medical Devices Directive – 90/385/EEC). In sectors where the barriers (regulatory or non-regulatory) do remain (circular saws, portable power tools or domestic gas cookers) the compliance costs are usually quite low[26].

The effectiveness of different approaches

Table I-1 presents the effectiveness of the EU attempts to remove technical barriers to trade. One can see that only 10% of products are affected by technical barriers to trade that either were "ignored" by the Commission (no measures taken) or not removed at least partially (measures adopted but not effective). On the other hand, the number of products, for which barriers were successfully (i.e. fully) removed, is not really impressive. Only in case of 18% of all products have the barriers been successfully removed (which is less than a quarter of all products affected by various TBTs). Thus, although there has been already some success in TBT removal in the European Union, there is still a lot to be done.

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[26] All examples are taken from European Commission (1998), p. 5.

Table I-1 Effectiveness of EU approaches to removal of TBTs.

	% share of intra-EU trade
Barriers successfully removed	18
Measures implemented and working, but other barriers remain	46
Measures adopted but problems/delays in implementation	7
Measures adopted but not effective	9
Barriers exist, but no measures taken	1
No barriers, no measures required	19
All products	100

Source: European Commission (1998) p. 6.

The broad sectoral progress in elimination of barriers resulting from both harmonization and applying Mutual Recognition Principle is presented in Table 2. We can see that the success in removing TBT is not uniform across different sectors. There are sectors with all barriers removed (such as agriculture, textiles, food) and those where only 20% of barriers were successfully removed (motor vehicles). We can also see that the full removal of a barrier to trade does not depend on the approach. Food industry is covered by harmonized regulations while textiles by MRP. For our research harmonized regulations are more interesting since they put a direct obligations on exporters to the EU and can be a source of additional adjustment costs (if an external firm, say from Israel or Algeria, wants to export to the EU). In Chapter 3 we will study possible problems that exporters to the EU might face in order to meet the EU regulations.

Table I-2. Number of standards implemented: success of different measures in removing TBTs within the EU – a sectoral breakdown.

Sector	Measures	Share of technical barriers removed (%)
Agriculture	Harmonised food regulation	100
Raw materials	MRP	100
Food	Harmonised food regulation	100
Textiles	MRP	100
Clothing	MRP	100
Leather	MRP	100
Wood	None	35
Paper and printing	Packaging and waste directive, European Copyright system	75
Petroleum	MRP	100
Chemicals	Detailed directives and MRP	40
Non-metallic Minerals	CPD	25
Iron, steel	Standards (Construction products (CPD))	35
Other metals		45
Metal products	CPD, Public procurement	45
Motor vehicles	Harmonised regulation	20
Other Transport Equipment	Harmonised regulation and public procurement	55

Electronic equipment	Standards (Machinery Directives)	25
Machinery nec	Standards (Machinery Directives)	25
Manufacturing nec		25
Utilities	None	25
Trade		55
Transport		80
Financial services		80

Source: Maliszewska (2002), p.17-18

Economic significance of different approaches

Standards and regulations play a significant role in the EU economy. According to the Commission Report (1998) only 21% of all products were not covered by any type of national or EU regulation. The remaining 79% were (or will be) covered by several types of regulations. Some of those regulations constitute a technical barrier to trade. 51% of the

regulated products are covered by either old or new approach to harmonization (including the LVD). A separate group (9% of the regulated products) consists of products covered by MRP. The examples of such products are electrical equipment, cables or computer machinery. Table I-3 shows the percentage of trade between the Members of the EU that is covered by different approaches to TBT removal. The data in the table is for 2003 and refers to intra-EU trade only (i.e. it does not take into account home sales). It shows that more than 50% of intra-EU trade is covered by harmonized regulations and over 30% is covered by some kind of mutual recognition. Only 13% of intra-EU trade is not covered by any type of technical regulation. Chapter 6 will present a more detailed analysis of trade coverage of different EU approaches to technical barriers to trade. It will focus on the importance of different approaches for the EU trade with Mediterranean Partner Countries and Central and Eastern European Countries.

Table I-3. Percent of Intra-EU trade covered by different approaches to TBT in 2003.

Approach	% of Intra-EU trade
OA	29,1
OA+MRA	1,9
OA+MRP	2,5
MRA	10,3
MRP	17,6
NA	19,1
NA+MRA	4,2
NA+MRP	2,3
No regulation	13,0

Source: Own calculations based on Eurostat data.
Notes: OA – Old Approach; NA – New Approach;
        MRP – Mutual Recognition Principle; MRA – Mutual Recognition Agreement

Every year there are proposals of new regulations coming from the Member States. In 2002 there were 508 drafts notifying new proposals of regulations. The largest number of notifications were issued by the Netherlands (88 notifications). The second country that issued the largest number of notifications was France (55 notifications). Broken down by sector, the notifications were most numerous for foodstuffs and agricultural products (20% of all drafts), transport (17%) and telecommunications (14%). These are the sectors where regulations are already to a large extent harmonized (the first two fall under the OA directives while telecommunications falls under the NA directives).

If the Commission decides to form EU-wide directive addressing the issue that was raised in the notification sent by a Member State, the country that sent the notification should postpone the introduction of the legislation. In 2002 this was the case only for 8 notifications (out of 508). Somewhat more significant was the number of observations and detailed opinions that followed the notifications. Member States sent 199 observations and 111 detailed opinions to the notifications. Every country that sent the notifications should take those observations and opinions to account before implementing new regulation.

From the point of view of exporters from Mediterranean countries removing of TBT within the European Union should be beneficial. They do not have to focus on one market. Once they are allowed entry to one EU market, they would automatically have access to the whole EU. On the other hand, if harmonization of the EU legislation moves towards making the standards more stringent, it could mean that the firms from Mediterranean countries would have to bear certain adjustment costs in order to be able to export to the EU.[27]

* * *

Summing up, the general aim of the WTO Technical Barriers to Trade (TBT) and Sanitary and Phyto-saniatary (SPS) Agreements is to ensure that mandatory technical regulations and voluntary standards, as well as testing and certification procedures, do not create unnecessary obstacles to international trade. However, it is recognized that countries have the right to establish protection, at levels they consider appropriate, for example for human, animal or plant life or for health or environment protection. Countries should not be prevented from taking measures necessary to ensure those levels of protection are met.

Therefore, the Agreements encourage countries to use international standards where these are appropriate, but it do not require them to change their levels of protection as a result of standardization. In the case of SPS Agreement members may maintain or introduce measures which result in "higher standards" if there is "scientific justification" or as a consequence of consistent risk decisions based on an appropriate risk assessment. Some of these issues cause trade disputes among the WTO members. The most controversial ones regard the appropriate level of standards, "avoiding unnecessary obstacles to international trade", and "scientific justification" of applied higher, technical regulations or standards.

The European Union, being one of the members, applies the rules, which have to be consistent with the provisions of the WTO. The EEC Treaty prohibits technical barriers to trade in general. However, there are some exceptions allowing the existence of TBT on the

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[27] The impact of TBT on trade flows will be discussed in Chapter 5.

grounds of consumer or environmental protection, public morality, public policy or security, or protection of health and life of humans.

According to reports from late 1980's the cost associated with existing TBT's was estimated to be as high as 2.2% of the EU GDP. The approach of the EU to the removal of TBT was and is twofold. It bases either on (i) Mutual Recognition (MR) Principle or on (ii) Harmonization. The MR Principle states that any product legally manufactured and marketed in one country of the EU must be allowed free entry in any other market of the EU. The harmonization approach is based on the unification of standards and regulations among the Member States. Harmonization of standards is needed when the MRP fails to remove TBT's, i.e. when the Member States do not want to recognize each other regulations and standards.

The traditional approach of the EU to harmonization is so-called the Old Approach (OA). It gives a very detailed instruction on the characteristics of a product as well as on the process of production. Since mid-eighties of XX century the EU is shifting slowly towards the New Approach (NA). It bases on setting only essential requirements for the most important characteristics of the products. The data for 2003 show that more than 50% of intra-EU trade is covered by harmonized regulations and over 30% is covered by some kind of mutual recognition. Only 13% of intra-EU trade is not covered by any type of technical regulation. The success in removing TBT is not uniform across different sectors. In some sectors, like food products or chemical products technical regulations can be especially important and create a trade barrier for other exporters.

Next section will present results obtained from surveys made among Israeli and Polish firms that face EU regulations. We will analyze how difficult is the adjustment to the EU norms for those firms. We will also study whether different EU approaches to standardization affects the exporters from Israel and from Poland.

II. The analysis of the importance of TBTs in trade with the EU for Polish and Israeli firms

Motivation for research

Opinion polls may be the source of interesting and important information we are not able to obtain from economic models. The companies provide us with detailed knowledge on specific problems they experience in their everyday activity. The idea of the survey was to receive opinion of Polish and Israeli companies on technical regulations and standards imposed by the European Union. In personal, telephone and email interviews we posed a set of questions directed to three industries: food, chemical and electrical. The firms were asked to assess the impact of technical regulations and norms on their activity, regarding costs and possible benefits. We also posed a number of sector-specific questions relating to particular standards and obligations effective in these industries. First section describes our methodology. The following two sections present Polish and Israeli results. The fourth section provides a comparison of country reports and the last section concludes the survey analysis.

Sampling methodology: Poland

In case of Poland, the questionnaire was made six months after accession to the European Union. The following industries were analyzed: food processing (NACE 15), chemical (NACE 24) and electrical (NACE 31). The main reason behind this choice was the extent of various EU regulations and standards effective in those industries. These industries also constitute relatively large shares of total Polish production (33%) as well as exports (19%) - see Figures 1. and 2. below[28].

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[28] Numbering of figures in this section is independent of the numbering of figures of the whole report. It is due to a technical difficulty.

Figure 3. Industry shares in total sold production, 2003, nominal terms
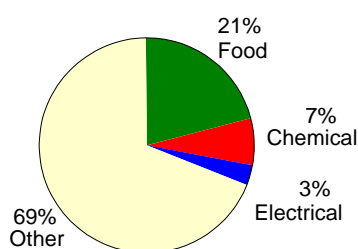
Source: Central Statistical Office, Poland

Figure 2. Industry shares in Polish exports, 2002, nominal terms
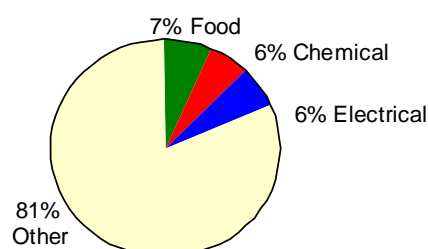
Source: STAN Database

Two methods of data collection were used: personal interviews with 96 firms and email questionnaires, to which 55 firms responded. Altogether, 155 Polish companies answered provided us with their opinion; among them 54 firms belonged to food, 46 to chemical and 55 to electrical industry. In case of personal interviews in food and chemical industries, two initial sampling criteria were imposed: 60% of the sample should be exporters and the companies should origin from 16 different administrative regions of Poland. The firms were asked to answer a number of general questions (same set for all three industries) and additional number of sector-specific questions (different in each group).

Sampling methodology: Israel

Figure 3: Domestic market shares, 2004
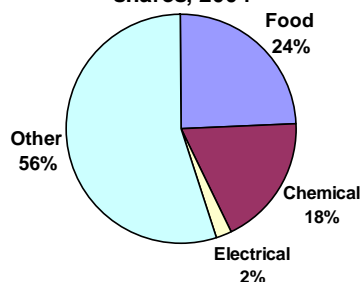
Source: Central Bureau of Statistics, Israel

Figure 4: Shares of exports to the EU, Jan-March/2005
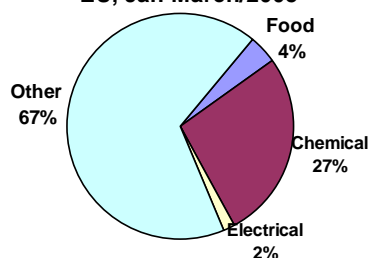
Source: Exporting Institute, Israel

The questionnaires that were used in the Israeli survey were very similar to those used for Polish industries, but the methodology of sampling was slightly different and a few irrelevant questions were omitted. The effect of the expansion of the EU after May 2004 was not analyzed. Instead, we investigated general problems that firms exporting to the EU faced.

In the Israeli survey, we considered only companies exporting to the European Union. 84 firms replied to the questionnaire: 36 in the food industry, 31 in the chemicals and 17 in the

electrical industry. The number of firms in each sector differs due to specific market structure of Israeli industry: the food sector consists of few large firms and a number of small firms, the chemical industry is very concentrated and the electrical sector is very small.

We contacted the firms by telephone in order to get in touch with competent people being able to answer the questions, but the vast majority of answers were received by fax or e-mail. However, part of the exporters were interviewed by phone, which allowed them to raise some specific additional problems, not covered by the standard questionnaire.

We did not ensure that the firms were spread evenly across the country, because this is irrelevant for such a small country as Israel. Especially in the chemical and the electrical industries, firms choose their location basing on the access to raw materials or proximity to business centers, seaports, cheap labor force etc. Therefore, we considered the entire country as a single region.

Country report – Poland

Surveys prior to accession

There were two similar opinion surveys made before accession of Poland to the EU. They considered various obstacles regarding technical regulations in exports to the EU faced by Polish companies. Firstly, Gorzelak and Żołkiewski (2002) reported opinion of 96 firms, mainly big companies from food and chemical sector. According to their results, over one third of the sample expressed some difficulties in selling due to specific technical regulations. However, the overall cost-benefits balances were assessed as neutral by 90% of the respondents. Harmonization and Mutual Recognition principle were perceived beneficial by almost 70% of companies from the sample. Other regulations, such as abolition of customs declarations, were also quoted as potentially beneficial.

Second survey by UKIE (2003), published in Marczewski (2003), included 272 Polish firms mainly from machinery, furniture and textile industries, where 70% of them were exporters to the EU. In this opinion poll most of the companies expressed their balanced interest in the technical regulations. Only smaller exporters assessed unification of standards as very beneficial. On the other hand these firms were the least prepared to meet the new EU regulations, including compulsory directives.

Analysis of general questions

In our personal survey, among 63 exporting companies (from all three sectors) only 9 (about 14%) faced some difficulties while selling their products in the EU market after 1 May 2004. More than 80% did not face any difficulties.

The percentage of firms that had to redesign their product so that it would meet the EU requirements varied from 25% to 31% depending on the NACE group (see Figure 5). The smallest share was found in the electrical industry, where only 25% of the sample had to redesign the product to fulfill the new EU requirements. Electrical sector also claimed that there were only minor investments required. The percentage of firms that had to redesign their product in the food industry reached 31%. In this case, vast majority (90%) had to make significant investments to achieve this goal (see Figure 6).[29]

Figure 5. Have you had to redesign your product?
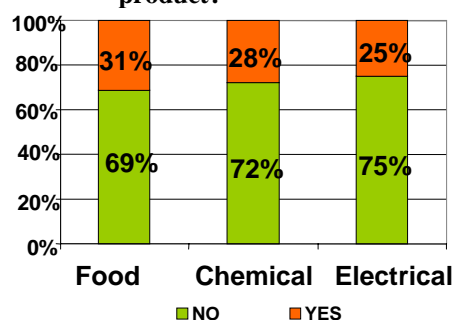
Figure 6. How many firms declared major investments?
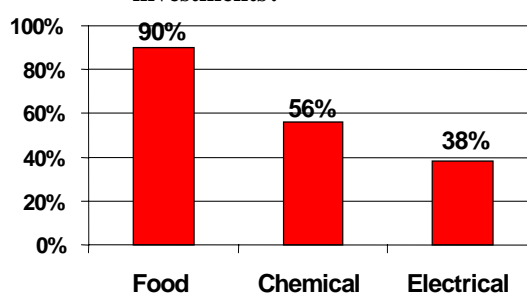
Harmonization is perceived as being beneficial in case of food and electrical sector (54% and 51%, respectively). Only 33% of chemical industry assessed this procedure positively, while opinion of 46% was neutral. Only 14 firms in the whole sample (9%) reported that harmonization of technical standards within the EU was harmful regarding their economic activity.

Slightly more than half of the interviewed companies answered that *mutual recognition* (MR) principle had beneficial effect on their activity. Most of them come from the food and the electrical industry. Only 37% of the firms from the chemical industry assessed MR effects positively and 46% said that MR has been negligible. It is possible that the firms in the chemical industry have had to meet Polish standards long before the EU enlargement. These standards were in line with new EU regulations, thus chemical companies did not notice any benefits from the MR principle.

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[29] These results were taken from personal interviews only, due to incomparable differences in questions 1, 2 and 3. in the email survey.

In all three sectors no more than 50% of the firms reported increase in the cost of certification of their products (Figure 7). The highest percentage of those firms (54%) was found in the food industry. Only 35% of the chemical industry noticed the rise, and 42% in the electrical industry. A large number of firms replied that the cost of certification had not changed since Poland joined the EU (about 30% in food and chemical industry and 40% in electrical industry).

Figure 7. Additional cost of certification

Legend: ■ increased □ remained unchanged ■ decreased □ hard to say/ not applicable

Figure 8. Cost of detailed labeling

Legend: ■ high or very high □ negligible ■ low □ hard to say
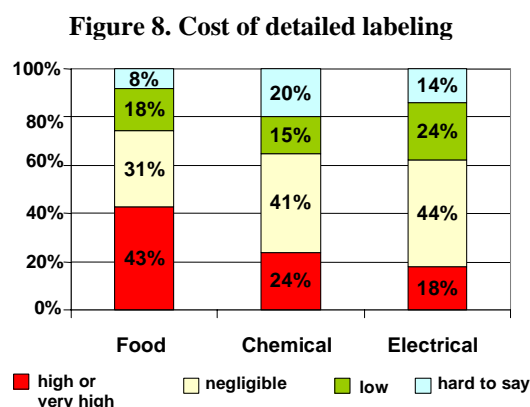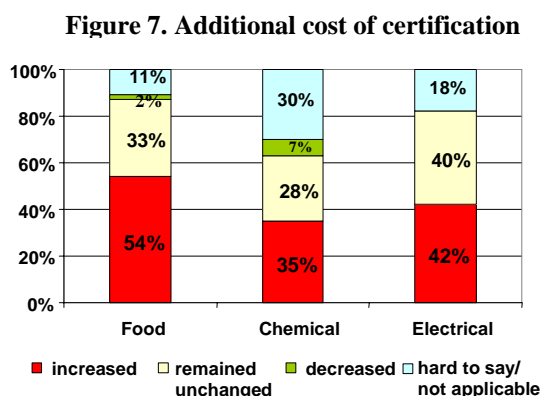
Less than half of the firms assessed the cost of providing detailed information on the labels as high (Figure 8). The largest number of firms pointed at the answer that this cost was regular, only the food sector reported the increase of this cost slightly more often (43%). More than a half of the exporters admitted that unification of the legislation and standards in the EU was beneficial for their activity (Figure 9). However, opinion of the food industry was slightly worse.

Figure 9. Impact of unification of standards

Legend: ■ beneficial □ no effect ■ harmful □ hard to say
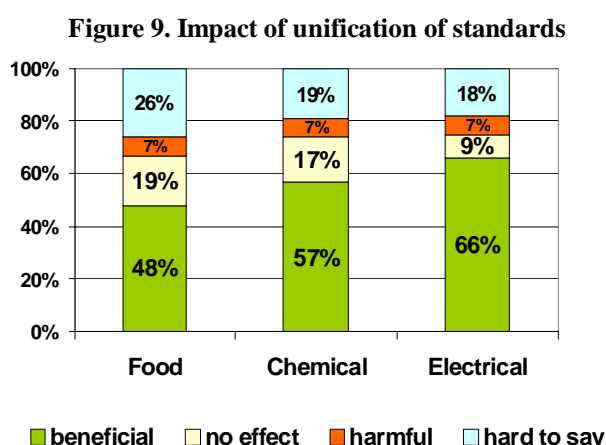
We also asked about the voluntary ISO system. A large percentage of all firms stated that they were interested in implementing ISO-9000 norms. However, about 26% of firms were not going to implement the ISO-9000 norm or have never heard of it. More than half of the firms were not going to implement the ISO-18000 norm. Similarly, more than half of the firms in

two sectors – food processing and electrical machinery – were not going to implement the ISO-14000 norm. Only the chemical industry was interested in the implementation of this norm. General attitude to Poland's membership in the EU is rather positive (see Figure 10). 54% of the whole sample thought that the membership in the EU was beneficial for them (taking into account opportunities and possible adjustment costs).

Figure 10. Assessment of benefits and costs balance (three industries together) after accession.
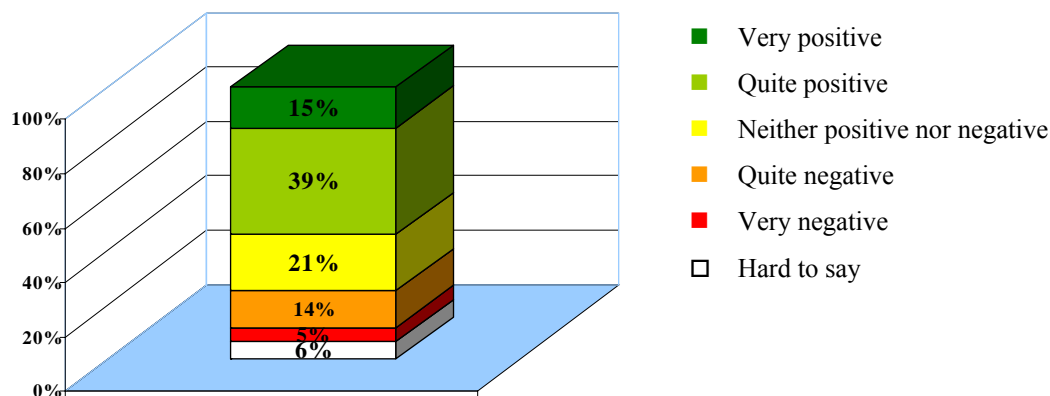
However, still large number of firms does not notice particular benefits from the membership, or these benefits do not seem to outweigh adjustment costs. In addition, 19% of the firms reported that the accession is harmful for them. Let us now present industry specific questions and replies.

Food-processing industry (NACE 15)

In general, the firms regard the Polish EU membership as beneficial (half of the food sector sample reported this answer). However, 20% of the firms are indifferent in this matter. Another 20% answered that the adjustment costs of the EU standards outweigh potential gains from the membership. More than 30% of firms had to modify their product so it would meet the EU requirements. To achieve this, as many as 90% of them had to make major investments.[30] Most of the food processing firms (54%) had positive attitude to the *harmonization*. At the same time 22% claimed that harmonization would not affect them and 13% assessed the negative impact. The crucial issue regarding adjustments in the food industry was HACCP system.[31] In our questionnaire, only 6% of the firms had not implemented the system and had no intention to do so. However, the implementation cost was estimated as high. This might be due to high investments in staff trainings and/or adjusting the

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[30] The food sector was the only one in our sample that required high investments.
[31] HACCP - Hazard Analysis and Critical Control Point. The aim of this compulsory system was to guarantee that products do not pose threat on consumers' health.

buildings to meet sanitary requirements within HACCP system. However, almost half of the firms estimated increase of the average cost of production due to this adjustment as low (less than 5%). This may suggest that Polish companies expect benefits from the HACCP as it enhances their capacity and competitiveness in the future.

More than a half of the firms in food industry reported that the EU requirements regarding materials in contact with food were beneficial for them. Most of them also stated that the EU regulations for regular medical check-ups of employees did not change the cost of such check-ups.

Food processing industry – summary of the answers

General questions

Have you ever faced any particular difficulties in exporting to the EU market?
18 firms, which is more than 85% of all exporters answered that after 1 may 2004 they have not faced any particular difficulties in exporting to the EU market.

Have you had to redesign your products for sale in the EU to meet the EU requirements?
10 of the firms (i.e. 31% of the sample) had to redesign their product so that it would meet the EU requirements.

Did this involve major/ moderate/ minor investments?
Among those 10 firms, 9 replied that they had to make significant investments to redesign the product.

How does <u>harmonization</u> of technical standards within the EU affect your trade with the EU member states?
More than half of the firms (54%) replied that harmonization of technical standards within the EU was beneficial in connection with their activity. Still, quite big percentage (22%) said that such harmonization did not affect them. Only 6% assessed harmonization as negative.

How does the existence of <u>mutual recognition</u> (MR) agreement affect your trade with the EU countries?
More than half of the firms (57%) claim that mutual recognition agreement has positive effect on their activity.

The <u>additional</u> cost of testing and certifications of your products, associated with exporting to the EU market has: increased/ remained unchanged/ decreased?
For 54% of the firms the cost of certification has increased. However, as many as 33% of the firms claim that this cost has not changed.

The <u>additional</u> cost of labelling so that the label meets the EU requirements is: very high/ quite high/ regular/ rather low/ very low?
The most frequent answer (31%) was that the cost was regular. 43% of the firms said the cost was high and 18% of the firms replied the cost was low.

How does <u>unification of standards</u> in all the EU countries affect your exports to the EU?
48% of the exporters in the food industry replied that the unification of standards in all the EU countries was beneficial for their exports to the EU. For 19% of the firms it had no impact. Only 7% of the firms assess this harmful.

Have you implemented (or are you planning to implement) the ISO-9000 norm ('Quality Management System')?
Have you implemented (or are you planning to implement) the ISO-14000 norm ('Environmental Management System')?
Have you implemented (or are you planning to implement) the ISO-18000 norm ('Health and Safety Management System')?
Almost 70% of the firms have implemented or would implement the ISO-9000 norm. 31% replied they did not plan to implement this norm.
As many as 61% of the firms are not going to implement the ISO-14000 and ISO-18000 norms. 11% of the firms have no information about the ISO-14000 norm, while 17% have no information about the ISO-18000 norm.

Food industry specific questions

Have you implemented (or are you planning to implement) HACCP?
Majority of the firms have already implemented the HACCP system. 6% replied they would not implement

the HACCP system.
What is/ was the cost of training that firms in the food industry had to bear while implementing HACCP system?
Almost half of the firms (48%) estimate that the cost of employees' training the firms had to bear while implementing HACCP system was high or very high. The same frequency replied that this cost was low or very low.
The cost of adjusting the production/storage buildings to the EU sanitary requirements is:
This cost turned out to be quite significant for majority of the firms. 89% of the firms responded that this cost was high or very high.
According to your knowledge and/or belief, what percentage of the firms in the food industry had problems to meet the requirements of the HACCP system?
We thought that a direct question whether the firm had problems to meet the requirements would make a firm reluctant to answer such question. Thus we decided to use such form – we think that the answers would be a good approximation of how many firms really had problems to meet the requirements of the HACCP system. More than half of the sample (59%) said that the percentage of firms having problems to meet the requirements of the HACCP system exceeded 10%. 7% of the firms said that this percentage was between 5% and 10%. Only 6% marked the answer "less than 5%".
How does the EU regulation regarding food additives and flavourings affect the firms in the food industry?
26% of the firms think that implementation of these regulations had positive impact on their activity while 15% of the firms say the effect was negative. 30% think that implementation of these regulations had no effect on their activity.
What is the effect of the implementation of HACCP on the average cost of production?
37% of the firms replied that the average cost of production associated with the implementation of the HACCP system was increased by no more than 5%. 30% of the firms replied that average cost was increased by more than 5%. 2 firms replied that since the HACCP system was implemented, the average cost of production actually had fallen.
How does the regulation regarding materials in contact with food (e.g. plastic materials etc.) affect the firms in the food industry?
52% of the firms said that meeting the requirements regarding materials in contact with food was beneficial for their activity. Only 4% said that this regulation affected them negatively.
How does the unification of the EU zoonoses[32] regulation affect the firms in the food industry?
Unification of the zoonoses regulation also had positive impact on the firms in food industry, according to 56% of firms in the sample. For 20% of the firms it had no impact.
What happens to the cost of medical check-up of the employees involved in production of food after the implementation of the EU regulation in this regard?
Majority of the firms think that implementation of the EU regulation relating to medical check-up of the employees involved in production of food did not change the cost of such check-ups.

*C*hemical industry (NACE 24)

Majority of Polish chemical firms (76%) did not face any particular difficulties while selling in the EU market after 1st of May 2004. More than 70% of the firms replied that they did not have to redesign their products to meet the EU regulations. Those firms that faced some difficulties while selling to the EU market usually pointed at "insufficient information on the requirements of the member states regarding technical standards" as well as at complicated and unclear legislation regarding taxation. Appreciation of Polish currency was also mentioned as an obstacle.

Firms in the chemical industry see Mutual Recognition principle and the harmonization of the EU technical standards as neutral or slightly beneficial for their activity. Adjustment costs of

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[32] Zoonoses are diseases that humans may acquire from animals.

testing and certification were high according to only 35% of the firms in the sample. 57% of exporters perceived the unification of the technical requirements as beneficial for their exporting activity. Regarding the ISO system chemical industry was mostly interested in implementing ISO-9000 and ISO-14000 norms. The overall effect of the membership in the EU was assessed as positive (48%) or neutral (28%).

In the sector-specific questions firms were submitting their opinion regarding standards on hazardous substances, fertilizers, soaps and the so-called Good Laboratory Practice (GLP). If a firm had no experience in this matter, it was asked to express their relevant opinion on the whole industry. On average, almost 70% of the sample believed that the legislation regarding the above issues is known and the appropriate procedures have already been implemented.

However, only 22% of firms reported that the entrepreneurs have already implemented the requirements regarding classification, packing and labeling of hazardous substances and pesticides. Further 61% of the sample admitted that the procedures were being introduced or would be introduced soon. Firms usually said that the adjustment investments raised the average cost of production by 1% to 5% and that only a small part of production (i.e. less than 1%) was removed from the market. However, the knowledge of other regulations (such as those related to soaps and fertilizers) was limited and the firms were reluctant to answer questions on those issues.

Chemical industry – summary of the answers

General questions

Have you ever faced any particular difficulties in exporting to the EU market?
76% of all exporters answered that after 1 may 2004 they have not faced any particular difficulties in exporting to the EU market.

Have you had to redesign your products for sale in the EU to meet the EU requirements? Did this involve major/ moderate/ minor investments?
28% of the firms had to redesign their product so that it would meet the EU requirements.
56% of those firms replied that they had to make significant investments to redesign the product.

How does harmonization of technical standards within the EU affect your trade with the EU member states?
Usually the firms were neutral in their opinion about the harmonization (46% replied that such legislation would not have much effect on their activity). 26% of the firms thought that harmonization had positive effect. Three firms (7%) thought that harmonization would be harmful for them.

How does the existence of mutual recognition (MR) agreement affect your trade with the EU countries?
Similarly to the previous question, most firms were neutral about MR agreement. 37% of the firms reported that the existence of MR agreement affected their activity positively.

The additional cost of testing and certifications of your products, associated with exporting to the EU market is: very high/ quite high/ regular/ rather low/ very low?
35% of the firms answered that the cost of certification has increased since the implementation of the EU legislation. However, as many as 28% of the firms claimed that this cost has not changed. 22% replied that the question was not relevant for them.

The additional cost of labelling so that the label meets the EU requirements is: very high/ quite high/ regular/ rather low/ very low?
24% of the firms said the cost was high and 41% said it was regular. Few firms pointed at either very high or very low cost. 9% of the firms said this problem did not apply in their case.

How does unification of standards in all the EU countries affect your exports to the EU?

Almost 60% of the firms in the chemical industry replied that the unification of standards in all the EU countries was beneficial for their exports to the EU. 5 firms said that unification of standards would be very beneficial for them. Only 3 firms in the whole sample said that such unification would affect them negatively.

Have you implemented (or are you planning to implement) the ISO-9000 norm ('Quality Management System')? Have you implemented (or are you planning to implement) the ISO-14000 norm ('Environmental Management System')? Have you implemented (or are you planning to implement) the ISO-18000 norm ('Health and Safety Management System')?

33% of the firms have already implemented the ISO-9000 norm. 11% was implementing it and 28% was about to begin the implementation. 12 firms (i.e. 26%) said they would not implement ISO-9000 at all.

30% of the firms were going to implement the ISO-14000 norm and 18% have already implemented it or were currently doing this. 41% of the firms did not plan to implement the ISO-14000 norm at all.

54% of the firms did not plan to implement the ISO-18000 norm. 26% have implemented this norm or were planning to do so. 20% of the firms replied that they had no information about the ISO-18000 norm.

Chemical industry specific questions

Do the firms in your industry adjust in order to meet the EU regulations that limit sales and usage of selected dangerous (hazardous) substances?

Half of the sample (52%) thought that entrepreneurs from the chemical industry have adjusted to the regulations regarding dangerous (hazardous) substances. 24% of the firms thought that this adjustment was yet to take place.

Do the firms in your industry adjust themselves in order to meet the EU regulations relating to classification, packing and labelling dangerous/hazardous substances and pesticides?

63% of the firms were in the process of adjusting or have already adjusted to the requirements regarding classification, packing and labelling hazardous substances and pesticides. Further 20% planned to adjust their production to these regulations.

Do the firms in your industry adjust in order to meet the EU regulations relating to „Good Laboratory Practice"?

According to 11% of the firms the process of adjustment to GLP in the industry has been accomplished. 35% reported that the industry is currently adjusting and 20% answered that the adjustment was going to start later. 9% did not expect the industry to meet the regulations relating to GLP.

Do the firms in your industry adjust in order to meet the EU regulations relating to „soap products"?

50% of the firms answered that the industry has already adjusted to meet these regulations or was in process of the adjustment. For 46% of the firms this problem was not known.

What share of the industry total production is rejected because of the failure to meet the EU regulations relating to „soap products"?

15% of the firms answered that less than 1% of the production is rejected because of the failure in fulfilling these regulations. 79% of the firms had no opinion about it.

What happens to the average cost of production when a firm adjusts the technology so as to meet the EU requirements relating to „soap products"?

11% of the firms answered that the cost rises by 1-5% and 9 firms (i.e. 19% of the sample) said that the increase in the average cost was up to 10%. Only two firms said that the average cost was rising by less than 1%. 76% declared they were not able to answer this question.

Do the firms in your industry adjust in order to meet the EU regulations relating to „fertilizers"?

Only 11 firms answered that the industry has adjusted or was in the process of adjustment to these regulations. Three firms thought that such adjustment would not take place. 70% were not able to answer this question.

What share of the industry total production is rejected because of the failure to meet the EU regulations relating to „fertilizers"?

Only five firms answered that 0-5% of the production is rejected because of the failure to meet those regulations. Most of the firms had no information about this issue.

What happens to the average cost of production when a firm adjusts the technology so as to meet the EU requirements relating to „fertilizers"?

Most firms had no information about this issue. Among those who answered (11%) the most common opinion was that the average cost was rising by 1-5%.

Electrical industry (NACE 31)

Vast majority (90%) of the electrical sector had not faced any difficulties while selling to the EU market after 1st of May 2004. Only 22% of the sample had to redesign the product and such modification usually required minor investment.

51% of the firms reported that *harmonization* is beneficial and 69% of firms assessed existence of the MR agreement as having a beneficial effect on their activity.

According to 42% of firms the cost of testing and certification has risen and for 40% it has not changed since Poland joined the EU. In case of ten firms (18%) the cost of providing additional information on products' labels was described as high. The most popular answer (44%) was that the cost was neither high nor low. Regarding the unification of the technical standards among the EU countries electrical firms answered that it might enhance the exports (66% of the exporters). Only 7% of the sample reported that such unification would be harmful. Regarding the ISO system, the ISO-9000 norm is popular among the firms in the electrical industry. 56% of them have already implemented this norm and only 25% said they would not implement it. Majority of the firms (around 60%) were not planning to implement the norms ISO-14000 and ISO-18000. Some of them had no information about these norms.

The overall effect of the membership in the EU is assessed as positive by 60% of the electrical sector. 13% of the firms said the net effect of Poland's membership in the EU would be negative for them.

Sector-specific questions in the electrical industry were related to the requirements on low-voltage machinery, noise emission and electromagnetic compatibility. 60% of firms reported that the adjustment to regulations relating to low-voltage machinery has been accomplished or has already started. Other 27% firms have said it will start in the future. The surveyed firms usually think that the process of adjustment did not result in rejecting the production from the market. In addition, the average cost of production rises from 5% to 10% in opinion of the 50% of the sample.

Regulations on noise emission are less known to the respondents. However, more firms were interested in norms regarding electromagnetic compatibility. For 42% of the firms adjustment to these regulations has been accomplished or has been currently in process. The amount of production that is removed from the market is rather small (less than 1%) according to 22% of the surveyed firms. However, further 72% of the firms have no information on this issue. According to 29% of the firms the average cost of production raised slightly (by 10% or less)

due to these adjustments. Seven firms (13%) admitted that the increase in the cost of production is higher and further 45% of the sample had no opinion on this issue.

Electrical industry – summary of the answers

General questions

Have you ever faced any particular difficulties in exporting to the EU market?
More than 90% of all exporters answered that after 1st of May 2004 they have not faced any particular difficulties in exporting to the EU market.

Have you had to redesign your products for sale in the EU to meet the EU requirements? Did this involve major/ moderate/ minor investments?
22% of the sample had to redesign their product so that it would meet the EU requirements. Those firms that had to redesign their products usually had to make only minor investments.

How does harmonization of technical standards within the EU affect your trade with the EU member states?
Half of the firms replied that harmonization of technical standards within the EU has been beneficial. Still, a significant percentage (36%) said that such harmonization did not affect them.

How does the existence of mutual recognition (MR) agreement affect your trade with the EU countries?
Nearly 70% of the firms claimed that MR had positive effect on their activity. 22% of the surveyed firms answered that the MR agreement did not affect them at all.

The additional cost of testing and certifications of your products, associated with exporting to the EU market is: very high/ quite high/ regular/ rather low/ very low?
40% of the firms claimed that since the implementation of the EU legislation, this cost has not changed. Nearly the same number of firms (42%) reported that the cost of certification has increased. 18% of the firms answered that they had no information on this issue.

The additional cost of labelling so that the label meets the EU requirements is: very high/ quite high/ regular/ rather low/ very low?
44% percent of the surveyed firms answered that the cost of particular labelling was regular. Only 18% said it was high or very high. 24% of the firms said it was low.

How does unification of standards in all the EU countries affect your exports to the EU?
66% of the exporters in the electrical industry replied that the unification of standards in all EU countries was beneficial for their exports to the EU. Four firms said that such unification was harmful for them and five firms were neutral about it.

Have you implemented (or are you planning to implement) the ISO-9000 norm ('Quality Management System')? Have you implemented (or are you planning to implement) the ISO-14000 norm ('Environmental Management System')? Have you implemented (or are you planning to implement) the ISO-18000 norm ('Health and Safety Management System')?
56% of the firms have already implemented the ISO-9000 norm. 19% were either in the process of implementation or were about to start it. Further 20% replied they did not plan to implement this norm. As many as 60% of the firms were not going to implement the ISO-14000. 10 firms (19%) have either implemented or were in the process of implementing this norm. Another six declared that they were planning to do so in the future. 58% of the firms are not going to implement the ISO-18000 norm. 13 firms (26% of the sample) have implemented the norm or would do so in the future. 16% of the firms had no information about the ISO-18000 norm.

Electrical industry specific questions

Do the firms in your industry adjust in order to meet the EU regulations relating to „low-voltage electrical products"?
25% (i.e. 13 firms) replied that the firms in electrical industry have adjusted to the regulations relating to "low-voltage electrical products". 35% reported that these regulations were being implemented. Other 24% firms replied that the implementation of the procedures would start in the future. 4 firms replied that meeting those regulations was not necessary for them.

What share of the industry total production is rejected because of the failure to meet the EU regulations relating to „low-voltage electrical products"?
Less than 1% of total industry production had been removed from the market according to 31% of the respondents. Two firms answered that the share of removed production was 1-5%, two firms pointed at the interval 5-10% and five firms marked the answer "more than 10%". 51% of the companies replied that the problem was either not relevant for them or they simply had no information about this issue.

What happens to the average cost of production when a firm adjusts the technology so as to meet the EU

requirements relating to „low-voltage electrical products”?
Half of the firms claimed that the increase in the average cost of production was less than 10%. Six firms thought that the average cost of production rose by more than 10%. Other firms either had no information or answered that the issue was not related to their production (28%).

Do the firms in your industry adjust in order to meet the EU regulations relating to „Noise emission of household machines”?
Above half of the firms said that this problem did not apply to them. Three firms said that the adjustment process had been accomplished. Eight firms answered the industry was currently adjusting to these regulations and three replied that the adjustment process would start in the future. Other firms were not able to assess the impact of these regulations on the industry.

What share of the industry total production is rejected because of the failure to meet the EU regulations relating to „Noise emission of household machines”?
62% of the firms answered that the problem does not apply to the industry. 15% were not able to answer this question. According to six firms the share of the production that is removed form the market is less than 1%. Three firms pointed that the share of production removed form the market might be between 1% and 5%, while two pointed at the interval 5-10%.

What happens to the average cost of production when a firm adjusts the technology so as to meet the EU requirements relating to „Noise emission of household machines”?
58% of the firms replied that adjusting to these requirements did not apply to their industry. 8 firms were not able to estimate the impact of these requirements on the cost of production. There is significant ambiguity among remaining answers: 4 firms did not perceive any change in the average cost of production, 1 firm said that the average cost increased by less than 1%, another three firms noticed a 1-5% increase. Three firms noticed a 5-10% increase and another three said the average cost of production rose by more than 10%.

Do the firms in your industry adjust in order to meet the EU regulations relating to „electromagnetic compatibility”?
16% of the firms answered that the industry has already adjusted to these regulations. 25% said that the industry was in the process of adjustment. 10 of the surveyed firms claimed that that process of adjustment would start in the future. 7 firms replied that the industry would not adjust to those regulations. 27% of the sample had no opinion on this issue.

What share of the industry total production is rejected because of the failure to meet the EU regulations relating to „electromagnetic compatibility”?
Firms had not usually any opinion on this issue (35% of the answers) or the problem did not apply to them (29%). Among the other firms the most common answer was that less than 1% of production was removed from the market (9 answers, 22%). Two firms marked interval 1-5%, three marked interval 5-10%. Three firms answered that more than 10% was removed from the market.

What happens to the average cost of production when a firm adjusts the technology so as to meet the EU requirements relating to „electromagnetic compatibility”?
45% of the firms answered that the problem did not apply to them or they simply had no opinion on this issue. Seven firms said there had been no change in the cost of production, 5 firms answered that cost rose by 5-10%. Another seven firms answered that the cost rose by more than 10%. Other pointed at small changes: a rise by 1% (5 firms) or by 1-5% (6 firms).

Summary of Polish results

We notice a number of positive effects that arose after joining the EU. The most important were the following:

More than 80% of the firms did not face any difficulties while selling their products in the EU and 75% of the firms did not have to redesign their products, i.e. they did not have to bear additional adjustment costs since the enlargement;

Most firms (usually in the food and electrical industries) assessed the existence of the MR principle positively due to their economic activity;

The firms are usually interested in ISO-9000 system, improving quality management in a company.

More than half of the exporters reported that the unification of technical standards within the European Union may positively affect their exports;

The general opinion on Poland's membership in the EU is rather positive, given both the necessity of adjustment costs and the opportunities to sell in the common market. However, 19% of the firms said the membership would be negative for their economic activity.

Apart from the positive effects of the membership we should notice that firms have to bear additional costs of adjustment to the new requirements. The assessment of these costs depends on a firm and on an industry:

Quite significant percentage of firms said that Poland's membership in the EU did not have any influence on their economic situation. Above 10% said that the harmonization of technical standards within the EU had negative impact on their activity;

A large number of firms in the food industry (54%) said that the cost of certification of their products had increased. Less than half of the surveyed firms answered that the cost of providing detailed information on their products' labels was high. Again, these firms were usually from the food industry (43%), whereas in the chemical and electrical industries the most frequent answer was 'neutral/negligible';

More than half of the firms were not interested in the ISO-18000 and ISO-14000 systems. Only firms from the chemical industry applied ISO-14000 system.

Results of the survey suggest that the effects of joining the EU may be quite different for firms from different industries. These effects are quite strong in the **food industry:**

54% of the firms said that the net effect of joining the EU was positive, while still 20% said that the effect was negative.

31% of the food- industry firms had to invest to redesign their products to fulfill EU requirements what required major investments;

In case of the compulsory HACCP system the food sector admitted that costs of its implementation were quite high and referred to employees' training or refurbishment of production facilities to meet sanitary requirements. However, the most common opinion about average cost associated with this adjustment was that it rises by less than 5%.

The costs seem to be less pronounced in the **chemical industry**:

76% of the firms have not faced any difficulties while selling in the EU since 1st of May 2004. More than 70% said they were not forced to redesign their product to fulfill the EU requirements.

An important issue is the opinion of firms about regulations on hazardous products, on soaps and fertilizers and on the so-called Good Laboratory Practice. 70% of the firms think that all these regulations have already been implemented or will be implemented soon;

The adjustment to the regulations relating to hazardous products and substances raises the average cost of production by 1-5% and only a small fraction of total industry production is being removed from the market due to inconsistency with regulations.

Firms from the **electrical industry** seemed to be well prepared for the membership in the EU and there has been little change in the industry since 1st of May 2004.

Only 25% of the firms redesigned their product, what required minor investments;

60% of the firms admitted that unification of technical standards within the EU would be beneficial for their activity;

60% of the firms think that the adjustment to the regulations on "low-voltage electrical products" has already been accomplished or it was currently in process.

Firms usually said that the average cost associated with adjustment to the regulations on "low-voltage electrical products" rose by less than 10%;

20% of the surveyed firms reported that the adjustment to the regulations relating to „electromagnetic compatibility" has been accomplished. 37% of the firms said the industry was in the process of adjustment or that the adjustment would begin soon.

The first general conclusion we may withdraw from the opinion of Polish companies facing various technical regulations within the EU common market is that they had to bear some adjustment costs. However the net effect of accession to EU is positive. Most of companies – especially exporters – said they expected benefits from harmonization of the standards and/or existence of the MR agreement. Secondly, it seems that the process of adjustment the EU regulations had already started and often was accomplished before 1 May 2004. It reduced the additional adjustment costs after accession and enabled the firms to perceive net benefits arising from access to the common European market.

Country report – Israel

Analysis of general questions

Among 84 firms exporting to the EU market (from all three sectors) 41 (about 49%) faced some difficulties. This includes firms who had faced difficulties before May 2004 as well as those who were harmed by the expansion of the EU.[33] 51% did not face any difficulties. In the vast majority (78%) of cases, the problems derived from differences between national requirements and those of the EU. 66% of the firms had to redesign their products and 87% of those who had to redesign their products, required some minor or major investments.

Figure 11: Percentage of firms in the industry who faced problems exporting to the EU

Industry	Percentage
Average of 84	49%
Electrical	18%
Chemical	52%
Food	61%
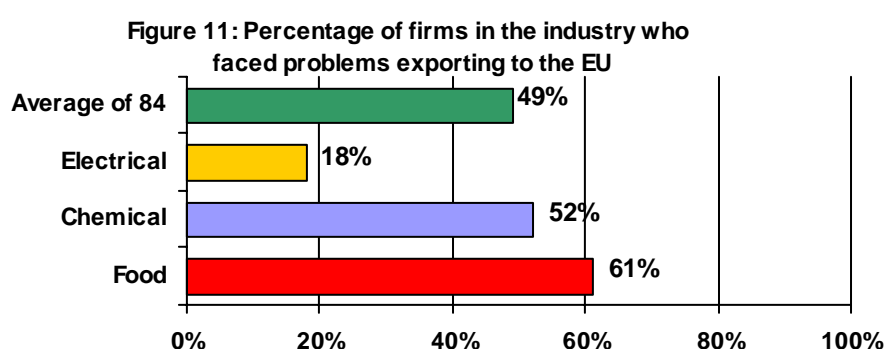
Reports of difficulties in exporting to the EU differed significantly between different NACE groups. Only 3 firms (or 18%) in the electrical industry faced difficulties. Reports of exporting difficulties were similar in the food and chemical industries. 61% in the food industry and 52% in chemicals faced difficulties (Figure 11), 70% and 88% respectively found that the national requirements differed from the EU's, 57% and 75% respectively had to redesign their products (Figures 12a and 12b) and nearly 13% in both sectors had to make major investments.

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[33] The question dealing with the influence of the expansion of the EU was not included in the questionnaire; however a few respondents mentioned it in the interview. A few firms commented on the membership of East European states to the EU and their adoption of European regulations. Former exporters to East Europe stopped exporting there, because the new regulations raised the cost of production and therefore the price of the product to a level that East European importers could not afford.

Figure 12a: Differences in regulations caused problems

Figure 12b: Had to redesign their products
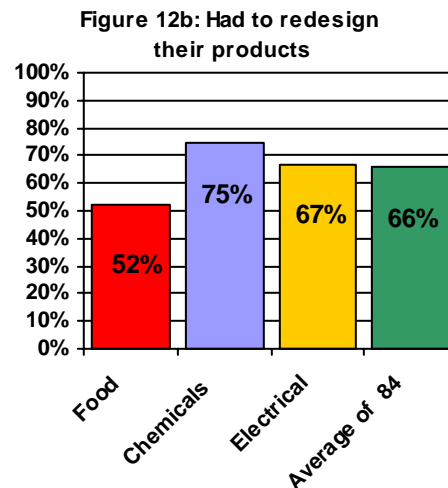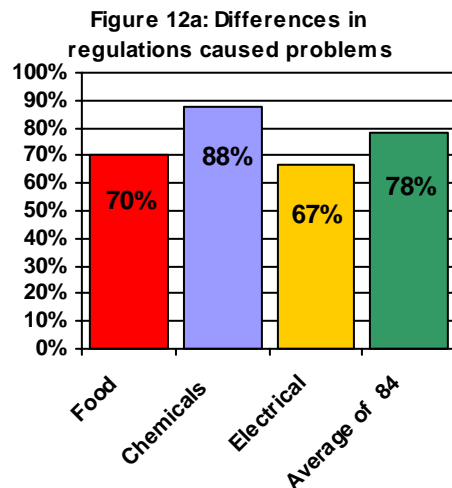
On average, half of the firms considered the harmonization of EU technical standards as positive for their activity (Figure 13a): 47% (mostly in the chemical industry). One third of the firms was neutral (42% in the food and electrical industries, 19% in the chemical industry), while only 10% of the entire sample found it harmful.

Nearly half of the exporters think that the unification of legislation of standards in the EU is beneficial, one third claims that it has no effect on their activity and only 3 firms, or 4% think it is harmful (Figure 13b).

Figure 13a: Harmonization of technical standards

Figure 13b: Unification of standards
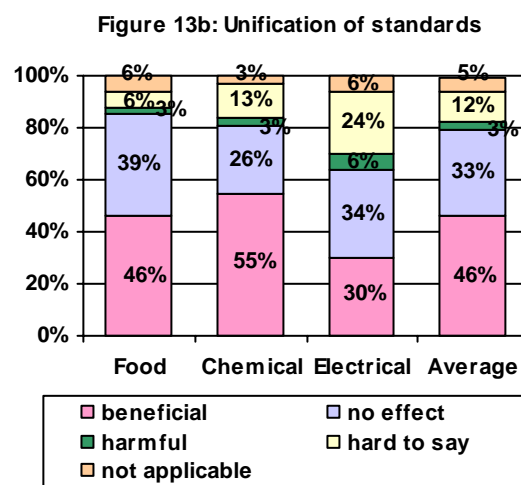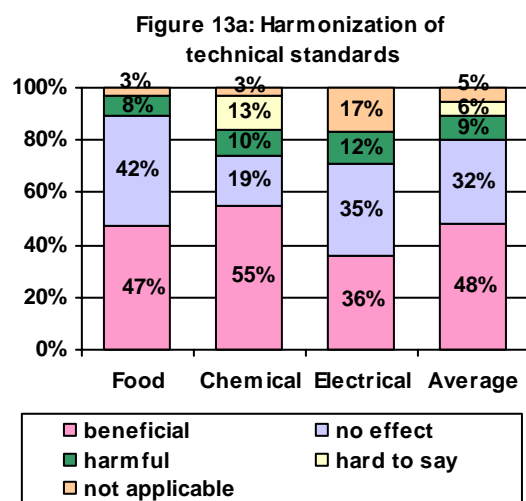
In all three sectors combined, nearly 40% of the firms claimed that the cost of testing and certification of their products was high. The highest percentage of those firms (45%) is found in the food industry, followed by the chemical industry (39%). The electrical industry suffers least from the high costs of certification (29%). 28% of the entire sample found the costs negligible (Figure 14a).

Only 21% of the entire sample found the additional cost of labeling high (most in the electrical sector – 30% and least in the chemicals sector – 16%). One third of the sample defined the costs as regular. 16% of the firms – mostly in the chemicals sector – reported the question as irrelevant (Figure 14b).

Figure 14a: Costs of testing and certifications

Figure14b: Cost of additional labelling
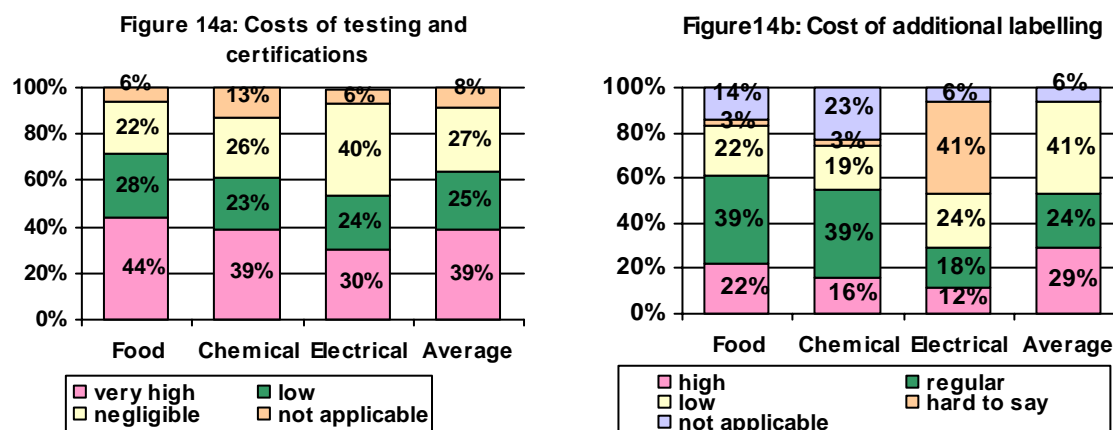
Only 2 firms (both in the chemical industry) have no intention to implement the ISO-9000 norm, whereas less than half of firms are interested in the ISO-14000 and ISO-18000 norms, mostly in the chemical industry.

Food processing industry (NACE-15)

The food industry in Israel exports relatively little (only 2% of total industrial exports, nominal terms, 2004), but is the largest supplying sector to the domestic market (nearly 20% of the total industrial production) and second in total sales, including exports. It consists of the greatest number of firms and therefore, makes up the largest component of the sample: 36 firms answered the questionnaire. These 36 cover nearly 85% of total exports in the industry (to all countries) and in particular, export to the EU. 7 are very large firms (with annual revenues from exports that exceed 20 million $), 12 are medium-size exporters (with revenues from exports between 5 million and 20 million $) and 16 are relatively small exporters (with revenues from exports lower than 5 million $).

Most firms (61%) faced problems exporting to the EU. 76% of those facing problems claimed they were due to differences between EU technical regulations and national ones. 52% had to redesign their products in order to meet the EU requirements.

Nearly half of the firms think the harmonization of technical standards between the European states is beneficial to them, 42% claim that it has no effect and only 3 firms, or 8% think the harmonization is harmful.

Most of the firms have already implemented or are planning to implement the HACCP requirements. 4 firms (11%) have no intention to do so. Nearly one third of the firms think the cost of implementing the HACCP is high or very high. The others defined these costs as regular or low.

Food processing industry: summary of the answers

General questions

Have you ever faced any particular difficulties in exporting to the EU market?
22 firms (61%) faced difficulties, including some who were harmed by the expansion of the EU.

Would one of those difficulties be that EU technical regulations differed from national requirements?
The vast majority (76%) of the firms who faced difficulties replied that they arose from differences in regulations.

Have you had to redesign your products for sale in the EU to meet the EU requirements?
Among those who faced problems, 52% had to redesign their products.

Did this involve major/ moderate/ minor investments?
Of those who redesigned their products, nearly 20% had to make major investments, half of the rest had to make moderate or minor investments, the other half claimed that no investments were necessary.

How does <u>harmonization</u> of technical standards within the EU affect your trade with the EU member states?
Only 3 firms (9%) found the harmonization harmful. 47% of the respondents claimed the harmonization is beneficial, the rest said it has no effect on their activity.

The <u>additional</u> cost of testing and certifications of your products, associated with exporting to the EU is:
- High or very high..16 firms (45%)
- Low...10 firms (28%)
- Negligible ....8 firms (22%)
- Not applicable...2 firms (6%)

The <u>additional</u> cost of labelling so that the label meets the EU requirements is:
- High or very high..8 firms (22%)
- Regular..14 firms (39%)
- Low or very low...8 firms (22%)
- It is hard to say/not applicable ....6 firms (17%)

How does <u>unification of standards</u> in all the EU countries affect your exports to the EU?
Only one firm found the unification of standards harmful. 17 firms (47%) considered it as beneficial and 14 firms (38%) claimed it has no effect.

Have you implemented (or are you planning to implement:

	ISO-9000	ISO-14000	ISO-18000
Already implemented or in the process	36 firms (100%)	8 firms (22%)	7 firms (19%)
Not going to implement		24 firms (67%)	21 firms (59%)
Have never heard of the norm		4 firms (11%)	8 firms (22%)

Food industry specific questions

Have you implemented (or are you planning to implement) HACCP?
- Already implemented or in the process.............26 firms (72%)
- Planning to implement it..................................3 firms (8%)
- Not going to implement it................................4 firms (12%)
- Have no information about HACCP.................3 firms (8%)

What is the cost of training that firms in the food industry have to bear while implementing HACCP?
30 firms or 83% of the sample answered the question. The answers are as follows:
- High or very high..9 firms (30%)
- Low or very low...15 firms (50%)
- Only a few firms did organize the trainings......1 firm (3%)
- It is hard to say...5 firms (17%)

The cost of adjusting the production/storage buildings to the EU sanitary requirements is:
30 firms or 83% of the sample answered the question. The answers are as follows:
- High or very high..14 firms (47%)
- Low or very low...11 firms (37%)

- Only a few firms did make such adjustments ... 1 firm (3%)
- It is hard to say .... 4 firms (13%)

According to your knowledge and/or belief, what percentage of the firms in the food industry have had problems to meet the requirements of the HACCP system?

Most of the respondents could not answer the question. Only one firm said the percentage is less than 5%, 4 firms claimed it is between 5% and 10%, but the majority (8 firms) said the percentage is more than 10%.

How does the EU regulation on food additives and flavourings affect the firms in the food industry?

31 firms or 86% of the sample answered the question. The answers are as follows:
- The effect is beneficial .... 9 firms (29%)
- It has no effect .... 7 firms (23%)
- The effect is harmful .... 7 firms (23%)
- Not applicable/hard to say .... 8 firms (25%)

What is the effect of the implementation of HACCP on the average cost of production?

28 firms or 78% of the sample answered the question. Nobody thought the cost can fall, and nobody thought it could increase by more than 10%. Half of those who answered claimed the cost does not change or increases by less than 1% and 8 firms (29% of the answers) said the cost increases by 1% to 5%.

How does the regulation regarding materials in contact with food (e.g. plastic materials etc.) affect the firms in the food industry?

31 firms or 86% of the sample answered the question. The answers are as follows:
- The effect is beneficial .... 8 firms (26%)
- It has no effect .... 10 firms (32%)
- The effect is harmful .... 4 firms (13%)
- Not applicable/hard to say .... 9 firms (29%)

How does the unification of the EU zoonoses regulation affect the firms in the food industry?

28 firms or 78% of the sample answered the question. The answers were distributed as follows:
- The effect is beneficial .... 6 firms (21%)
- It has no effect .... 4 firms (14%)
- The effect is harmful .... 2 firms (7%)
- Not applicable/hard to say .... 16 firms (58%)

What happens to the cost of medical check-up of the employees involved in production of food after the implementation of the EU regulation in this regard?

30 firms or 83% of the sample answered the question. Of those who did, nobody thought the cost can fall, 13 firms (44%) claimed the cost would not change and 7 firms (23%) thought the cost would increase. 10 firms had no information about the EU regulation in this matter.

Apart from the problems raised in the questionnaire, the respondents mentioned several other issues on their own initiative. For example, several firms claimed that they faced difficulties in exporting to the EU because of their location beyond the "green line" or even because of the location of their suppliers.[34]

Another problem related to different regulations regarding veterinarian certificates and additional tests required by the EU regulations. A dairy exporting firm claimed that the waiting time for additional tests required by the EU made exporting almost irrelevant, because dairy products have very short life span.[35]

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[34] The more extreme case concerned a firm who had to present certificates that her suppliers were not located beyond the "green line". With nearly 50 suppliers from different parts of the country, the firm was unable to identify the suppliers of any specific batch of production. As a result, it could not expand its exports.

[35] A similar problem (the need for additional tests) arose with an exporter, who claimed that he had to present veterinarian certificates for the hens who laid the eggs of which his product was made.

A common complaint was of discrimination in the realm of controls. Several exporters claimed their production was checked meticulously in order to determine if it met the regulations, but that similar production made in Europe was not submitted to these tests, even though the producer was not complying with regulations. Several entrepreneurs also mentioned that in fact there is no harmonization of standards throughout Europe and regulations differ from one country to another.

Chemical industry (NACE 24)

The chemical industry is the largest producing sector in Israel and accounts for nearly 20% of total sales (nominal terms, 2004). It is also the largest exporter and accounts for one fourth of total Israeli exports. The industry includes several giant conglomerates, consisting of several very large firms. The number of firms in the chemical industry is smaller than in the food industry, partly because of the existence of firms with very high revenues and the highest average output in the entire industry.

31 firms answered the questionnaire. These 31 cover nearly 35% of total exports in the industry (to all countries) and in particular, export to the EU. 3 are very large firms (with revenues from exports that exceed 250 million $), 7 are medium exporters (with revenues from exports between 20 million and 250 million $) and 20 are relatively small exporters (with revenues from exports lower than 20 million $).

Half of the firms faced difficulties exporting to the EU. 14 firms or 88% of those facing problems claimed that they were due to differences between EU technical regulations and national ones. 12 (75%) had to redesign their products in order to meet the EU requirements.

55% of the respondents think the harmonization of standards between the European states is beneficial to them, 19% claim that it has no effect and 10% think the harmonization is harmful. The rest found the question irrelevant.

39% found the additional costs of tests and certifications to be high or very high. One fourth thinks they are negligible. The additional cost of labelling was high for 16%. 60% thought the costs are regular or low, all the rest found the cost negligible.

Almost all the firms (29 or 93% of the sample) have implemented the ISO-9000 norm, the rest had no intention to do so. 21 firms were interested in the ISO-14000 norm and half of the sample was interested in the ISO-18000 norm.

The chemical industry comprises a wide range of products (pharmaceutics, paints, industrial chemicals, bromine compounds etc). Not everyone could answer specific questions, and only a few – questions dealing with "soap-products" and fertilizers.

Chemical industry: summary of the answers

General questions

Have you ever faced any particular difficulties in exporting to the EU market?
Half of the firms replied that they did face problems.

Would one of those difficulties be that EU technical regulations differed from national requirements?
The vast majority (88%) of firms who faced difficulties replied that they arose from differences in regulations.

Have you had to redesign your products for sale in the EU to meet the EU requirements?
Of those who faced difficulties 12 firms or 75% had to redesign their products.

Did this involve major/ moderate/ minor investments?
Of those who redesigned their products, two thirds had to make moderate or minor investments, half of the rest made major investments and the other half claimed that no investments were necessary.

How does <u>harmonization</u> of technical standards within the EU affect your trade with the EU member states?
3 firms found the harmonization harmful to them. More than half of the respondents thought the harmonization is beneficial and 6 firms (19%) claimed it has no effect on their activity.

The <u>additional</u> cost of testing and certifications of your products, associated with exporting to the EU is:
- High or very high...12 firms (39%)
- Low..7 firms (23%)
- Negligible ....8 firms (26%)
- Not applicable...4 firms (13%)

The <u>additional</u> cost of labelling so that the label meets the EU requirements is:
- High ....5 firms (16%)
- Regular...12 firms (40%)
- Low or very low...6 firms (18%)
- It is hard to say/not applicable ....8 firms (26%)

How does <u>unification of standards</u> in all the EU countries affect your exports to the EU?
Only one firm admitted that the unification of standards is harmful. More than half of the respondents found it beneficial and 8 firms (26%) said it has no effect on their activity.

Have you implemented (or are you planning to implement:

	ISO-9000	*ISO-14000*	*ISO-18000*
Already implemented or in the process	29 firms (93%)	21 firms (68%)	15 firms (48%)
Not going to implement	2 firms (7%)	8 firms (26%)	9 firms (29%)
Have never heard of the norm		2 firms (7%)	7 firms (23%)

Chemical industry specific questions

Do the firms in your industry adjust in order to meet the EU regulations that limit sales and usage of selected dangerous (hazardous) substances?
Out of 25 firms that answered the question, 20 (80%) think the firms have already adjusted (40%) or are in the process of adjustment and only one respondent thinks the firms do not adjust.

Do the firms in your industry adjust in order to meet the EU regulations relating to identification of, packing and labelling dangerous/hazardous substances and pesticides?
Out of 25 firms that answered the question, 21 (84%) think the firms have already adjusted (44%) or are in the process of adjustment and only one respondent thinks the firms do not adjust.

Do the firms in your industry adjust in order to meet the EU regulations relating to:

	"Good Laboratory Practice"	*"soap products"*	*"fertilizers"*
already adjusted	9 firms (36%)	1 firm (4%)	1 firm (4%)
they are adjusting	5 firms (20%)	5 firms (20%)	2 firms (8%)
they will be adjusting	3 firms (12%)	1 firm (4%)	
no	3 firms (12%)	3 firms (12%)	4 firms (17%)
it is hard to say	2 firms (8%)		1 firm (4%)
not applicable	3 firms (12%)	15 firms (60%)	16 firms (67%)
Firms answered	25	25	24

What share of the industry total production is rejected because of the failure to meet the EU regulations

Only 5 firms were able to estimate the rate of rejection. Of those who did, 4 think only 1% of the total production is rejected and one claims it to be between 1% and 5%. Nobody thinks it is more than 5%.
What happens to the average cost of production when a firm adjusts the technology so as to meet the EU requirements relating to „soap products"?
Only 5 firms answered the question. Of those who did, 2 claim the cost of production increases by less than 1% and 2 think it increases between 5% and 10%. None of the respondents thinks the cost increases by more than 10%. Nobody thinks the cost could fall either.
What share of the industry total production is rejected because of the failure to meet the EU regulations relating to „fertilizers"?
Only 2 firms answered, claiming that the percentage of rejected production does not exceed 1%.
What happens to the average cost of production when a firm adjusts the technology so as to meet the EU requirements relating to „fertilizers"?
Only two firms gave an answer, claiming that the average cost was rising by 1-5%.

Electrical industry (NACE 31)

The electrical industry in Israel is relatively small. Its exports as well as its total sales are among the smallest in the entire Israeli industry. It also consists of the least number of firms out of the three sectors investigated. Accordingly, the sample of firms in this industry is relatively small, comprising 17 firms that cover nearly 40% of total exports in the industry (to all countries) and in particular, exports to the EU. 4 are very large firms (with revenues from exports that exceed 25 million $), 6 are small-sized firms (with revenues from exports lower than 2 million $) and the rest are medium-sized firms.

The vast majority (14 firms or 82% of the sample) did not face any difficulties in exporting to the EU. Of those who did, two claimed it was due to differences in regulations and it had to redesign its products, which involved major investments.

Two firms think the harmonization of standards between the European states was harmful. Half of the rest think it was beneficial, the other half think it did not affect their activity. Regarding the unification of standards, 6 firms claim it has no effect on them, one firm finds it harmful, the rest describe it as beneficial.

Regarding the costs of testing, certification and labeling, almost half of the respondents found it negligible. Most of the rest thought the cost is high and nearly 24% thought the cost is relatively low.

Regarding the ISO norms, all of the respondents have implemented the ISO-9000 norm, half of them implemented the ISO-14000 norm as well, but only 3 were interested in ISO-18000.

Electrical industry: summary of the answers
General questions
Have you ever faced any particular difficulties in exporting to the EU market?
Only 3 firms reported they faced any problems.
Would one of those difficulties be that EU technical regulations differed from national requirements?

Two firms of those who faced difficulties replied it was due to differences in regulations.
Have you had to redesign your products for sale in the EU to meet the EU requirements?
Two firms of those who faced difficulties had to redesign its products.
Did this involve major/ moderate/ minor investments?
One firms of those who had to redesign its products, had to make major investments, the other one claimed the investments were moderate.
How does <u>harmonization</u> of technical standards within the EU affect your trade with the EU member states?
Only two firms claimed the harmonization is harmful. The same number (6 firms or 35% of the sample) thought the harmonization is beneficial or has no effect on their activity.
The <u>additional</u> cost of testing and certifications of your products, associated with exporting to the EU is:
- ▪ High or very high...5 firms (29%)
- ▪ Low...4 firms (24%)
- ▪ Negligible ....7 firms (41%)
- ▪ Not applicable..1 firm (6%)

The <u>additional</u> cost of labelling so that the label meets the EU requirements is:
- ▪ High or very high...5 firms (29%)
- ▪ Regular..4 firms (24%)
- ▪ Low or very low...7 firms (41%)
- ▪ not applicable..1 firm (6%)

How does <u>unification of standards</u> in all the EU countries affect your exports to the EU?
Only one firm reported that the unification of standards is harmful. 5 firms (29%) think the unification of standards is beneficial and 6 (35%) said it has no effect.
Have you implemented (or are you planning to implement:

	ISO-9000	ISO-14000	ISO-18000
Already implemented or in the process	17 firms (100%)	8 firms (47%)	3 firms (18%)
Not going to implement		6 firms (35%)	9 firms (53%)
Have never heard of the norm		3 firms (18%)	5 firms (29%)

Electrical industry specific questions
Do the firms in your industry adjust in order to meet the EU regulations relating to:
- ▪ ***„low-voltage electrical products”:*** 9 firms answered, 2 of them think the firms do not adjust.
- ▪ ***„noise emission of household machines”:*** 3 firms answered, saying the firms have adjusted or in the process of adjusting.
- ▪ *„electromagnetic compatibility”:* 7 firms answered, none of them thought the firms do not adjust.

What share of the industry total production is rejected because of the failure to meet the EU regulations relating to:
- ▪ ***„low-voltage electrical products”:*** 7 firms answered, all of them think the share is less than 1%.
- ▪ ***„noise emission of household machines”:*** 3 firms answered, saying the share is less than 1%.
- ▪ ***„electromagnetic compatibility”:*** 5 firms answered, the share is less than 1%.

What happens to the average cost of production when a firm adjusts the technology so as to meet the EU requirements relating to:
- ▪ ***„low-voltage electrical products”:*** 7 firms answered, only two thought the cost increases by more than 10%, 2 said the cost does not change, others claimed the cost increases by less than 5%.
- ▪ ***„noise emission of household machines”:*** 3 firms answered, saying the cost increases by less than 1%.
- ▪ ***„electromagnetic compatibility”:*** 7 firms answered, 3 of them thought the cost does not change.

A few exporters in the sector mentioned that in actuality there is no harmonization of regulations and no unification of standards throughout Europe, which makes their exporting very complicated. No specific problems were mentioned.

Summary of Israeli results

Half of the exporters do face problems in exporting to the EU, mostly in the food industry, but only a few firms in the electrical industry faced problems. Almost every firm among those who faced problems had to redesign its products and deal with differences in regulations.

In general, the harmonization of regulations is thought to be beneficial. Only 10% of firms found it harmful. Not everyone thinks the harmonization is accomplished.

For the entire industry, the necessity to perform additional tests is the main issue, entailing the highest costs. The costs of special labeling are of lesser concern.

The unification of standards was considered mostly beneficial, especially by the chemical industry. However, most of the firms claimed it has no effect on them or found the question inapplicable to their activity.

Only two firms are not interested in the ISO-9000 norm, both belonging to the chemical industry. The ISO-14000 and ISO-18000 norms are less popular, nearly half the firms are implementing the norms, mostly in the chemical industry.

The **food industry** seems to suffer most from the obligations to meet European regulations, especially in regard to certificates and tests, which costs are perceived to be relatively high. On the other hand, the costs of labeling seem to be reasonable.

Most firms think that the harmonization of technical standards is beneficial to their activity. A large percentage of firms, however, claimed that it did not affect their activity

All of the firms have already implemented or are in the process of implementing the ISO-9000 norm. Half of the respondents are interested in the ISO-14000 norm and one forth – in the ISO-18000 norm.

Most firms have implemented the HACCP norm and on average, they define the cost of training and adjusting to the norm the storage buildings as "not very high, but not very low either". Many firms in the food industry had problems meeting the requirements of the HACCP. However, most of the firms claim the HACCP does not increase the costs of production by more than 5%.

There is no common agreement about the more specific regulations regarding food flavourings, food additives, or materials that come in contact with food. A large percentage of the respondents found it had no effect; the opinions of the rest are spread evenly from "very

beneficial" to "very harmful". Most of the respondents think the cost of medical check-ups would not rise, if the EU requirements were to be implemented.

In the **chemical industry** half of the respondents reported having difficulties in exporting to the EU. Almost all of them claimed that these were due to differences in regulations and said they had to redesign their products, making moderate investments.

The harmonization of regulations was perceived mostly as beneficial, as well as the unification of standards. Only a few thought it was harmful.

There is no common agreement regarding the costs of testing and certification, as well as the costs of labeling. However, the tendency is to report the costs of certification as relatively high, in comparison to labeling costs (perceived mostly as reasonable).

Regarding the ISO norms, only two firms were not interested in the ISO-9000 norm, as they were following more specific norms concerning their production. The majority of firms are interested in the ISO-14000 norm and nearly half in the ISO-18000.

Regarding the adjustment of regulations dealing with dangerous substances, only one firm thinks the producers do not adjust. Three firms think the producers do not adjust in order to meet the requirements of the "Good Laboratory Practice" regulations.

Very few answered the questions about "soap products" (10 firms) and fertilizers (7 firms). Three respondents think the firms do not adjust in order to meet regulations regarding "soap products" and 4 respondents think they do not adjust in order to meet regulations regarding fertilizers. On the other hand, the common opinion is that the rate of production that is rejected because of the failure to meet these regulations does not exceed 1%.

The **electrical industry** seems to be the most successful in meeting the EU regulations and dealing with the difficulties of exporting to the EU. The answers about the harmonization of European regulations and the unification of standards were spread evenly between "very beneficial" and "no effect". Only two firms claimed the harmonization was harmful.

This is also the industry that perceives the costs of certification and labeling as relatively low in comparison with the two other industries.

All firms have implemented the ISO-9000 norm, half of them have implemented the ISO-14000 norm, and one fifth has implemented the ISO-18000 norm.

Very few replied to more specific questions; most found it irrelevant to them. All of them claimed there were not many problems meeting the sector-specific regulations, and that there

is only a negligible amount of production that is rejected due to the failure to meet these regulations.

Summarizing the results we can state that the harmonization of regulations inside Europe and the unification of standards are beneficial to Israeli exporters. Although the obligation to meet European regulations is costly, especially regarding testing and certification, many respondents claimed it helped them to improve the quality of their production and therefore increased their sales.

Comparison of Polish and Israeli results

In both countries the food sector is the most important in the domestic market (around 20% of shares in total production sold). In case of the chemical sector, which has significant shares in Israeli exports (24%), Polish industry amounts only for 6% shares of total exports. The electrical sector is the least important (out of three) in both countries and reaches 3% of the domestic production and 6% of exports in Poland, and only 2% and 1% in Israel (respectively). However, all three industries have been subject to relatively high number of various technical regulations in selling or exporting to the EU market. Previous sections presented particular results of Polish and Israeli results, now we discuss the most important similarities and differences among the answers in both countries. We compare the answers on general questions in all three sectors and present sector-specific comparison of the food and chemical sector, as they seem to be the most diverse.

Difficulties in exporting were declared by half of the Israeli companies in food and chemical industries, whereas most of the Polish firms in these sectors did not experience any problems. However, the electrical industry in both countries seems to be the most satisfied: no difficulties were declared by 82% in Israel and 91% in Poland.

Redesign of products was required in case of about two thirds of Israeli firms and only in 31% of Polish producers. Food industry invested the most in Poland: 90% firms reported major investments, whereas in Israel these companies reported major investments in 17% of the cases. The Polish chemical industry had much more major investments (56%) than Israeli (18%).

The results of assessment of the harmonization were the same in both countries for the entire sample. However, chemical industry in Israel benefited the most (55% of the answers),

whereas Polish chemical firms were the least satisfied with harmonization - only 33% assessed it as beneficial.

Unification of standards is beneficial for 57% of Polish firms and only for 46% of firms in Israel. In particular, it helps 56% of Israeli chemicals producers, unlike in Poland where the most satisfied industry is electrical (66% answers). Interestingly, both Israeli and Polish firms rarely report negative effect of unification.

Regarding the ISO norms, the percentage of those interested in ISO-9000 and ISO-14000 was higher in Israel (98% and 38% respectively have already implemented or in the process of implementing the norms) than in Poland (74% and 35%). On the other hand, the ISO-18000 norms are more popular in Poland – 25% of Polish firms have implemented or are in the process of implementing the norm, but only 8% in Israel (mostly in the chemical industry).

Food industry comparison

Only few firms in the Polish food industry had problems in exporting to the EU, whereas in Israel more than half of food exporters admitted problems. The necessity to redesign products was reported by only one third of Polish firms. The rate was higher in Israel – more than half of the exporters had to redesign their products. However, almost all of the Polish firms that redesigned their products had to make major investments, while in Israel those firms shared only 18% of the answers (see Figures 15a, 15b and 15c).

Figure 15a: Problems exporting to the EU

Figure 15b: Had to redesign their products

Figure 15c: Investments requiered
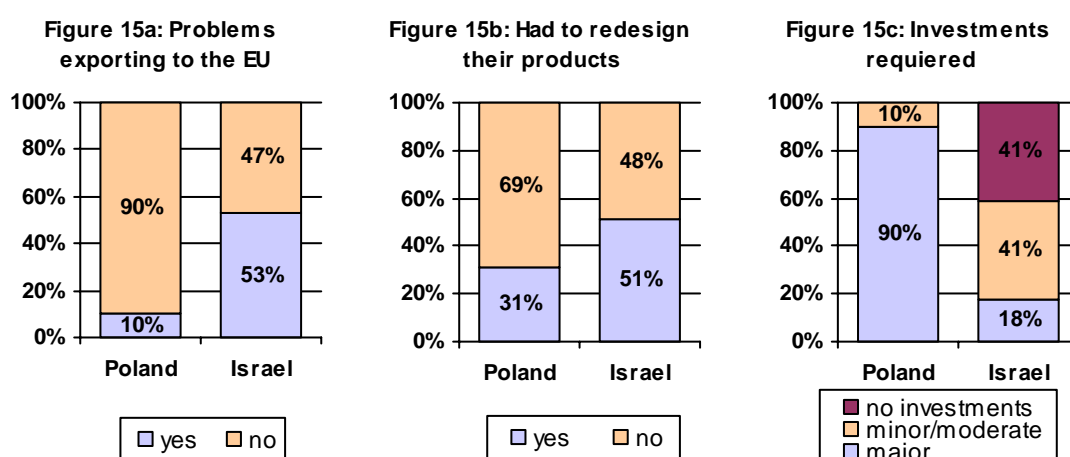
The harmonization of technical standards was perceived as beneficial by nearly half of the firms in both countries, as well as the unification of standards. They were viewed as harmful by slightly higher percentage of the firms in Poland (harmonization of technical standards: 13% and unification of standards: 7%) than in Israel (harmonization of technical standards:

8% and unification of standards: 3%).The cost of detailed labeling was estimated as high by 43% of firms, whereas in Israel only 22% of firms said the cost was high.

In both countries almost the whole food sector implemented or was in the process of implementation of the HACCP system. However, the same amount of the firms in Israel and

Figure 16: percentage of the firms in the food industry have had problems to meet the requirements of the HACCP system
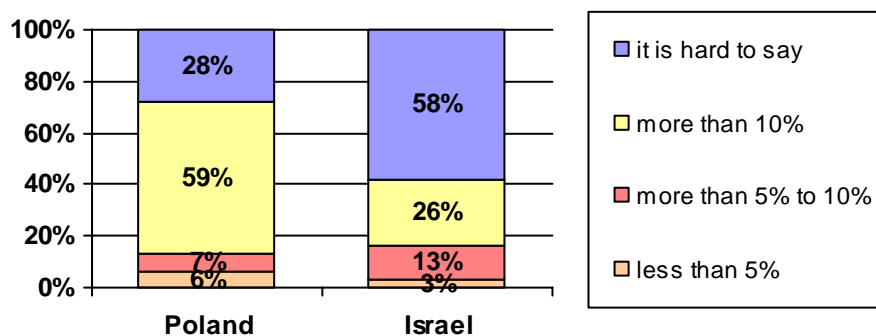
Poland admitted that above 10% of the industry experienced difficulties in implementation of the HACCP. Polish companies reported more problems in adjustments to the new regulations regarding this system (Figure 16).

The average cost of production due to implementation of the HACCP rises by less than 5% in case of 60% of Israeli firms. Only 37% of Polish food firms pointed at this amount. Additionally, 11% of the Polish sample assessed this increase as higher than 10%, whereas no one in Israel shared this answer (Figure 17).

Figure 17: Comparison of the effect of the implementation of HACCP on the average cost of production
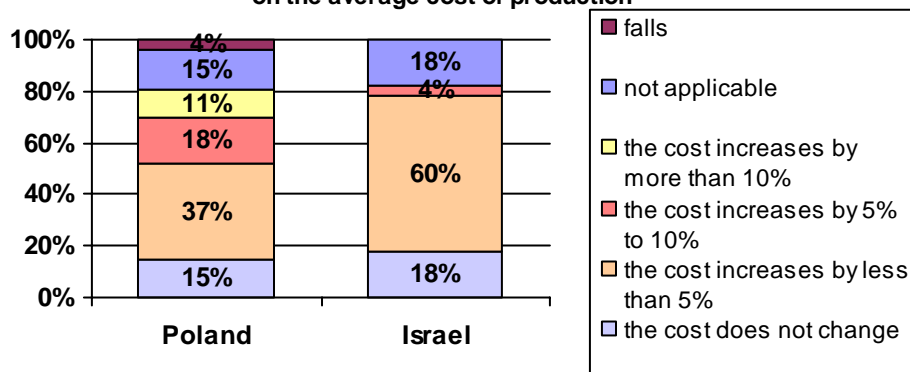
In particular, Polish firms experienced problems with adjustments in staff trainings and storage buildings (Figures 18 and 19).

Figure 18: The cost of staff training that firms in the food industry had to bear while implementing HACCP system

Poland: High or very high 48%, Low or very low 48%, it is hard to say 4%
Israel: High or very high 30%, Low or very low 50%, Only a few firms did organize the trainings 3%, it is hard to say 17%

Legend:
□ it is hard to say
■ Only a few firms did organize the trainings
□ Low or very low
□ High or very high
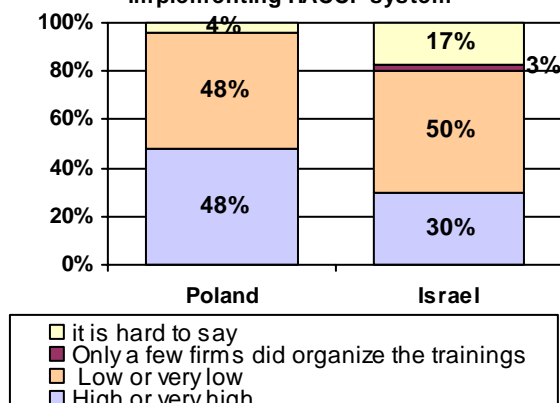
Figure 19: The cost of adjusting the production/storage buildings to the EU sanitary requirements is:

Poland: High or very high 89%, Low or very low 11%
Israel: High or very high 47%, Low or very low 37%, Only a few firms did organize the trainings 3%, it is hard to say 13%

Legend:
□ it is hard to say
■ Only a few firms did organize the trainings
□ Low or very low
□ High or very high
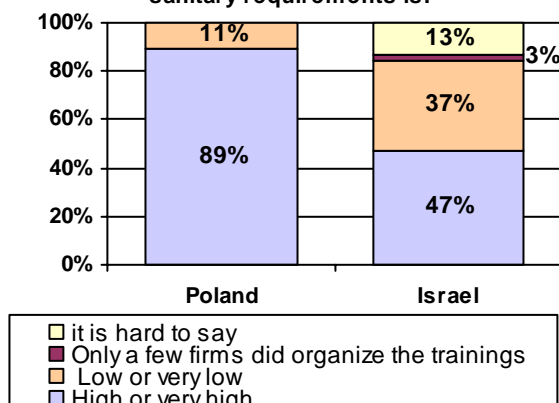
The cost of adjustments of the production/storage buildings to meet the sanitary requirements was assessed as high or very high by vast majority (90%) of the Polish firms, while Israeli food industry usually pointed at the low cost (47% of the sample). The cost of employees' training to meet HACCP requirements was ambiguous in case of Polish firms: either high (48%) or low (48%). In case of Israeli food sector only 30% of the firms reported high cost, where the most frequent answer – 50% – was "low or very low" cost.

Above half of the Polish firms stated that the necessity of adjustments to the EU regulations for materials in contact with food was beneficial for them. Less Israeli firms agreed with this opinion – only 26% of the answers. Around 30% of the food sector in both countries saw it neither beneficial nor costly (Figure 20).

In case of regulations regarding food additives/flavourings the Israeli firms were less satisfied than Polish (22% answered the regulation was harmful compared to only 15% in Poland – Figure 21).

The costs of medical check-ups of the employees did not change due to the EU regulation in

Figure 20: The effect of regulation regarding materials in contact with food
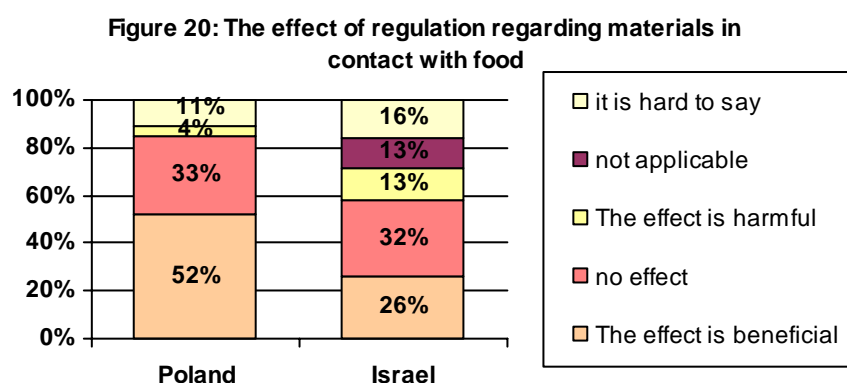
opinion of most of Israeli and half of Polish companies. This might be due to severe national regulations prevailing already before adjustments to the EU regulations. However, for 44% of Polish food industry this cost increased.

Figure 21: The effect of regulation regarding food additives and flavourings
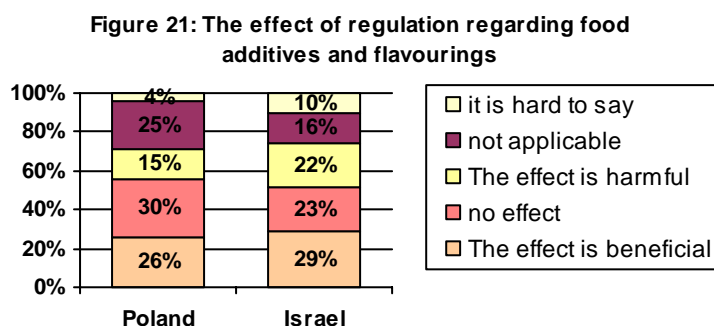
All Israeli firms in the food industry have implemented the ISO-9000 norm, whereas in Poland still 31% have not implemented this norm at all. The rate of implementation of ISO-14000 and ISO-18000 norms is similar in both countries – nearly one fourth of the respondents are interested in the norms.

Chemical industry comparison

The Israeli chemical industry seems to be facing more difficulties in exporting to the EU market than the Polish industry – 52% of Israeli chemical producers reported difficulties comparing to only 24% in Poland (Figure 22a). In addition, the rate of those who had to redesign their products was about three times higher in Israel than in Poland – 75% compared

to only 28% in Poland (Figure 22b). However, the process required much more major investments in Poland (56%), while in Israel the majority perceived the investments as moderate or minor (61%) and only 18% claimed for major investments (Figure 22c).

Figure 22a: Problems exporting to the EU

	Poland	Israel
no	76%	48%
yes	24%	52%

☐ yes ☐ no

Figure 22b: Had to redesign their products

	Poland	Israel
no	69%	48%
yes	31%	51%

☐ yes ☐ no

Figure 22c: Investments requiered

	Poland	Israel
no investments		12%
minor/moderate	44%	70%
major	56%	18%

☐ no investments
☐ minor/moderate
☐ major
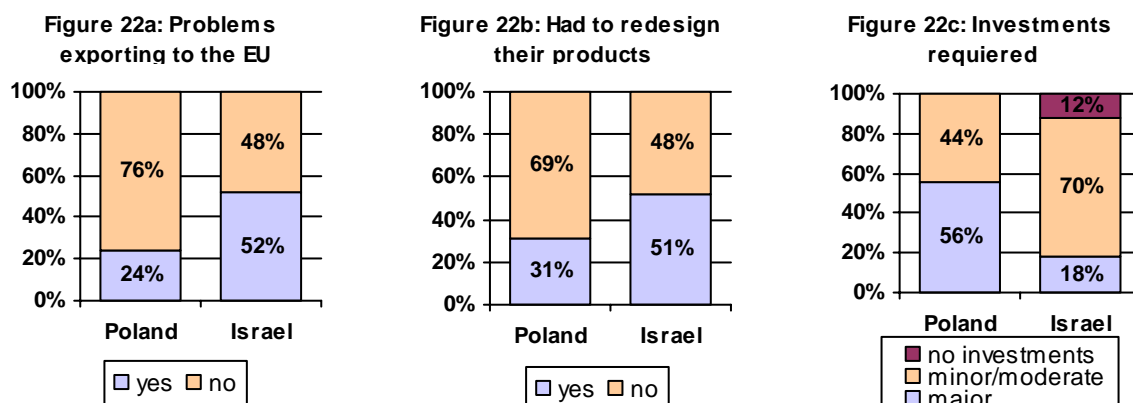
Regarding the harmonization of technical standards, Israeli firms found it more beneficial than Polish: more than half of Israeli firms claimed the harmonization was beneficial or very beneficial, while only one third of the Polish firms could say so (Figure 23). On the other hand, unification of standards was perceived equally by the firms in both countries (Figure 24):

Figure 23: The effect of the harmonization of technical standards

	Poland	Israel
hard to say	14%	16%
harmful	6%	10%
no effect	47%	19%
beneficial	33%	55%

☐ beneficial ☐ no effect
☐ harmful ☐ hard to say

Figure 24: The effect of the unification of standards

	Poland	Israel
hard to say	19%	16%
harmful	7%	3%
no effect	17%	26%
beneficial	57%	55%

☐ beneficial ☐ no effect
☐ harmful ☐ hard to say
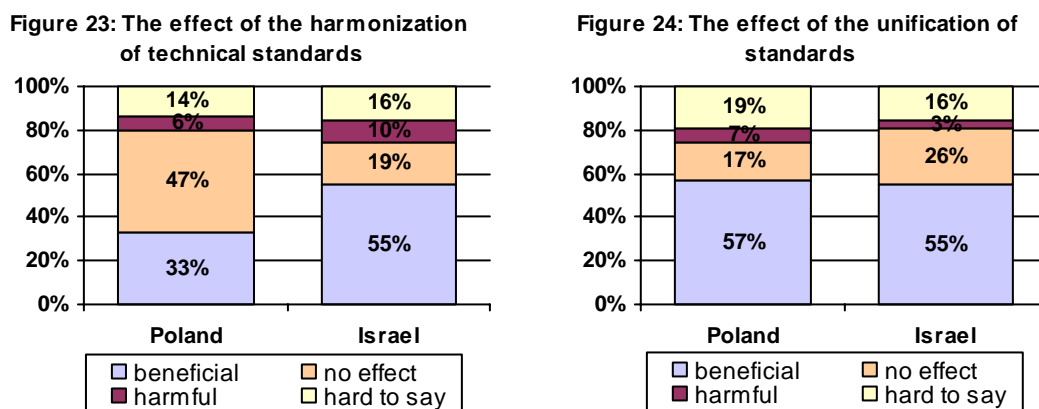
The costs of additional labeling were also viewed similarly by the industries in both countries. Regarding special regulations on hazardous products, Good Laboratory Practice, soaps and fertilizers, 70% of the Polish firms estimated that all these regulations have been implemented or will be implemented soon. In Israel almost everyone have implemented the regulation on hazardous products, the same number of firms in both countries implemented the regulations on soaps but only 25% of Israeli firms that deal with fertilizers were interested in adjusting to regulations concerning fertilizers.

Polish firms in the chemical industry seem to be less interested in the ISO norms than in Israel (Figures 25a, 25b and 25c).

Figure 25a: Implementation of the ISO-9000 norm

Poland: implemented/plan to implement 72%, not going to implement 26%, no information about the norm 2%
Israel: implemented/plan to implement 94%, not going to implement 6%
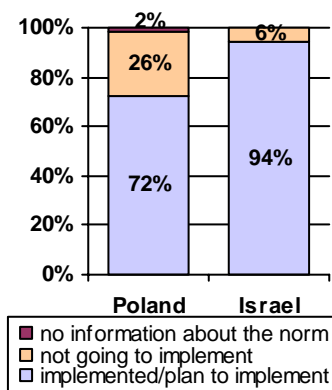
Figure 25b: Implementation of the ISO-14000 norm

Poland: implemented/plan to implement 48%, not going to implement 41%, no information about the norm 11%
Israel: implemented/plan to implement 57%, not going to implement 26%, no information about the norm 7%
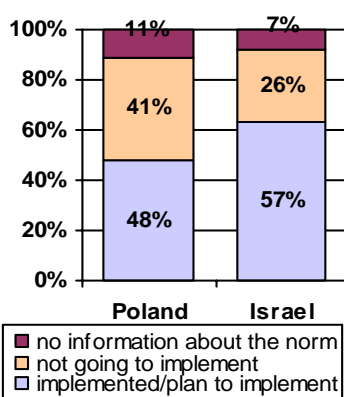
Figure 25c: Implementation of the ISO-18000 norm

Poland: implemented/plan to implement 26%, not going to implement 54%, no information about the norm 20%
Israel: implemented/plan to implement 48%, not going to implement 29%, no information about the norm 23%
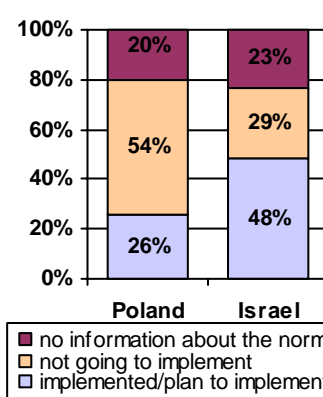
Summary and Conclusions

All three industries in Poland assessed positively the accession to the European Union. Additionally, the attitude of the companies to the technical regulations was either positive or neutral. In comparison, the Israeli firms reported many more difficulties in exporting to the EU. Similarly in both countries, the most pronounced difficulties were reported in the food sector. The electrical industry is the most successful in exporting to the EU member states.

One of the main problems in Israel is the difference between the national regulations and those of the EU. Poland, being part of the EU, does not face these problems.

The necessity to redesign products is significantly lower in Poland than in Israel, but Polish firms have to make much greater investments. However, concerning the food industry, the costs of additional labeling and the costs of adjustment to regulations were regarded as slightly lower in Israel than in Poland.

One of the main similarities between the two countries was the response to questions regarding harmonization and unification of standards, which were considered in both countries to be mostly beneficial. The Mutual Recognition principle was assessed positively by majority of Polish firms. The popularity of ISO norms is similar too (except for the ISO-9000 that is much more popular in Israel than in Poland).

The main problem of Israeli firms is the necessity to perform additional tests and certifications, which are costly. The food industry suffers most from the obligation to perform additional tests and complains about their complexity. In Poland the question regarding

testing and certifications related to the changes in costs after May 1, 2004, and more than half of the firms reported increases in these costs.

However, based upon the results presented in this survey and in the surveys made prior to accession to the EU, we may conclude that major adjustments were already implemented before the 1st of May 2004 in Poland. In comparison, Israeli firms are at a disadvantage although they have already taken major steps to implement the EU regulations.

In conclusion, we can state that technical regulations and standards do play important informative role and therefore are in general positively assessed by exporting companies. But they can also create a barrier to trade, especially in the food sector. Long lasting certifications can make exports – in extreme cases - unprofitable. It seems that Polish companies do face smaller problems in exporting their goods to the EU market, but they also have made larger investments in order to meet all EU technical regulations and requirements.

III. The Economic Functions of Product Regulations

Introduction

To analyze the economic impact of standards, we classify standards by functions having unique characteristics. We start with a short description of technical standards and provide some economic rationale by discussing the benefits a standard may provide. We then consider three key determinants of the economics of standards: the cost aspect of standardization (compliance cost); the interaction between the compliance cost and innovation; and the link between the liberalization of product regulations and trade. In the final section of the chapter, we discuss some policy implications of the interaction between the compliance cost and innovation for the EU enlargement.

What are Technical Norms?

Technical norms consist of (i) regulations, (ii) standards, and (iii) testing procedures that can functionally be looked at as a set of specifications to which all elements of products, processes or procedures must conform. The process of conformity is called "standardization" or "conformity assessment" with the objective of increasing efficiency of economic activity. The economic rationale for technical norms is to prevent market failures by public intervention (usually by governments) in markets. So, it is assumed that governments or regulators act in the interests of the whole society and being concerned with efficiency.

Regulations can provide significant benefits:

- Correcting information asymmetries between buyers and sellers.

- Providing incentives schemes for quality by specifying a minimum level of performance. For example, a car manufacturer develops a new engine and specifies the minimum acceptable lubrication attributes; this may induce competition among petroleum companies who either compete in prices, at the minimum specified level of quality or by offering motor oil with a level of performance above the minimum.

- Variety reduction: standards limit a product to a certain range or number of characteristics such as size or quality levels. By reducing varieties, firms are able to attain economies of scale by focusing on larger production volumes.

- Compatibility/Interoperability: These are merely called interface standards so to provide open systems and thereby allow multiple proprietary components. So standards specify properties that a product must meet in order to work with complementary products (e.g. DVD players, PCs, VCRs). An important notion is that these standards do not affect the design of the components themselves.

- Reducing health, safety and environmental hazards trough the "command-and-control approach" or government-mandated regulations. These regulations include control on air quality, water quality, food additives, pharmaceuticals, toxic substances (pesticides), consume product safety, etc.

Three types of standards can be distinguished. If standards evolve out of the market process these are generally referred to as *de facto* standards. Such standards are merely imposed on a voluntarily basis. Standards imposed by law are called *de jure* standards or technical regulations in accordance with the WTO/EU definitions. These standards are mandatory, produced in the form of directives, law decrees, etc. Institutional standards are *de facto* standards however they result from coordination of standardized bodies (e.g., International Organization for Standardization, ISO). So the common usage in terminology is that standards are voluntary and technical regulations are mandatory.

An important feature of technical norms in an international trade context (c.f., international regulations) is that it raises issues concerning differences in standards, regulations and conformity assessment across countries. The way those differences are managed within each domestic market will in turn reflect to what extent they may serve as potential barriers to trade (in section 4, we will return to this issue); however, it is important to note that the economic functions of standard in an international context is somewhat more complex since it takes into account the domestic regulations from both trading partners.

Compliance Cost

An essential point in the economics of regulations is the cost raising aspects. With the introduction of regulations, firms may need to adapt product design, re-organize production systems, incurring re-labeling costs and the costs of multiple testing and certification. Such

costs, described by firms in our questionnaire survey are merely referred to as *compliance costs*. It is important to note that the nature of these compliance costs differs between *de facto* or *de jure* standards. In the context of *de facto* standards, a compliance cost could rather be defined as the cost of assessing a certain level of product quality and firms can freely choose the level of quality of their products. In the context of *de jure* standards (technical regulations), firms do not choose but are obliged to undergo the compliance cost and invest in a system for controlling the compliance. In this case, the impact of regulations can act as an entry barrier for firms.

An important feature of such compliance costs is that they are perceived as fixed costs. The figure below shows how a typical regulation involves a fixed cost. Once a regulation is introduced, producers learn about it (commencement costs) and bring the product in conformity. The second component of ongoing costs consists of periodic monitoring and testing. The level of the compliance costs also dictates the level of stringency (rigidity) of a regulation. According to Ashford (2002) a regulation is stringent either (i) because compliance requires a significant level of conformity, (ii) because it is costly or (iii) because compliance requires a significant change in the production process.

A further element to take into account is that the potential impact of regulations is related to the size of the firm. Normally, we may expect that imposing fixed costs is relatively more important for small firms than large firms.
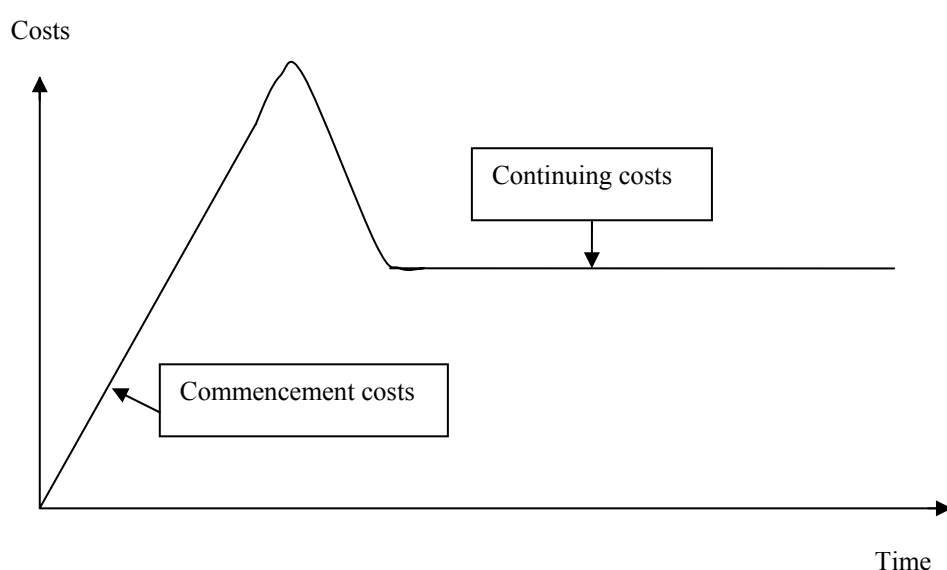
Source: Baldwin, 2000

However other factors may also be crucial. It is evident that different *degrees of stringency* may exist, coinciding with (i) the nature of the industry (e.g. the chemical industry versus food industry), (ii) the type of regulations (e.g. product/standard regulations which primarily elicit product characteristics or process regulations/standard eliciting both a product and process response), (iii) the type of regulator (e.g. a government versus an industry) and last but not least (iv) the level of technological endowment. We discuss the link between innovation and regulations in the next section.

Innovation

In some sense, compliance costs measure an industry response to regulations, and empirical evidence suggests (Porter, 1991; Jaffe et al., 1996, Ashford et al., 1985) that increasing the stringency of regulations may induce firms to develop new and less costly ways of complying with regulations.

Whether or not, one firm has a cost advantage in its compliance cost depends on the level of technological innovation. For example, it may well be so, that the type of innovation required for process development (cost-reducing R&D) may generate the advantage that firms have been able to develop configurations of equipment that can, , adapt to varying circumstances. Thus the need to completely redesign most of the productive process can be reduced and products can be manufactured more easily[36]. As an example, minor product modification and adaptation has been considerably eased with the use of computer aided design (CAD) software. Alcorta (1995) points out that CAD software embodies enough accumulated design and knowledge as to adapt product design to local market conditions, match raw material and component availability.

The figure below (adopted from Ashford, 2002) illustrates a possible effect of making a link between technological innovation and the stringency of regulations. Suppose the government wishes to introduce a regulation (e.g. a reduction in health risk) from point A to the risk presented by the longer dotted line. Using the most efficient technological capabilities (with existing technology), this would impose a cost, represented by point B. However, if these new regulations were possible to stimulate technological innovation (the optimal technological

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[36]   It may well be so that some degree of re-configuration of the production process may not be so easily implemented for more complex machinery that entails a lot of process innovation R&D. An example might be, the development of sophisticated robots or microelectronics that has created complex advancement in the industrial automation of industries.

solutions), a new technology supply curve would arise, allowing the same degree of health risk reduction at a lower cost represented by point C.

According to Ashford (2002) several factors within the internal structure of regulations may alter the general climate for innovation. Elements of that structure include: (i) the form of regulations (product versus process), (ii) the time for compliance (e.g. anticipation of regulations stimulate innovation), (iii) the uncertainty, (iv) the stringency of the requirement (upward, downward regulation with existing regulations), (v) product-life cycle, and (vi) the existence of other economic incentives that complement the regulatory signal. These factors play a significant role for the general operations of firms. However, it is certainly a challenge that a set of all these factors would induce a smooth transition to the implementation of a compliance with regulations.

Essentially, uncertainty related to the effect or the introduction of new regulations may create a potential difficulty in the decision to innovate. For example, the Construction Directive introduced by the European Commission is unclear in stipulating the maximum allowance of noise.
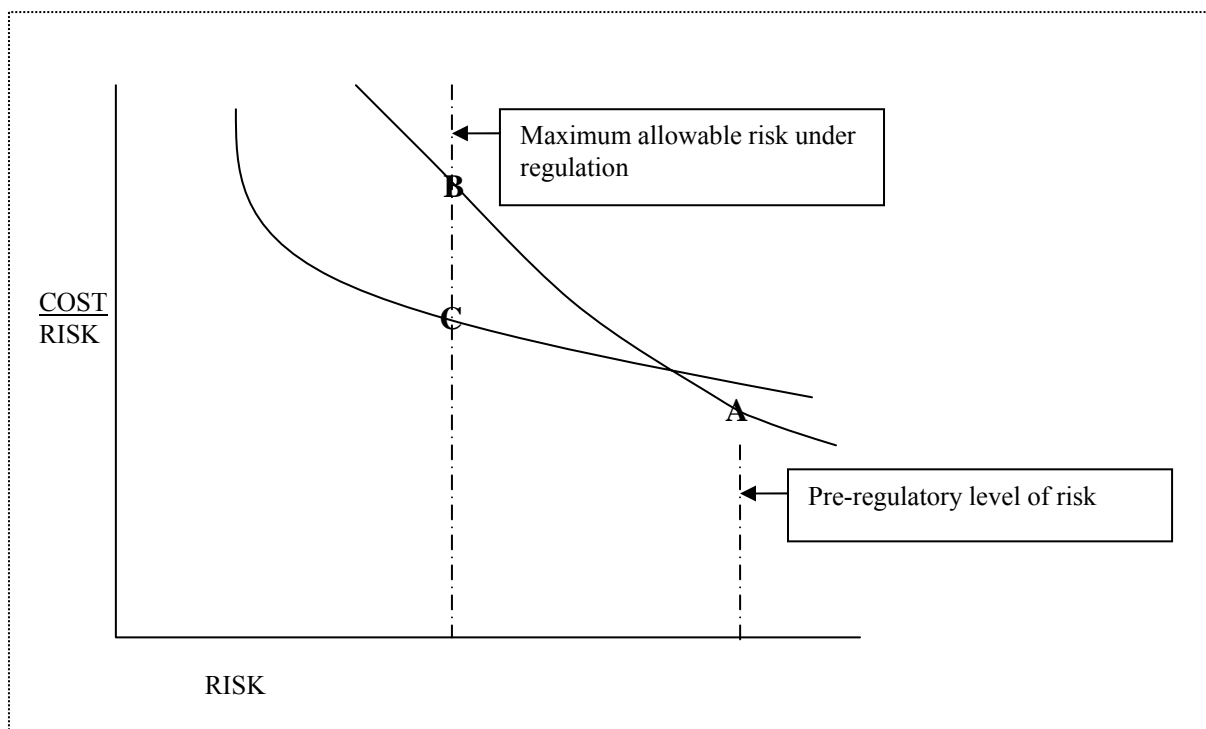
For construction machinery, its position in a product-life cycle may vary but for most construction machinery with a position at the end of a cycle, uncertainty on how to align with such directives may be problematic. At this stage of the life cycle, the cost to further innovate

in the product or comply with the product is proportionally higher since producers already need to challenge the marketability of the product.

Regulations in an international context

The harmonization of regulations in an international context has received a much greater awareness at all levels of multilateral agreements. For example, in an interview in the Financial Times (December, 2004) Pascal Lamy, former EU trade commissioner, calls the harmonization of standards the "real 21st century trade issues". It is clear that regulatory initiatives can be used as a crude substitute for trade policy. The scope of regulations that could mainly be applied to an international dimension is merely related to government regulations produced in forms of directives, law decrees. In an international dimension, a crucial element to consider is that not the regulation itself acts as trade impediment but differences of regulations across regional boundaries. In this context, technical barriers to trade arise when exporters have to alter his/her products in order to comply with differing partner country requirements or when the product has to undergo multiple testing and certification procedures to be sold in both domestic and foreign markets. Therefore TBTs inhibit trade by raising compliance costs faced by foreign firms more than those by domestic firms. Lowering or eliminating this gap of costs across countries is referred to as harmonization and mutual recognition.

Effect on intra-regional trade

The main question to be addressed is whether harmonization of regulations within a regional trade agreement has increased trade between member countries? A direct answer to this question can be already analytically challenged. The precise trade impact much depends on the cost of meeting the standard and the stringency of harmonized regulatory level. The compliance cost is determined as a fixed production cost and in the case a country faces an upward harmonization such that the level of harmonized regulations are higher than domestic regulations, this may be considered as a comparative cost disadvantage decreasing a country's exports. In the literature, the general consensus is that internationally shared standards should be trade promoting. In the case a country faces an upward harmonization much depends on how much this cost disadvantage outweighs further trade opportunities. Therefore, it is noted that the overall increase in trade flows may be unevenly distributed among countries.

In the case of mutual recognition, there is less ambiguity in predicting its economic impact. With such initiatives, the general principle is that products lawfully produced and marketed in one jurisdiction, can be sold and marketed freely in the other jurisdiction without the necessity to implement harmonized procedures. In such a framework, the liberalization of the fixed compliance cost entails a one time cost among mutual recognized member countries.[37]

To date, theoretical and empirical literature on the link between standardization and trade is limited and also in some degree inclusive. A series of articles at the abstract level have studied the economic effects of international (governmental) standardization policies (Wallner, 1998; Baldwin, 2000; Eisenmann and Verdier, 2002; Fisher and Serra, 1999; Shy, 1991; Gandal and Shy, 1996). In this cited references, the idea that standardization policy may promote trade is explicitly captured in a theoretical framework of strategies with network externalities.

Little empirical work related to harmonization of technical regulations exists. Perhaps, it is difficult to measure this effect and indeed, they have been characterized as "one of the most difficult non-tariff barriers imaginable to quantify "(Deardorff and Stern, 1997). This reflects in part problems relating to data and in many cases the impact of integration has simply, and inadequately, been modeled as an ad hoc reduction in trade costs common across all suppliers.[38]

With specific reference to the liberalization or harmonization of regulations or standards, Swann et al. (1996) and Moenius (1999) showed that the harmonization of (voluntarily) standards promote trade between countries. With respect to the EU, the process of EU harmonization of standards is the most advanced. Typically for the European Union, Vancauteren and Weiserbs (2005) have shown that for 1990-1998, intra-EU trade has increased due to efforts in harmonizing technical regulations across EU countries. However, in addition, we also find that a higher degree of market integration (due to lower border effects) has been possible for sectors that are regulated by EU policies that require the lowest degree of complicated harmonization procedures (mutual recognition). In other words, the EU approach of mutual recognition allows national diversity to a certain degree. In line with this argument, Holmes and Young (2001) argue that the EU is reaching a logical limitation in that market integration is only possible if some degree of national is permitted but such variations

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[37] *Baldwin (2000) provides an excellent treatment on the liberalization of fixed costs among member countries of a regional integration agreement*.

[38] For example, Gasiorek *et al*. (1991) and Brenton and Winters (1992) in different exercises assume that the completion of the Single Market implies a 2.5% reduction in trade costs for all EU members. The next chapter will deal with the quantification of TBTs.

constrain integration. Within the context of enlargement, some paradigm exists. On one hand, mutual recognition will play a crucial role in an enlarged EU allowing the accession of diverse countries. On the other hand, by increasing diversity in the Union and raising the number of legitimate national policies, enlargement may constrain the future level of integration in the EU. To EU policymakers, the immediate priority for the EU enlargement will be to ensure that there is no retrenchment from the current level of integration.

Effect on extra-regional trade

In a more international context, the economic impact of harmonization of regulations on trade between member countries of a regional integration agreement and non-member countries raises the questions to what would happen to the latter group? Extending the harmonization of regulations to outside members has been made possible through the mutual recognition agreement (MRA)[39]. Such an instrument is based on the fact that countries recognize each other regulatory protection levels including each other's conformity assessment requirements. In other words, it ascertains that country A trusts country B to certify that the products by country B conform to country A's standards. For example, for a number of sectors the European Union has formed MRA´s with Australia, United States, New-Zealand, Canada. A key element of a MRA is that in many cases, the MRA includes rules of origin.[40] For example, the MRA between the EU and Canada specify that third country products continue to meet the conformity assessment of each country in the agreement region. Or simply, it can be used as an exclusionary instrument so to leave out the rest-of-the-world members.

This raises another effect. What would happen to those countries that do not have any agreement on harmonized regulations with member countries of a RTA? Again, much of this essentially depends on the initial level of harmonized regulations; however more analytical elements are present. First, for excluded countries, the impact of harmonized regulations within a regional trade agreement may determine new export activities since they might find it worthwhile if each country has converged to one single norm (see Baldwin, 2000 for an example).

At the level of the European Union, initiatives are also aimed at providing technical assistance to excluded countries (Mexico, ASEAN countries, India) so to facilitate to the compliance

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[39] MRA is also implied within a regional trade agreement. It is usually applied to non-harmonized sectors/industries.

[40] Rules of origin are defined as "the criteria used to define where a product was made".

with EU standards. Such initiatives are mainly aimed to create trade opportunities; however, Egan (1997) notes that they could be seen as a "component of industrial policy for greater political and economic leverage in the international arena."

Some empirical evidence on the economic impact of EU harmonized standards on excluded countries exists. Perhaps, the most cited study is that in the food and agricultural sector, Otskuki *et al.* (2000) suggest that technical regulations in developed countries constitute a considerable obstacle to exports of developing countries.

5.3. The Justification to harmonize standards: Perspectives from the political economy

Agreements on standards raise issues that are also economic-politically challenging. In case, harmonization of regulations has an upward effect (more stringent), Vogels (1995) notes "stricter regulations may not make a nation poorer, neither do they make it richer; greater wealth leads to a preference for strong regulatory standards, not the reverse…" In addition, the same author argues that stricter regulations (c.f. environmental) can improve the public benefits (e.g. better health leads to productivity, reduction of health-care expenditures) and if such regulations are seen as a form of collective consumption, then "many citizens in relatively affluent countries would be expected to increase their consumption of such goods, even at the price of some reductions in their levels of private consumption".

On the other hand, Casella (1995) argues that standards are regulations aimed at a public good that a community seems desirable but if they behave as a well-defined function in the economy there is no reason to make them equal everywhere. In addition, the author notes that harmonization of regulations are a result of opening trade. The main mechanism that would be responsible for harmonization would be convergence of income.

Conclusion and policy implications of harmonized regulations for EU enlargement

Since compliance costs in some sense measure an industry's response to regulation, high compliance costs could indicate an ineffective response. This raises two issues. A first issue regarding the post-enlargement situation and in particular, the impact that enlargement has on the harmonization process. Accession of new members substantially increases the pressures on the internal market and stretches the abilities to ensure compliance with harmonized

directives.[41] The enlargement certainly improves economic conditions and capabilities for the CEEC countries, but there are also potential negative sides to an enlargement process. Problems related to the enforcement and implementation of regulations in the EU will probably be repeated in Central and Eastern Europe, if not enough resources are invested to bring up the capacity to implement the alignment process with EU regulations. But these investments are certainly a heavy burden. Thus, there is a risk that the political prestige invested in the enlargement process will impose costs on the alignment with EU regulations and that in the end what matters for the accession countries is growth, which may be prioritized. In that sense, the economic environment might come under even further pressure and the gap might continue to grow.

The second but more crucial issue is that the capacity to implement the Acquis seems to be of a greater challenge to enlargement. Evidence suggests that R&D capacity, measured in R&D spillovers is relatively weak in NMS and CEE countries.[42] The process of transition can be attributed to this obvious weakness. As we have mentioned in section 3, it is suggested that high R&D intensity increases the capacity and flexibility of production facilities. So, it is expected that innovation will facilitate the development of new technologies/products in response to EU regulations, lower productions costs and improve trade performance. However, given the high cost of relative compliance cost of meeting the acquis (e.g., Dziegielewska, 2000, estimates the compliance cost to be around 3% of GDP), the relatively weak R&D capacity raises the question as to how the CEEC countries will properly take care of (sustain) their 'obligation' to enforce the implementation of EU regulations?

The capacity or capability for CEE firms to meet those challenges can be enhanced by increases in R&D knowledge from support of current EU firms (engineering consulting services, technical assistance, demonstration projects, training,) that have 'internalized' decades of EU legislation[43]. This can be enhanced by a deliberate creation of networks or strategic alliances but in reality, such willingness requires a climate, which is not necessarily

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[41] Most new member countries and acceding countries undergo a phasing period when dealing with the alignment of EU regulations.

[42]   See Mantovani and Vancauteren (2004). One of the underlying reasons for low levels of innovation is that for example, the sharp shock model encourages "short term-term economics" in company planning, whereas R&D requires long-term perspectives (Grabner, 1992, p.219). Williams et al. (1998) note that the demand for traditional company-level research has declined in favor of imported technology, a substitution that has been encouraged by appreciation in the real exchange rate in the early transition.

[43] For example in the area of environmental regulations, especially, the heavy basic industries, which are sometimes the most polluting , unsafe, and resource-intensive industries may find it more difficult to meet environmental demands.

confined to a technological regime, a geographical area and the reliance of the more liberal forms of R&D modernization on firms' economic self-interest. The role of the regulator (European Commission) should not only be limited to creating directives and monitoring progress but also to coordinate a more substantive development/transformation process where firms' interests collide with public endeavors. To the regulator, this suggests that a more creative use of law is a more promising strategic instrument for achieving the sustainable demands in the CEEC.

The capacity NMS to face the compliance costs seems to be crucial. It will be analyzed in a subsequent chapter on the basis of questionnaire based analysis made among Polish companies, after the enlargement of the EU.

IV. The importance of technical barriers in international trade. Theory and empirics – a review.

In the previous chapters we pointed at economic functions of product regulations and presented a perception of standards by representatives of Polish and Israeli companies. The survey-based analysis showed that technical regulations and standards could create a barrier to trade, especially for non-member of the European Union. The crucial question is therefore how these regulations do impact the pattern of international trade? How important can they be for new member states and Mediterranean countries? What are the right measures and approaches to evaluate economic implications of TBTs? In order to put a structure on the evaluation of total effects of TBTs Roberts, Orden and Josling (1999) point at three basic economic effects of the barriers[44]:

Regulatory protection effect refers to additional costs that are necessary in order to meet the technical requirements.[45] Thus, TBT works as a tariff. The only difference is that it does not provide tariff revenues for the government budget, which in turn generates a deadweight loss. In this approach one studies the price difference arising from the introduction of new technical regulation and the effects of this difference for international trade.

"Supply shift" effect refers to the impact of the changes in imports resulting from TBTs on the domestic supply as well as to the costs/benefits of the uniformity of standards. Within the analysis of domestic supply changes, one can study for instance benefits resulting from improvement in consumers' health (due to e.g. new SPS standards). More important however, are the effects of new regulations on market structure and the degree of competition. This can affect the size of market and producers' rents as well as create new equilibrium in a given sector (Navasen, 2000; Fisher and Serra, 2000; Maskus et al., 2001).

"Demand shift" effect is probably the most complicated. It refers to the effect of new regulations on the information available to consumers, which can raise the demand for the analyzed good. This creates a number of benefits. Introduction of standards improves transparency and reduces the cost of acquiring of information. This reduces the information asymmetry between consumer and producer which results in more efficient economic

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[44] This classification was also applied in the survey study by OECD (2003), pp. 44-45.
[45] The production implications of standards were already discussed in the second chapter.

behavior. Thus, technical standards and regulations can be treated as a public good. Existence of standards makes products more similar which in turn increases elasticity of substitution between them and makes the market more competitive. There can also arise the so-called network effects, which increase complementarity among products within the same sector. All these effects may lead to higher welfare, which at least partially offsets protectionist character of regulations. Some of them were already presented in the second chapter.

In fact, it is impossible to analyze all three effects in one model. We will discuss the most important analytical methods that take into account each of these effects. In practice, it is very common to apply more than one analytical method within one analysis or paper.

TBTs as tariff equivalents – price wedge

The simplest method used to evaluate the protectionist effect of technical barriers is to calculate their tariff equivalence. In this case we assume that we know the situation before the introduction of the regulation and we study the effects of this regulation on the level of both production and imports. Such effects can be illustrated with a simple partial equilibrium diagram (see below).
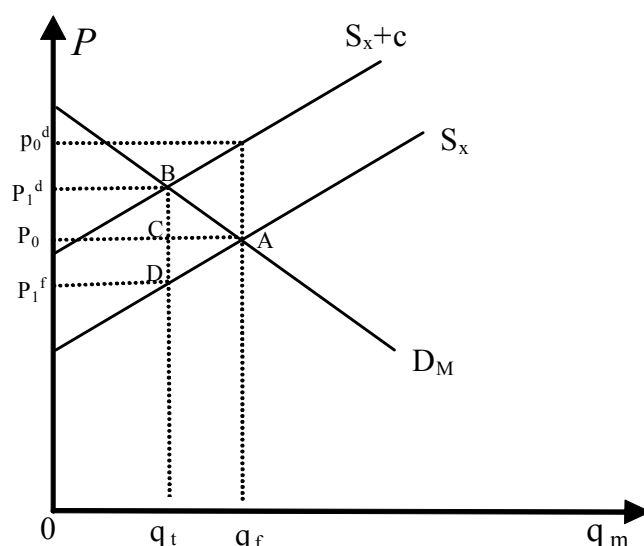
Figure IV-1. Technical barriers as tariff equivalents.

Source: Maskus, Otsuki and Wilson (2001), p. 39.

Curve S_X shows the export supply (of a foreign supplier) and D_M shows the import demand curve (of an importing country). The initial equilibrium (before the introduction of technical regulations) is at point A. Domestic price equals p_0 and the volume of imports is q_f. If the introduction of technical regulation in the importing country increases exporter's marginal cost by c (i.e. the compliance cost due to e.g. conformity assessment and certification procedures) curve S_X will shift to S_X+c. Import will fall to q_t and domestic price will rise to p_1^d. If however such compliance cost refers also to domestic producer (and assuming that domestic and imported goods are perfect substitutes) the import demand curve will shift too by the same vector – [0,c] –imports will not change (q_t) and domestic price will rise to p_0^d. Higher price of imported good is not necessarily measure of "technical" discrimination of importers. Therefore, percentage difference between the domestic and foreign prices $\left(p_1^d - p_1^f\right)/p_1^f$ is not necessary a good measure of tariff equivalence of technical barrier[46]. It should be compared to the cost increase imposed o domestic producer or to import quantity. The size of this measure depends on the slope of D_M curve as well.

A better measure, independent of the demand curve, would be the tariff equivalent equal to $\left(p_1^d - p_0\right)/p_0$, which is measured at previous (free trade) level of imports. However, it is quite unlikely that these pricess are observable.

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[46] Maskus, Otsuki and Wilson (2001), p. 38-39.

The easiest way to do that would be comparing prices of a given product right before and right after the introduction of the regulation. Comparing these two prices would be the measure of restrictiveness of TBT and would be the base to calculate tariff equivalence. Unfortunately, we usually miss price observations that are long enough and disaggregated. Therefore one usually tries to reconstruct the import price that would emerge under no TBT (Laird and Yeats, 1990). Comparison should be between domestic price of imported good and the c.i.f. price, including transport cost but excluding the tariff. In such a case one uses different sources of information about export prices (Deardorff and Stern, 1998).

The method of price wedge has been frequently used in a number of empirical studies. The early studies date back to mid 1990s. They referred mostly to agricultural and food industry. Examples of such studies are Campbell and Gossette (1995), the study by US International Trade Commission (1995) and Calvin and Krissoff (1997). The last study, which addressed the issue of American exports of apples, seems the most interesting. The authors studied the behavior of price of identical (assumed) apples in similar time across different markets. The differences between prices per unit of American and local apples, controlled for the tariff level, were treated as a tariff equivalence reflecting existence of quality standards. The results were in line with expectations, although the authors agreed that one could not treat the results as fully credible, since the apples were not in fact identical.

European Commission did a similar analysis to study the markets of beef and poultry meat as well as of apples and tomatoes (EU Commission, 2001). In case of tomato market the results were very unsatisfactory. The market was characterized by huge variation of unit prices that depended on the market and time of origin and seemed independent of quality of products. In that case, the distribution channels seemed to influence prices.

Those studies show practical problems that arise when one tries to apply the method of price wedge. First of all, one usually cannot be sure, that the calculated price wedge reveals only technical barriers and not other barriers to trade. Secondly, it is extremely difficult to find two identical products. Even in case of apples and tomatoes (products that usually do not have brands) comparing domestic with imported products was very difficult. Thirdly, price differences may arise from a market power of domestic and foreign suppliers. If domestic producers have large share of the domestic market they are more likely to extract oligopolistic rent and thus influence prices. Fourthly, the access to disaggregated data, which is crucial for this type of analysis, is quite limited. Even when one takes data at 6-digit HS level of aggregation, there are still differences between products that may result in significant

differences in prices. Calculations based on a 2-digit HS level of aggregation make the usage of this method impossible.

The inventory based analysis of technical barriers to trade

In this approach one analyzes the frequency of TBTs, treating this as an indicator of restrictiveness of such barriers. The source of information can be:

Information on the number of technical regulations and standards in different sectors;

Information on how frequent was the product subject to detention at the border and/or not allowed to be sold in the importing market;

Information on how often did firms in different industries complain about the standards and/or how often was a case against such regulations brought to international forum.

The most common measures of importance of technical barriers to trade are:

Total number of restrictions and/or regulations

Frequency of TBTs in operation

Import coverage ratios calculated as the value of import of each good covered with TBT divided by total value of import of particular sector

Ratio of international to domestic standards

A number of papers have analyzed frequency of TBTs in imports of selected countries. Among the seminal papers are those by Swann, Temple and Shurmer (1996) and Moenius (1999). Swann, Temple and Shurmer (1996) used an econometric model to calculate frequency of international and domestic standards in Great Briatain and in Germany in 1985-1991. Moenius (1999) analyzed the importance of technical regulations and norms in a broad number of sectors and countries in 1980-1995. These studies were already mentioned in the second chapter. In both cases frequency of technical regulations was treated as a measure of restrictiveness of trade barriers.

For this paper, the most interesting are the studies by European Commission and Brenton, Sheehy and Vancauteren (2001). The first study showed the part of production and trade in the EU-15 is covered by technical regulations of the "old" and "new" approach and by the mutual recognition (MR) principle. Brenton et al. (2001) studied the share of each approach to technical standards in bilateral trade of "old" and "new" members of the European Union. The point at existing differences that may reflect both opportunities for and problems with exports

of Central and Eastern European Countries (CEECs) accessing the EU. The analysis was extended to other European countries by Brenton and Manzocchi (2002). Similar study for Poland was done by Hagemejer and Michalek (2004). The results of our comparative analysis for new member states and Mediterranean countries, based on the same methodology will be presented in subsequent sections of this work.

This type of analysis was further extended by Otsuki, Wilson and Sewadeh (2001a, 2001b). They study how the allowed limit of aflatoxines in peanuts (treated as a measure of the restrictiveness of SPS) affects the volume of exports from African countries. Fontagne, von Kirbach and Mimouni (2001) analyze the importance of obligatory environmental standards as technical barrier to trade. They assume that if a particular standard is enforced in only a few countries it is more likely that it has a protectionist character. Using a large sample of countries they study the frequency of TBTs across countries.

Finally, Henson, Lux and Traill (2001) did a study for European Commission. They studied the importance of requirements regarding food quality and/or safety in the United States and in the European Union. 279 European and 447 American regulations were analyzed from the point of view of instruments and declared objectives. This measure of frequency was treated as a standard that can be a technical barrier to trade.

Almost every study that was mentioned above has been based on the assumption that existence of technical standards and regulations is a barrier to international trade. However, this need not be the case. Some regulations might be not restrictive if they are commonly used. The frequency of such norms does not have to be a signal of the restrictiveness in international trade. Moreover, the correlation between the number of applied regulations and its restrictiveness is far from obvious. A better measure of restrictiveness seems to be information on how often the products were detained on the border due to not meeting technical regulations. This type of information is however rarely revealed by relevant customs office (except for the United States).

It doesn't mean that the analysis of frequency of technical regulations is useless. On the contrary, they are usually the first and quite good an indicator of possible technical barriers to trade. They are also quite often used in econometric models (see forthcoming sections). One has to remember however that the mere frequency is not a direct proof of restrictiveness.

Survey-based analysis

In order to avoid possible problems associated with the analysis of frequency one can focus on surveys among firms, which are asked to evaluate the restrictiveness of technical regulations and standards. It is often argued that only the firms, that are active in international markets, can properly assess the importance of TBTs. Therefore, well prepared and thorough surveys can reveal links that could otherwise remain hidden. They can also serve as a sound basis for further research.

Large cross-section studies are organized by government institutions and international organizations. European Commission surveys its exporters that face barriers when exporting to the US market. Similar studies are made by the United States (US Trade Representative) for the main US exporting markets. Surveys are also made by OECD (1999b). OECD asked about technical barriers faced by exporters from four largest developed countries (USA, Japan, Germany and Great Britain). Roberts and DeRemer (1997) and Thornsbury et al. (1999) use the results of the surveys made by USDA in their econometric studies where they analyzed the effects of TBTs in American agriculture exports.

Technical barriers to trade can be especially harmful for developing countries that export agriculture products. Exporters and information points from these countries were surveyed by researchers from Reading University published in Henson et al. (1999, 2000 and 2001). Most of survey studies show that sanitary and phyto-sanitary norms – especially in the EU – are a significant barrier for the exports of agriculture products from the developing countries.

There were already two questionnaire based surveys that analyzed the restrictiveness of technical barriers faced by Polish exporters, before the accession to the EU. The first was ordered by State Committee for European Integration in Poland (UKIE) and done by IKCHZ[47] (2003). The results from this study were presented in Marczewski (2003). The authors surveyed 272 Polish firms, mostly in the textile, machinery and furniture industry. Most of the firms did not overestimate the importance of technical barriers. Small firms usually expected to benefit from the unification of standards. The second study by Gorzelak and Żółkiewski (2002) surveyed 96 firms mostly in chemical and food industry. More than 1/3 of the firms declared that they had faced difficulties in exporting to the EU associated mostly because of the necessity to meet technical regulations. The detailed results of our study for Poland after accession were presented in Chapter 2 of this report.

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[47] Polish Foreign Trade Institute (Polish abbreviation CIHZ)

It seems that survey studies may be a source of important information that are not available using other methods. They allow for the identification of barriers and problems that exporters face and that were not considered in the standard microeconomic models.

On the other hand however, survey studies are rather supplemental and are not useful for the precise quantification of the effects of TBTs. Another problem is that such surveys are often not objective. Exporters may have an incentive to give false answers if they believe that the results of the survey may influence policymakers' decisions and/or cases in international forum. Thus, survey results should be treated with caution and applied for the introductory analysis of the problem. We treated the results of our surveys in the same way.

Gravity models

The most common approach to quantifying the effects of TBTs relies on the estimation of the difference between actual and potential trade controlling for tariff and non-tariff barriers. Gravity models are the most popular tool for this kind of analysis. They are derived directly from the Newtonian gravity law that can be written in the following way:

$$F_{ij} = G \cdot \left(M_i \cdot M_j \right) / D_{ij}^2 ,$$

where: F_{ij} is the force of gravitation, D_{ij} is the distance between i and j, M_i and M_j are the masses of i and j and G is a constant. In the 1960s gravity models were successfully applied to explain bilateral trade flows (F_{ij}) between countries. Theoretical foundations for this approach were presented in Anderson (1979) and further extended by Bergstand (1989) who studied the mechanisms of gravity models in a monopolistic setting and by Deardorf (1998). The usefulness of gravity models for explaining flows of goods in accordance with modern trade theories is demonstrated by Feenstra (2003).

Gravity models often use additional variables that along with basic ones (GDPs of two countries and distance) can explain the value of bilateral trade flows. McCallum (1995) showed that trade between Canada and United States is much smaller than predicted by gravity model. On the other hand intra-Canadian trade was larger. This finding is a result of the so-called border effect.

Moenius (1999) used a gravity model to study the effects of technical barriers on international trade. He analyzed the role of standards depending on who imposes those standards and whether such standards are common for exporting and importing country. The study was done for 471 SITC categories in 12 countries in 16 years. The results suggest that the existence of

common standards is beneficial for bilateral trade. The results referring to standards that are introduced only in the importing country are less clear-cut. Moenius finds that such situation affects negatively trade of food products but positively trade of industrial goods. His interpretation is that existence of standards in the industrial sector is an important piece of information for the exporter. The exporter knows how the product must be adjusted to be sold in a particular market. Gathering such information would have been costly.

Maskus, Otsuki and Wilson (2001) criticize the study of Moenius (1999). They point at lack of distinction between technical regulations and non-obligatory norms (standards). Moenius also did not take into consideration the effects of changes in international trade resulting from the formation of regional free trade areas. They suggest that the analysis of Moenius should be modified. The gravity equation they propose is the following:

$$\ln\left(M_{ij}^{k}\right) = b_0 \ln\left(GNP_i\right) + b_1 \ln\left(POP_i\right) + b_2 \ln\left(GNP_j\right) + b_3 \ln\left(POP_j\right) + b_4 \ln\left(GNP_i\right) +$$
$$b_5 \ln\left(DIST_{ij}\right) + b_6 RTA_{ij} + b_7 \ln\left(ST_i^{k}\right) + b_8 \ln\left(ST_j^{k}\right) + b_9 \ln\left(ST_{ij}^{k}\right) +$$
$$b_{10} \ln\left(TB_i^{k}\right) + b_{11} \ln\left(TB_i^{k}\right) + \varepsilon_{ijk}$$

Where:

- i, j are subscripts for exporter/importer;
- k is a 4-digit SITC product;
- GNP is gross national product;
- POP is population;
- RTA is a dummy variable taking the value of one if there is a regional free trade area between exporter and importer (zero otherwise);
- ST is a number of standards that can be both exporter- and importer-specific or mutual (ST_{ij});
- TB is technical regulation in trade of industrial goods (SPS for agricultural and food products).

Estimating this equation would allow to assess the differences between the effects of regulations and standards. In particular it might happen that the coefficients at ST (standards) are positive and at TB (regulations) negative. The proposal however is still theoretical for the moment. In order to apply it one needs a correct method of quantifying both standards and regulations. It seems that such method is not available yet.

Gravity models are often used to analyze the importance of TBTs and the results obtained from such analysis seem valuable. Main problems associated with this approach lies in the difficulties to capture the border effect that comprises not only of technical standards but also of fiscal and administrative barriers associated with crossing the border. Another problem is

the quantification of technical standards and regulations as well as the proper aggregation of data. Finally, the approach based on gravity models does not answer one important question – what are the welfare effects of technical barriers to trade.

Cost-benefit analysis based on the risk assessment

Assessing the risk (e.g. of an epidemic) seems not relevant for TBTs at first glance. However, these methods have been coupled to cost-benefit calculations, and indirectly contribute to the measurement of the effect of NTBs. When technical or SPS regulations aim at correcting market failures, one difficulty is often to identify the protectionist component of the regulation. There are only limited cases where the efficiency assessment is straightforward.

If the cost associated with protectionism is larger than the benefit associated with reduction of market failure then one can say that the regulation is a technical barrier to trade. Such analysis also enables an indirect assessment of economic and scientific sense of such instrument.

Fisher and Serra (2000) extend this approach and build a model of oligopolistic competition between domestic and foreign firm. They assume that the cost of production rises with rising requirements regarding minimal level of technical regulation (standard). They also assume that there is a fixed (compliance) cost of production at two levels of standards (for a foreign firm). They prove that, depending on the size of domestic market, home firm will lobby for the highest standard (τ_e) that would eliminate foreign firm from the market or will lobby against any standard at all (τ_0), since it also raises its own compliance cost). These strategies are presented in Figure 2.
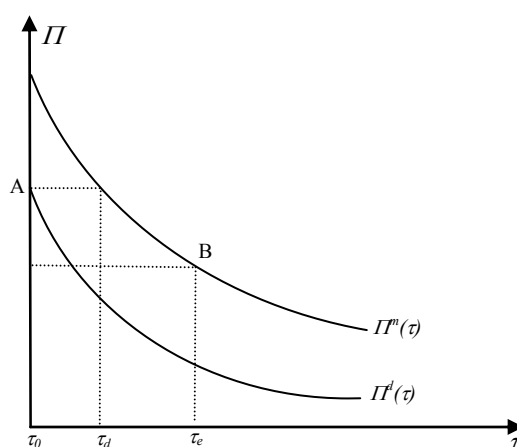
Figure IV-2. Profits of the domestic firm under monopoly and duopoly.

$\Pi^m(\tau)$ and $\Pi^d(\tau)$ are domestic firm's profit curves, depending on level of standard imposed (τ), under monopoly and duopoly respectively. The above mentioned level of standard τ_e, excludes foreign company from the domestic market. In turn, if there is a negative externality from consumption , then the "objective social planner" will choose the standard being a decreasing function of the market size, and which always be a protective one. In this case the standard will be (should be) less stringent (comparing to the level desired by the domestic producer) since from the efficiency point of view duopoly is preferred to monopoly in the domestic market[48]. The model explains why domestic firms lobby for the introduction of standards and why the standards often have protectionist character. It also shows welfare changes resulting from the introduction of various levels of standards.

There have been a number of studies that analyzed costs and benefits resulting from the introduction of SPS measures in agriculture. The studies refer to the risk of epidemic (Bigsby and Whyte, 2000) and/or quarantine procedures (James and Anderson, 1998). In a more general setting Arrow et al. (1996) argue for a systematic application of cost-benefit analysis when assessing whether health protecting instruments should be introduced or not. They claim that quite often such instruments can be too expensive for consumers and tax payers in the importing country comparing to the benefits associated with health and/or environment protection.

An interesting and well-known example of such analysis is the study by Otsuki, Wilson and Sewadeh (2001). The basis for this analysis was the introduction of the maximum level of aflatoxines by the EU countries. This new regulation was more stringent than agreed under *Codex Alimentarius*, and accepted by WTO SPS Agreement. The authors studied the determinants of African exports of peanuts to the EU controlling for the specified maximum level of aflatoxines. They estimated the following gravity equation:

$$\ln\left(V_{ij}^k\right) = b_0^k + b_1^k \ln\left(PCGNP^j\right) + b_2^k \ln\left(PCGNP^i\right) + b_3^k \ln\left(DIST^{ij}\right)$$
$$+ b_4^k YEAR + b_5^k COL^{ij} + b_6^k \ln\left(ST^{ij}\right) + \varepsilon_i^k$$

Where:

- V_{ij}^k is the trade in product k between countries *i* and *j*;

- $PCGNP^i$ is a real income per capita in country *i*;

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[48] Deadweight loss is smaller under duopoly.

- $DIST^{ij}$ is the distance between countries i and j;
- $YEAR$ is a year dummy;
- COL^{ij} is a dummy taking the value of one if one of the countries is a former colony of the partner country;
- ST_i^k captures the maximal allowed level of aflatoxines B1 in the import of product k from country i.

At the centre of the analysis was the importance of aflatoxines as a technical barrier to trade. The coefficient at ST_i^k was positive and significant, which suggested that the maximal allowed level of aflatoxines was indeed a barrier to trade. The next step was to determine the effects of new regulations on consumers' health in the EU. The authors drew upon the analysis of FAO/WHO and assessed that the new regulation would contribute to the fall in the death rate (due to a cancer caused by hepatitis B1) by 2 persons per one billion of citizens in one year. Then they calculated changes in exports of African countries (cereals, dried fruits and edible nuts) comparing to two regimes – *Codex Alimentaris* norms and previous EU regulation. The implementation of EU harmonized standard will reduce –according to this study - African export revenue by 59% for cereals, and 47% for dried and preserved fruits and edible nuts. The comparative results of these scenarios are presented in Table IV-1.

Table IV-1. Effects of new EU aflatoxines regulations for African export and health of EU citizens.

	Relative to Codex Alimentarius	Relative to pre-EU harmonization (1998 trade)
Loss in the value of African food exports to EU	$ 670 milllion	$ 340 milllion
Number of cancer deaths saved in the EU (per year)	2.3 persons	0.9 persons

Source: Otsuki, Wilson and Sewadeh (2001), pp. 510.

The results presented in Table IV-1 are not a direct cost-benefit analysis. On one hand there is life of a few persons in the EU compared with export of African countries. However, African countries are among the poorest countries in the world. Reduction in the export of food may affect people whose life depends on sales of those goods. Anyhow the example shows that the right granted under SPS Agreement to determine the 'appropriate levels of protection' of human health can have important implications for international trade. .

Standardization union

The best known theoretical model aiming at analyzing the effects of common standardization policy has been elaborated by Gandal and Shy (2001). The authors develop the basic three-country, three-firm, and three horizontally differentiated goods model. For sake of simplicity they assume that all varieties are produced with the same unit cost (equal to zero). But producers have to face the unit conversion (compliance) cost of a new compulsory standard (technical regulation). The utility of an arbitrary consumer, based on Salop approach, depends mainly on price and on index measuring how close a given variety to the ideal model is. The consumers can benefit from network effects, while producers do not. The latter assumption is not very realistic, because producers (as it was argued earlier) may also benefit from information value provided by standard or from economies of scale.

In the model the difference between these two effects is important. In the case of conversion costs, nonrecognition increases the market share and profits of the domestic firm and reduces the market share and profits of the foreign firms relative to the case in which foreign standards are recognized. In the network effects case, nonrecognition of foreign standards has no effect on prices, market shares, or profits, but has impact on consumers' utility.

In this framework Gandal and Shy analyze the efficiency of governmental policy. When government policy is limited to either recognizing all foreign standards or not recognizing any foreign standard, recognition is always the outcome.

Initially, authors examine two extreme cases: in the first one, they assume that there are no network effects and conversion costs are high. In this setting, when governments do not recognize foreign standards, foreign firms must incur a compliance cost in order be permitted to sell in the domestic country. In the second case, they assume the network effects are large while conversion costs are non-existent (or negligible).

On this basis Gandal and Shy analyze prerequisites of creating the standardization union. They prove that in the case in which there are no network effects, it is profitable for two of the countries to form a union, when the conversion costs are moderate or large. The formation of a standardization union will cause some consumers in member countries to switch from the third country's good to a brand produced by a member country. Thus, a formation of the union will increase trade between member countries, whereas trade between members and the nonmember will decrease. Therefore, in classic terminology, the formation of a the standardization union will cause trade diversion, and therefore will reduce aggregate world

welfare, since with the absence of a union, countries will choose to mutually recognize all standards.

In the reverse case in which there are positive network effects, and no conversion costs, all countries mutually recognize all (obligatory) standards and have no incentives to form standardization unions. In the more realistic setting in which there are both conversion costs and network effects, the profitability of a standardization union will depend on the relative magnitudes of the two effects. The work of Gandal and Shy suggests that strong network effects will reduce the likelihood of standardization unions which divert trade and reduce world welfare.

The last conclusion is qualified. They point out that standardization unions are not always welfare reducing. In an earlier version of the presented paper, they showed that when standardization conversion costs are extremely large, the nonrecognition of foreign brands eliminates foreign products from domestic market. In this case a formation of the union will create new trade between the union countries.[49] Thus in some instances, a formation of a standardization union may increase world welfare.

Thus, we may conclude that work of Gandal and Shy has important theoretical implications for explaining effects of the standardization policy of the European Union. It may also be useful in better understanding the economic position of exporters from new member states and Mediterranean countries.

First, it provides a theoretical explanation why uniform technical regulations applied by the European Union may provoke trade diversion, restrict imports from third countries and thus decrease the world welfare. The trade disputes in the framework of WTO, might have real economic foundations.

Second, it explains why protective effect may be more powerful in some sectors (like food industry) in which the compliance costs are relatively high, whereas network effects are probably close to zero. On the other hand the restrictive effect of technical regulations in sectors exhibiting substantial network effects (like household electronics or electric equipment) might not exist or be only very limited.

Third, it provides explanation why East European countries, having previously quite distinct system of technical regulations, limiting the foreign competition, might benefit from the accession to the European Union. It could be interpreted as a case for trade creation in the

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[49] The concept of trade creation and diversion is used here in a traditional Vinerian terminology.

standardization union. The similar argument can probably be applied with respect to Mediterranean countries being economically linked with the European Union.

General and partial equilibrium treatment of NTB's

Effects of future policy changes of a kind that never happened in the past are hard to evaluate using traditional econometric approaches. A popular approach in assessing possible directions of economic changes following policy shocks is based on simulation studies using different sorts of so-called computable general or partial equilibrium models. A number of such models have been used to evaluate the effects of the European integration process. Some of these models will be shortly presented here.

The models work in a simple way. The starting point is to formulate a model that is assumed to reflect the macro and microeconomic structure of the economy. Using this assumption, a researcher can then assume that the data he observes corresponds with the equilibrium of the model in question. The model is then calibrated to the data – the unknown parameters are either estimated in other econometric studies or computed within the model using other available data – given the equilibrium assumption. Once the data is calibrated, the model can be used to simulate policy changes – with the parameter fixed, policy shocks are reflected in changes in consumption, output, welfare, profits etc.

Computable simulation models require a large set of data. In case of a general equilibrium model, one needs sectoral input-output data, data on international trade, data on protection, taxes and many others. When data is a problem, researchers often use partial equilibrium models – these are focused only on one sector, taking the rest of the economy as given and unaffected by price-quantity changes in the sector under consideration (this of course requires many assumptions on the preference and production structure).

Single Market effects studies

The process of European integration was often assessed in the economic literature based computable simulation models. In most of the trade-related works, the attention is focused mainly on the subject of non-tariff barriers and their removal within the Single Market framework. The large part of the NTB's is usually contributed to technical barriers to trade being the major focus of this study.

Smith and Venables (1988) in their pioneer study based on the original Dixit-Stiglitz (1977) framework evaluate possible effects of 1992 Single Market program implementation in selected industries. They use a partial equilibrium model with a *love-for-variety* utility function with a constant elasticity of substitution and a cost function exhibiting increasing returns to scale. The model by Smith and Venables was later used (with modifications) in other works by Smith and Venables (1991) and Smith and Venables (1994). It was also a basis for the simple assessment of the effects of Polish accession to the EU in selected sectors by Hagemejer (2003).

Smith and Venables assume that the Single Market policies lead to a reduction in trade costs. They distinguish two stages of integration. First one, the partial integration, allows for market segmentation – firms are allowed to have different pricing policies in different EU market. In the second stage – full integration – producer pricing is uniform.

A 10 percent reduction of transport cost causes large changes in the volume of trade. It causes an increased penetration of imports and an increase in the competitiveness of markets. Prices fall, consumer surplus goes up and profits shrink. In the long run scenarios the number of firms falls significantly. The simulated changes in output as a response to the change range from 3 to even 15 percent increase. This results in exploitation of economies of scale and cost savings leading to further price drops. In the long run scenarios the changes in output are even higher. Simulated total welfare changes range from 0.5 to 2 percent of initial value of GDP.

A computable general equilibrium model was used by Allen, Gasiorek and Smith (1998) who further evaluate the Single Market effects. In this paper, the integration process is reflected in the reduction of transportation costs. The authors distinguish two effects of this change – a direct demand effect (a direct increase in imports of the EU goods following a price drop resulting from change in transport cost) and a pro-competitive effect, resulting in lowering of an average domestic firm share in a domestic market.

The model includes 64 sectors of an imperfectly competitive structure, some of which exhibit large degree of increasing returns to scale and high concentration. Due to a policy shock, the average share of a domestic firm falls from 1 to even 50 percent in the most sensitive sectors. There are scenarios where concentration actually goes up – where segmentation is permitted and there is a variable number of firms and firms exit to restore the pre-simulation level of profits.

The simulated welfare changes are higher for small economies. In most cases, the welfare effects are positive except for the long-run scenario permitting market segmentation (these are

due to increased concentration). For large countries such as France, Germany or Italy, the welfare effects do not exceed 1 percent of GDP. In case of smaller economies, these effects are much larger: Greece – 15 percent and Portugal – 18 percent.

Harrison, Rutherford and Tarr (1996) present a somewhat different approach to the modeling of European integration. They focus their attention to the standardization policy and removal of technical barriers to trade. They claim that the implementation of common standards affect the way consumers substitute goods together, not only the cost of transporting.

The authors use a multiply nested constant elasticity of substitution utility function. The process of substitution is the following: in the first stage of the utility maximization process, the consumer distinguishes domestic and foreign goods. In the second stage, the income allocated to foreign goods is then divided into goods coming from all different trading partners. In the third stage, these share of expenditures are further spent on products of particular firms.

The single market program, according to Harrison, Rutherford and Tarr (1996) has an effect on substitution – the consumer treats goods as either EU or non-EU wherever she chose between domestic and foreign (the top nest). At lower levels of nesting, Armington (country) differentiation and firm level differentiation is used as before. This is believed to reflect a greater degree of substitution between the EU goods due to harmonization.

The results of the simulation imply that the aggregated EU Members' welfare was expected to rise by 2.6 percent of GDP. This rise in welfare varies across countries from 0.8 to almost 8 percent depending on a scenario (short/long run).

The effects of EU enlargement

Francois (1998) evaluates the effects of accession of selected Central and Eastern European countries to the European Union. The model used is similar to the ones used in studies quoted before. The data used comes from a GTAP database and the effects are evaluated on regional basis – EU, CEEC's, NAFTA etc. The effects of integration are measured on the level of largely aggregated 13 sectors, of which 7 are characterized by increasing returns to scale. The CGE model used here is the one allowing for imperfect competition.

The EU enlargement is modeled twofold. First, more important for our purposes, the decrease of NTB's is modeled through a drop in transport costs. Second, the risk premium on capital investments in accession countries goes down.

Authors distinguish three effects of integration: the static effects (classical trade theory), the pro-competitive effects and the dynamic effects of capital accumulation. The simulation shows large welfare changes for the EU acceding countries while the effects for the "old" EU-15 are not significant. For the EU acceding countries, the static effects are of the order of 0.1 percent of GDP, while the pro-competitive effects are close to 12 percent. The total effects of EU enlargement for the CEEC's according to Francois are of the order of 22 percent of GDP in the long run. As in every imperfect competition CGE simulation, the sectoral reallocations are large and the output changes are in some cases close to 100 percent.

Maliszewska (2002) uses a model similar in its structure to the one used by Harrison, Rutherford and Tarr (1996) with imperfect competition and increasing returns to scale. The preference structure is the same as in HRT. Three experiments are undertaken: adoption of the common external tariff, a free trade area and the reduction in technical barriers to trade. The first two do not have a large effect on the acceding economies (tariffs in trade with EU were largely removed prior to the accession), the focus of the simulation is placed on the reduction in TBT's which is modeled as transport cost decrease.

Maliszewska considers a short-run and a long run scenario with capital accumulation. In the first scenario, the removal of TBT's is expected to bring welfare effects of 2 percent GDP for Hungary and 1 percent GDP for Poland. The production changes are of the order of 1-10 percent depending on an industry and some industries experience large drops in production. The long run scenario brings larger expected welfare effects – the EU enlargement is expected to affect the aggregate level of welfare by 6 percent in Hungary and 3 percent in Poland.

As we have seen in this section, various simulation models were commonly used in the literature in the evaluation of the process of European integration. Later on we employ a simple computable general equilibrium model to try to evaluate the effects of Poland and other CEECs adopting the standardization policy of the EU.

V. Effects of the standardization policy in the EU

Effects of standardization on intra and extra-EU-15 trade

In order to later assess the importance of the technical barriers to trade and the EU policy towards TBT's for the new member states (CEEC) and the Mediterranean countries we look

at the significance of the TBT's in the EU. This is currently being analyzed by Hagemejer (2005) and we believe that the results of his work have important implications for further analysis of the structure of exports of both MPC's and CEEC's to the EU.

The study uses a commonly employed CES preference structure as a basis for the theoretical model. At the top tier of preference, the consumer assigns fixed shares of into products of K sectors. Preferences are homothethic and the shares of expenditure are constant. Within each of the K sectors, there is n varieties that are either produced locally or imported.

The subutility function at the industry level (for industry i) is given by the standard CES formulation:

$$U_i = [\sum_{j=1}^{n} q_{ij}^{\frac{\sigma-1}{\sigma}}]^{\frac{\sigma}{\sigma-1}}$$

(1)

It is assumed that the world consists of 3 regions. A rest-of-the world region, a partner region and a home country. I assume that there are the following costs of trade: t_i^* is the external tariff in industry i, r_i and r_i^* are *ad-valorem* transport costs from respectively the partner region and the rest of the world. There is also another cost of importing - a technical barrier to trade: b_i and b_i^* [50] that is also *ad-valorem* and b_i=1 means no technical barriers.

The demand for variety imported from the rest of the world j in sector i in home is:

$$q_{ij}^* = \frac{(p_{ij}^* t_i^* r_i^* b_i^*)^{-\sigma} E_i}{P}$$

(2)

Where E_i is the expenditure assigned to the i-th variety at the first stage of the consumer optimization problem, σ is the elasticity of substitution, p_{ij} is the price of of variety j coming from sector i, and P is the CES price index. The demand for variety imported from the partner country is given by:

$$q_{ij} = \frac{(p_{ij}r_ib_i)^{-\sigma}E_i}{P},$$ (3)

assuming that the preferential tariff with respect to the partner country is equal to zero. Let Q_i and Q_i^* be total imports from partner and rest of the world in sector i. $Q_i = N_iq_{ij}$ and $Q_i^* = N_i^*q_{ij}$, where N and N^* are the numbers of varieties produced in partner and the rest of the world. This requires an assumption that varieties coming from a given region have equal quantities within an industry. We assume the home country is small with respect to the partner country and the rest of the world and thus it treats the prices as given.

Assume there is a sector m, where the technical barriers to trade are not present and $b_m = 1$ and $b_m^* = 1$, and that prices in a given industry from a given destination are equal across varieties, so that $p_{ij} = p_i$ We can compute the following ratio[51]:

$$Y_{im} = \frac{(p_iQ_i)/(p_i * Q_i^*)}{(p_mQ_m)/(p_m^*Q_m^*)} = [\frac{(p_ir_ib_i)/(p_i^*t_i^*r_i^*b_i^*)}{(p_mr_m)/(p_m^*t_m^*r_m^*)}]^{-\sigma} \frac{p_i/p_i^*}{p_m/p_m^*} \frac{N_i/N_i^*}{N_m/N_m^*}$$ (4)

$$= (\frac{p_m/p_m^*}{p_m/p_m^*})^{1-\sigma}[\frac{b_i}{b_i^*}\frac{r_i/(t_i^*r_i^*)}{r_m/(t_m^*r_m^*)}]^{-\sigma} \frac{N_i/N_i^*}{N_m/N_m^*}$$

Taking the above in logs:

$$\log(Y_{im}) = -\sigma\log(\frac{b_i}{b_i^*}) + (1-\sigma)\log(\frac{p_i/p_i^*}{p_m/p_m^*}) + \sigma\log(\frac{t_i^*}{t_m^*}) - \sigma\log(\frac{r_i/r_i^*}{r_m/r_m^*}) - \log(\frac{N_i/N_i^*}{N_m/N_m^*})$$ (5)

Equation (5) states the relationship between the relative trade volume and the relative level of the technical barriers to trade measured by b and will be a starting point for estimation of relative TBT barriers.

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[51]Taking the double difference washes out everything that is either industry specific and uniform across countries or country specific and uniform across industries - that helps eliminating unobservables, such as unobserved barriers to trade

The estimated equation becomes (after dropping the variable corresponding to other remaining barriers to trade):

$$\log(Y_i) = \beta_0 + \beta_1 \text{TBT}_i + \beta_2 \log(p_i) + \beta_3 \log(t_i) + \beta_4 \log(N_i) \tag{6}$$

Where y, p, t, and N are relative, eg: $p_i = \dfrac{p(i)^{EU}_{TBT} / p(i)^{RoW}_{TBT}}{p^{EU}_{nTBT} / p^{RoW}_{nTBT}}$. TBT is a set of dummy variables

corresponding to existence of one or more EU approaches in every *i* category. The variables indexed by *i* and marked by TBT correspond to those CN-8 categories where there is one (or more) of the EU approaches present. For each EU country a ratio is used between the variable corresponding to imports from EU subject to an EU approach (*EU,TBT*) and the same variable corresponding to rest of the World (*RoW, TBT)*. This is then normalized by a ratio of the same variable corresponding to the aggregate imports of products not covered by any approaches (*EU, nTBT* and *RoW, nTBT*).

The estimations are based on trade data for European Union extracted from the Eurostat Comext database. Data is available at 8-digit Combined Nomenclature. The database contains intra and extra European Union trade. For each 8 digit CN category bilateral trade flows are reported using values, weight (in tons) and supplementary units. The data on technical barriers to trade is taken from European Commission (1997). The publication reports what approach to reducing technical barriers to trade the European Single Market program has selected for each industry. This is reported at the 3-digit NACE level. NACE is an activity based industry classification. The concordance between CN and NACE 1970 table is available and updated to correspond to years 1995 and 1999 that are used for estimation. For each NACE industry we can construct dummy variables reflecting presence of one or more EU approaches: harmonization, "new approach", mutual recognition.

The estimations were performed at the level of CN 8 nomenclature. The price (unit value) data is derived from the Comext database by division of the value of a particular product by its imported weight. This is extracted for each of the EU countries and with recognition of the intra and extra EU trade. This gives a proxy for average price per product/source. The tariff data is extracted at the HS 6-digit level from the trains database. These MFN tariffs are averaged across import sources for the extra EU trade (intra-EU trade is tariff-free) using a simple mean. For each of the CN8 category, the corresponding tariff is the relevant HS6 category (CN6 and HS6 are equivalent). The variable measuring remaining (country AND product specific) trade barriers is omitted.

Table V-1presents the results of the estimation. Variable `pratio` corresponds to the ratio of prices, variable `nratio` to the ratio of the number of varieties and variable `tratio` to relative tariffs. Variables `HR`, `NA`, `MR` correspond to dummy variables that are on when harmonization, new approach or mutual recognition are present (there are a number of categories where more than one approach is present).

Table V-1 Estimation results

| year | 1995 | | 1999 | |
variable	coefficient	t-statistic	coefficient	t-statistic
pratio	-1.09294	-159.17	-1.0926	-132.76
tratio	0.198738	18.55	0.022359	2.12
nratio	1.432676	147.36	1.326079	115.4
HR	0.054694	2.78	0.157403	5.44
NA	0.18727	11.33	0.137403	4.83
MR	-0.0763	-4.94	-0.14174	-5.72
constant	1.448324	108.77	1.278861	44.18
Number of obs		86633		60112
F-statistic		9322.86		6360.85
Prob > F		0		0
R-squared		0.3924		0.3884
Adj R-squared		0.3923		0.3883
Root MSE		2.0578		2.0149

From Table V-1 we can see that all coefficients in all years are significant. `pratio`, `tratio` and `nratio` have also expected signs - negative on the price coefficient and positive on both the extra-EU tariff ratio and on the ratio of prices. When looking at the estimate of the β_1 we can extract the estimate of the elasticity of substitution $\sigma = 1 - \beta_1$. In both cases, 1995 and 1999, the elasticity of substitution is of the order of 2.09 which is within the lower range suggested by the literature.

The estimates of *tratio* vary a lot between 1995 and 1999 with the latter being almost 10 times smaller. Testing the hypothesis implied by the theoretical model that $\beta_2 = 1 - \beta_1$ is heavily rejected in both periods. This may be due either to low quality of tariff and price data and also to the aggregation procedure involving taking means over multiple partners.

Turning to the estimates of coefficients on the variables of main interest `HR`, `NA` and `MR` we see significant differences between the estimates in the two periods. In 1995 the estimate for `NA` was the highest among all three, and the ratio of import volumes was on higher than the average by around 12.5 percent (ratio of the coefficient and the intercept). The same ratio for the products covered by harmonization was only higher by 3.75 percent (holding everything

else constant). For products covered by mutual recognition, the ratio was lower than the average holding everything else constant, by about 4.8 percent. The coefficients are significantly different from each other.

In 1999 however, the estimates on the TBT variables are somewhat different. The highest is the coefficient on the harmonization dummy. In 1999 the import ratio for products covered by this approach was 12.3 percent higher than the average, holding everything else constant. For the second highest coefficient, on the new approach, the distance from the mean is equal to 10.7 percent. However, we have to note that these two coefficients are not significantly different from each other. They are significantly different from the coefficient corresponding to the mutual recognition, which is again negative, and the ratio of imports for product covered by this approach is over 11 percent lower than average.

The above results are somewhat striking. The common sense suggests that the mutual recognition approach is the most effective in combating technical barriers to trade. I have also noted that the harmonization approach is the most difficult for the firms to adjust to and that the problems with reaching agreement between EU members may actually impede trade. The results completely contradict this hypothesis. There seems however, to be the plausible explanation for what the results suggest.

We have to take into account how in fact import ratio is constructed. In the denominator we have everything that corresponds to the extra-EU trade, including the trade barriers. The possible explanation to the results is that the trade barriers within the European Union are not very significant due to the standardization policy being in place for quite some time at the time the data was gathered. However, this policy affects a lot the external EU trade. We may expect that the mutual recognition approach is introduced in sectors when the amount of required product characteristics such as safety standards is low and in fact this sectors have low technical barriers to trade. The EU-mutual recognition do not impede the extra-EU imports since TBTs are low anyway. That is why we observe low internal/external import ratio for this sectors.

The new approach and harmonization have a different effect. They do facilitate trade between the EU members but they impede the external trade. We can expect, than in these sectors - which are chemicals, pharmaceuticals, motor vehicles etc., the technical barriers to trade are really high and common EU standardization policy is actually promoting trade since it removes the need of meeting each country's regulations. The external partners have to meet both their home requirements and the EU requirements which seems to impede trade a lot.

The above hypothesis seems to be confirmed by the changes in the TBT's significance over time. The results suggest that the EU members were still struggling with establishing agreements in the harmonization policy in 1995, while the adjustment process of both the national regulations and the firms have been more or less completed by 1999. That is why we see the increase in the coefficient on HR. The high coefficient on NA approach is as expected - this approach clearly facilitate trade since only the essential requirements need to be met.

The results suggest that there is a huge protective effect of both the harmonization and the NA approach. In fact, we can calculate the required decrease in the price ratio that would be equivalent to setting the ratio of imports to the same value as obtained by setting HR dummy to 1. This requires a decrease in the price ratio by 15 percent of a good for which the price ratio was initially equal to one. This corresponds to the idea of the high welfare effects of the standardization union, similar to the effects of the customs union, although without the negative impact of the loss of tariff revenue. The country/region that is left out certainly looses, the countries within the union gain, provided that the difference in the costs of production between the union and the non-union trade partners are not too large.

At first it seems that these results are contradicting the theorethical findings of the Gandal and Shy model of standardization union. However, it is not necessarily so. We may expect that the level of technical barriers to trade in the New Approach and Old Approach sectors prior to the standardization union. At the same time the network effects at the world level may not be significantly higher than the network effects on the level of the EU as a whole. Thus, countries may find it more reasonable to rather create a union than to completely recognize all standards.

We can also see the TBT induced change in the structure of trade. The trade between EU members seems to be more and more concentrated within the high-TBT products while the imports from outside are only focused on the low-TBT or no-TBT products. This certainly has implications for the world welfare since EU is one of the largest trade players in the world market and specialization facilitates exploitation in economies of scale and greater competitiveness in the world market. The possible implications for CEEC and MPC exports are presented in the summary of this chapter.

Effects of standardization policy on new EU members – a simple GTAP CGE simulation

In this part of the project we try to asses the potential effects of implementing the EU standardization policy by new EU members. In the analysis we will use a computable general equilibrium model GTAP. It is a multi-sector, multi-country general equilibrium model that is often employed in the evaluation of trade policies. The model and the corresponding GTAP database used here is prepared by the Global Trade Analysis Project at Purdue University, USA.

The GTAP model is available in two versions: a single country version and the multi-region version. The regions in the GTAP notions can be either countries or aggregated sets of countries. The multi-region version used here is especially useful for modeling changes in trade policy but also in evaluating the environmental or energy-related policies.

The general structure of the model is relatively simple[52]. It assumes the existence of the regional household that takes all the expenditure decisions within the economy. This entity is allocating expenditures to private consumption, government expenditures or savings. In the multi-region model each of these shares of expenditures is further divided into domestically produced goods and imports.

This structure has very convenient characteristics. The utility function governing the division of expenditures is in fact a social utility function and can be used in the analysis of the changes in economic policy. It has its drawbacks however – the expenditure decisions on the part of government are unrelated to the government budget constraints; the expenditures are allocated according to the total budget constraint of the household and not taking into account the government receipts.

The firms produce using the primary factors purchased from the regional household and intermediates. The sources of primary factors are purely domestic – it is assumed that the factors are strictly immobile internationally and mobile within a region (with exception of land and natural resources). The intermediate goods can be either domestically produced and imported.

In the multi-region GTAP model there are two global sectors. One of them is the global banking sector being an intermediary between the regional demand for investment goods and the supply of savings. On the world level, these two values are assumed to be equal in

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[52]This part follows Hertel, Tsigas (1997), *Structure of GTAP*

equilibrium. Second global sector is the transport sector that supplies transport services used in international trade.

As mentioned before, the demand side of the GTAP model is modeled through the regional household concept. The structure of preference of the regional household is based on the multiply nested utility function. According to such a function, the division of expenditure is made at different level of aggregation. In the case of the GTAP model, on the top level or the top nest the household is taking a decision concerning allocation of expenditures between the private consumption, government consumption and savings. The allocation is done according to the Cobb-Douglas utility function. The government consumption and private consumption expenditures are further allocated into domestic and imported goods according to the constant elasticity of substitution (CES) function. The imported goods are differentiated according to the Armington aggregation, using another CES function.

On the supply side, the production function has a similar structure as the utility function. It is also a multi-level concept. The demands derived from the production function allocate expenditures into primary factors (eg. land, capital, labour, natural resoutces) and intermediates. The demand for these two broadly defined aggregates is Leontief. The model in its basic version does not allow substitution between primary factors and intermediate goods. After assigning the shares of costs into the broad top level aggregates, the further allocation between factors is governed by a more general CES function allowing substitution. The structure of demand for intermediate goods is of the same structure as the demand for private consumption – intermediates are differentiated by country of origin using a CES aggregate.

The GTAP database is specifically designed to be used in the computable general equilibrium simulation. It is ready to use with the GTAP model. It is constructed using the input-output data of individual countries, macroeconomic data and data on international trade obtained from different sources, both country specific and international. In its most disaggregated form, the version 6 of the database covers information about 87 regions (of which some are countries – which applies especially to developed countries and some are aggregate regions, eg. 'rest of Sub-Saharan Africa').

The database has information on 57 sectors in all of the regions. This data includes information on the production volume, sales both domestic and international, intermediate use and primary factor use. It also contains information about bilateral trade between countries in both goods and services. Version 6 of the database uses year 2001 as a reference year.

The research cited before, both on the problem of the creation of the single market and on the EU enlargement assumes that the standardization policy of the European Union leads to the partial or complete removal of the non-tariff barriers, especially the technical barriers to trade that arise due to different and incompatible policies on norm and standards of countries being trade partners. This assumptions seems plausible, taking into account that the one of the main objective of the of the European Union single market-related policies is dismantling the technical barriers to trade. Also, the theoretical models cited before underline the benefits of participation in the so-called standardization union which is a sort of description we could assign to European Union.

In papers by Maliszewska (2002) and Hofmann (2001) it is assumed that the lack of the common standardization policy of the countries participating in international trade leads to a inefficiency that leads to the increase in price of a product imported.

In Hofmann's work it is assumed that the inefficiency is leading to an increase in prices equal to 2.5 percent of the value of imports. Maliszewska differentiates these costs according to sector. In her research she assumes that the removal of the inefficiency leads to a reduction of transport costs. In the GTAP model, transport costs are modeled by a global transport sector producing a transport service which is purchased in the process of imports of good. In the way the GTAP model works, reduction of the cost of transport leads to a decrease of its price. This in turns leads to an increased demand for transport services. In a general equilibrium framework it leads to an increase in supply and requires extra resources shifted into transport sector from other sector. A decrease in transport cost thus leads here to a decrease of production by all sectors except the transport sector. Thus, in the GTAP framework, modeling of price wedges through transport costs is not a correct solution.

 Keeping the above in mind, we take another approach to the problem which is easily implemented using the simple structure of the GTAP model. The parameter *ams*, indexed by product, origin country, destination country, import-augmenting "technical change" variable can be used. "Shocks to *ams*(i,r,s) represent the negative of the rate of decay on imports of commodity or service i from region r imported by region s. When *ams*(i,r,s) is shocked by 20%, then 20% more of the product becomes available to domestic consumers - given the same level of exports from the source country. In order to ensure that producers still receive the same revenue on their sales, effective import prices (*pms*) fall by 20%" (Hertel, McDougall, Itakura, 2001). In fact, the parameter corresponds to the iceberg transport cost and causes the effective price faced by the importer to go down.

For the purpose of the simulation, the following aggregated database has been created. The following Central and Eastern European countries have been disaggregated: Czech Republic, Estonia, Lithuania, Latvia, Poland, Slovakia and Hungary. The EU has been disaggregated into two regions: Germany (being a largest trade partner of many of the CEEC's) and the Rest of the UE. The remaining regions were aggregated into Rest of the World.

In the simulation, it was assumed that due to the decrease in the technical barriers to trade in the European Union (similarly as in Hoffmann), the prices of imports go down by maximally 2.5 percent. It is reflected by shocking the ams variable to 2.5 percent. This price change is also differentiated by sector (following Hoffmann (2001) and cited by Maliszewska (2002)). The exact change of *ams* is given below:

Table V-2 Shock to price of imports

Sector	Change in price
Agriculture	2.5
Raw materials	2.5
Food	2.5
Textiles	2.5
Apparel	2.5
Leather products	2.5
Wood products	0.875
Paper and printing	1.875
Fuels	2.5
Chemicals	1
Minerals	0.625
Ferrous metals	0.875
Other materials	1.125
Metal products	1.125
Vehicles	0.5
Other transport equipment	1.375
Electronics	0.625
Other industrial production	0.625
Other machinery	0.625

The decrease of the price of imports is bilateral and focused on the new EU members and the EU-15. The price of a given product from a CEEC goes down in every EU country (both EU-15 and accessing) and the same applies to EU-15 products purchased in the CEEC markets.

We evaluate two scenarios a short term and a long term (with capital accumulation). The immediate effect in short run of the decrease of the price of imports is the increase of the volume of international trade. The table below shows the German import changes from the Central and Eastern European countries under consideration.

Table V-3 Export changes to Germany

Industry	Rest of UE	Czech Republic	Estonia	Poland	Hungary	Slovakia	Slovenia	Lithuania	Latria	Rest of the World
Agriculture	-0.3	7.6	9.0	8.9	6.8	8.4	10.0	9.1	8.2	-0.1
Raw materials	-0.4	15.3	13.2	17.2	20.6	20.4	23.4	12.4	19.9	-0.3
Food	-0.2	4.8	7.1	5.8	5.1	5.0	5.8	4.6	4.0	-0.1
Textiles	-1.3	14.0	17.2	14.5	12.9	14.6	14.0	16.2	15.5	-1.3
Apparel	-1.8	12.0	13.6	12.0	9.4	11.5	13.9	14.8	13.2	-1.8
Leather products	-1.4	13.8	14.0	13.3	13.0	13.2	13.2	14.2	13.2	-1.3
Wood products	-0.3	-0.5	2.9	0.4	3.4	-0.7	1.8	-0.9	-1.6	-0.2
Paper and printing	-0.4	5.3	6.4	6.5	7.5	4.9	5.6	5.9	5.0	-0.3

Fuels	-0.2	7.7	3.4	7.2	7.7	7.9	7.9	4.9	6.9	-0.3
Chemicals	-0.1	3.7	2.7	2.9	1.9	2.6	2.5	2.7	2.0	0.0
Minerals	0.1	-1.4	1.1	0.2	-1.5	-0.7	-0.4	-1.3	-1.6	0.2
Ferrous metals	-0.2	1.8	-0.3	0.7	1.9	2.2	2.4	1.3	0.2	-0.1
Other materials	-0.3	2.5	1.0	2.7	5.0	2.3	2.6	3.6	2.2	-0.2
Metal products	-0.5	1.7	3.6	2.7	1.5	1.2	3.1	2.3	0.7	-0.3
Vehicles	-0.2	1.0	-0.8	0.9	1.0	1.3	1.0	-0.9	-0.7	-0.1
Other transport equipment	-0.4	8.7	7.3	6.9	6.7	5.5	6.3	3.0	2.3	-0.3
Electronics	-0.1	0.7	0.2	0.8	3.5	-1.6	1.1	0.1	-1.3	0.0
Other industrial production	-0.2	2.8	-2.4	-0.1	0.6	0.0	2.0	-1.0	-2.2	-0.1
Other machinery	0.0	-0.6	2.7	0.9	-0.8	-0.8	0.1	-0.4	-1.4	0.1

Clearly the most significant export changes in all countries under consideration are concentrated in sectors producing raw materials, textiles, apparel, leather products. The changes in exports to Germany in the case of imports amount to 20 percent and are the highest in Slovenia, Slovakia and Hungary. In Poland, the simulated increase in exports to Germany amounts to 17 percent. In the case of textiles, apparel or leather products, the simulated changes range close to 15 percent. There are significant changes in exports of agricultural products, however, we have to keep in mind that this simulation does not take into account changes in agricultural tariffs and subsidies due to EU enlargement and we should probably expect much larger changes if those are included (as 2003 increase of Polish exports have shown), paper and printing industry and transport equipment. Changes in those sectors range between 5 to 10 percent depending on a region. In the remaining sectors, for most of the new member states of the EU, the change in exports is less than 5 percent. As a result of the demand shift towards new member states, import of Germany from remaing EU member falls down by a small amount. The largest change is found in the case of apparel.

Table V-4 Export changes to the EU-15 (excluding Germany)

Industry	Rest of UE	Czech Republic	Estonia	Poland	Hungary	Slovakia	Slovenia	Lithuania	Latria	Rest of the World
Agriculture	-0.26	7.74	9.12	9.04	6.88	8.67	10.16	9.24	7.90	-0.03
Raw materials	-0.75	15.23	12.39	17.22	20.21	19.55	23.88	9.34	18.43	-0.22
Food	-0.17	4.84	7.26	5.89	5.24	5.13	5.96	4.73	4.07	0.00
Textiles	-0.68	14.75	17.92	15.21	13.70	15.32	14.71	16.92	16.28	-0.59
Apparel	-0.59	13.21	14.78	13.13	10.53	12.71	15.12	15.98	14.40	-0.62
Leather products	-0.32	14.78	15.03	14.24	13.93	14.15	14.17	15.15	14.11	-0.34
Wood products	-0.29	-0.30	3.10	0.52	3.56	-0.53	1.97	-0.67	-1.52	-0.06
Paper and printing	-0.16	5.66	6.72	6.79	7.78	5.23	5.92	6.20	5.12	-0.03

Fuels	-0.12	7.71	3.40	7.19	7.74	7.98	7.99	4.82	6.95	-0.23
Chemicals	-0.14	3.81	2.75	2.95	2.02	2.66	2.54	2.87	2.09	0.03
Minerals	-0.13	-1.47	1.20	0.08	-1.46	-0.76	-0.52	-1.79	-1.32	0.10
Ferrous metals	-0.17	1.94	0.01	0.88	2.06	2.35	2.51	1.45	0.26	0.00
Other materials	-0.19	2.63	1.14	2.83	5.20	2.44	2.72	3.75	2.27	-0.02
Metal products	-0.25	1.99	3.81	3.06	1.85	1.50	3.39	2.67	0.80	0.02
Vehicles	-0.12	1.15	-0.59	1.09	1.13	1.50	1.18	-0.71	-0.57	0.05
Other transport equipment	-0.25	8.97	7.55	7.22	6.81	5.76	6.47	3.12	2.20	-0.02
Electronics	-0.27	0.67	0.20	0.84	3.46	-1.59	1.11	0.09	-1.40	0.04
Other industrial production	-0.19	2.95	-2.20	0.07	0.81	0.15	2.18	-0.86	-2.18	0.10
Other machinery	-0.19	-0.72	2.69	0.85	-0.91	-0.70	0.05	-0.34	-1.29	0.08

The simulated changes in exports to the EU-14 countries are given in the table above. We can see that the growth in imports has a similar structure as in the case of exports to Germany. The largest increase in exports (above 5 percent) is expected in agriculture, food, paper, fuels and the transport equipment. In Poland, the largest simulated increase is expected in the textile industry.

Changes in export to the EU cause a large change in the total exports of the EU-acceding CEEC's. The largest changes in exports are expected for Poland where the change is estimated at 1.6 percent. In Czech Republic, Estonia, Lithuania and Slovakia, this value amounts to around 1.4 percent change. In the remaining countries the change is close to one percent. The results are given in the table below.

Table V-5 Change in total export value

Country	% change in export value
Czech Republic	1.407
Estonia	1.347
Poland	1.616
Hungary	0.882
Slovakia	1.4
Slovenia	0.993
Latvia	0.919
Lithuania	1.434

Table V-6 Output changes

Sector/Country	Czech Republic	Estonia	Poland	Hungary	Slovakia	Slovenia	Lithuania	Latria
Agriculture	-0.17	-0.548	-0.172	0.079	-0.182	-0.787	-0.768	-0.576
Raw materials	0.217	1.361	0.302	-0.296	-0.127	-0.401	1.741	0.216
Food	0.13	0.674	0.13	-0.063	0.129	-0.388	-0.845	-0.719
Textiles	5.422	11.988	1.604	3.429	3.437	3.156	8.364	7.691
Apparel	3.578	9.502	5.12	5.206	5.439	4.48	9.889	10.231
Leather products	2.523	3.89	0.464	6.941	5.618	0.706	0.145	1.35
Wood products	-1.42	1.898	-0.734	1.51	-1.755	-0.227	-1.458	-2.667
Paper and printing	-0.649	-0.99	-0.647	-0.283	-0.397	-1.094	-2.421	-2.553
Fuels	-0.681	-4.905	0.193	0.998	1.408	-2.873	-4.603	1.603
Chemicals	0.128	-1.169	-1.205	-1.625	-1.078	-1.854	-1.718	-1.585
Minerals	-1.597	-0.343	-0.715	-1.9	-1.278	-1.504	-2.784	-2.085
Ferrous metals	-0.909	-2.431	-1.655	-0.654	-0.272	-1.074	-1.273	-2.396
Other materials	-1.89	-2.35	-1.121	1.298	-1.525	-0.719	0.711	-2.676
Metal products	-0.895	0.841	-0.695	-1.407	-1.731	-0.214	-2.283	-1.881
Vehicles	0.344	-1.938	0.264	0.58	0.846	0.416	-1.17	-1.441
Other transport equipment	1.676	0.53	0.89	3.825	0.911	0.382	-3.178	-1.396
Electronics	-1.277	-0.339	-1.305	1.556	-2.755	-1.421	-1.862	-3.25
Other industrial production	0.682	-3.372	-1.454	-0.406	-1.497	0.269	-3.041	-3.9
Other machinery	-1.061	0.357	-0.119	-2.169	-0.587	-0.293	-1.824	-2.28

The output changes resulting from policy experiment are concentrated in the industries where the largest increase in export was simulated. The largest increase in production is expected in textiles and apparel industry. In the case of textiles the largest increase is simulated for Estonia, Lithuania and Latvia and for apparel for Estonia and Lithuania. This changes range from 5 to 12 percent. Other industries where there are expected significant changes in production are raw materials (especially Lithuania and Estonia), fuels, other materials and transport equipment. There are industries where output is expected to drop – chemicals, minerals, ferrous metals, metal products and electronics. The changes are usually less than two percent of the value of production. The detailed simulation results are given below.

The changes in export lead to, through changes in production, change in the gross domestic product. Not only the export grows but also we impose a policy experiment where the import demand grows as well. The change in GDP is a sum of these two changes. The simulated change of GDP of the countries under consideration is given below.

Table V-7 GDP changes

Country	Change in GDP
Germany	0.037
Rest of EU	0.006
Czech Republic	1.512
Estonia	1.599
Poland	1.015
Hungary	1.544
Slovakia	1.565
Slovenia	1.456
Latvia	1.66
Lithuania	1.774
Rest of the World	-0.023

According to the simulation results, the largest increase of GDP as a result of a decrease of the technical barriers to trade will be experienced by Lithuania and Latvia, where the increase amounts to 1.77 and 1.66 percent respectively. For Czech Republic, Estonia, Slovaka and Slovenia the simulated GDP increases are equal to 1.4 to 1.6 percent. For Poland the simulated change is equal to 1 percent.

The GTAP model allows the modeler to calculate the change in the social welfare resulting from the economic policy. The change in welfare is measured by change in equivalent variation (EV), expressed in monetary units. From the simulation results it turns out that the change in welfare due to the policy change is equal to no more than 1.5 percent of GDP and varies from 0.46 in Poland to 1.38 in Estonia. In most of the countries the change amounts to around 1 percent of GDP. In the case of Germany and the remaining EU-15 countries, the impact on the equivalent variation is not significant.

Table V-8 Change in equivalent variation

Country	Change in EV
Germany	0.03%
Rest of EU	0.01%
Czech Republic	1.00%
Estonia	1.38%
Poland	0.46%
Hungary	0.84%
Slovakia	1.02%
Slovenia	0.97%
Latvia	1.00%
Lithuania	0.91%
Rest of the World	0.00%

In the short run scenario, the endowments of primary factors are given exogenously. We also performed a similar simulation in a different model closure where capital accumulation is possible. In this scenario, the purchases of investment goods expand the stock of capital (with same level of other factors of production).

Simulated changes of the total exports in the long run scenario are slightly higher than in the short run scenario. They amount to more than 2.4 percent for Czech Republic, Poland, Slovakia and Lithuania. For Lithuania, the change was close to 3 percent. For the remaining CEEC's the calculated changes vary from 1.9 to 2.2. percent.

Table V-9 Change in export value – long run

Country	Change in export value
Czech Republic	2.508
Estonia	2.007
Poland	2.406
Hungary	2.195
Slovakia	2.721
Slovenia	1.761
Latvia	1.926
Lithuania	2.746

The GDP changes in the long run scenario are also higher than in the short run. The calculated output gain is are the highest for Lithuania and Slovakia – more than 2.3 percent of value, Latvia, Czech Republic and Hungary (about 2 percent). The lowest are expected for Poland and amount to roughly 1 percent change. It is worth noting than these changes are around 2 percent higher than in the short run scenario.

Table V-10 Change in GDP - long run

Country	Change in GDP
Germany	0.054
Rest of EU	0.011
Czech Republic	2.019
Estonia	1.976
Poland	1.181
Hungary	2.044
Slovakia	2.362
Slovenia	1.7
Latvia	2.058
Lithuania	2.295
Rest of the World	-0.022

The changes in the equivalent variation measure for the long-run scenario are presented below. The lowest change is forecasted for Poland – it is expected to be around 0,7 percent of GDP. The remaining countries experience a change in EV at around 1.4 percent of GDP. The largest change is expected for Slovakia.

Table V-11 Change in equivalent variation - long run

Country	Change in Equivalent Variation
Germany	0.05%
Rest of EU	0.01%
Czech Republic	1.47%
Estonia	1.73%
Poland	0.72%
Hungary	1.40%
Slovakia	1.81%
Slovenia	1.23%
Latvia	1.47%
Lithuania	1.56%
Rest of the World	-0.01%

Conclusions

This part of the project seems to be an important one in terms of the predictions that the report is trying to give concerning the impact of the standardization policy on both CEEC's and MPC. The first part briefly describing the econometric exercise undertaken by Hagemejer (2005) shows that the EU standardization policy affects the trade structure of the EU. It seems that due to standardization policy (union) the intra-EU trade is shifting towards high-TBT goods that are covered by either new approach or old approach to harmonization, whereas the extra-EU trade is becoming more and more specialized in the low TBT goods covered by mutual recognition or not covered by any of the EU approaches. This has very important implications for the EU acceding countries and for the MPC's and will be taken into account when the trade structure of these countries is analyzed at later stage of the report. It may be the case that the acceding countries that have a trade structure that are similar to the intra-EU trade have already gone through the process of the trade structure evolution and those whose trade structure is different from EU-15, may experience an adjustment. This adjustment will clearly have some significant welfare and employment effects. On the other hand, the Mediterranean countries that export products mostly covered by mutual recognition and not covered by any of the EU approach may experience a gradual increase of their exports to the EU as a result of the intra-EU imports shifting towards higher TBT goods (NA and HR). However, it may be the case that this increase may be slowed down by proliferation of new regulations imposed in the EU in the sectors where extra EU imports are large.

We also tried to show what kind of reallocation effects the EU standardization policy may have on the acceding country using a widely known GTAP model and database. We have to

note that disaggregated data was not available for most of the Mediterranean countries and thus the results of the policy change toward CEEC's could not be evaluated against MPC's. This is clearly a field for future research and certainly an unexplored one. In our simulations we have shown that the reallocations across industries are large – changes in output amount to almost 10 percent in some cases – and this clearly has large social/employment effects. At the same time, the output and welfare effects amounted to 1-2 percent of GDP which is a significant gain from policy change.

Both the econometric analysis and the GTAP simulation imply that the effects of changes in standardization policy and especially creation of standardization unions have large welfare effects. It remains clearly an open area for further research, focused mainly on improving methods of quantification of TBTs. The results of the above studies will be further used in the next section, where we try to asses importance of TBTs in the international trade between the "old" EU, the CEEC's and the MPC's.

VI. The importance of TBTs for CEEC's and MPC's trade with the European Union

This chapter will focus on the importance of different approaches to standardization in the EU for exporters from Mediterranean Partner Countries. First however, we will present differences in trade profiles of CEEC's and MPC's. Then, we will follow the methodology of Brenton, Sheehy and Vancauteren (BSV) (2001) who analyzed the structure of exports of Central and Eastern European Countries to the European Union. We will apply this methodology to study the structure of selected MPCs' exports to the EU.[53] We will also redo the calculations of BSV using most recent data and compare the results obtained for CEECs with those obtained for MPCs.

Differences in trade profiles of MPC an CEEC countries

We will start with a short presentation of trade profiles of each group of countries. This will give a general view of main differences in the trade relations of these two groups with the European Union. Later on, we will study in more detail the problem of technical barriers that these countries face in their trade with the EU.

Table VI-1 presents the export concentration of selected MPCs and CEECs in their trade with the European Union. We can see that on average the MPCs' exports tend to be much more concentrated than those of the CEECs. MPCs' exports seem to be much more product dependent than the exports of CEECs. For instance, for Algeria, top 3 exported product categories (at 2-digit level of CN) constitute 97% of all exports. For CEECs the most concentrated is the export of Hungary – top 3 categories constitute 65% of all exports.

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[53] In our study we analyzed only five MPC countries, having largest trade flows with the European Union. These countries were: Algeria, Israel, Morocco, Tunisia and Turkey.

Table VI-1. Export concentration: share in percentage of exports of main 10, 5 and 3 product categories (CN2).

	10 products	5 products	3 products
Algeria	99.06%	98.05%	97.14%
Egypt	75.35%	57.77%	49.82%
Israel	70.25%	53.08%	39.71%
Jordan	81.72%	63.27%	50.63%
Lebanon	64.76%	46.50%	33.49%
Morocco	81.30%	65.52%	53.66%
Syrian Arab Republic	97.77%	94.85%	91.74%
Tunisia	84.26%	74.31%	59.00%
Czech Republic	74.60%	62.41%	53.50%
Estonia	78.76%	64.15%	50.74%
Hungary	79.65%	70.28%	64.97%
Latvia	85.95%	75.43%	64.52%
Lithuania	75.63%	56.22%	37.77%
Poland	70.22%	53.09%	38.96%
Slovak Republic	80.15%	67.52%	60.01%
Slovenia	70.74%	54.43%	40.61%

Sources: Eurostat, Comext

On the other hand imports of both groups are more or less equally differentiated. It is presented in Table VI-2. For most of the countries top 3 imported product categories constitute not more than 50% (and the distribution across MPC and CEEC is quite similar).

Let's look now at certain product categories. We will start from the import side, since this one is more similar. In most of CEEC the top imported categories are nuclear reactors and machinery (CN 84), electrical machinery (85) and vehicles (87). For MPC the picture is similar with some really minor exceptions, namely for Israel (the three categories are natural or cultured pearls (71), and machinery (CN 84 and 85), Lebanon (mineral fuels (27), machinery (84) and aircraft (88)) and for Tunisia (cotton (52), and machinery (84 and 85)). The details are presented in the Appendix.

Table VI-2. Import concentration: share in percentage of imports for main 10, 5 and 3 product categories (CN2).

	10 products	5 products	3 products
Algeria	73.83%	59.13%	47.43%
Egypt	67.27%	49.22%	40.47%
Israel	75.25%	60.31%	49.58%
Jordan	69.76%	54.78%	38.85%
Lebanon	66.20%	49.33%	35.67%
Morocco	60.56%	44.83%	33.52%
Syrian Arab Republic	97.77%	94.85%	91.74%
Tunisia	84.26%	74.31%	59.00%
Czech Republic	70.09%	56.99%	47.10%
Estonia	78.76%	64.15%	50.74%
Hungary	75.08%	64.87%	57.25%
Latvia	62.98%	51.17%	41.97%
Lithuania	64.41%	53.39%	44.33%
Poland	67.58%	54.39%	43.06%
Slovak Republic	73.25%	62.29%	54.51%
Slovenia	62.89%	47.64%	38.23%

Sources: Eurostat, Comext

The picture for exports however seems to be different. In all CEEC (excluding the Baltic States) the top 3 exported categories are the same as imported (84, 85 and 87). For the MPC top 3 exported categories turn out to be different. The only MP country for which the top imported and exported categories are the same is Israel. This finding is not really surprising. Israel is the most advanced among the MPC and CEEC are new members of the EU. One can therefore expect that trade of those counties with the EU will have more intra-industry character at this high level of aggregation.

The trade pattern between countries that are at different level of development usually reflects – in line with Heckscher-Ohlin neoclassical theory – the relative factor abundance. In order to analyze these changes we used the industry classification elaborated by Neven (1995). He divided the industrial sectors into five groups, according to their factor intensity. He used following criteria: the share of wages in the value added, the level of investment as a percentage of value added, the average total compensation per worker and the share and the share of blue collar workers in total number of employees. These variables were calculated for industries in 12 EU member states.

Table VI-3 presents the industries allocated to different groups according to their factor intensity.

Table VI-3 Neven's five groups of industries divided according to factor intensities.

Sector	Characteristics	Examples
1	Very high human capital	Chemicals, office machinery
2	High human capital, low physical capital	Mechanical, electrical engineering
3	Low human capital, low physical capital	Footwear and clothing, furniture
4	Low human capital, high physical capital	Vehicles, textiles
5	High human capital, high physical capital	Food processing

Source: Drabek and Smith, 1995, Table 11.

The detailed data on net exports of all CEEC and MPC to the EU in each cluster of the Neven's classification is provided in the Tables 70-71 of the Appendix.[54] Generally speaking all CEEC reveal quite important comparative advantage in group 3 of Neven's classification, i.e. in products requiring large inputs of unskilled labor. Some other countries do export products from group four, requiring also inputs of physical capital (Czech Rep., Latvia, Poland, Slovakia), whereas some other states (Estonia, Hungary and Slovenia) minor advantage in group 2, where high human capital is combined with low physical capital.

The pattern of net exports of MPC countries is somewhat more diversified. Majority of them, namely Tunisia, Morocco, Syria, Egypt and Turkey, reveal very strong comparative advantage in unskilled labor intensive group 3 of Neven's classification. This structure of trade is fully in line with relative factor abundance of MPC against EU member states. But there are some important exceptions as well. The most pronounced one is in case of Algeria, being a large net exporter of Neven's group one, i.e. goods requiring large inputs of high human capital. The phenomenon reflects crucial role of oil exports from Algeria. Petrochemical industry falls in the category one of Neven's classification. Another important distinction is a strong relative position of Israel in groups 1 and 2 of Neven's classification, i.e. in high-technology products, being very intensive in human capital. Finally, some countries, like Syria and Egypt reveal comparative advantage in group four, requiring high inputs of unskilled labor and physical capital.

Summing up, we can state that in general the pattern of inter-industry trade between MPC and EU countries is also in line with neo-classical Heckscher-Ohlin theory, based on relative

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[54] . We have defined the relative net exports (RNE) as: $RNE_i = c_i^{\exp} - c_i^{imp}$, where $c_i^{\exp}$, c_i^{imp} are shares of cluster i in exports and imports, accordingly

factor abundance. Thus, the next question is whether there are differences resulting from technical regulations imposed on products commercialized at the EU market?

Methodology of Brenton, Sheehy and Vancauteren (2001)

The paper of Brenton, Sheehy and Vancauteren (2001) evaluates the importance of technical barriers to trade for 10 Central and Eastern European Countries: Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The authors estimated the share of the tradable goods that were affected by the various EU approaches to TBT removal. They analyzed 114 industrial sectors for the intensity of 3 EU approaches – the Old Approach, the New Approach and Mutual Recognition Principle. According to the study the Old Approach was dominating in 22 sectors. The same number of sectors was affected by MRP regulation. The New Approach applied to 19 sectors. In the remaining 51 sectors the standards were rare or nonexistent. The authors estimated the importance of standards in the intra-EU in the EU trade with acceding countries. While standards played moderately important role in the internal EU trade (20-25%), they seem much more important in the case of trade with the new entrants. For example, German imports from Poland are in 30% covered by the Old Approach and only 20% is not covered by any standards. In general, Polish supplies to the EU market that are not covered by any regulations constitute only 12% of all exports (in 2003) and this share has diminished by 75% during the last 15 years.

The procedure applied by BSV in the original paper is simple and proceed as follows. First, the authors calculate *trade coverage* of different EU approaches to technical barriers to trade. Trade coverage of an approach is defined as the share of value of EU imports from a region subject to a particular standardization approach in the total value of EU imports from that region. The different approaches of the European Union to standardization were described in Chapter 1 of the Report. The main categories distinguished there were: Mutual Recognition (MR), Old Approach (OA) and New Approach (NA). In practice, several products are covered by more than one approach. Therefore, in our analysis, we placed the products into 8 categories, depending on which approach covers the EU imports of those products. The categories are presented in Table VI-4.

Table VI-4. Approaches considered in the calculations of trade coverage.

Abbreviation	Description
OA	Products covered by Old Approach only
OA+MRA	Products covered by Old Approach where Mutual Recognition Arrangements have been signed
OA+MRP	Products covered by Old Approach where Mutual Recognition Principle applies (but no MRA have been signed)
MRA	Products not covered by harmonization where Mutual Recognition Arrangements have been signed
MRP	Products not covered by harmonization where Mutual Recognition Principle applies (but no MRA have been signed)
NA	Products covered by New Approach only
NA+MRA	Products covered by New Approach where Mutual Recognition Arrangements have been signed
NA+MRP	Products covered by New Approach where Mutual Recognition Principle applies (but no MRA have been signed)
No regulations	Products not covered by technical regulations

The second element of the BSV study is the analysis of the evolution of the trade coverage over time. The structure of CEEC's exports evolved since the early 1990s as the countries began reorientation of their economies towards market economy and more integration with the European Communities. This change was also revealed in the evolution of trade coverage of different approaches. We will take a look at how the trade coverage of MPC's and CEEC's exports to the EU has been evolving in the last 5 years.

The last element of the BSV analysis was calculation of the index of revealed comparative advantage. The authors analyzed which approaches dominate in sectors where the CEECs reveal comparative advantage. The index of revealed comparative advantage (RCA) is defined in the following way:

$$RCA_{i,l} = \frac{\dfrac{x_{i,l}}{\sum_{l-1}^{n} x_{i,l}}}{\dfrac{\sum_{i=1}^{m} x_{i,l}}{\sum_{l=1}^{n} \sum_{i=1}^{m} x_{i,l}}} \qquad (1)$$

where x_{il} is the value of exports of product l from country i to the EU, n is the number of products traded and m is the number of countries exporting to the EU. The numerator of (1) is the share of product l in total export of country i to the EU while the denominator is the share of product l in total imports of the EU. The value of RCA greater than one indicates that country i reveals comparative advantage in the trade in product l with the EU.

The structure of CEEC and MPC trade with the EU until 2003

Main focus of this section is on the differences in trade coverage of different approaches to the removal of TBTs in exports of CEECs and MPCs to the EU. We will start our analysis by the description of the structure of MPCs' exports. We will then compare them with the structure of CEEC exports to the EU.

Trade data for the analysis comes from COMEXT. The data on sectoral incidence of technical barriers and EU approaches to the removal of TBTs are taken from the publication of European Commission (1998). The publication provides information on the incidence of various approaches to standardization on a 3-digit NACE level.

The analysis for Mediterranean Partner Countries

Trade coverage of various approaches in export of selected MPCs to the EU in 2003 is presented in Table VI-5. The analysis below is done in conjunction with Table VI-7, presented later on and with the results presented in the Brenton et al.(2000).

Table VI-5 Trade coverage of various approaches to standardization in MPC's exports to the EU in 2003

Approach	Algeria	Israel	Morocco	Tunisia	Turkey	MPCs
OA	13%	7%	12%	5%	19%	14%
OA+MRA	0%	1%	1%	0%	6%	3%
OA+MRP	0%	2%	0%	0%	0%	1%
MRA	0%	10%	8%	7%	2%	4%
MRP	48%	14%	47%	61%	43%	43%
NA	1%	43%	5%	9%	13%	13%
NA+MRA	0%	10%	1%	1%	3%	3%
NA+MRP	0%	0%	0%	0%	3%	1%
No regulation	38%	13%	26%	16%	11%	19%

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Source: Own calculations using the data from European Commission (1998) and COMEXT 2004

The relative amount of exports to the EU in 2003 not concerned by technical regulations is very high for Algeria (38%), substantial for Morocco (26%), similar to the CEECs average for Tunisia (16%) but as small as for intra-European imports for Turkey and Israel (between 11% and 13%). Among the new member countries, only Hungary seems to be even more concerned by technical regulations than both Turkey and Israel (almost for 90% of the total amount exported to the EU). In this respect Turkey and Israel can be compared to Poland and the Czech Republic. On the other hand Latvia (with 36%) is in the same situation as Algeria.

What seems striking is that Morocco and Tunisia seem much less concerned by TBTs in terms of total trade coverage than the Visegrad countries and Lithuania; only Estonia and Slovakia can be put in the same category.

In general, the trade coverage of the different approaches varies considerably across the 5 MPCs selected. The share of exports to the EU in 2003 submitted to the new approach is very large in the case of Israel (53%), more than twice the share of the new approach in intra-EU imports and much larger than this share in EU imports from the CEEC/Baltic countries. For the Maghreb countries the new approach seems to be almost irrelevant, with the exception of Turkey.

Instead, the large share of what the Maghreb countries and Turkey are exporting to the EU is covered by the Mutual Recognition Principle (61% in the case of Tunisia!). This stands in contrast with what happens to Israel, to old EU member countries and most of the CEECs).

Finally the old approach does not seem to be relevant to Maghreb countries, in any case much less than for old and new EU member countries. Summing up, Maghreb countries are less exposed to TBTs than old and new member countries. On the other hand, for those goods exposed to TBTs the relevant solution to overcome them is by far the Mutual Recognition Principle. In Israel, the new approach based on ''essential requirements'' would address the problems confronted by the bulk of its exports to the EU. But this would have also to be complemented by mutual recognition in most instances. If we compare to individual CEECs (see next section), Israel's profile seems closest to the one of the Czech Republic (regarding which MRP, NA and NA+MRA represent more than 50% of its exports to the EU). Turkey , being the most diversified economy of all the 5 MPCs selected, seems to be concerned by all the different approaches.

Table VI-6 covers the evolution of trade coverage of four distinct categories of products: those not covered by any regulation and those covered either by the Old or the New Approach or by Mutual Recognition.

Table VI-6. Evolution of trade coverage of Old Approach, New Approach and Mutual Recognition in MPC export to the EU – 1999-2003.

Year	Approach	Algeria	Israel	Morocco	Tunisia	Turkey	INTRA-EUR	EXTRA-EUR
1999	OA	15%	5%	10%	3%	16%	27,8%	12,2%
2000	OA	13%	6%	14%	4%	16%	27,7%	12,2%
2001	OA	14%	6%	11%	4%	18%	27,7%	12,7%
2002	OA	11%	6%	11%	5%	18%	28,2%	13,2%
2003	OA	12,8%	7,2%	11,7%	5,4%	19,3%	29,1%	13,7%
1999	MR	28%	11%	24%	7%	32%	25,8%	37,9%
2000	MR	27%	12%	25%	7%	34%	27,6%	39,4%
2001	MR	25%	13%	22%	9%	36%	28,0%	37,9%
2002	MR	24%	14%	23%	10%	37%	27,9%	38,1%
2003	MR	47,7%	23,8%	54,7%	68,0%	44,3%	27,9%	38,4%
1999	NA	1%	44%	4%	6%	10%	20,7%	22,1%
2000	NA	0%	43%	5%	6%	12%	19,8%	21,2%
2001	NA	0%	40%	5%	7%	13%	19,6%	21,3%
2002	NA	1%	45%	5%	8%	13%	19,3%	21,2%
2003	NA	1%	43%	5%	9%	13%	19,1%	20,5%
1999	No regulation	42%	13%	27%	20%	13%	13,5%	16,7%
2000	No regulation	36%	11%	26%	19%	13%	12,5%	15,3%
2001	No regulation	41%	13%	26%	17%	13%	12,8%	16,5%
2002	No regulation	41%	12%	27%	16%	11%	12,8%	16,4%
2003	No regulation	38%	13%	26%	16%	11%	13,0%	16,5%

From the table it appears that all MPCs should to be increasingly concerned by TBTs, as the share of MPCs exports not covered by any regulation has diminished over the last five years particularly for Tunisia and Algeria (by 4 points in these two cases). But whereas for Algeria new TBTs seems to be able to be overcome by the mutual recognition principle, in the case of

Tunisia both the old and new approach seem to be those increasing most in terms of trade coverage. In the case of Morocco what we see is a switch of roles, since Mutual Recognition Agreements (MRAs) become much more important over time to the detriment of the sheer application of the Mutual Recognition principle previously favoured by the EU. Interestingly, .MRAs are also increasingly relevant to Israel (10% of trade coverage in 2003 instead than 6% in 1999) but here it is to the detriment of the lighter new approach (which goes down from 58% to 53%). The toughening of EU treatment in terms of new TBTs imposed on MPC is mostly evident in the case of Turkey, which must increasingly cope with the Old and the New Approach instead than with the Mutual Recognition Principle. To avoid the detrimental effect of these policies, the possible solutions here would be improve the standards of MPC in cooperation with the EU or sign the mutual recognition agreements between MPC and the EU.

The analysis for Central and Eastern European Countries

The original paper of Brenton, Sheehy and Vancauteren (2001) analyzed trade coverage of different approaches to standardization in exports of CEECs to the EU. In this section we will present an update of their analysis based on updated data.

Trade coverage of various approaches in export of selected CEECs to the EU in 2003 is presented in Table VI-7.

Table VI-7. Trade coverage of various approaches to standardization in CEEC's exports to the EU in 2003.

Approach	Czech Republic	Estonia	Lithuania	Latvia	Poland	Slovakia	Hungary	Intra-EU trade	EU external trade
OA	21,2%	15,1%	19,8%	15,6%	30,2%	39,4%	27,9%	29,1%	13,6%
OA+MRA	2,0%	0,6%	3,8%	0,2%	3,4%	1,4%	7,0%	1,9%	3,2%
OA+MRP	0,5%	0,3%	0,1%	0,3%	0,4%	0,5%	0,5%	2,5%	1,9%
MRA	8,9%	3,0%	5,4%	0,7%	3,2%	5,5%	11,1%	10,3%	9,4%
MRP	12,8%	24,0%	42,1%	22,3%	20,1%	10,5%	9,2%	17,6%	29,1%
NA	35,0%	23,7%	12,8%	17,2%	25,7%	19,4%	19,7%	19,1%	20,5%
NA+MRA	4,1%	11,4%	1,9%	1,3%	3,3%	2,7%	13,4%	4,2%	4,8%
NA+MRP	1,8%	1,5%	0,1%	6,1%	1,6%	3,5%	0,6%	2,3%	0,9%
No regulation	13,8%	20,5%	14,0%	36,4%	12,1%	17,1%	10,5%	13,0%	16,5%

OA: old approach; **NA**: new approach; **MRP**: Mutual Recognition Principle; **MRA**: Mutual Recognition Arrangement
Source: Own calculations using the data from European Commission (1998) and COMEXT 2004.

We can see that trade coverage of different approaches varies considerably across the CEEC. For instance, high share of Slovakian and Polish exports to the EU is covered by the Old

Approach. For Poland, the share of exports covered by Old Approach is actually very close to the value calculated for intra-EU[55] trade. Old Approach seems least important for the Baltic States – it covers only 15-16% of the Estonian and Latvian exports to the EU. Baltic States benefit considerably from Mutual Recognition Principle. 47.5% of the Lithuanian export to the EU is covered either by Mutual Recognition Principle (42.1%) or by Mutual Recognition Agreements (remaining 5.4%). The numbers for Estonia and Latvia slightly lower. The New Approach dominates in the exports of Czech Republic to the EU. As much as 35% of the value of their export are products covered by the New Approach.

The structure of trade (from the point of view of trade coverage) has been evolving since the early 1990s when Central and Eastern European Countries began to integrate with the European Communities. It is especially visible for Poland, for which over half of its exports to the EU in the late 1980s were not covered by any of the approaches. The evolution of trade coverage of Old and New Approach in Polish export to the EU is presented in Table VI-8.

Table VI-8. Share of "old" and "new" approach in Polish export to the EU since 1990 (in %).

Year	Old Approach	New Approach
1990	25.2	9.0
1992	19.2	8.4
1994	16.6	10.1
1996	17.0	14.2
1998	17.2	18.0
1999	19.8	26.3
2000	27.6	24.7
2001	28.7	24.5
2002	28.4	25.3
2003	30.2	25.7

Source: 1990-1998 – IKCHZ (2001)

1999-2003 – own calculations

Table VI-13 shows an increase in the share of New Approach in trade coverage until the very late 1990s as well as the rising share of Old Approach since the late 1990s. A similar dynamics can be reported for other CEECs in the 1990s (BSV, 2001). An interesting phenomenon for Poland is that the share of New Approach is rising until 1999 and stabilizes

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[55] By intra-EU we mean the trade between the countries that were Member States of the EU before 1 May 2004.

later on, while the share of Old Approach is quite stable until 1999 and rises in years 2000-2003. The evolution of trade coverage of 3 approaches in exports of other CEECs to the EU in the years 1999-2003 is presented in Table VI-9.

We can observe that the share of trade covered with Mutual Recognition for Polish, Hungarian and Slovakian exports to the EU has fallen in the last 5 years. The same share for Czech Republic has risen. Still, for all CEEC it is below the value obtained for the intra-EU trade.

Table VI-9. Evolution of trade coverage of Old Approach, New Approach and Mutual Recognition in CEEC export to the EU – 1999-2003.

Year	Approach	Czech Republic	Hungary	Poland	Slovakia	INTRA-EUR
1999	OA	21,0%	30,3%	19,8%	33,4%	27,8%
2000	OA	24,7%	28,2%	27,6%	31,4%	27,7%
2001	OA	23,2%	29,9%	28,7%	31,0%	27,7%
2002	OA	22,2%	28,6%	28,4%	37,5%	28,2%
2003	OA	21,0%	27,9%	30,2%	39,4%	29,1%
1999	MR	18,9%	27,3%	29,9%	24,9%	25,8%
2000	MR	18,3%	26,3%	26,7%	23,3%	27,6%
2001	MR	19,9%	22,1%	26,0%	21,3%	28,0%
2002	MR	21,9%	22,6%	25,8%	19,0%	27,9%
2003	MR	21,7%	20,3%	23,4%	16,0%	27,9%
1999	NA	37,0%	17,0%	26,3%	22,0%	20,7%
2000	NA	35,1%	17,6%	24,7%	24,3%	19,8%
2001	NA	35,0%	17,7%	24,5%	24,5%	19,6%
2002	NA	34,3%	19,1%	25,3%	21,3%	19,3%
2003	NA	34,8%	19,6%	25,7%	19,3%	19,1%
1999	No regulation	17,2%	10,8%	13,9%	12,7%	13,5%
2000	No regulation	15,3%	10,2%	11,7%	12,5%	12,5%
2001	No regulation	14,5%	10,4%	11,6%	13,5%	12,8%
2002	No regulation	13,9%	11,0%	11,6%	12,5%	12,8%
2003	No regulation	13,9%	10,5%	12,1%	17,1%	13,0%

Source: Own calculations

Trade coverage of the Old Approach was rising for Poland and Slovakia, with much larger level of the OA coverage for Slovakian exports. The value for Poland seemed to be converging to the average level for the intra-EU trade. Czech Republic has a considerably smaller share of exports covered by the OA and this share has been quite stable over the last 5 years.

For the New Approach Czech Republic is the country that has the largest coverage of exports to the EU. It has been falling in the last 5 years, yet it is still much larger the level for the intra-EU trade. In Poland, the share of products covered by the New Approach in total exports

to the EU has been quite stable over the last 5 years and is slightly higher comparing to the average for the intra-EU trade. The levels for Hungary and Slovakia have converged during the last 5 years to the average for the intra-EU trade, which is about 19%.

It seems (see also Hagemejer and Michalek, 2004) that the structure of trade between CEEC and the EU has been converging to the structure of trade between the "old" Member States of the EU (intra-EU trade). Yet, this structure is still quite different from the structure of intra-EU trade.

The story for the Baltic States is slightly different. It is presented in Table VI-10

Table VI-10. Evolution of trade coverage of Old Approach, New Approach and Mutual Recognition in Baltic States' exports to the EU – 1999-2003

Year	Approach	Estonia	Latvia	Lithuania	INTRA-EUR
1999	OA	10,3%	17,3%	13,2%	27,8%
2000	OA	13,5%	25,1%	18,6%	27,7%
2001	OA	13,2%	15,7%	28,2%	27,7%
2002	OA	20,8%	18,5%	23,8%	28,2%
2003	OA	15,2%	15,6%	19,7%	29,1%
1999	MR	25,9%	24,6%	45,9%	25,8%
2000	MR	20,4%	22,8%	43,8%	27,6%
2001	MR	26,6%	31,6%	40,7%	28,0%
2002	MR	26,6%	25,0%	45,0%	27,9%
2003	MR	27,3%	23,0%	47,5%	27,9%
1999	NA	20,7%	17,7%	18,5%	20,7%
2000	NA	17,1%	16,3%	18,1%	19,8%
2001	NA	21,2%	17,9%	14,2%	19,6%
2002	NA	21,4%	17,7%	12,7%	19,3%
2003	NA	23,1%	17,2%	12,9%	19,1%
1999	No regulation	25,4%	38,6%	16,9%	13,5%
2000	No regulation	17,0%	32,7%	13,7%	12,5%
2001	No regulation	17,3%	31,2%	12,5%	12,8%
2002	No regulation	19,9%	33,7%	13,8%	12,8%
2003	No regulation	20,7%	36,4%	14,0%	13,0%

All these countries have relatively small share of products exported to the EU covered by Harmonization Approaches. A striking characteristic is the large share of Lithuanian exports being covered by MRP. The MR coverage of Estonian and Latvian exports is close to the average level for intra-EU trade. Another interesting feature in the structure of Baltic States with the EU is that quite a high share of their exports is not covered by any type of regulation. This share is especially large for Latvia. We can see therefore that this group has slightly different structure of trade with the EU comparing to other CEECs.

After having looked at trade coverage and its dynamics over the last 5 years, we can now analyze which approaches seem most important for the analyzed Central and Eastern European Countries. For this purpose we shall again use the index of revealed comparative advantage (RCA). The numbers of sectors covered by different approaches where the CEEC reveal comparative advantage in trade with the EU are presented in Table VI-11.

Table VI-11. Number of sectors covered by different approaches where CEECs reveal comparative advantage in trade with the EU.

	Number of sectors	Czech Republic	Estonia	Lithuania	Latvia	Poland	Slovakia	Hungary
OA	24	9	4	5	5	16	7	9
OA+MRA	1	0	0	1	0	1	0	1
OA+MRP	2	0	0	0	0	0	0	0
MRA	3	2	1	1	0	1	1	2
MRP	25	10	7	9	11	9	4	4
NA	23	18	12	4	6	14	12	11
NA+MRA	4	1	2	0	1	2	2	3
NA+MRP	1	1	1	0	1	1	1	0
No regulations	43	19	13	11	9	17	14	11
Total	126	60	40	31	33	61	41	41
OA - old approach; **NA** - new approach;								
MRA - Mutual Recognition Arrangement; **MRP** - Mutual Recognition Principle								

The results for this exercise confirm our previous interpretation. For Poland, the most important approach to TBT removal is the Old Approach. In 16 sectors covered by this approach (out of 61 in which Poland reveals comparative advantage) products are regulated by the Old Approach. Other countries that reveal comparative advantage in large number of sectors covered by the Old Approach are Czech Republic and Hungary (both 9 sectors).

Poland, Czech Republic, Latvia and Lithuania have also the largest numbers of sectors with revealed comparative advantage that are covered by Mutual Recognition Principle. However, in percentage terms, those sectors seem much more important for the Baltic states – as much as 30% of all sectors where these two countries reveal comparative advantage are covered by MRP.

In case of the New Approach the largest number of comparative advantages in 2003 reveal Czech Republic (18 sectors out of 60), Estonia (12 out of 40), Poland (14 out of 61), Slovakia (12 out of 41) and Hungary (11 out of 41).

We can see that in all analyzed countries the majority of sectors where the CEEC reveal comparative advantage in trade with the EU are covered by at least one approach to

standardization. This confirms indirectly the hypothesis that the trade structure of the Accession Countries has been converging to the structure of intra-EU trade.

Hagemejer and Michalek (2004) tried to link the structure of trade of CEEC with EU to the relative endowment of production factors in those countries. Using Neven (1995) classification they have constructed a comparative table that described factor-intensity of each product that falls under a certain approach to TBT removal. It is presented in Table VI-12.

Table VI-12. Trade coverage of products belonging to different Neven (1995) categories.

The EU approach *Factor intensity*	OA	NA	OA+ MRP	NA+ MRP	MRP	NONE
1. *High share of human capital*	10%	0%	20%	10%	60%	0%
2. *High share of human capital; low share of physical capital*	18%	41%	5%	9%	9%	18%
3. *Low share of human capital; low share of physical capital*	0%	22%	0%	0%	33%	44%
4. *Low share of human capital; high share of physical capital*	18%	26%	0%	6%	12%	38%
5. *High share of human capital; high share of physical capital*	50%	7%	0%	0%	36%	7%

The products subject to "old" approach, are mainly intensive in human capital or physical capital (group 2, 4 and 5). The products regulated by "new" approach do not have clear characteristics from factor intensities point of view, because group 2 of Neven's classification is intensive in human capital and low physical capital, whereas group 4 has reverse proportions of factor utilization.

The clearest factor allocation exists in products subject to OA+MRP and OA+MRA approaches. Both of them are dominated by Neven's groups 1 and 2, intensive in human capital. In contrast, products that are not subject to any sort of standardization policy (None) are mainly dominated by groups intensive in unskilled labor (Neven's groups 3 and 4). A somewhat similar pattern of factor intensities exists also on MRP sectors. The implications of this relationship will be analyzed later on.

Comparing MPC with CEEC

MPCs are now at a state of institutionalized trade relations with the EU akin to the situation of the CEEC/Baltic countries in the mid- and late-1990s at the time the Europe Agreements prevailed. This is why it makes sense first to compare CEECs/Baltic countries and MPCs using data of 1999, a time where the degree of institutional integration of the two group of countries with the EU was roughly similar (or for the matter 1998 data used in the Brenton et al. study) . In the next section a comparison of data for CEEC/Baltic countries, old member states and Mediterranean Partner Countries is done , the first two relating both to 1998 (Brenton et al.) and our own data for 1999.

Approach	MPCs	CEECs
OA	12%	22%
OA+MRA	2%	3%
OA+MRP	1%	2%
MRA	3%	8%
MRP	43%	22%
NA	14%	21%
NA+MRA	4%	5%
NA+MRP	1%	2%
No regulation	21%	15%

OA: old approach;
NA: new approach;
MRP: Mutual Recognition Principle;
MRA: Mutual Recognition Arrangement

Table VI-13. Trade coverage of different approaches in 1999. MPCs and CEECs exports to the EU.

The relative amount of exports to the EU in 1999 not concerned by technical regulations is clearly higher for MPCs (20.8%) than for CEECs (14.7%) . This is not astonishing in view of the fact that for that year it was very high for Algeria (42.4%), substantial for Morocco (26.8%) and Tunisia (20.5%) but as small as for intra-European imports for Israel and Turkey (between 13% and 14%).

The share of MPC exports to the EU in 1999 submitted to the new approach is quite small (19%), with the exception of Israel where it is very large (59%), more than twice the share of the new approach in intra-EU imports (27%) and much larger than this share in EU imports from the CEEC/Baltic countries at that time. But for the Maghreb countries the new approach

seems to be pretty irrelevant, while for Turkey a little more but much less than for CEECs/Baltic countries taken as a group(about 28%).

Instead much of what the Maghreb countries and Turkey were exporting to the EU was covered by the Mutual Recognition Principle. In fact 42.7% of all MPC industrial exports to the EU were covered by this principle (62% in the case of Tunisia). This stands in contrast with what happens to Israel , to old EU member countries and most of the CEECs (for which the share was 22% that year), but for the exception of the Czech Republic and Poland.

Finally the old approach did not seem to be relevant at that time to MPCs , in any case much less than for old and new EU member countries.

Table VI-14. Trade coverage of different approaches in 2003. MPC's and CEEC's export to the EU.

Approach	MPCs	CEECs
OA	14%	23%
OA+MRA	3%	2%
OA+MRP	1%	2%
MRA	4%	10%
MRP	43%	22%
NA	13%	20%
NA+MRA	3%	5%
NA+MRP	1%	2%
No regulation	19%	14%

OA: old approach;
NA: new approach;
MRP: Mutual Recognition Principle;
MRA: Mutual Recognition Arrangement

Summing up, at the beginning of the period, MPCs countries were less exposed to TBTs than old and new member countries. On the other hand, for those goods exposed to TBTs the relevant solution was mostly the Mutual Recognition Principle, except Israel where the new approach based on New Approach applied to the largest share of exports.

In the preceding section we saw that in the hectic five years preceding accession, CEECs/Baltic countries have mostly seen more of their exports being affected by TBTs in the EU15. The old approach became increasingly relevant covering on the verge of accession 27.8% of the CEECs exports, instead than 27% five years before. On the other hand the

amount of exports concerned by the new approach seems to have diminished (from 27.9% to 26.2%)[56]. As far as MPCs are concerned one can see a similar development.

Old approach type of products see their share increase from 14.4% to 17.5% , while the new approach concerns only 17.3% of their exports, down from 19%. The mutual recognition principle remains for MPCs the cornerstone to overcome almost half of the TBTs encountered by producers exporting to the EU. One could say that the more time passes, the more we come closer to the entry date of May 2004 and the more seems to be the potential for trade diversion countries against MPCs due to the elimination of TBTs in trade between old and new member states as a result of the latter accession in the Single Market. This is due to the fact that more MPC imports are now falling under the purview of the rigid old approach, while CEECs will have the obligation to fully harmonize their standards as every other EU member country does to a common standard, but with the advantage later on to get full free access to the entire EU market. In fact what the analysis shows is that MPCs are increasingly impacted by TBTs used now by a larger market than before. One might then think that the solution to their problems should be to reach arrangements with the EU using as a vehicle the new ENP, which evokes the possibility of giving MPCs 'a stake in the Internal Market'. But this might be illusory for some of the MPCs analyzed above since the latter means reaching MRA-type agreements or application of the MRP or, third, applying the new approach. However as we have seen from the analysis an increasing share of MPC exports (particularly for Turkey, Israel and Tunisia) are covered by the old approach for which the ENP does not provide for solutions.

We are now turning to Revealed Comparative Advantage comparisons for the most recent year available (2003) both between different MPCs as well as between MPCs and new member countries (see Table VI-15) .

In terms of number of sectors having a revealed comparative advantage, Israel (33) and Turkey (38) can be compared to Hungary (43) and the Baltic countries. On the other hand, there are no NMCs with as many sectors with RCA as Poland (62) or the Czech Republic (60). In fact Maghreb countries and Algeria in particular have very few sectors with positive RCA.

Again , Israel's RCA seems to concentrate in sectors where the NA seems the relevant one (40% of all sectors) . In any case about 80% of sectors are concerned by some kind of TBT. At the other extreme, Algeria, an energy exporter, should be unconcerned by TBT in exports

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[56] A similar trend is observed when dealing with old member states (intra-EU trade).

to the EU if we go by the RCA indicator. Morocco and Tunisia are in an intermediate position, since between 40% to 45% of sectors seem unconcerned by TBTs. Turkey lies somewhere between Maghreb countries and Israel in this respect. When TBTs affect its export sectors, they can be overcome by the mutual recognition principle or the new approach, rather than the old approach. The same holds for Morocco and Tunisia. In this respect the situation very much resembles the situation in CEEC, but for Poland where a substantial amount of sectors with comparative advantage fall under the purview of the old approach.[57]

Table VI-15. Number of sectors covered by different approaches where MPCs reveal comparative advantage in trade with the EU in 2003.

Approaches	Number of sectors	Algeria	Israel	Morocco	Tunisia	Turkey	INTRA-EUR
OA	24	1	6	4	2	6	20
OA+MRA	1	0	1	0	0	0	1
OA+MRP	2	0	1	0	0	1	1
MRA	3	0	1	0	0	1	1
MRP	25	1	4	6	7	9	11
NA	23	0	10	1	4	9	15
NA+MRA	4	0	2	0	0	0	1
NA+MRP	1	0	1	0	0	0	1
No regulation	42	2	7	9	9	12	22
Total	125	4	33	20	22	38	73

Source: own calculations based o COMEXT data base.

In their conclusions, Brenton et al.(2000) insisted there was a low degree of overlap between EU imports from the CEEC and EU imports from non-member countries and that the magnitude of trade diversion upon entry of CEEC/Baltic countries in the SM would be limited. This certainly also applies to Maghreb countries, but less so to Israel and Turkey. In research prepared for FEMISE in 2000 Tovias showed that the MNMC country having the

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[57] This is totally at odds with the findings of Brenton et al (2000), which insist on the basis of 1998 data, that Poland was almost unconcerned by the old approach, as only 3 out of 49 sectors with a positive RCA were covered by it.

largest degree of overlap in exports to the EU with exports to the EU by CEEC was Israel, followed by Turkey and that therefore Israel and Turkey would be the two MNMCs most concerned by the 2004 Enlargement. On the other hand, Egypt and Morocco should be more concerned by the entry of Romania and Bulgaria. There is no doubt from all the above, that the entry of CEECs/Baltic countries in the Single Market of goods, mainly implemented last year upon entry as far as TBTs are concerned is having a deleterious effect on a relative large amount of Israeli and Turkish economic sectors exporting to the EU (but as stated above should be qualified by our observation that all sounds less alarming when real trade coverage is considered). This is why it is of the first order of importance for Israel to reach MRA agreements with the EU in the context of the ENP as well as participation in CEN/CENELEC and ETSI. And as we saw, with time passing Maghreb countries should be increasingly concerned by the discriminatory effect of new TBTs, which the EU is constantly introducing even in sectors not affected before by any regulation.

TBTs in trade between Turkey and the EU

TBTs have played a central role in the customs union, as they represent an important step forward in Turkey's integration with the EU single market. Nevertheless, the actual incorporation of TBTs in the 1995 agreement has been characterized by serious asymmetries, which in turn allow significant leeway for the continuation of barriers. More specifically the 1995 agreement focuses primarily on standardization - the process by which product standards and regulations are developed and adopted. By contrast, the agreement adopts a relatively minimalist position in the area of conformity assessment- the process that certifies that a product conforms to the requirements set out by a given standard or regulation. This in turn means that Turkish goods, produced under correct EU specifications can still face barriers upon export to the EU, since their certification is not recognized by the EC.

The analysis focuses on three main areas:

1) Problems arising from the institutional setting in Turkey
2) Progress and prospects in the area of standardization
3) Progress and prospects in the area of conformity assessment

Starting with the institutional environment, the current system of standardization and conformity assessment in Turkey, includes several governmental and semi governmental bodies with direct control over the creation and enforcement of standards. The centerpiece of the system is the Turkish Standards Institute (TSE) with primary authority and responsibility

for preparing and publishing Turkish standards for all types of materials, products and services.

In the area of conformity assessment, the Turkish system is characterized by various levels of authority. Testing and certification procedures on imported products are performed by different national bodies, including the TSE and relevant ministries. In terms of enforcement, all imported products that are subject to mandatory standards must hold a certificate of conformity (TSE mark) and a quality conformance certificate (TSEK), produced by the TSE prior to importation.

The newly founded Turkish Accreditation Authority (TURKAK) is argued to be an independent legal entity with administrative and financial autonomy. Thus it appears that the current institutional environment in Turkey allows for considerable room for the continuation of barriers between the two parties. Problems seem to arise from the relatively low levels of transparency and openness of the system. European officials claim that the number and nature of products subject to mandatory standards are above and beyond the international standards. Notable examples include, rigorous regulations on certain chemical and cosmetic goods such as detergents and soap, as well as certain foodstuffs and beverages such as lentils and alcohol. Further delays and unnecessary documentation continue to act as a serious technical barrier against foreign producers, placing them in a disadvantageous position in the Turkish market.

Turning to the area of standardization, Turkey's process of harmonization with the EU system has concentrated on two principal domains: The first relates to the preparation and adoption of the necessary horizontal legislation and is primarily under the authority of the Undersecretariat of Foreign Trade. The second deals with the adoption of vertical legislation relating to the removal of TBTs and has a much more detailed sectoral coverage.

Starting with the horizontal legislation, a major development in this area has been the adoption of the new framework law, in July 2001, designed to enhance transparency and efficiency in the implementation of the harmonized technical regulations. Turning to the adoption of vertical legislation, the customs union agreement requires Turkey to adopt all 319 EU directives.

Of the total 319 directives, around 32% are currently in full concordance, while the remaining 68% are either in progress or partially harmonized. Significant progress could be reported in motor vehicles, foodstuffs and particularly telecommunications sectors, given the bulk of regulations in these areas. Other areas in significant progress are pressure vessels, medical

products and toys. In the crucial areas of measuring instruments, medicinal and other chemical products, progress appear to be rather slow with most directives under or partial harmonization.

Turning finally, to the area of conformity assessment, the two parties' relationship is still underdeveloped. Much remains to be done to reduce barriers for Turkish exporters. Efforts should focus on strengthening the technical capacity of the Turkish system of certification and institutionalizing confidence and mutual trust between the two parties.

More specifically Turkey continues to lack the technical capacity and infrastructure to fully meet the needs of the testing and certification process. The most serious problems appear to be concentrated in the crucial areas of metrology and calibration, quality certification and laboratory testing. Such lack of infrastructure in turn translates into a lack of confidence in Turkish procedures and processes. In effect the resulting burden for Turkish exporters has become significant, as they need to certify their products with foreign laboratories and institutes, which in turn means increased transport and other administrative costs. To overcome these difficulties, two major projects have been launched over the past few years. The first is an initiative supported by the WB, which aims at strengthening the country's metrology and technology infrastructure to serve a larger section of the industry as well as to become recognized by European institutions. The second one is a project financed by the EU MEDA programme, which aims at strengthening the country's testing and certification infrastructure.

An area for future work seems to be broader cooperation in the field both at regional and international levels. In the realm of TBTs Turkish institutes and organizations have been working to build up a more active profile in recent years. Turkey has gained full membership in all the major international standardization initiatives. The most important of these include the ISO, which works to promote standardization among national standards bodies, the IEC, which focuses on standardization in electro technical products, the FAO, which focuses on standards in food and agricultural products. Turkey is also actively pursuing membership in the relevant European standardization initiatives focusing mainly on CEN and CENELEC.

Nevertheless, the country's participation in vital certification and accreditation initiatives at the European and international levels is still limited. Turkey's non-participation in the European Organization for Conformity Assessment is a clear example. Further work is also needed with the development of Turkey's infrastructure to the levels of the EU.

TBTs in trade between Israel and the EU

It is common to hear in Israel say that one of the main reasons for the on-going trade deficit with the EU since more than a decade is due to TBTs hindering Israeli exports to the EU, much more than the TBTs encountered by EU exporters to Israel. This concerns mainly but not only high tech trade.

Apparently Israeli producers have difficulty in certifying the quality of goods exported. Wherever the EU standards are applied in EC-Israel trade, the Israeli producers often complain of being at relative disadvantage, having to adjust themselves and go through expensive tests in the EU. In an interview done for this research project to Mrs Alona Ron, of the Export Institute, she stressed that every time the EU changes its regulations, there is no way for Israeli exporters to know about this well in advance. She gave us a recent example where all exports to the EU were rejected suddenly because the EU changed its regulations (in the domain of textile dyes) and did not bother to let the Israeli exporter know about it. In general, the Israeli Export Institute insists Israel sticks to international standards. Sometimes European standards are more severe than local ones. But there is no problem in adopting them, provided exporters are informed in advance. To solve for these problem, the Ministry of Finance has sought a MRA, which would allow both MR between the laboratory accreditation authorities of the EC and Israel and mutual recognition of standards. The EU authorities have refused this so far, arguing that MRAs between the EC and the US or with Japan have proved to be very complex to administer and thus are not justified in the case of a small trade partner as Israel. Also officials at the Standards Institute of Israel are skeptical too arguing that they are able to help exporters in getting the certification they need.

In May 2000 an Agreement on Good Laboratory Practices entered into force, providing for Israeli laboratories to certify the fulfillment of EC industrial standards by Israeli producers of industrial chemicals, cosmetics, medicine, pesticides and food additives. And Israel wants to go further and has submitted to the Commission a list of other areas where MR of tests should apply such as telecommunications, medical services, pressure vessels, machinery, etc. Israel would like also to be part of the European Rapid Alert System alerting consumers of damaged or malfunctioning goods and removing them from the market.

Israeli adoption of EU standards could put Israel in an awkward position vis a vis the US. This is not phantasy since the Americans have said so in the past. They have tried to influence

Israeli standards and production in several sectors (food products). But Israel would like to be part of European standards institutes in spite of this.

Israeli importers on the other hand protest that the SII is too influenced by import-competing producers of industrial goods. Kosher labels are a typical case. They argue that tailored standards are applied to glass bottles, electrical sockets, ladders, instant coffee, tea, aerosols, electrical transformers, car engines, special shoes, industrial vacuum cleaners and cement. They also argue that the SII wants to keep at all costs the monopoly of certification in Israel, allowing charging unreasonable prices.

Summary and conclusions

Analyzing trade profiles of MPC and CEEC we came to conclusion that the pattern of inter-industry trade between these countries and "old" EU member states is in general in line with neo-classical Heckscher-Ohlin theory, based on relative factor abundance. Majority of them reveal comparative advantage in group three of Neven's classification, i.e. in products requiring high inputs of unskilled labor and low physical capital. The notable exceptions, among MPC countries, are Algeria and Israel, having large exports of high human capital intensive products.

The analysis of the pattern of MPC and CEEC exports, subject to TBT's reveals significant differences. In general the CEEC have a pattern of exports being quite similar to intra-EU trade. It means that in CEEC much larger share of exports is covered by harmonization (OA and NA) approaches than in MPCs. The similar conclusions can be drawn from comparison of revealed comparative advantages in different sectors.

Certainly there are important discrepancies within each group of countries. In the case of MPC the pattern of Israeli exports is very different from other countries. Israel has much larger share of exports falling into sectors covered by new approach of harmonization (up to 45%). These sectors are falling mainly to the second group of Neven's classification, i.e. products of high technology with large inputs of human capital. The next country having also quite differentiated structure of exports is Turkey. In this case large share of exports to the EU falls into MR approach. The remaining three MPC have much lower share of exports covered by harmonization approaches, in comparison with intra-EU trade. Especially, in the case of Algeria a very large share of exports (up to 40%) is subject to no regulation.

The differences within CEEC are less pronounced. The pattern of Czech Republic, Hungary, Poland and Slovakia are very similar in terms of TBT coverage to intra EU-trade. More important differences exist in case of Baltic states, which have slightly lower share of OA sectors, falling mainly into 5th group of Neven's classification, characterized by high share of human and physical capital. In general, the pattern of trade between CEEC is reflecting relative factor endowment, but is not distorted by existence of technical regulations and standards. But it must be recognized that CEEC, having previously very distinct system of obligatory standards, made a great effort in adapting their technical regulations to EU requirements and being able to benefit from the accession to the EU. The change in the recent years seems to be quite important.

The case of MPC is somewhat different. Three of the analyzed countries (Algeria, Tunisia and Morocco) have a much larger share of exports being subject to no regulations. This situation reflects to some extent different factor endowment, but, at least to some extent, the inability to meet technical regulations or standards in the EU. We can make such a statement on the basis of Israeli and Turkish experience. The exporters, from these two successful countries (in terms of exporting goods subject to harmonization) do complain about technical barriers they have to face in exporting their goods to the EU. The last section of this chapter and the results of surveys among Israeli firms are quite convincing in showing the restrictive impact of some technical regulations of the EU. The similar conclusions can be drawn from our econometric analysis, presented in the fifth chapter. In fact, we have concluded that they might be a highly trade divertive effect that is especially strong in the sectors covered by New and Old Approach. This is again especially important in the case of Israel and Turkey. There is also need for greater cooperation between MPC and the EU to avoid the distortion in trade and it also involves informational coordination – providing up to date information to exporters on future changes in regulations to allow them to adapt their products in advance. In the case of the MPC where trade is concentrated in the Mutual Recognition sectors, the obvious solution would be to allow for Mutual Recognition arrangements.

But one crucial open question remains. Should MPC countries – being largely dependent on EU export market - make an effort and approximate (or adapt fully) their regulations with those existing in EU countries? The potential advantage is quite obvious, and the possible outcome was illustrated by our general equilibrium simulations, demonstrating welfare gains for CEEC countries. On the other hand the acceptance of EU technical regulations, as illustrated by our surveys, requires substantial compliance costs. These costs were

unavoidable for CEEC's becoming member of the EU. In the case of MPC the decision, whether to accept the EU harmonization system, should be based on a more precise cost-benefit analysis.

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VIII. Appendix – Trade profiles

Table VIII-1 Algeria. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
27	96.81%	93.62%	94.59%	96.65%	93.55%	94.88%	93.73%	-3.09%
88	0.40%	1.54%	0.27%	0.52%	3.48%	1.86%	2.37%	1.97%
28	0.47%	0.79%	1.18%	0.79%	0.73%	0.86%	1.04%	0.57%
72	0.35%	1.01%	0.89%	0.41%	0.23%	0.51%	0.61%	0.26%
31	0.04%	0.01%	0.06%	0.22%	0.33%	0.15%	0.30%	0.26%
84	0.16%	0.34%	0.29%	0.14%	0.14%	0.21%	0.27%	0.11%
29	0.20%	0.60%	0.45%	0.27%	0.30%	0.21%	0.26%	0.06%
74	0.05%	0.28%	0.10%	0.03%	0.10%	0.15%	0.21%	0.17%
79	0.22%	0.21%	0.24%	0.13%	0.11%	0.13%	0.15%	-0.07%
41	0.00%	0.19%	0.11%	0.11%	0.19%	0.21%	0.12%	0.11%

Table VIII-2 Egypt. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
27	64.39%	47.49%	45.29%	45.89%	37.94%	43.21%	39.91%	-24.48%
61	2.77%	3.54%	4.37%	6.41%	6.54%	6.39%	5.33%	2.56%
52	6.99%	11.02%	10.86%	6.35%	5.92%	5.07%	4.58%	-2.41%
88	4.12%	1.00%	6.32%	2.15%	3.42%	1.91%	4.10%	-0.03%
84	1.58%	2.09%	1.95%	4.48%	3.07%	2.32%	3.85%	2.27%
76	3.38%	4.87%	4.60%	5.29%	5.76%	5.33%	3.74%	0.37%
31	0.53%	1.15%	0.51%	1.61%	2.77%	3.09%	3.66%	3.13%
7	2.72%	6.45%	3.07%	2.42%	3.17%	3.71%	3.52%	0.80%
72	0.95%	3.46%	1.90%	2.83%	3.89%	3.06%	3.48%	2.53%
25	0.24%	0.31%	0.65%	0.73%	0.94%	1.05%	3.18%	2.94%

Table VIII-3 Israel. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
71	10.78%	17.90%	21.30%	20.33%	18.25%	21.15%	18.44%	7.67%
85	8.74%	10.32%	12.75%	17.89%	16.71%	12.22%	11.11%	2.37%
84	9.64%	9.48%	8.39%	10.49%	9.58%	9.64%	10.15%	0.52%
39	5.83%	6.92%	6.23%	5.64%	5.77%	6.31%	7.16%	1.33%
90	4.77%	3.83%	5.66%	6.87%	8.10%	6.28%	6.21%	1.44%
30	0.41%	0.40%	1.70%	4.06%	5.95%	6.01%	5.17%	4.77%
29	4.40%	4.43%	4.23%	3.56%	3.36%	4.26%	4.77%	0.37%
8	4.21%	3.80%	3.69%	2.36%	2.49%	2.36%	2.59%	-1.62%
82	1.74%	2.14%	2.00%	2.16%	2.51%	2.65%	2.52%	0.78%
28	3.34%	3.13%	3.12%	1.77%	1.81%	1.84%	2.12%	-1.21%

Table VIII-4 Jordan. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
88	25.28%	1.34%	2.51%	26.27%	5.60%	15.36%	28.20%	2.91%
31	2.13%	24.03%	13.56%	9.60%	16.30%	8.91%	15.17%	13.05%
25	6.49%	20.98%	30.10%	3.67%	3.76%	2.50%	7.25%	0.76%

85	2.05%	4.66%	3.40%	5.79%	10.86%	3.45%	6.62%	4.58%
84	1.87%	9.04%	16.06%	9.09%	10.07%	6.80%	6.02%	4.15%
90	4.61%	7.85%	4.95%	15.48%	7.84%	4.50%	5.21%	0.60%
30	0.20%	0.58%	0.39%	0.24%	12.28%	4.84%	4.16%	3.96%
7	0.30%	1.19%	1.78%	1.96%	2.08%	1.28%	3.28%	2.98%
62	1.94%	5.54%	7.57%	7.73%	5.66%	2.15%	3.03%	1.09%
87	0.79%	1.01%	0.85%	1.28%	1.20%	0.16%	2.77%	1.98%

Table VIII-5 Lebanon. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
71	1.96%	11.92%	22.38%	12.99%	9.22%	18.15%	13.96%	12.00%
5	9.04%	7.86%	7.42%	2.88%	3.19%	6.86%	11.04%	2.00%
25	0.14%	0.11%	0.18%	6.36%	6.79%	9.94%	8.49%	8.35%
28	0.00%	0.02%	0.09%	7.83%	5.67%	5.89%	7.71%	7.71%
76	5.89%	8.98%	7.54%	8.74%	5.61%	7.16%	5.30%	-0.59%
85	4.41%	4.27%	6.61%	6.26%	3.98%	5.34%	5.01%	0.61%
61	15.35%	7.13%	4.32%	3.33%	2.32%	4.16%	3.77%	-11.58%
27	1.07%	3.61%	2.04%	0.02%	0.00%	0.04%	3.51%	2.44%
72	3.25%	2.40%	4.17%	1.13%	2.81%	3.17%	3.03%	-0.22%
84	2.97%	3.36%	1.74%	1.77%	3.16%	2.55%	2.94%	-0.03%

Table VIII-6 Morocco. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
62	29.61%	30.74%	29.20%	28.28%	30.08%	29.64%	28.48%	-1.12%
85	5.55%	7.95%	9.65%	9.38%	9.54%	10.86%	13.48%	7.93%
61	10.79%	9.98%	10.63%	11.30%	12.44%	11.88%	11.70%	0.91%
3	5.49%	5.48%	5.25%	6.26%	6.82%	7.35%	6.94%	1.45%
7	5.18%	4.67%	3.25%	3.66%	3.88%	5.06%	4.92%	-0.26%
8	4.98%	4.73%	4.92%	3.69%	3.78%	4.06%	4.41%	-0.58%
16	2.31%	1.93%	2.36%	2.72%	2.53%	3.10%	3.48%	1.17%
64	2.25%	2.59%	2.90%	2.95%	3.22%	3.24%	3.26%	1.01%
25	3.34%	2.89%	3.82%	3.23%	3.31%	2.98%	2.54%	-0.80%
31	4.13%	5.03%	4.05%	2.85%	2.68%	2.46%	2.10%	-2.03%

Table VIII-7 Syria. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
27	88.49%	82.65%	83.86%	87.33%	88.70%	88.69%	85.17%	-3.31%
52	3.76%	5.82%	6.97%	4.94%	3.66%	3.90%	4.35%	0.60%
61	2.07%	2.67%	2.36%	1.89%	1.51%	1.48%	2.21%	0.14%
41	0.90%	1.93%	1.54%	1.60%	1.71%	1.66%	1.58%	0.69%
15	0.00%	0.23%	0.02%	0.00%	0.01%	0.04%	1.53%	1.53%
62	0.84%	1.29%	1.53%	1.09%	1.20%	1.11%	1.04%	0.21%
5	0.81%	0.90%	0.55%	0.51%	0.38%	0.45%	0.74%	-0.08%
25	0.30%	1.16%	0.99%	0.61%	0.48%	0.42%	0.59%	0.30%
10	0.00%	0.67%	0.16%	0.00%	0.00%	0.36%	0.33%	0.33%
39	0.00%	0.01%	0.02%	0.07%	0.05%	0.10%	0.21%	0.21%

Table VIII-8 Tunisia. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993

62	44.50%	42.27%	40.33%	35.65%	35.77%	35.43%	32.71%	-11.79%
85	7.15%	7.82%	9.55%	13.32%	13.80%	13.48%	14.67%	7.51%
61	9.01%	9.36%	9.90%	11.09%	10.57%	12.21%	11.62%	2.62%
27	5.77%	6.76%	9.19%	8.91%	8.09%	8.71%	9.21%	3.45%
64	4.25%	4.79%	5.32%	5.83%	5.75%	6.11%	6.10%	1.85%
31	3.06%	4.44%	3.72%	2.69%	2.69%	2.72%	2.89%	-0.17%
87	0.53%	0.52%	0.52%	1.34%	1.67%	1.95%	2.27%	1.74%
84	1.57%	1.69%	1.67%	1.26%	1.35%	1.62%	1.74%	0.16%
3	2.29%	1.51%	1.97%	1.75%	1.54%	1.53%	1.55%	-0.75%
63	0.54%	0.66%	0.69%	0.93%	1.27%	1.49%	1.51%	0.96%

Table VIII-9 Turkey. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
62	44.50%	42.27%	40.33%	35.65%	35.77%	35.43%	32.71%	-5.39%
85	7.15%	7.82%	9.55%	13.32%	13.80%	13.48%	14.67%	11.24%
61	9.01%	9.36%	9.90%	11.09%	10.57%	12.21%	11.62%	-4.92%
27	5.77%	6.76%	9.19%	8.91%	8.09%	8.71%	9.21%	4.47%
64	4.25%	4.79%	5.32%	5.83%	5.75%	6.11%	6.10%	4.29%
31	3.06%	4.44%	3.72%	2.69%	2.69%	2.72%	2.89%	1.23%
87	0.53%	0.52%	0.52%	1.34%	1.67%	1.95%	2.27%	-4.56%
84	1.57%	1.69%	1.67%	1.26%	1.35%	1.62%	1.74%	2.79%
3	2.29%	1.51%	1.97%	1.75%	1.54%	1.53%	1.55%	0.98%
63	0.54%	0.66%	0.69%	0.93%	1.27%	1.49%	1.51%	1.01%

Table VIII-10 Czech Rep. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	8.16%	10.09%	11.58%	13.22%	16.28%	19.95%	20.75%	12.58%
87	8.31%	7.38%	12.99%	19.16%	18.10%	17.29%	16.42%	8.12%
85	7.55%	10.00%	11.81%	15.95%	16.93%	15.94%	16.33%	8.78%
73	5.64%	6.49%	6.11%	5.51%	5.31%	4.77%	4.83%	-0.81%
94	5.19%	4.51%	4.73%	4.32%	4.36%	4.41%	4.08%	-1.10%
39	3.12%	3.49%	3.73%	3.22%	2.93%	2.77%	2.94%	-0.18%
72	6.69%	6.53%	4.56%	3.13%	2.80%	2.66%	2.72%	-3.97%
40	1.98%	2.10%	2.23%	2.55%	2.48%	2.66%	2.63%	0.65%
44	3.25%	5.51%	4.40%	2.86%	2.41%	2.21%	2.17%	-1.08%
70	3.29%	2.69%	2.35%	2.02%	1.88%	1.80%	1.73%	-1.56%

Table VIII-11 Estonia. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
85	0.22%	5.07%	8.95%	36.50%	28.99%	23.20%	24.59%	24.37%
44	8.09%	17.22%	19.38%	14.21%	14.29%	15.81%	16.40%	8.30%
94	4.03%	5.03%	5.92%	5.87%	7.69%	9.23%	9.75%	5.72%
27	17.61%	10.55%	19.42%	11.84%	11.61%	14.00%	8.66%	-8.95%
62	5.96%	9.71%	7.47%	4.30%	4.67%	4.75%	4.76%	-1.20%
84	0.70%	9.28%	7.21%	2.46%	3.48%	3.18%	3.96%	3.26%
87	0.36%	0.70%	0.76%	1.14%	2.05%	2.71%	3.57%	3.21%
73	0.34%	1.63%	2.28%	2.09%	3.01%	3.60%	3.07%	2.73%
72	3.05%	8.32%	3.87%	1.05%	0.61%	0.55%	2.23%	-0.82%
63	1.43%	1.94%	2.02%	1.64%	1.95%	1.74%	1.78%	0.34%

Table VIII-12 Hungary. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
85	10.88%	14.50%	21.46%	24.66%	26.88%	26.82%	29.71%	18.83%
84	9.55%	16.33%	24.53%	27.67%	25.06%	24.61%	25.49%	15.94%
87	2.60%	5.24%	5.75%	10.83%	11.36%	10.98%	9.77%	7.17%
90	0.80%	0.96%	1.04%	1.75%	2.34%	3.01%	3.06%	2.26%
29	3.57%	2.50%	1.92%	2.39%	3.32%	3.32%	2.26%	-1.31%
94	3.24%	2.76%	2.11%	2.20%	2.08%	2.13%	2.09%	-1.15%
39	4.29%	4.29%	3.07%	2.64%	2.23%	2.17%	2.02%	-2.27%
76	2.25%	4.11%	2.99%	2.18%	1.94%	1.88%	1.92%	-0.33%
62	11.28%	6.77%	4.98%	2.77%	2.51%	2.28%	1.77%	-9.51%
73	3.42%	2.90%	2.07%	1.55%	1.53%	1.58%	1.57%	-1.85%

Table VIII-13 Latvia. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
44	7.30%	25.74%	38.14%	42.86%	40.79%	42.33%	44.68%	37.38%
27	58.08%	35.30%	27.39%	20.41%	18.46%	16.26%	13.42%	-44.66%
62	2.30%	5.07%	6.90%	7.12%	7.58%	6.79%	6.42%	4.12%
72	1.99%	7.39%	3.37%	2.98%	3.34%	3.77%	5.50%	3.51%
94	1.17%	1.75%	2.27%	3.94%	4.82%	5.18%	5.41%	4.25%
61	0.89%	2.09%	3.03%	3.42%	3.76%	3.45%	3.10%	2.21%
76	5.42%	1.84%	0.89%	2.67%	3.03%	2.51%	2.34%	-3.08%
84	0.33%	0.45%	0.89%	1.44%	1.73%	1.98%	1.82%	1.49%
85	0.46%	0.91%	1.97%	1.17%	1.32%	1.64%	1.77%	1.31%
63	0.37%	1.03%	1.04%	1.19%	1.23%	1.30%	1.49%	1.12%
73	0.36%	0.50%	0.53%	0.78%	1.03%	1.18%	1.33%	0.97%

Table VIII-14 Lithuania. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
27	48.55%	13.76%	8.76%	10.92%	20.35%	18.61%	15.35%	-33.20%
62	5.17%	11.37%	17.92%	15.31%	15.46%	14.86%	12.47%	7.30%
94	1.05%	1.97%	2.52%	5.92%	6.04%	7.94%	9.95%	8.90%
44	2.72%	11.86%	13.22%	9.17%	7.94%	8.77%	9.25%	6.53%
85	0.50%	5.08%	6.95%	6.61%	5.77%	6.20%	9.20%	8.70%
31	5.56%	10.38%	9.48%	8.23%	6.13%	6.25%	7.23%	1.67%
61	1.45%	4.50%	5.39%	6.14%	5.85%	5.79%	5.06%	3.61%
23	0.23%	0.33%	1.13%	2.38%	2.44%	2.43%	2.51%	2.28%
72	3.26%	6.66%	3.40%	2.65%	2.01%	1.64%	2.38%	-0.88%
73	0.72%	0.75%	0.90%	1.60%	1.73%	1.60%	2.24%	1.52%

Table VIII-15 Poland. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	3.55%	4.35%	5.21%	11.15%	12.34%	12.93%	13.71%	10.16%
87	6.98%	6.83%	9.19%	11.56%	11.00%	11.13%	12.69%	5.71%
85	4.22%	6.12%	9.72%	10.74%	11.36%	12.21%	12.56%	8.34%
94	6.89%	7.77%	8.76%	9.09%	9.21%	9.57%	9.79%	2.90%
73	5.05%	5.38%	4.92%	4.67%	4.74%	4.50%	4.34%	-0.70%
27	7.35%	8.22%	6.53%	5.11%	5.85%	5.24%	4.34%	-3.01%

44	5.51%	5.62%	5.22%	4.54%	3.83%	3.81%	3.92%	-1.59%
62	14.04%	11.15%	9.53%	6.19%	5.63%	4.62%	3.55%	-10.49%
48	0.97%	1.74%	1.72%	2.18%	2.58%	2.92%	2.74%	1.77%
39	1.48%	1.62%	1.79%	2.51%	2.34%	2.52%	2.58%	1.10%

Table VIII-16 Slovakia. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
87	3.72%	10.45%	15.99%	23.15%	23.53%	31.12%	39.77%	36.05%
85	3.44%	6.53%	11.26%	11.96%	12.71%	12.40%	10.83%	7.39%
84	5.94%	5.98%	6.98%	11.83%	10.75%	9.49%	9.41%	3.47%
72	12.87%	12.51%	8.37%	5.39%	5.62%	4.99%	4.09%	-8.78%
94	4.74%	4.11%	3.05%	2.83%	3.33%	3.82%	3.42%	-1.32%
64	2.60%	2.97%	3.26%	3.30%	3.18%	2.99%	2.79%	0.19%
62	10.92%	7.23%	6.82%	5.05%	4.67%	3.81%	2.67%	-8.25%
40	1.39%	1.49%	1.54%	1.41%	2.14%	2.67%	2.57%	1.18%
73	6.28%	5.04%	4.15%	3.41%	3.30%	2.72%	2.47%	-3.81%
27	1.80%	1.96%	2.03%	3.47%	2.89%	2.54%	2.13%	0.32%

Table VIII-17 Slovenia. Share in exports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
87	12.72%	13.85%	15.46%	17.67%	17.51%	19.00%	16.69%	3.97%
85	9.46%	10.02%	11.22%	12.50%	12.30%	12.57%	12.58%	3.12%
84	8.74%	10.57%	10.69%	10.93%	11.05%	10.93%	11.34%	2.60%
94	6.39%	7.49%	8.59%	9.28%	9.55%	9.09%	8.77%	2.38%
88	0.40%	0.09%	0.08%	0.09%	0.10%	1.27%	5.05%	4.66%
76	2.51%	3.62%	4.14%	4.97%	5.47%	4.99%	4.82%	2.31%
44	5.16%	5.42%	4.38%	3.73%	3.34%	3.21%	2.98%	-2.18%
72	2.09%	3.56%	2.94%	2.98%	2.95%	2.86%	2.98%	0.89%
39	1.62%	2.04%	2.40%	2.91%	2.89%	2.89%	2.93%	1.31%
48	3.37%	3.88%	3.21%	3.31%	2.97%	2.75%	2.59%	-0.78%

Table VIII-18 Export concentration: share in percentage of exports of main 10, 5 and 3 product categories (CN2). Sources: Eurostat, Comext

Country	10 products	5 products	3 products
Algeria	99.06%	98.05%	97.14%
Egypt	75.35%	57.77%	49.82%
Israel	70.25%	53.08%	39.71%
Jordan	81.72%	63.27%	50.63%
Lebanon	64.76%	46.50%	33.49%
Morocco	81.30%	65.52%	53.66%
Syrian Arab Republic	97.77%	94.85%	91.74%
Tunisia	84.26%	74.31%	59.00%
Turkey	73.01%	58.22%	42.49%
Czech Republic	74.60%	62.41%	53.50%
Estonia	78.76%	64.15%	50.74%
Hungary	79.65%	70.28%	64.97%
Latvia	85.95%	75.43%	64.52%
Lithuania	75.63%	56.22%	37.77%
Poland	70.22%	53.09%	38.96%
Slovak Republic	80.15%	67.52%	60.01%
Slovenia	70.74%	54.43%	40.61%

Figure VIII-1 Export concentration, the MP countries: share in percentage of exports of main 10, 5 and 3 product categories (CN2). Sources: Eurostat, Comext
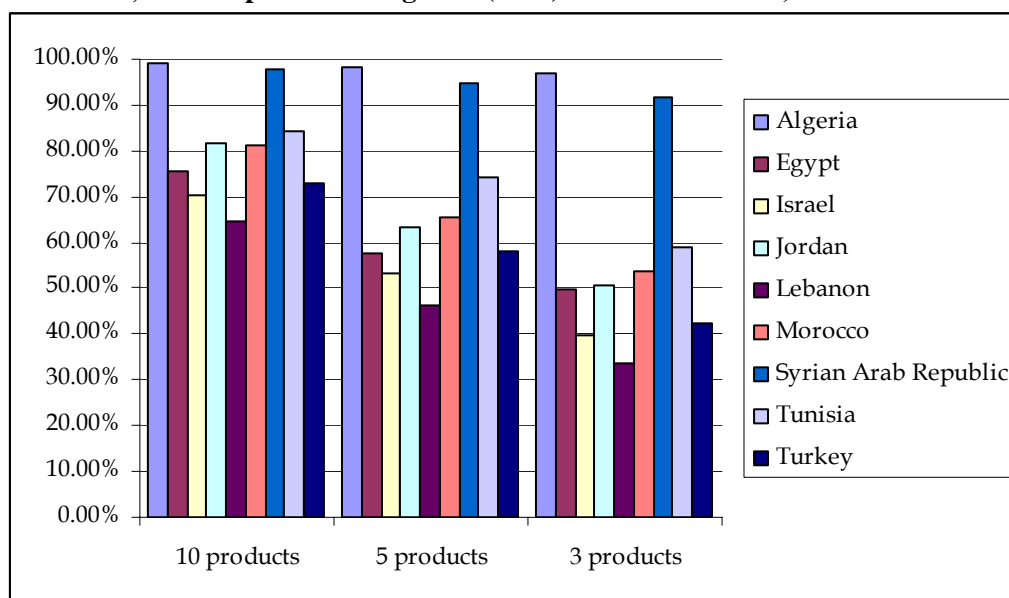
Figure VIII-2 Export concentration, the CEE countries: share in percentage of exports of main 10, 5 and 3 product categories (CN2). Sources: Eurostat, Comext
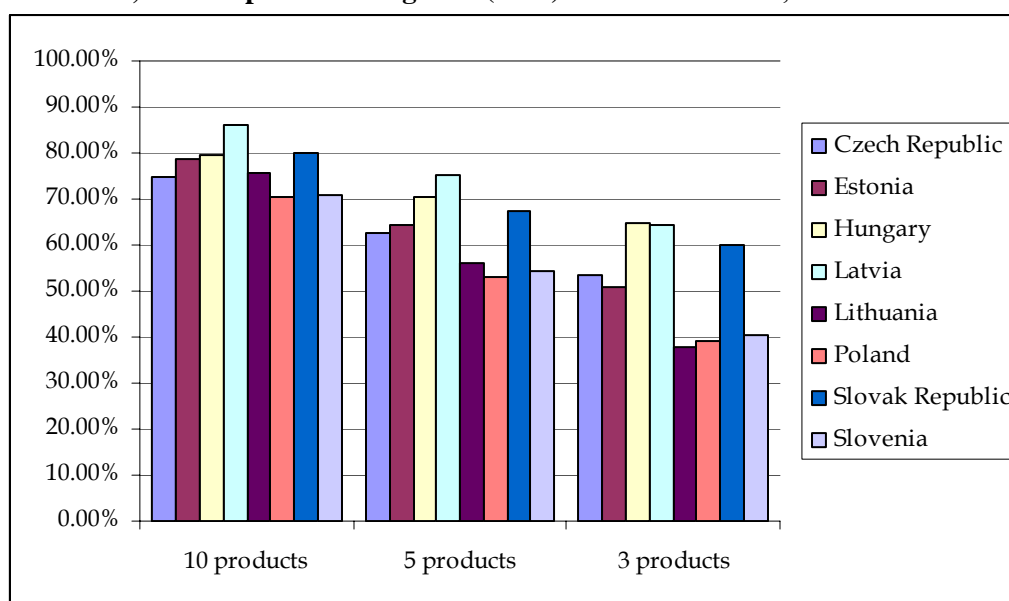
RCA

Table VIII-19 The MP countries. RCA index of five largest comparative advantage (CN2),
sources: Eurostat, Comext

Country	cn2	1993	1995	1997	2000	2001	2002	2003
Algeria	27	101.1	77.9	84.0	110.2	102.2	111.6	120.9
Algeria	72	1.4	4.2	3.7	1.8	1.0	2.2	2.6
Algeria	45	0.9	1.3	0.8	3.5	2.9	1.3	1.8
Algeria	84	1.2	1.7	1.4	0.8	0.7	1.2	1.7
Israel	6	24.5	20.4	20.0	15.8	14.8	14.9	15.8
Israel	93	0.5	0.3	5.6	4.0	2.5	1.4	10.6
Israel	56	2.5	2.8	2.9	5.0	5.0	7.1	8.7
Israel	31	11.2	10.0	9.5	6.2	5.9	8.7	8.6
Israel	7	3.1	2.4	4.6	5.0	5.9	6.2	7.6
Jordan	31	8.6	65.2	50.9	46.5	79.6	48.1	69.5
Jordan	60	20.6	69.5	72.5	90.4	73.9	28.8	44.3
Jordan	81	14.6	46.5	76.0	50.5	52.3	41.2	38.6
Jordan	59	4.0	33.9	34.9	35.9	35.7	15.9	30.7
Jordan	25	14.6	43.8	69.6	10.5	10.4	7.0	21.4
Lebanon	5	63.5	53.0	55.0	32.3	36.9	81.0	132.5
Lebanon	78	5.5	16.1	26.0	36.8	23.9	28.5	37.7
Lebanon	25	0.3	0.2	0.4	18.3	18.8	27.9	25.1
Lebanon	28	0.0	0.0	0.1	12.5	8.4	9.8	12.5
Lebanon	31	1.7	16.5	42.1	19.7	11.0	18.4	8.8
Morocco	45	43.2	40.8	47.0	64.4	46.3	44.9	56.2
Morocco	7	10.3	9.6	10.2	14.0	13.8	17.9	18.2
Morocco	78	13.8	13.6	13.9	16.4	11.6	12.7	13.0
Morocco	16	6.1	4.8	6.6	10.0	8.9	10.1	11.2
Morocco	62	8.9	9.2	9.1	10.6	10.6	10.0	9.7
Morocco	31	16.8	13.6	15.2	13.8	13.1	13.3	9.6
Syria	60	22.0	33.5	22.6	22.1	19.8	19.8	32.3
Syria	51	12.6	16.0	20.8	23.3	17.4	19.9	23.6
Syria	14	4.7	4.5	6.5	8.1	12.8	11.3	14.8
Syria	5	5.7	6.1	4.1	5.7	4.4	5.4	8.9
Syria	27	6.7	7.0	6.6	6.0	6.3	6.3	5.8
Tunisia	45	14.4	7.8	18.0	20.9	16.2	26.3	27.2
Tunisia	31	12.4	12.0	13.9	13.0	13.1	14.7	13.2
Tunisia	62	13.4	12.7	12.6	13.4	12.6	11.9	11.2
Tunisia	64	4.2	5.0	5.1	6.4	5.7	5.7	5.6
Tunisia	61	4.3	4.9	4.7	5.7	5.2	5.8	5.4
Turkey	61	11.40	10.75	9.57	9.57	8.45	8.58	8.54
Turkey	63	6.65	6.59	8.40	9.63	8.49	7.65	7.70
Turkey	60	6.25	5.57	6.57	6.33	5.94	5.37	6.66
Turkey	55	5.06	5.89	6.04	7.58	6.94	6.09	5.55
Turkey	52	4.43	3.66	4.61	6.54	6.76	5.39	5.45

Table VIII-20 The CEE countries. RCA index of five largest comparative advantage (CN2),
sources: Eurostat, Comext

Country	cn2	1993	1995	1997	2000	2001	2002	2003
Czech Rep.	49	1.4	1.4	1.9	3.2	3.1	4.0	4.7
Czech Rep.	86	8.9	7.8	9.6	7.2	5.5	5.1	4.6
Czech Rep.	70	9.1	7.4	6.9	5.7	4.8	4.6	4.5
Czech Rep.	83	1.4	3.3	4.3	4.9	4.8	4.6	4.4
Czech Rep.	73	4.9	5.5	5.4	5.2	4.6	4.0	3.9
Egypt	31	2.2	3.1	1.9	7.8	13.5	16.7	16.8
Egypt	52	10.6	14.9	16.0	15.6	13.8	13.0	13.4
Egypt	7	5.4	13.3	9.7	9.3	11.3	13.1	13.0
Egypt	57	1.7	3.1	5.1	7.0	7.4	8.2	11.5
Egypt	25	0.5	0.6	1.5	2.1	2.6	2.9	9.4
Estonia	53	0.9	5.1	1.2	16.5	25.7	24.5	15.6
Estonia	4	2.5	2.1	9.6	7.4	10.1	11.5	12.5
Estonia	44	3.7	9.8	12.2	10.4	11.0	11.9	12.3
Estonia	43	7.3	2.7	4.6	6.4	7.9	5.8	6.0
Estonia	94	3.7	4.6	5.1	4.4	5.4	5.9	5.7
Hungary	2	12.0	8.8	6.7	5.1	4.6	4.1	4.1
Hungary	1	14.7	9.8	7.6	3.6	4.3	3.4	3.2
Hungary	14	7.7	3.4	2.3	2.3	2.3	2.8	2.9
Hungary	86	1.7	1.3	2.8	2.8	3.7	2.9	2.7
Hungary	85	1.1	1.3	1.9	1.7	2.0	2.2	2.4
Latvia	44	3.3	14.6	24.1	31.3	31.3	32.0	33.5
Latvia	4	0.6	0.3	5.1	4.9	9.4	7.5	6.8
Latvia	52	0.7	2.4	2.6	2.5	2.5	3.2	3.9
Latvia	72	1.5	4.2	2.5	2.2	2.7	3.1	3.9
Latvia	94	1.1	1.6	2.0	2.9	3.4	3.3	3.2
Lithuania	31	22.6	28.2	35.5	39.9	29.9	33.8	33.1
Lithuania	53	4.6	8.1	10.3	18.5	15.0	21.0	24.6
Lithuania	4	5.6	6.6	15.4	8.0	11.0	9.4	9.3
Lithuania	44	1.2	6.7	8.3	6.7	6.1	6.6	6.9
Lithuania	51	0.9	1.3	1.1	2.9	4.5	7.2	6.9
Poland	86	5.5	3.2	3.9	4.9	6.4	6.7	6.3
Poland	94	6.3	7.2	7.5	6.8	6.5	6.1	5.7
Poland	1	16.6	11.8	11.6	5.6	5.0	4.6	5.1
Poland	43	2.6	3.1	3.1	3.4	4.4	3.8	4.3
Poland	11	0.9	1.3	1.6	0.8	1.0	2.4	3.8
Slovakia	87	0.8	2.5	3.5	4.9	4.9	5.9	6.9
Slovakia	86	7.9	20.5	15.6	8.3	10.7	6.6	6.8
Slovakia	70	8.3	5.8	5.4	4.4	4.0	3.7	3.0
Slovakia	72	9.5	7.1	6.3	4.0	4.5	4.1	2.9
Slovakia	54	6.7	5.9	4.6	3.8	3.3	3.1	2.8
Slovenia	68	6.0	6.8	6.5	6.0	6.0	6.0	5.2
Slovenia	94	5.8	6.9	7.4	6.9	6.7	5.8	5.1
Slovenia	76	2.8	2.7	3.3	4.4	4.8	4.6	4.4
Slovenia	54	1.8	2.6	2.8	3.9	4.0	3.9	4.0
Slovenia	79	11.8	9.8	6.0	4.5	4.5	3.6	3.5

Table VIII-21 Share in exports and number of product categories of largest comparative advantage, sources: Eurostat, Comext

Country	Share in % of exports to the EU		Number of categories of products (CN2)	
	rca>2	rca>1	rca>2	rca>1
Algeria	94.3%	94.7%	2	4
Egypt	76.6%	86.1%	16	25
Israel	51.7%	67.5%	20	34
Jordan	86.5%	88.2%	17	21
Lebanon	66.5%	75.0%	21	30
Morocco	72.8%	88.7%	16	24
Syria	95.8%	96.8%	8	11
Tunisia	58.0%	77.8%	11	23
Turkey	54.1%	47.7%	33	25
Czech Rep.	35.3%	86.6%	14	37
Estonia	61.6%	71.9%	14	25
Hungary	32.6%	80.5%	7	27
Latvia	70.1%	75.8%	11	19
Lithuania	54.0%	77.0%	13	28
Poland	46.7%	72.6%	27	46
Slovakia	60.1%	65.6%	10	19
Slovenia	49.6%	74.0%	16	28

Table VIII-22 Algeria. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	18.85%	18.90%	18.54%	21.28%	21.40%	24.35%	23.54%	4.69%
87	10.20%	10.61%	11.73%	11.96%	11.83%	12.95%	14.43%	4.23%
85	6.77%	7.08%	8.31%	6.76%	7.74%	7.78%	9.46%	2.69%
30	5.97%	7.26%	7.00%	6.82%	6.63%	6.56%	7.42%	1.45%
73	3.17%	5.03%	3.30%	2.92%	4.34%	3.68%	4.28%	1.11%
10	2.74%	2.79%	2.44%	5.78%	4.94%	4.34%	3.72%	0.98%
4	4.88%	3.04%	5.32%	5.78%	4.37%	3.36%	3.21%	-1.67%
90	2.49%	2.19%	2.53%	2.43%	2.49%	2.82%	3.00%	0.51%
39	2.68%	2.79%	2.77%	2.74%	2.61%	2.80%	2.83%	0.14%
48	1.60%	1.81%	1.75%	2.25%	2.07%	2.27%	1.95%	0.36%

Table VIII-23 Egypt. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	26.83%	22.76%	26.24%	25.26%	24.93%	23.69%	22.84%	-3.99%
85	11.41%	10.13%	9.99%	15.79%	14.28%	11.74%	11.34%	-0.07%
88	4.88%	4.95%	5.32%	2.29%	2.38%	2.13%	6.30%	1.42%
87	4.63%	6.46%	5.62%	4.30%	4.81%	4.75%	4.41%	-0.22%
30	1.54%	2.04%	2.16%	3.03%	4.19%	4.73%	4.33%	2.79%
29	2.57%	3.19%	2.79%	3.13%	3.91%	4.38%	4.26%	1.69%
39	3.69%	3.93%	3.28%	3.75%	4.51%	4.51%	4.09%	0.41%
90	3.53%	2.98%	3.35%	3.42%	4.11%	4.68%	3.55%	0.02%
73	2.63%	2.70%	3.51%	3.18%	2.96%	2.98%	3.25%	0.62%
48	1.36%	2.84%	2.20%	2.24%	2.76%	2.88%	2.91%	1.55%

Table VIII-24 Israel. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
71	26.73%	22.46%	25.40%	25.91%	21.56%	23.23%	24.89%	-1.83%
84	14.36%	13.87%	12.97%	14.51%	14.59%	14.58%	15.10%	0.74%
85	7.10%	8.08%	7.16%	11.03%	10.98%	9.16%	9.60%	2.49%
87	8.31%	9.34%	7.78%	9.02%	9.69%	8.04%	6.08%	-2.24%
90	2.01%	2.20%	2.29%	3.58%	3.80%	4.43%	4.65%	2.64%
39	3.90%	4.18%	3.81%	3.74%	3.87%	3.99%	4.32%	0.42%
29	2.39%	2.37%	2.38%	2.23%	2.48%	3.23%	3.46%	1.07%
30	1.65%	1.76%	2.29%	2.25%	2.82%	3.16%	3.19%	1.54%
48	1.49%	2.68%	2.25%	2.20%	2.26%	2.51%	2.42%	0.93%
33	0.98%	1.05%	1.14%	1.06%	1.30%	1.44%	1.54%	0.57%

Table VIII-25 Jordan. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	23.81%	20.90%	19.89%	17.15%	19.24%	17.16%	15.01%	-8.80%
87	8.15%	7.26%	8.62%	13.58%	13.19%	10.33%	12.84%	4.69%
85	6.56%	7.77%	10.03%	9.70%	13.01%	10.16%	11.00%	4.45%
88	0.96%	0.58%	2.18%	2.33%	0.90%	11.07%	8.37%	7.41%
30	4.23%	5.01%	7.16%	5.79%	6.73%	6.58%	7.56%	3.33%
90	3.88%	4.82%	4.25%	5.58%	4.58%	4.54%	4.91%	1.03%
48	1.75%	3.60%	2.94%	3.32%	3.58%	2.91%	2.84%	1.09%
38	2.00%	1.89%	2.56%	2.21%	2.88%	2.81%	2.55%	0.55%
39	4.06%	3.77%	3.52%	2.81%	2.62%	2.54%	2.51%	-1.55%
71	1.34%	1.17%	0.54%	0.53%	0.36%	0.54%	2.18%	0.84%

Table VIII-26 Lebanon. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
88	0.17%	0.18%	5.95%	0.97%	0.35%	1.94%	15.65%	15.48%
27	8.07%	7.64%	8.94%	13.41%	8.09%	7.15%	10.39%	2.33%
84	10.44%	10.96%	10.26%	9.10%	10.14%	10.20%	9.63%	-0.81%
30	3.45%	4.06%	4.46%	6.75%	7.53%	7.82%	6.90%	3.45%
87	6.21%	8.41%	7.54%	9.03%	9.77%	9.59%	6.76%	0.55%
85	5.49%	10.53%	8.56%	7.10%	7.12%	5.85%	5.30%	-0.19%
71	4.44%	3.91%	4.15%	3.67%	4.38%	4.75%	3.05%	-1.38%
1	3.08%	2.31%	3.00%	3.65%	2.90%	4.38%	2.94%	-0.13%
62	4.00%	3.40%	2.82%	2.90%	3.26%	3.88%	2.94%	-1.06%
90	2.18%	1.94%	2.10%	2.19%	2.81%	2.50%	2.63%	0.45%

Table VIII-27 Morocco. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	18.53%	14.79%	13.04%	12.92%	14.15%	14.12%	14.33%	-4.20%
85	9.87%	10.32%	10.80%	18.45%	14.64%	12.99%	12.95%	3.08%
87	4.83%	5.24%	5.96%	5.38%	6.82%	7.21%	6.24%	1.41%
52	5.81%	6.05%	6.28%	5.12%	6.21%	6.13%	5.73%	-0.08%
27	1.80%	1.67%	2.86%	4.21%	3.10%	3.40%	5.59%	3.78%
55	5.68%	5.82%	5.96%	4.82%	4.66%	4.40%	3.66%	-2.02%
39	3.04%	4.18%	3.55%	3.10%	3.35%	3.50%	3.55%	0.50%
62	1.97%	2.45%	4.59%	4.30%	4.40%	3.83%	3.49%	1.51%
72	4.30%	2.61%	2.97%	1.90%	2.35%	2.66%	2.75%	-1.54%
88	6.46%	2.20%	4.24%	2.81%	1.00%	0.98%	2.29%	-4.17%

Table VIII-28 Syria. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	19.95%	28.90%	22.22%	20.99%	23.97%	25.60%	26.49%	6.54%
85	10.88%	11.29%	8.95%	12.65%	9.51%	9.71%	12.19%	1.32%
87	9.12%	4.42%	4.32%	4.17%	5.36%	6.54%	7.61%	-1.52%
17	4.28%	7.33%	8.13%	5.50%	7.75%	5.45%	5.04%	0.76%
90	1.92%	3.13%	3.06%	2.23%	3.56%	5.13%	3.90%	1.98%
27	6.95%	2.45%	4.19%	6.01%	4.57%	1.74%	3.87%	-3.08%
39	3.81%	4.10%	5.19%	5.57%	4.60%	4.74%	3.86%	0.05%
48	1.36%	3.68%	3.17%	3.18%	3.20%	3.27%	3.21%	1.85%
72	3.71%	2.62%	2.67%	2.71%	2.85%	3.06%	2.91%	-0.81%
30	1.04%	1.04%	1.28%	1.49%	2.12%	2.83%	2.50%	1.46%

Table VIII-29 Tunisia. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
85	8.36%	8.02%	9.31%	10.57%	10.56%	11.09%	13.33%	4.97%
84	18.03%	12.61%	13.98%	13.22%	13.45%	12.78%	12.17%	-5.86%
52	8.10%	9.58%	8.93%	7.66%	8.65%	8.40%	8.39%	0.29%
87	7.45%	6.86%	7.30%	8.13%	8.91%	8.34%	7.20%	-0.24%
27	5.25%	3.20%	5.06%	6.42%	6.22%	5.05%	6.06%	0.81%
39	2.67%	3.33%	3.00%	3.34%	3.50%	4.08%	4.29%	1.62%
62	3.27%	4.63%	4.39%	3.82%	3.90%	4.32%	4.03%	0.75%
55	5.59%	5.35%	4.30%	3.89%	3.83%	3.64%	3.03%	-2.56%
60	1.63%	2.04%	2.47%	2.95%	2.50%	2.16%	2.47%	0.84%

cn2								
30	2.69%	2.82%	2.61%	2.10%	2.21%	2.58%	2.45%	-0.24%

Table VIII-30 Turkey. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	23.87%	23.07%	23.63%	18.39%	20.70%	22.85%	21.98%	-1.90%
87	13.27%	9.43%	14.49%	18.08%	8.16%	9.33%	15.21%	1.94%
85	8.79%	9.18%	10.47%	16.14%	13.44%	11.51%	9.97%	1.18%
39	3.75%	5.22%	5.48%	5.53%	6.14%	6.51%	6.66%	2.91%
72	8.60%	7.74%	4.54%	2.86%	3.65%	4.32%	4.88%	-3.72%
30	0.94%	1.43%	1.56%	2.49%	4.09%	4.38%	4.18%	3.23%
29	3.03%	3.41%	2.56%	3.05%	3.89%	3.23%	2.92%	-0.11%
90	3.13%	2.83%	2.66%	2.54%	3.35%	2.82%	2.66%	-0.47%
48	1.29%	2.25%	2.01%	2.20%	2.34%	2.51%	2.40%	1.12%
38	1.90%	2.00%	1.72%	1.55%	2.13%	2.06%	1.95%	0.05%

Table VIII-31Czech Rep. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	25.15%	20.32%	19.11%	18.24%	19.22%	18.93%	19.08%	-6.08%
85	12.03%	14.34%	16.06%	18.91%	18.02%	15.01%	15.28%	3.25%
87	9.29%	9.26%	10.73%	11.03%	11.73%	12.80%	12.75%	3.45%
39	4.03%	5.14%	5.80%	6.23%	5.96%	6.23%	6.54%	2.51%
90	4.10%	3.62%	3.00%	2.90%	2.93%	3.15%	3.35%	-0.75%
73	2.74%	3.50%	3.15%	3.21%	3.15%	3.16%	3.25%	0.51%
72	1.29%	2.42%	2.42%	2.90%	2.77%	2.55%	2.79%	1.50%
30	1.62%	2.13%	2.29%	2.16%	2.40%	2.96%	2.76%	1.14%
48	1.65%	2.45%	2.46%	2.41%	2.37%	2.44%	2.43%	0.78%
40	1.22%	1.16%	1.37%	1.65%	1.82%	1.83%	1.87%	0.65%

Table VIII-32 Estonia. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	85	3.0%	12.9%	17.3%	31.1%	17.3%	15.0%	13.22%
85	84	9.9%	13.0%	11.2%	11.5%	13.3%	14.8%	5.20%
87	87	11.8%	8.6%	10.8%	7.5%	10.8%	11.6%	0.52%
39	39	2.1%	3.8%	4.0%	4.6%	5.1%	5.0%	4.06%
90	73	0.8%	2.4%	3.0%	2.5%	3.4%	3.3%	2.53%
73	48	0.7%	3.2%	3.3%	2.4%	2.6%	2.6%	2.04%
72	72	2.3%	1.3%	2.2%	2.1%	2.5%	2.4%	0.35%
30	90	2.9%	2.5%	2.1%	2.2%	3.0%	2.4%	-0.48%
48	32	0.5%	1.5%	1.4%	1.6%	1.9%	2.0%	1.57%
40	30	1.5%	1.0%	1.3%	1.6%	2.0%	1.8%	0.25%

Table VIII-33 Hungary. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
87	12.48%	9.73%	11.91%	18.57%	18.14%	19.67%	19.98%	7.50%
85	10.69%	14.65%	20.07%	22.15%	20.98%	19.54%	18.74%	8.04%
84	17.52%	17.93%	19.99%	19.41%	18.45%	17.30%	18.52%	1.00%
39	3.81%	4.63%	4.40%	4.44%	4.49%	4.59%	4.73%	0.92%
30	2.81%	2.58%	2.10%	1.86%	2.49%	2.69%	2.89%	0.08%
90	3.10%	2.77%	2.55%	2.18%	2.12%	2.29%	2.52%	-0.58%
73	2.57%	2.84%	2.51%	2.21%	2.30%	2.44%	2.47%	-0.10%
48	2.03%	4.09%	3.19%	2.39%	2.53%	2.46%	2.37%	0.34%

| | 72 | 1.43% | 1.91% | 1.57% | 1.52% | 1.55% | 1.44% | 1.48% | 0.05% |
| | 94 | 2.05% | 1.73% | 1.42% | 1.50% | 1.34% | 1.46% | 1.37% | -0.69% |

Table VIII-34 Latvia. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2		1993	1995	1997	2000	2001	2002	2003	2003/1993
	84	13.07%	11.33%	13.25%	18.11%	18.44%	18.58%	19.73%	6.66%
	85	3.91%	7.43%	9.15%	9.35%	11.34%	12.49%	11.15%	7.23%
	87	18.46%	11.21%	11.60%	9.08%	10.45%	10.67%	11.09%	-7.37%
	39	1.28%	2.64%	3.65%	5.13%	5.06%	4.91%	5.02%	3.74%
	48	0.46%	3.83%	3.84%	4.37%	4.58%	4.45%	4.18%	3.71%
	73	1.47%	1.57%	1.98%	2.79%	2.39%	2.49%	2.56%	1.10%
	30	1.01%	1.65%	2.09%	2.65%	2.53%	2.40%	2.55%	1.54%
	94	2.77%	2.86%	2.13%	1.96%	2.27%	2.08%	2.34%	-0.43%
	90	1.70%	1.86%	1.78%	2.61%	2.29%	2.28%	2.19%	0.50%
	33	1.11%	1.88%	3.13%	2.41%	2.25%	2.51%	2.17%	1.06%
	22	6.91%	6.85%	2.22%	1.29%	1.76%	2.16%	2.13%	-4.78%

Table VIII-35 Lithuania. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2		1993	1995	1997	2000	2001	2002	2003	2003/1993
	84	12.00%	14.13%	12.19%	15.73%	16.61%	17.36%	20.99%	8.99%
	87	16.21%	11.78%	14.21%	9.86%	13.94%	15.30%	13.30%	-2.91%
	85	3.13%	7.86%	10.20%	10.87%	12.34%	12.48%	10.04%	6.91%
	39	2.28%	5.14%	5.24%	5.63%	5.61%	5.74%	5.93%	3.65%
	30	1.01%	1.51%	2.63%	3.60%	3.74%	3.25%	3.13%	2.12%
	73	0.56%	2.02%	2.62%	2.06%	1.86%	2.02%	2.46%	1.90%
	55	2.30%	2.76%	2.50%	3.34%	2.86%	2.61%	2.25%	-0.05%
	48	0.64%	2.82%	2.81%	2.53%	2.19%	2.17%	2.23%	1.59%
	32	0.82%	1.25%	1.38%	1.54%	1.51%	1.70%	2.05%	1.23%
	90	2.06%	3.40%	2.63%	2.32%	2.14%	2.06%	2.02%	-0.04%
	83	0.24%	0.51%	0.64%	0.83%	0.87%	1.06%	1.74%	1.50%

Table VIII-36 Poland. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2		1993	1995	1997	2000	2001	2002	2003	2003/1993
	84	16.98%	18.64%	19.42%	19.85%	19.54%	18.97%	18.75%	1.77%
	87	10.77%	10.25%	12.64%	11.40%	11.10%	12.35%	13.88%	3.11%
	85	7.70%	8.39%	10.21%	11.55%	11.83%	11.05%	10.43%	2.73%
	39	4.97%	6.19%	6.24%	6.95%	7.03%	7.19%	7.51%	2.54%
	48	2.24%	3.91%	3.70%	3.74%	3.76%	3.81%	3.82%	1.58%
	30	2.84%	2.59%	2.71%	3.03%	4.01%	4.00%	3.63%	0.79%
	73	2.21%	2.61%	2.64%	2.68%	2.70%	2.82%	3.08%	0.87%
	72	1.39%	2.05%	1.64%	2.31%	2.41%	2.39%	2.72%	1.33%
	90	2.84%	2.47%	2.34%	2.26%	2.26%	2.06%	1.96%	-0.89%
	32	1.46%	1.52%	1.61%	1.76%	1.68%	1.81%	1.81%	0.35%

Table VIII-37 Slovakia. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2		1993	1995	1997	2000	2001	2002	2003	2003/1993
	87	7.42%	13.55%	13.76%	17.76%	17.21%	17.75%	21.34%	13.92%
	84	25.73%	19.79%	20.18%	18.98%	19.29%	19.16%	18.52%	-7.21%
	85	9.84%	12.84%	15.61%	14.59%	15.72%	15.73%	14.65%	4.81%
	39	3.22%	4.14%	4.31%	4.75%	4.42%	4.89%	4.97%	1.75%
	73	2.13%	3.15%	2.98%	2.49%	2.73%	2.91%	2.80%	0.67%

90	4.11%	3.28%	3.05%	2.78%	2.81%	2.31%	2.56%	-1.56%
48	1.20%	2.08%	2.60%	2.77%	2.80%	2.71%	2.42%	1.22%
30	2.06%	2.19%	2.45%	2.76%	3.12%	2.90%	2.41%	0.34%
72	0.91%	1.41%	1.18%	1.32%	1.43%	1.66%	1.79%	0.88%
40	0.70%	1.13%	0.98%	1.41%	1.23%	1.60%	1.79%	1.09%

Table VIII-38 Slovenia. Share in imports to the EU of ten main product categories (CN2) and the change since 1993, sources: Eurostat, Comext

cn2	1993	1995	1997	2000	2001	2002	2003	2003/1993
84	14.79%	15.10%	15.21%	15.07%	15.88%	15.75%	15.60%	0.80%
87	18.71%	15.40%	14.08%	13.44%	13.74%	13.64%	14.05%	-4.66%
85	6.17%	7.30%	8.67%	10.98%	10.21%	9.44%	8.58%	2.41%
39	4.27%	5.17%	5.55%	4.88%	5.03%	5.14%	5.15%	0.88%
27	1.65%	1.47%	2.57%	5.10%	3.93%	3.32%	4.26%	2.62%
72	2.75%	3.12%	2.99%	3.67%	3.65%	3.91%	4.12%	1.37%
88	0.11%	0.63%	0.03%	0.18%	0.12%	1.37%	3.38%	3.26%
73	2.07%	2.61%	3.03%	3.01%	3.00%	3.06%	3.13%	1.06%
90	2.32%	2.43%	2.32%	2.17%	2.38%	2.50%	2.36%	0.03%
30	0.79%	1.14%	1.24%	2.04%	2.33%	2.50%	2.27%	1.48%

Table VIII-39 Import concentration: share in percentage of imports for main 10, 5 and 3 product categories (CN2), sources: Eurostat, Comext

	10 products	5 products	3 products
Algeria	73.83%	59.13%	47.43%
Egypt	67.27%	49.22%	40.47%
Israel	75.25%	60.31%	49.58%
Jordan	69.76%	54.78%	38.85%
Lebanon	66.20%	49.33%	35.67%
Morocco	60.56%	44.83%	33.52%
Syrian Arab Republic	97.77%	94.85%	91.74%
Tunisia	84.26%	74.31%	59.00%
Turkey	72.83%	58.70%	47.16%
Czech Republic	70.09%	56.99%	47.10%
Estonia	64.91%	53.27%	43.70%
Hungary	75.08%	64.87%	57.25%
Latvia	62.98%	51.17%	41.97%
Lithuania	64.41%	53.39%	44.33%
Poland	67.58%	54.39%	43.06%
Slovak Republic	73.25%	62.29%	54.51%
Slovenia	62.89%	47.64%	38.23%

Figure VIII-3 Import concentration, the MP countries: share in percentage of exports of main 10, 5 and 3 product categories (CN2). Sources: Eurostat, Comext
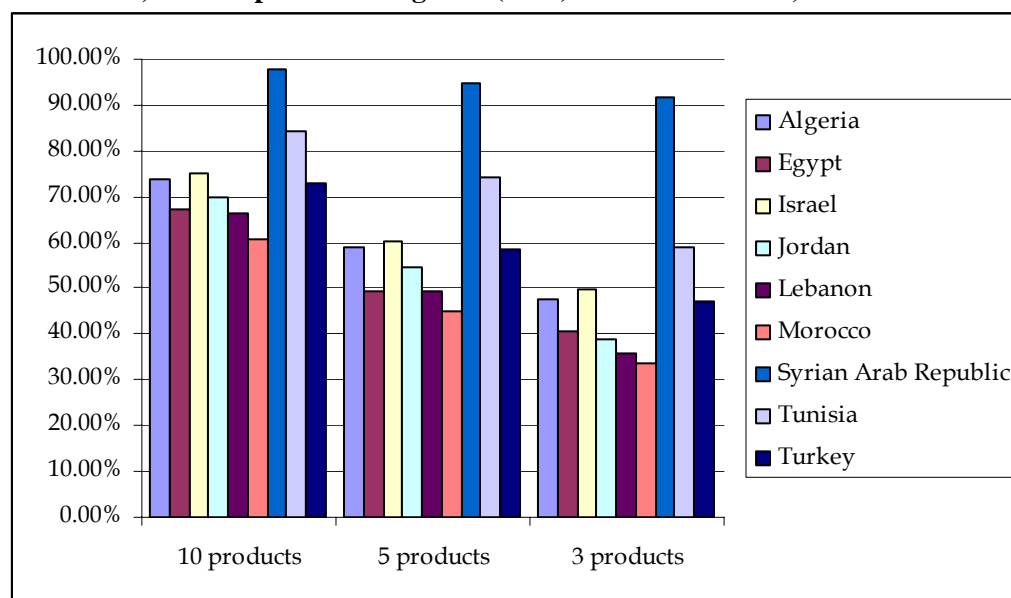
Figure VIII-4 Import concentration, the CEE countries: share in percentage of exports of main 10, 5 and 3 product categories (CN2). Sources: Eurostat, Comext
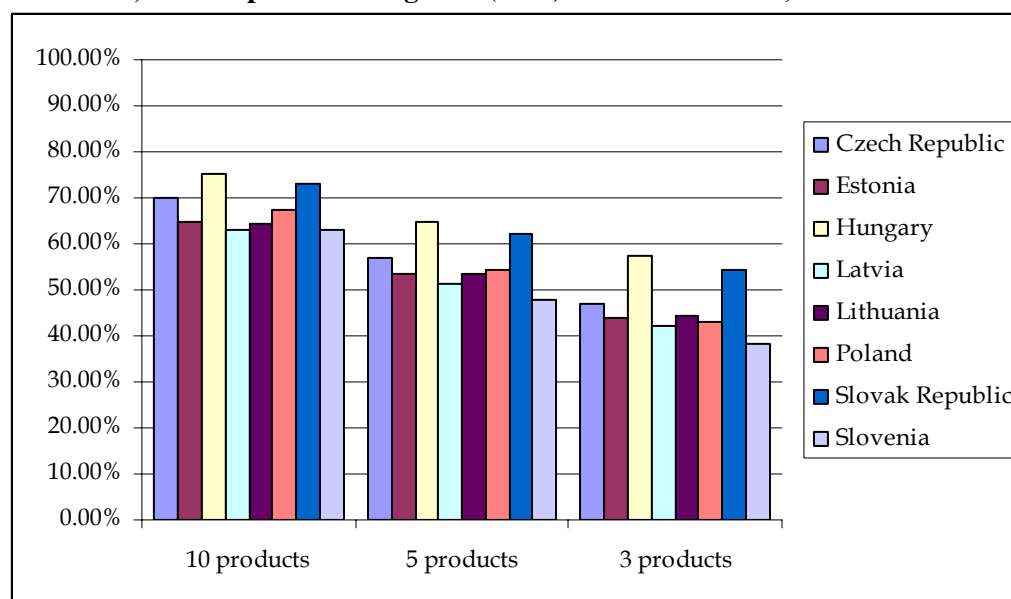
Table VIII-40 Value of exports from the CEE towards the EU in each cluster of the Neven's classifications, million of dollars, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Czech Rep.	1	321.3	667.8	805.0	1248.3	1883.4	2812.0	2958.2
Czech Rep.	2	575.3	1427.6	2300.4	5955.3	7316.6	8225.9	9304.4
Czech Rep.	3	888.0	1502.7	1739.8	2385.7	2558.0	2624.3	2870.0
Czech Rep.	4	1028.5	2410.3	4329.4	9644.1	10740.9	11907.9	12537.8
Czech Rep.	5	181.2	271.7	224.7	308.1	281.6	330.8	333.8
Estonia	1	14.4	107.7	105.0	59.7	72.7	53.4	73.9
Estonia	2	1.5	38.3	114.0	1245.2	1004.8	829.5	936.4
Estonia	3	21.1	176.4	293.3	475.3	551.3	595.4	636.7
Estonia	4	56.3	199.3	277.3	618.4	669.7	759.3	866.3
Estonia	5	9.3	35.7	38.0	69.4	71.1	75.1	72.8

Hungary	1	220.5	528.9	1314.0	3026.0	2568.8	3648.7	3111.9
Hungary	2	468.9	1067.8	2488.7	6431.4	7984.5	8489.7	9667.5
Hungary	3	1017.6	1377.6	1712.7	2288.4	2426.7	2417.1	2194.0
Hungary	4	637.3	2001.3	3457.3	7225.1	8216.3	8687.5	8523.2
Hungary	5	10.9	18.3	19.0	33.0	38.3	108.8	80.3
Latvia	1	19.1	34.4	36.8	34.6	46.4	57.7	42.9
Latvia	2	2.6	10.7	24.6	33.2	40.9	55.7	61.9
Latvia	3	33.2	94.5	160.3	310.7	344.6	364.3	358.5
Latvia	4	129.0	278.1	350.5	775.1	775.7	840.5	930.1
Latvia	5	8.2	20.0	21.4	29.5	32.4	35.6	52.0
Lithuania	1	39.7	97.6	103.9	228.3	208.4	224.9	260.7
Lithuania	2	4.8	59.2	110.4	188.5	205.1	236.1	349.6
Lithuania	3	52.5	178.0	361.7	629.9	757.3	827.4	872.4
Lithuania	4	99.6	183.9	247.3	427.2	437.6	579.5	626.0
Lithuania	5	23.9	40.7	42.6	31.3	32.6	24.8	28.5
Poland	1	383.4	693.2	750.0	1273.2	1317.3	1373.2	1512.2
Poland	2	380.9	1015.0	1800.6	3661.0	4576.2	5191.7	5905.0
Poland	3	2240.1	3196.7	3600.2	5210.5	5674.6	5821.4	5810.0
Poland	4	1700.9	3243.8	4260.7	9258.6	10424.8	11531.0	13416.6
Poland	5	232.2	334.4	264.7	272.4	261.2	455.4	471.5
Slovakia	1	94.7	290.1	313.4	529.8	479.0	530.0	595.4
Slovakia	2	77.7	294.4	550.3	1262.1	1495.9	1734.8	1959.9
Slovakia	3	311.7	685.0	797.7	1172.4	1382.3	1505.6	2321.0
Slovakia	4	230.0	869.1	1568.8	3112.2	3850.6	5173.6	6633.9
Slovakia	5	58.8	131.9	97.0	108.6	88.9	176.6	171.5
Slovenia	1	81.5	187.9	207.8	381.3	385.0	489.8	817.0
Slovenia	2	468.3	860.8	1025.1	1560.4	1664.9	1765.4	1892.8
Slovenia	3	722.1	824.4	942.6	956.8	961.0	890.9	857.9
Slovenia	4	628.3	1124.6	1445.6	2808.4	3025.5	3228.8	3188.2
Slovenia	5	15.8	57.5	36.5	44.1	40.8	89.0	85.3

Table VIII-41 Value of exports from the MPC towards the EU in each cluster of the Neven's classifications, million of dollars, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Algeria	1	61.8	150.0	145.2	230.2	585.5	361.1	467.3
Algeria	2	8.5	12.9	16.1	18.7	26.3	30.6	28.5
Algeria	3	12.4	5.8	50.0	3.8	5.9	3.8	7.4
Algeria	4	36.9	68.2	87.0	86.3	72.2	128.5	134.5
Algeria	5	4.2	5.9	16.9	13.7	12.3	11.9	9.7
Egypt	1	147.4	107.8	253.0	299.0	315.0	287.6	472.1
Egypt	2	26.1	48.6	75.8	188.3	174.7	163.2	163.5
Egypt	3	132.6	165.3	230.6	342.0	328.6	328.5	339.4
Egypt	4	256.2	421.9	555.6	630.5	619.6	650.2	609.6
Egypt	5	5.3	7.6	24.6	30.9	34.6	41.4	110.1
Israel	1	477.1	720.9	1133.5	1850.6	1867.3	1899.0	1715.3
Israel	2	295.7	522.6	1181.6	2777.1	2677.1	2012.5	1688.5
Israel	3	303.5	288.6	326.3	364.1	283.7	217.9	202.4
Israel	4	687.4	1346.7	2026.5	3124.6	2839.3	2921.4	2457.6
Israel	5	54.7	45.9	68.7	58.2	52.2	62.1	57.9
Jordan	1	75.5	36.8	44.0	59.3	55.6	101.2	97.5
Jordan	2	10.9	19.3	22.6	46.9	33.5	30.7	26.4
Jordan	3	6.8	11.7	19.7	19.8	14.3	10.8	10.8
Jordan	4	101.3	12.9	12.1	13.0	20.3	130.7	16.0
Jordan	5	17.4	26.2	54.6	11.5	9.0	10.1	15.3
Lebanon	1	1.8	11.3	18.5	34.1	112.2	20.2	22.2
Lebanon	2	3.3	5.8	10.1	19.9	21.0	14.1	14.2
Lebanon	3	23.9	22.1	19.1	59.0	15.6	15.0	16.8

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Lebanon	4	14.3	33.2	58.3	81.1	84.5	67.9	57.6
Lebanon	5	0.4	0.4	1.3	15.7	20.5	19.7	18.4
Morocco	1	332.9	328.2	423.7	452.9	409.8	315.7	288.5
Morocco	2	104.1	125.6	156.2	562.9	603.6	761.1	911.6
Morocco	3	1456.1	1734.6	2018.1	2608.0	2897.1	2882.3	2755.9
Morocco	4	119.9	180.8	220.3	337.8	345.5	395.7	345.2
Morocco	5	123.1	135.1	202.6	228.8	216.5	218.2	184.3
Syria	1	22.1	0.5	1.4	6.0	31.0	11.2	9.3
Syria	2	2.4	5.9	4.9	16.8	8.9	9.4	8.4
Syria	3	48.5	69.3	81.7	108.7	115.1	108.3	95.6
Syria	4	23.2	49.8	27.5	99.3	101.6	162.5	149.3
Syria	5	5.1	20.1	20.1	21.0	19.8	16.9	16.8
Tunisia	1	132.1	123.9	131.1	308.1	395.2	294.4	312.7
Tunisia	2	124.9	239.5	400.0	818.6	936.2	924.1	1039.9
Tunisia	3	1416.3	1822.2	2142.2	2884.8	3227.7	3374.9	3211.1
Tunisia	4	123.8	160.8	201.3	413.1	556.9	599.1	628.5
Tunisia	5	19.5	34.9	42.3	22.9	22.3	22.3	32.0
Turkey	1	176.9	524.8	654.9	876.0	855.2	877.1	725.4
Turkey	2	343.8	571.9	1174.1	2323.6	2813.5	3455.4	3611.9
Turkey	3	3051.4	3778.8	4587.0	6293.4	6832.5	8014.1	8702.5
Turkey	4	815.8	1608.7	2518.7	4952.8	6178.7	6568.9	7783.3
Turkey	5	131.5	202.0	251.8	384.6	466.6	507.1	444.8

Table VIII-42 Share of exports from the CEE towards the EU for each cluster of the Neven's classifications, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Czech Rep.	1	10.7%	10.6%	8.6%	6.4%	8.3%	10.9%	10.6%
Czech Rep.	2	19.2%	22.7%	24.5%	30.5%	32.1%	31.8%	33.2%
Czech Rep.	3	29.7%	23.9%	18.5%	12.2%	11.2%	10.1%	10.2%
Czech Rep.	4	34.3%	38.4%	46.1%	49.4%	47.1%	46.0%	44.8%
Czech Rep.	5	6.1%	4.3%	2.4%	1.6%	1.2%	1.3%	1.2%
Estonia	1	14.0%	19.3%	12.7%	2.4%	3.1%	2.3%	2.9%
Estonia	2	1.5%	6.9%	13.8%	50.5%	42.4%	35.9%	36.2%
Estonia	3	20.6%	31.6%	35.4%	19.3%	23.3%	25.7%	24.6%
Estonia	4	54.8%	35.8%	33.5%	25.1%	28.3%	32.8%	33.5%
Estonia	5	9.1%	6.4%	4.6%	2.8%	3.0%	3.2%	2.8%
Hungary	1	9.4%	10.6%	14.6%	15.9%	12.1%	15.6%	13.2%
Hungary	2	19.9%	21.4%	27.7%	33.8%	37.6%	36.4%	41.0%
Hungary	3	43.2%	27.6%	19.0%	12.0%	11.4%	10.4%	9.3%
Hungary	4	27.1%	40.1%	38.5%	38.0%	38.7%	37.2%	36.2%
Hungary	5	0.5%	0.4%	0.2%	0.2%	0.2%	0.5%	0.3%
Latvia	1	9.9%	7.9%	6.2%	2.9%	3.7%	4.3%	3.0%
Latvia	2	1.4%	2.5%	4.1%	2.8%	3.3%	4.1%	4.3%
Latvia	3	17.3%	21.6%	27.0%	26.3%	27.8%	26.9%	24.8%
Latvia	4	67.2%	63.5%	59.1%	65.5%	62.6%	62.1%	64.3%
Latvia	5	4.3%	4.6%	3.6%	2.5%	2.6%	2.6%	3.6%
Lithuania	1	18.0%	17.4%	12.0%	15.2%	12.7%	11.9%	12.2%
Lithuania	2	2.2%	10.6%	12.7%	12.5%	12.5%	12.5%	16.4%
Lithuania	3	23.8%	31.8%	41.8%	41.8%	46.1%	43.7%	40.8%
Lithuania	4	45.2%	32.9%	28.6%	28.4%	26.7%	30.6%	29.3%
Lithuania	5	10.8%	7.3%	4.9%	2.1%	2.0%	1.3%	1.3%
Poland	1	7.8%	8.2%	7.0%	6.5%	5.9%	5.6%	5.6%
Poland	2	7.7%	12.0%	16.9%	18.6%	20.6%	21.3%	21.8%
Poland	3	45.4%	37.7%	33.7%	26.5%	25.5%	23.9%	21.4%
Poland	4	34.4%	38.2%	39.9%	47.1%	46.8%	47.3%	49.5%
Poland	5	4.7%	3.9%	2.5%	1.4%	1.2%	1.9%	1.7%
Slovakia	1	12.2%	12.8%	9.4%	8.6%	6.6%	5.8%	5.1%

country	group	1993	1995	1997	2000	2001	2002	2003
Slovakia	2	10.1%	13.0%	16.5%	20.4%	20.5%	19.0%	16.8%
Slovakia	3	40.3%	30.2%	24.0%	19.0%	18.9%	16.5%	19.9%
Slovakia	4	29.8%	38.3%	47.1%	50.3%	52.8%	56.7%	56.8%
Slovakia	5	7.6%	5.8%	2.9%	1.8%	1.2%	1.9%	1.5%
Slovenia	1	4.3%	6.2%	5.7%	6.6%	6.3%	7.6%	11.9%
Slovenia	2	24.4%	28.2%	28.0%	27.1%	27.4%	27.3%	27.7%
Slovenia	3	37.7%	27.0%	25.8%	16.6%	15.8%	13.8%	12.5%
Slovenia	4	32.8%	36.8%	39.5%	48.8%	49.8%	50.0%	46.6%
Slovenia	5	0.8%	1.9%	1.0%	0.8%	0.7%	1.4%	1.2%

Table VIII-43 Share of exports from the MPC towards EU for each cluster of the Neven's classifications, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Algeria	1	49.9%	61.8%	46.0%	65.3%	83.4%	67.4%	72.2%
Algeria	2	6.8%	5.3%	5.1%	5.3%	3.7%	5.7%	4.4%
Algeria	3	10.0%	2.4%	15.9%	1.1%	0.8%	0.7%	1.1%
Algeria	4	29.8%	28.1%	27.6%	24.5%	10.3%	24.0%	20.8%
Algeria	5	3.4%	2.4%	5.4%	3.9%	1.8%	2.2%	1.5%
Egypt	1	26.0%	14.4%	22.2%	20.1%	21.4%	19.6%	27.9%
Egypt	2	4.6%	6.5%	6.6%	12.6%	11.9%	11.1%	9.6%
Egypt	3	23.4%	22.0%	20.2%	22.9%	22.3%	22.3%	20.0%
Egypt	4	45.1%	56.2%	48.8%	42.3%	42.1%	44.2%	36.0%
Egypt	5	0.9%	1.0%	2.2%	2.1%	2.4%	2.8%	6.5%
Israel	1	26.2%	24.6%	23.9%	22.6%	24.2%	26.7%	28.0%
Israel	2	16.3%	17.9%	24.9%	34.0%	34.7%	28.3%	27.6%
Israel	3	16.7%	9.9%	6.9%	4.5%	3.7%	3.1%	3.3%
Israel	4	37.8%	46.0%	42.8%	38.2%	36.8%	41.1%	40.1%
Israel	5	3.0%	1.6%	1.4%	0.7%	0.7%	0.9%	0.9%
Jordan	1	35.6%	34.4%	28.8%	39.4%	41.9%	35.7%	58.7%
Jordan	2	5.1%	18.1%	14.8%	31.1%	25.2%	10.8%	15.9%
Jordan	3	3.2%	10.9%	12.9%	13.1%	10.8%	3.8%	6.5%
Jordan	4	47.8%	12.1%	7.9%	8.6%	15.3%	46.1%	9.6%
Jordan	5	8.2%	24.5%	35.7%	7.7%	6.8%	3.6%	9.2%
Lebanon	1	4.1%	15.5%	17.3%	16.3%	44.2%	14.8%	17.2%
Lebanon	2	7.5%	7.9%	9.5%	9.5%	8.3%	10.3%	11.0%
Lebanon	3	54.8%	30.4%	17.8%	28.1%	6.1%	11.0%	13.0%
Lebanon	4	32.7%	45.6%	54.3%	38.7%	33.3%	49.6%	44.6%
Lebanon	5	0.8%	0.6%	1.2%	7.5%	8.1%	14.4%	14.2%
Morocco	1	15.6%	13.1%	14.0%	10.8%	9.2%	6.9%	6.4%
Morocco	2	4.9%	5.0%	5.2%	13.4%	13.5%	16.6%	20.3%
Morocco	3	68.2%	69.3%	66.8%	62.2%	64.8%	63.0%	61.4%
Morocco	4	5.6%	7.2%	7.3%	8.1%	7.7%	8.7%	7.7%
Morocco	5	5.8%	5.4%	6.7%	5.5%	4.8%	4.8%	4.1%
Syria	1	21.8%	0.4%	1.0%	2.4%	11.2%	3.6%	3.3%
Syria	2	2.3%	4.1%	3.6%	6.7%	3.2%	3.1%	3.0%
Syria	3	47.9%	47.6%	60.3%	43.2%	41.6%	35.1%	34.2%
Syria	4	22.9%	34.2%	20.3%	39.4%	36.8%	52.7%	53.5%
Syria	5	5.0%	13.8%	14.9%	8.4%	7.2%	5.5%	6.0%
Tunisia	1	7.3%	5.2%	4.5%	6.9%	7.7%	5.6%	6.0%
Tunisia	2	6.9%	10.1%	13.7%	18.4%	18.2%	17.7%	19.9%
Tunisia	3	78.0%	76.5%	73.4%	64.9%	62.8%	64.7%	61.5%
Tunisia	4	6.8%	6.8%	6.9%	9.3%	10.8%	11.5%	12.0%
Tunisia	5	1.1%	1.5%	1.4%	0.5%	0.4%	0.4%	0.6%
Turkey	1	3.9%	7.8%	7.1%	5.9%	5.0%	4.5%	3.4%
Turkey	2	7.6%	8.6%	12.8%	15.7%	16.4%	17.8%	17.0%
Turkey	3	67.5%	56.5%	49.9%	42.4%	39.8%	41.3%	40.9%
Turkey	4	18.1%	24.1%	27.4%	33.4%	36.0%	33.8%	36.6%

Turkey	5	2.9%	3.0%	2.7%	2.6%	2.7%	2.6%	2.1%

Table VIII-44 Value of imports to the CEE from the EU in each cluster of the Neven's classifications, million of dollars, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Czech Rep.	1	558.1	1158.2	1845.1	2904.3	3433.5	4141.6	4023.7
Czech Rep.	2	1412.6	2882.6	4145.7	7658.7	8642.7	8771.1	9438.9
Czech Rep.	3	468.9	998.7	1285.9	1466.3	1625.5	1899.7	2114.2
Czech Rep.	4	1289.7	2903.3	4666.3	7653.8	8944.5	10153.5	10618.5
Czech Rep.	5	19.8	78.4	113.8	171.6	175.8	379.9	418.6
Estonia	1	13.4	117.0	212.7	335.4	360.0	394.9	401.1
Estonia	2	18.3	216.5	491.1	1067.0	850.9	999.4	1043.1
Estonia	3	10.9	132.8	247.1	243.0	279.9	477.7	361.0
Estonia	4	27.3	338.6	603.9	783.7	898.1	1065.0	1164.3
Estonia	5	0.2	5.7	9.9	12.2	14.1	45.0	49.1
Hungary	1	529.7	982.5	1722.6	3222.0	3341.2	3552.4	3721.9
Hungary	2	772.2	1921.8	3457.2	6873.1	6988.0	7675.1	8367.1
Hungary	3	444.1	796.9	1011.0	1621.4	1737.8	1910.9	1921.7
Hungary	4	1102.5	2137.5	3294.5	5692.1	6161.9	7179.6	7530.7
Hungary	5	18.1	102.4	119.1	129.1	145.6	338.0	346.5
Latvia	1	13.9	65.7	183.0	320.5	384.1	376.7	376.4
Latvia	2	32.5	120.9	280.8	461.3	575.6	690.3	703.4
Latvia	3	32.1	84.5	132.1	182.4	235.6	266.8	286.5
Latvia	4	54.0	179.6	332.2	527.4	649.3	697.4	743.5
Latvia	5	0.2	3.7	11.0	14.7	15.2	40.2	44.0
Lithuania	1	23.9	87.8	265.3	355.2	494.7	553.8	605.7
Lithuania	2	46.1	162.1	401.5	619.7	872.1	1073.5	1174.3
Lithuania	3	31.8	120.5	249.0	234.8	321.0	375.8	424.0
Lithuania	4	78.0	221.5	523.2	730.1	952.6	1133.4	1199.5
Lithuania	5	0.1	2.7	5.8	11.0	17.0	35.4	33.1
Poland	1	1035.9	1635.6	3202.3	5304.6	5874.5	6471.2	6358.9
Poland	2	1516.1	2898.5	5704.7	9065.1	9516.9	9811.4	9806.3
Poland	3	564.5	1082.9	2219.3	2352.8	2279.5	2499.9	2504.8
Poland	4	2360.0	4145.3	6833.6	10172.2	10922.2	12600.4	14031.3
Poland	5	27.5	151.7	179.6	337.5	352.4	929.0	982.4
Slovakia	1	103.9	342.3	567.7	826.0	1001.9	1047.0	1055.0
Slovakia	2	294.3	738.2	1282.6	1731.8	2211.9	2488.7	2694.4
Slovakia	3	93.2	262.0	398.2	391.8	509.5	619.0	668.3
Slovakia	4	217.4	794.0	1254.9	2265.7	2950.6	3529.7	4622.8
Slovakia	5	3.3	28.6	33.0	40.1	49.7	177.7	181.2
Slovenia	1	259.3	540.9	658.3	942.5	1043.4	1263.4	1422.7
Slovenia	2	384.4	866.7	1192.6	1854.4	1935.4	1928.7	1989.2
Slovenia	3	243.0	458.9	630.2	710.4	761.8	844.4	858.9
Slovenia	4	821.3	1609.4	2236.3	2747.8	3065.9	3220.1	3167.2
Slovenia	5	21.7	84.8	81.4	104.0	105.5	153.2	160.6

Table VIII-45 Value of imports to the MPC from the EU in each cluster of the Neven's classifications, million of dollars, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Algeria	1	543.4	712.5	730.8	1229.0	1628.0	1551.1	1348.8
Algeria	2	714.8	929.1	973.1	1569.6	2016.7	2456.1	2449.6
Algeria	3	161.7	390.9	240.9	307.8	448.8	495.8	587.1
Algeria	4	664.5	761.3	731.3	1028.2	1326.8	1560.6	1576.6
Algeria	5	42.8	65.6	59.9	70.0	87.4	152.5	115.9
Egypt	1	620.5	810.8	1177.3	1402.6	1454.2	1466.6	1618.6
Egypt	2	1035.0	1264.1	1971.9	2916.8	2431.1	2095.4	1902.2
Egypt	3	209.2	216.7	365.9	420.1	333.1	303.3	296.3

Egypt	4	534.3	911.8	1176.6	1234.5	1107.1	1022.3	1002.6
Egypt	5	17.5	78.1	94.1	109.0	105.2	169.4	175.1
Israel	1	690.1	931.5	1513.7	2374.2	2467.1	2370.3	2169.9
Israel	2	896.0	1456.1	1620.2	3099.3	2880.3	2691.8	2357.9
Israel	3	361.2	582.4	983.9	741.6	843.2	751.1	517.5
Israel	4	3361.6	4148.9	5165.1	6873.8	5805.7	5188.8	4588.7
Israel	5	56.4	97.4	113.1	119.6	95.4	195.3	178.4
Jordan	1	126.7	144.8	244.6	308.4	383.1	552.0	488.1
Jordan	2	172.5	233.7	311.2	444.3	551.0	537.5	479.2
Jordan	3	52.4	50.2	57.7	72.3	81.6	99.2	108.1
Jordan	4	167.3	192.0	216.3	251.5	307.3	295.9	333.4
Jordan	5	7.6	19.0	17.5	24.5	26.4	44.5	43.3
Lebanon	1	171.7	271.7	552.8	462.2	513.8	578.0	1006.3
Lebanon	2	190.9	370.1	505.5	461.1	520.9	473.3	494.0
Lebanon	3	203.6	250.3	283.7	233.2	289.5	291.9	258.7
Lebanon	4	381.0	551.0	636.0	566.9	665.4	669.5	563.2
Lebanon	5	32.5	38.6	48.8	29.1	29.1	55.8	61.0
Morocco	1	585.4	551.8	789.4	980.4	870.3	933.6	1119.0
Morocco	2	692.2	792.7	790.6	2112.4	1875.4	1938.7	1999.3
Morocco	3	357.6	321.0	443.1	645.2	673.6	831.3	816.9
Morocco	4	1105.9	1400.0	1720.7	2243.7	2496.7	2738.1	2695.1
Morocco	5	26.1	63.9	63.0	67.1	69.6	118.5	129.3
Syria	1	127.8	140.1	204.6	280.2	336.3	373.1	312.5
Syria	2	242.5	441.1	365.4	548.9	674.2	749.0	819.0
Syria	3	48.8	58.6	57.8	87.0	121.7	92.6	86.9
Syria	4	228.5	196.9	247.7	279.4	352.5	393.8	374.9
Syria	5	6.0	15.5	16.5	25.9	27.5	62.0	57.9
Tunisia	1	356.8	365.9	542.5	899.8	1018.9	969.6	809.6
Tunisia	2	584.8	657.3	982.0	1667.2	1752.8	1762.8	1761.7
Tunisia	3	374.1	405.0	583.2	718.0	747.7	943.4	798.8
Tunisia	4	1023.2	1361.8	1666.3	2395.4	2787.0	2848.1	2684.1
Tunisia	5	19.7	34.7	33.0	60.3	63.6	91.0	90.4
Turkey	1	1387.6	2012.5	3612.2	5337.5	4355.7	5306.5	5572.1
Turkey	2	2256.3	2917.9	5711.0	8790.8	5782.4	7099.2	7804.5
Turkey	3	488.3	561.5	1309.6	1208.5	1103.6	1178.9	1318.1
Turkey	4	2270.5	2736.1	5983.3	8854.3	4787.6	6659.0	9107.8
Turkey	5	37.7	99.3	147.9	207.9	165.4	418.8	488.9

Table VIII-46 Share of imports to the CEE from the EU for each cluster of the Neven's classifications, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Czech Rep.	1	14.9%	14.4%	15.3%	14.6%	15.0%	16.3%	15.1%
Czech Rep.	2	37.7%	35.9%	34.4%	38.6%	37.9%	34.6%	35.5%
Czech Rep.	3	12.5%	12.5%	10.7%	7.4%	7.1%	7.5%	7.9%
Czech Rep.	4	34.4%	36.2%	38.7%	38.5%	39.2%	40.1%	39.9%
Czech Rep.	5	0.5%	1.0%	0.9%	0.9%	0.8%	1.5%	1.6%
Estonia	1	19.1%	14.4%	13.6%	13.7%	15.0%	13.2%	13.3%
Estonia	2	26.1%	26.7%	31.4%	43.7%	35.4%	33.5%	34.6%
Estonia	3	15.6%	16.4%	15.8%	10.0%	11.6%	16.0%	12.0%
Estonia	4	39.0%	41.8%	38.6%	32.1%	37.4%	35.7%	38.6%
Estonia	5	0.3%	0.7%	0.6%	0.5%	0.6%	1.5%	1.6%
Hungary	1	18.5%	16.5%	17.9%	18.4%	18.2%	17.2%	17.0%
Hungary	2	26.9%	32.3%	36.0%	39.2%	38.0%	37.2%	38.2%
Hungary	3	15.5%	13.4%	10.5%	9.2%	9.5%	9.3%	8.8%
Hungary	4	38.5%	36.0%	34.3%	32.5%	33.5%	34.8%	34.4%
Hungary	5	0.6%	1.7%	1.2%	0.7%	0.8%	1.6%	1.6%
Latvia	1	10.5%	14.5%	19.5%	21.3%	20.7%	18.2%	17.5%

Latvia	2	24.5%	26.6%	29.9%	30.6%	31.0%	33.3%	32.7%
Latvia	3	24.2%	18.6%	14.1%	12.1%	12.7%	12.9%	13.3%
Latvia	4	40.7%	39.5%	35.4%	35.0%	34.9%	33.7%	34.5%
Latvia	5	0.1%	0.8%	1.2%	1.0%	0.8%	1.9%	2.0%
Lithuania	1	13.3%	14.8%	18.4%	18.2%	18.6%	17.5%	17.6%
Lithuania	2	25.6%	27.3%	27.8%	31.8%	32.8%	33.8%	34.2%
Lithuania	3	17.7%	20.3%	17.2%	12.0%	12.1%	11.8%	12.3%
Lithuania	4	43.4%	37.3%	36.2%	37.4%	35.8%	35.7%	34.9%
Lithuania	5	0.0%	0.5%	0.4%	0.6%	0.6%	1.1%	1.0%
Poland	1	18.8%	16.5%	17.7%	19.5%	20.3%	20.0%	18.9%
Poland	2	27.5%	29.2%	31.4%	33.3%	32.9%	30.4%	29.1%
Poland	3	10.3%	10.9%	12.2%	8.6%	7.9%	7.7%	7.4%
Poland	4	42.9%	41.8%	37.7%	37.4%	37.7%	39.0%	41.7%
Poland	5	0.5%	1.5%	1.0%	1.2%	1.2%	2.9%	2.9%
Slovakia	1	14.6%	15.8%	16.1%	15.7%	14.9%	13.3%	11.4%
Slovakia	2	41.3%	34.1%	36.3%	33.0%	32.9%	31.7%	29.2%
Slovakia	3	13.1%	12.1%	11.3%	7.5%	7.6%	7.9%	7.2%
Slovakia	4	30.5%	36.7%	35.5%	43.1%	43.9%	44.9%	50.1%
Slovakia	5	0.5%	1.3%	0.9%	0.8%	0.7%	2.3%	2.0%
Slovenia	1	15.0%	15.2%	13.7%	14.8%	15.1%	17.1%	18.7%
Slovenia	2	22.2%	24.3%	24.9%	29.2%	28.0%	26.0%	26.2%
Slovenia	3	14.0%	12.9%	13.1%	11.2%	11.0%	11.4%	11.3%
Slovenia	4	47.5%	45.2%	46.6%	43.2%	44.4%	43.5%	41.7%
Slovenia	5	1.3%	2.4%	1.7%	1.6%	1.5%	2.1%	2.1%

Table VIII-47 Share of imports to the MPC from the EU for each cluster of the Neven's classifications, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Algeria	1	25.5%	24.9%	26.7%	29.2%	29.6%	25.0%	22.2%
Algeria	2	33.6%	32.5%	35.6%	37.3%	36.6%	39.5%	40.3%
Algeria	3	7.6%	13.7%	8.8%	7.3%	8.1%	8.0%	9.7%
Algeria	4	31.2%	26.6%	26.7%	24.5%	24.1%	25.1%	25.9%
Algeria	5	2.0%	2.3%	2.2%	1.7%	1.6%	2.5%	1.9%
Egypt	1	25.7%	24.7%	24.6%	23.1%	26.8%	29.0%	32.4%
Egypt	2	42.8%	38.5%	41.2%	48.0%	44.8%	41.4%	38.1%
Egypt	3	8.7%	6.6%	7.6%	6.9%	6.1%	6.0%	5.9%
Egypt	4	22.1%	27.8%	24.6%	20.3%	20.4%	20.2%	20.1%
Egypt	5	0.7%	2.4%	2.0%	1.8%	1.9%	3.3%	3.5%
Israel	1	12.9%	12.9%	16.1%	18.0%	20.4%	21.2%	22.1%
Israel	2	16.7%	20.2%	17.2%	23.5%	23.8%	24.0%	24.0%
Israel	3	6.7%	8.1%	10.5%	5.6%	7.0%	6.7%	5.3%
Israel	4	62.7%	57.5%	55.0%	52.0%	48.0%	46.3%	46.8%
Israel	5	1.1%	1.3%	1.2%	0.9%	0.8%	1.7%	1.8%
Jordan	1	24.1%	22.6%	28.9%	28.0%	28.4%	36.1%	33.6%
Jordan	2	32.8%	36.5%	36.7%	40.4%	40.8%	35.1%	33.0%
Jordan	3	10.0%	7.8%	6.8%	6.6%	6.1%	6.5%	7.4%
Jordan	4	31.8%	30.0%	25.5%	22.8%	22.8%	19.4%	23.0%
Jordan	5	1.4%	3.0%	2.1%	2.2%	2.0%	2.9%	3.0%
Lebanon	1	17.5%	18.3%	27.3%	26.4%	25.5%	27.9%	42.2%
Lebanon	2	19.5%	25.0%	24.9%	26.3%	25.8%	22.9%	20.7%
Lebanon	3	20.8%	16.9%	14.0%	13.3%	14.3%	14.1%	10.9%
Lebanon	4	38.9%	37.2%	31.4%	32.3%	33.0%	32.4%	23.6%
Lebanon	5	3.3%	2.6%	2.4%	1.7%	1.4%	2.7%	2.6%
Morocco	1	21.2%	17.6%	20.7%	16.2%	14.5%	14.2%	16.6%
Morocco	2	25.0%	25.3%	20.8%	34.9%	31.3%	29.6%	29.6%
Morocco	3	12.9%	10.3%	11.6%	10.7%	11.3%	12.7%	12.1%
Morocco	4	40.0%	44.7%	45.2%	37.1%	41.7%	41.7%	39.9%

Morocco	5	0.9%	2.0%	1.7%	1.1%	1.2%	1.8%	1.9%
Syria	1	19.6%	16.4%	22.9%	22.9%	22.2%	22.3%	18.9%
Syria	2	37.1%	51.8%	41.0%	44.9%	44.6%	44.8%	49.6%
Syria	3	7.5%	6.9%	6.5%	7.1%	8.0%	5.5%	5.3%
Syria	4	35.0%	23.1%	27.8%	22.9%	23.3%	23.6%	22.7%
Syria	5	0.9%	1.8%	1.8%	2.1%	1.8%	3.7%	3.5%
Tunisia	1	15.1%	13.0%	14.2%	15.7%	16.0%	14.7%	13.2%
Tunisia	2	24.8%	23.3%	25.8%	29.0%	27.5%	26.6%	28.7%
Tunisia	3	15.9%	14.3%	15.3%	12.5%	11.7%	14.3%	13.0%
Tunisia	4	43.4%	48.2%	43.8%	41.7%	43.8%	43.1%	43.7%
Tunisia	5	0.8%	1.2%	0.9%	1.0%	1.0%	1.4%	1.5%
Turkey	1	21.5%	24.2%	21.5%	21.9%	26.9%	25.7%	22.9%
Turkey	2	35.0%	35.0%	34.1%	36.0%	35.7%	34.4%	32.1%
Turkey	3	7.6%	6.7%	7.8%	5.0%	6.8%	5.7%	5.4%
Turkey	4	35.3%	32.9%	35.7%	36.3%	29.6%	32.2%	37.5%
Turkey	5	0.6%	1.2%	0.9%	0.9%	1.0%	2.0%	2.0%

Table VIII-48 Trade deficit of the CEE countries vis-à-vis the EU in each cluster of the Neven's classification, in million dollars, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Czech Rep.	1	-236.7	-490.4	-1040.0	-1656.0	-1550.1	-1329.7	-1065.5
Czech Rep.	2	-837.3	-1455.0	-1845.3	-1703.3	-1326.1	-545.2	-134.5
Czech Rep.	3	419.1	504.0	453.9	919.3	932.6	724.6	755.8
Czech Rep.	4	-261.2	-493.1	-336.8	1990.3	1796.4	1754.4	1919.3
Czech Rep.	5	161.4	193.2	110.9	136.5	105.8	-49.2	-84.8
Estonia	1	1.0	-9.3	-107.7	-275.8	-287.3	-341.5	-327.2
Estonia	2	-16.8	-178.1	-377.1	178.2	154.0	-169.9	-106.7
Estonia	3	10.2	43.6	46.2	232.3	271.4	117.6	275.7
Estonia	4	28.9	-139.2	-326.5	-165.4	-228.4	-305.7	-298.0
Estonia	5	9.2	30.0	28.1	57.1	57.1	30.1	23.7
Hungary	1	-309.2	-453.6	-408.6	-195.9	-772.4	96.3	-609.9
Hungary	2	-303.4	-854.0	-968.4	-441.8	996.5	814.6	1300.3
Hungary	3	573.5	580.6	701.7	667.0	688.8	506.2	272.3
Hungary	4	-465.2	-136.2	162.9	1533.0	2054.4	1507.8	992.6
Hungary	5	-7.3	-84.1	-100.1	-96.1	-107.2	-229.2	-266.2
Latvia	1	5.2	-31.3	-146.3	-285.8	-337.7	-319.0	-333.4
Latvia	2	-29.9	-110.2	-256.2	-428.1	-534.7	-634.6	-641.4
Latvia	3	1.1	10.0	28.2	128.3	109.0	97.5	72.0
Latvia	4	75.0	98.5	18.3	247.8	126.5	143.2	186.6
Latvia	5	8.0	16.3	10.4	14.7	17.2	-4.6	8.0
Lithuania	1	15.8	9.8	-161.4	-126.9	-286.3	-328.9	-345.0
Lithuania	2	-41.2	-102.9	-291.1	-431.2	-667.0	-837.4	-824.7
Lithuania	3	20.7	57.5	112.6	395.1	436.3	451.5	448.4
Lithuania	4	21.6	-37.7	-275.9	-302.9	-515.0	-553.9	-573.5
Lithuania	5	23.8	38.0	36.8	20.3	15.6	-10.7	-4.6
Poland	1	-652.5	-942.4	-2452.3	-4031.4	-4557.1	-5098.1	-4846.7
Poland	2	-1135.1	-1883.5	-3904.1	-5404.1	-4940.6	-4619.7	-3901.3
Poland	3	1675.6	2113.8	1380.9	2857.7	3395.1	3321.6	3305.2
Poland	4	-659.1	-901.5	-2572.8	-913.7	-497.5	-1069.4	-614.8
Poland	5	204.7	182.7	85.1	-65.1	-91.2	-473.6	-510.9
Slovakia	1	-9.2	-52.2	-254.2	-296.2	-522.9	-517.1	-459.6
Slovakia	2	-216.6	-443.8	-732.3	-469.7	-716.0	-754.0	-734.5
Slovakia	3	218.4	423.0	399.6	780.6	872.8	886.6	1652.8
Slovakia	4	12.7	75.1	313.9	846.5	900.0	1643.9	2011.1
Slovakia	5	55.5	103.3	64.0	68.5	39.2	-1.1	-9.7
Slovenia	1	-177.7	-353.0	-450.5	-561.2	-658.4	-773.6	-605.7
Slovenia	2	83.9	-5.9	-167.5	-294.0	-270.4	-163.3	-96.4

Slovenia	3	479.1	365.5	312.4	246.3	199.2	46.5	-1.0
Slovenia	4	-193.0	-484.8	-790.7	60.6	-40.4	8.8	21.0
Slovenia	5	-5.9	-27.3	-44.8	-60.0	-64.7	-64.2	-75.3

Table VIII-49 Trade deficit of the MPC countries vis-à-vis the EU in each cluster of the Neven's classification, in million dollars, sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Algeria	1	-481.5	-562.5	-585.5	-998.8	-1042.4	-1190.0	-881.5
Algeria	2	-706.3	-916.2	-957.0	-1550.9	-1990.4	-2425.5	-2421.1
Algeria	3	-149.3	-385.1	-190.9	-303.9	-442.9	-492.0	-579.7
Algeria	4	-627.6	-693.2	-644.3	-941.9	-1254.6	-1432.2	-1442.1
Algeria	5	-38.6	-59.7	-42.9	-56.3	-75.1	-140.6	-106.3
Egypt	1	-473.1	-703.0	-924.3	-1103.6	-1139.2	-1179.0	-1146.5
Egypt	2	-1008.9	-1215.5	-1896.1	-2728.5	-2256.5	-1932.2	-1738.7
Egypt	3	-76.6	-51.4	-135.3	-78.1	-4.5	25.3	43.1
Egypt	4	-278.1	-489.9	-621.0	-604.0	-487.6	-372.1	-393.0
Egypt	5	-12.2	-70.5	-69.6	-78.1	-70.6	-128.0	-65.0
Israel	1	-213.0	-210.6	-380.3	-523.5	-599.8	-471.3	-454.6
Israel	2	-600.3	-933.5	-438.7	-322.3	-203.3	-679.3	-669.4
Israel	3	-57.7	-293.9	-657.6	-377.6	-559.4	-533.2	-315.1
Israel	4	-2674.2	-2802.2	-3138.6	-3749.2	-2966.4	-2267.4	-2131.1
Israel	5	-1.7	-51.5	-44.5	-61.5	-43.1	-133.2	-120.5
Jordan	1	-51.2	-108.0	-200.6	-249.1	-327.4	-450.8	-390.6
Jordan	2	-161.7	-214.3	-288.6	-397.5	-517.5	-506.8	-452.8
Jordan	3	-45.6	-38.6	-38.0	-52.5	-67.3	-88.4	-97.4
Jordan	4	-66.0	-179.0	-204.2	-238.5	-287.1	-165.2	-317.4
Jordan	5	9.9	7.2	37.1	-13.0	-17.4	-34.4	-28.0
Lebanon	1	-169.9	-260.4	-534.3	-428.1	-401.5	-557.8	-984.1
Lebanon	2	-187.6	-364.3	-495.4	-441.2	-499.9	-459.2	-479.8
Lebanon	3	-179.6	-228.2	-264.6	-174.1	-274.0	-276.9	-242.0
Lebanon	4	-366.7	-517.8	-577.7	-485.7	-580.8	-601.6	-505.5
Lebanon	5	-32.2	-38.2	-47.5	-13.4	-8.5	-36.1	-42.6
Morocco	1	-252.5	-223.5	-365.7	-527.5	-460.5	-617.9	-830.5
Morocco	2	-588.1	-667.2	-634.4	-1549.4	-1271.7	-1177.6	-1087.7
Morocco	3	1098.5	1413.6	1575.0	1962.8	2223.5	2051.0	1939.0
Morocco	4	-986.1	-1219.2	-1500.4	-1905.9	-2151.2	-2342.5	-2349.9
Morocco	5	97.0	71.2	139.7	161.8	146.9	99.7	54.9
Syria	1	-105.6	-139.6	-203.2	-274.2	-305.3	-361.9	-303.2
Syria	2	-240.1	-435.2	-360.6	-532.1	-665.3	-739.6	-810.6
Syria	3	-0.3	10.6	23.9	21.7	-6.5	15.7	8.6
Syria	4	-205.3	-147.2	-220.3	-180.1	-250.9	-231.3	-225.5
Syria	5	-0.9	4.6	3.7	-4.9	-7.7	-45.1	-41.1
Tunisia	1	-224.7	-242.0	-411.4	-591.8	-623.7	-675.3	-497.0
Tunisia	2	-459.9	-417.8	-582.0	-848.6	-816.6	-838.7	-721.8
Tunisia	3	1042.2	1417.1	1559.1	2166.8	2480.0	2431.6	2412.3
Tunisia	4	-899.4	-1200.9	-1465.0	-1982.2	-2230.1	-2248.9	-2055.6
Tunisia	5	-0.2	0.2	9.2	-37.3	-41.2	-68.7	-58.4
Turkey	1	-1210.7	-1487.7	-2957.3	-4461.4	-3500.5	-4429.4	-4846.7
Turkey	2	-1912.5	-2346.0	-4536.9	-6467.2	-2968.9	-3643.8	-4192.5
Turkey	3	2563.1	3217.3	3277.4	5084.9	5728.9	6835.2	7384.4
Turkey	4	-1454.7	-1127.5	-3464.5	-3901.5	1391.1	-90.1	-1324.5
Turkey	5	93.7	102.7	103.9	176.7	301.2	88.3	-44.1

Table VIII-50 Net export of the CEEC to the EU in each cluster of the Neven's classification,
sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Czech Rep.	1	-4.2%	-3.8%	-6.7%	-8.2%	-6.8%	-5.5%	-4.6%
Czech Rep.	2	-18.5%	-13.2%	-9.9%	-8.1%	-5.8%	-2.8%	-2.2%
Czech Rep.	3	17.1%	11.5%	7.8%	4.8%	4.1%	2.6%	2.3%
Czech Rep.	4	-0.1%	2.2%	7.4%	10.8%	8.0%	5.9%	4.9%
Czech Rep.	5	5.5%	3.3%	1.4%	0.7%	0.5%	-0.2%	-0.4%
Estonia	1	-5.1%	4.9%	-0.9%	-11.3%	-11.9%	-10.9%	-10.4%
Estonia	2	-24.6%	-19.8%	-17.6%	6.8%	7.0%	2.4%	1.7%
Estonia	3	5.0%	15.3%	19.6%	9.3%	11.6%	9.7%	12.7%
Estonia	4	15.8%	-6.0%	-5.1%	-7.0%	-9.1%	-2.9%	-5.1%
Estonia	5	8.8%	5.7%	4.0%	2.3%	2.4%	1.7%	1.2%
Hungary	1	-9.1%	-5.9%	-3.3%	-2.4%	-6.1%	-1.6%	-3.8%
Hungary	2	-7.0%	-11.0%	-8.3%	-5.3%	-0.4%	-0.8%	2.8%
Hungary	3	27.7%	14.2%	8.5%	2.8%	2.0%	1.1%	0.5%
Hungary	4	-11.4%	4.1%	4.1%	5.6%	5.2%	2.4%	1.7%
Hungary	5	-0.2%	-1.4%	-1.0%	-0.6%	-0.6%	-1.2%	-1.2%
Latvia	1	-0.5%	-6.6%	-13.3%	-18.3%	-16.9%	-13.9%	-14.5%
Latvia	2	-23.1%	-24.2%	-25.8%	-27.8%	-27.7%	-29.2%	-28.4%
Latvia	3	-6.9%	3.0%	12.9%	14.2%	15.1%	14.0%	11.5%
Latvia	4	26.5%	24.0%	23.7%	30.5%	27.6%	28.4%	29.8%
Latvia	5	4.1%	3.8%	2.4%	1.5%	1.8%	0.7%	1.6%
Lithuania	1	4.7%	2.7%	-6.4%	-3.0%	-5.9%	-5.6%	-5.4%
Lithuania	2	-23.4%	-16.7%	-15.0%	-19.2%	-20.3%	-21.4%	-17.8%
Lithuania	3	6.1%	11.6%	24.5%	29.8%	34.1%	31.9%	28.5%
Lithuania	4	1.8%	-4.4%	-7.6%	-9.0%	-9.2%	-5.1%	-5.6%
Lithuania	5	10.8%	6.8%	4.5%	1.5%	1.3%	0.2%	0.4%
Poland	1	-11.1%	-8.3%	-10.6%	-13.0%	-14.4%	-14.4%	-13.3%
Poland	2	-19.8%	-17.3%	-14.6%	-14.7%	-12.3%	-9.1%	-7.3%
Poland	3	35.1%	26.8%	21.5%	17.8%	17.6%	16.1%	14.0%
Poland	4	-8.4%	-3.6%	2.2%	9.7%	9.1%	8.3%	7.8%
Poland	5	4.2%	2.4%	1.5%	0.1%	0.0%	-1.0%	-1.2%
Slovakia	1	-2.3%	-3.0%	-6.6%	-7.2%	-8.3%	-7.5%	-6.3%
Slovakia	2	-31.3%	-21.1%	-19.7%	-12.5%	-12.4%	-12.6%	-12.4%
Slovakia	3	27.2%	18.1%	12.7%	11.5%	11.4%	8.6%	12.6%
Slovakia	4	-0.8%	1.6%	11.7%	7.2%	8.9%	11.8%	6.7%
Slovakia	5	7.1%	4.5%	2.0%	1.0%	0.5%	-0.3%	-0.5%
Slovenia	1	-10.7%	-9.0%	-8.0%	-8.2%	-8.8%	-9.5%	-6.8%
Slovenia	2	2.2%	3.8%	3.2%	-2.0%	-0.6%	1.3%	1.5%
Slovenia	3	23.6%	14.1%	12.6%	5.5%	4.8%	2.4%	1.2%
Slovenia	4	-14.7%	-8.4%	-7.1%	5.6%	5.4%	6.5%	4.9%
Slovenia	5	-0.4%	-0.5%	-0.7%	-0.9%	-0.9%	-0.7%	-0.9%

Table VIII-51 Net export of the MPC to the EU in each cluster of the Neven's classification,
sources: Eurostat, Comext

country	group	1993	1995	1997	2000	2001	2002	2003
Algeria	1	24.4%	36.9%	19.3%	36.0%	53.8%	42.4%	50.0%
Algeria	2	-26.8%	-27.2%	-30.4%	-32.0%	-32.9%	-33.8%	-35.9%
Algeria	3	2.4%	-11.3%	7.1%	-6.2%	-7.3%	-7.3%	-8.5%
Algeria	4	-1.4%	1.5%	0.9%	0.0%	-13.8%	-1.1%	-5.2%
Algeria	5	1.4%	0.1%	3.2%	2.2%	0.2%	-0.2%	-0.4%
Egypt	1	0.3%	-10.4%	-2.4%	-3.0%	-5.4%	-9.4%	-4.5%
Egypt	2	-38.2%	-32.1%	-34.6%	-35.3%	-32.9%	-30.3%	-28.4%
Egypt	3	14.7%	15.4%	12.6%	16.0%	16.2%	16.3%	14.1%
Egypt	4	23.0%	28.4%	24.2%	22.0%	21.7%	24.0%	15.9%
Egypt	5	0.2%	-1.4%	0.2%	0.3%	0.4%	-0.5%	3.0%

Israel	1	13.4%	11.7%	7.8%	4.7%	3.8%	5.5%	5.9%
Israel	2	-0.4%	-2.3%	7.7%	10.5%	10.9%	4.3%	3.6%
Israel	3	10.0%	1.8%	-3.6%	-1.2%	-3.3%	-3.6%	-2.0%
Israel	4	-24.9%	-11.4%	-12.2%	-13.8%	-11.2%	-5.3%	-6.6%
Israel	5	2.0%	0.2%	0.2%	-0.2%	-0.1%	-0.9%	-0.9%
Jordan	1	11.6%	11.8%	-0.1%	11.4%	13.5%	-0.4%	25.1%
Jordan	2	-27.6%	-18.5%	-22.0%	-9.2%	-15.6%	-24.3%	-17.1%
Jordan	3	-6.7%	3.0%	6.1%	6.6%	4.7%	-2.7%	-1.0%
Jordan	4	16.0%	-17.9%	-17.6%	-14.2%	-7.5%	26.7%	-13.3%
Jordan	5	6.8%	21.5%	33.6%	5.4%	4.8%	0.7%	6.2%
Lebanon	1	-13.4%	-2.9%	-10.0%	-10.1%	18.8%	-13.2%	-25.1%
Lebanon	2	-11.9%	-17.1%	-15.5%	-16.8%	-17.5%	-12.6%	-9.8%
Lebanon	3	34.1%	13.5%	3.8%	14.8%	-8.2%	-3.1%	2.1%
Lebanon	4	-6.2%	8.4%	22.9%	6.3%	0.3%	17.2%	21.0%
Lebanon	5	-2.5%	-2.0%	-1.2%	5.8%	6.6%	11.7%	11.7%
Morocco	1	-5.6%	-4.5%	-6.7%	-5.4%	-5.4%	-7.3%	-10.1%
Morocco	2	-20.1%	-20.3%	-15.6%	-21.5%	-17.8%	-12.9%	-9.3%
Morocco	3	55.2%	59.0%	55.2%	51.6%	53.5%	50.4%	49.4%
Morocco	4	-34.4%	-37.5%	-37.9%	-29.0%	-34.0%	-33.1%	-32.2%
Morocco	5	4.8%	3.4%	5.1%	4.4%	3.7%	3.0%	2.2%
Syria	1	2.3%	-16.1%	-21.9%	-20.6%	-11.0%	-18.7%	-15.6%
Syria	2	-34.8%	-47.7%	-37.4%	-38.3%	-41.3%	-41.8%	-46.6%
Syria	3	40.4%	40.7%	53.8%	36.0%	33.6%	29.6%	28.9%
Syria	4	-12.1%	11.1%	-7.5%	16.6%	13.4%	29.1%	30.8%
Syria	5	4.1%	12.0%	13.0%	6.2%	5.3%	1.8%	2.5%
Tunisia	1	-7.9%	-7.7%	-9.8%	-8.7%	-8.3%	-9.0%	-7.2%
Tunisia	2	-17.9%	-13.2%	-12.1%	-10.6%	-9.3%	-8.9%	-8.8%
Tunisia	3	62.1%	62.2%	58.1%	52.4%	51.1%	50.5%	48.5%
Tunisia	4	-36.6%	-41.5%	-36.9%	-32.4%	-32.9%	-31.6%	-31.7%
Tunisia	5	0.2%	0.2%	0.6%	-0.5%	-0.6%	-0.9%	-0.9%
Turkey	1	-17.6%	-16.3%	-14.4%	-16.0%	-21.9%	-21.2%	-19.5%
Turkey	2	-27.4%	-26.5%	-21.3%	-20.4%	-19.3%	-16.6%	-15.1%
Turkey	3	59.9%	49.8%	42.1%	37.5%	33.0%	35.6%	35.5%
Turkey	4	-17.2%	-8.8%	-8.3%	-2.9%	6.5%	1.6%	-0.9%
Turkey	5	2.3%	1.8%	1.9%	1.7%	1.7%	0.6%	0.1%

Figure VIII-5 Net export of the Czech Republic to the EU in each cluster of the Neven's classification
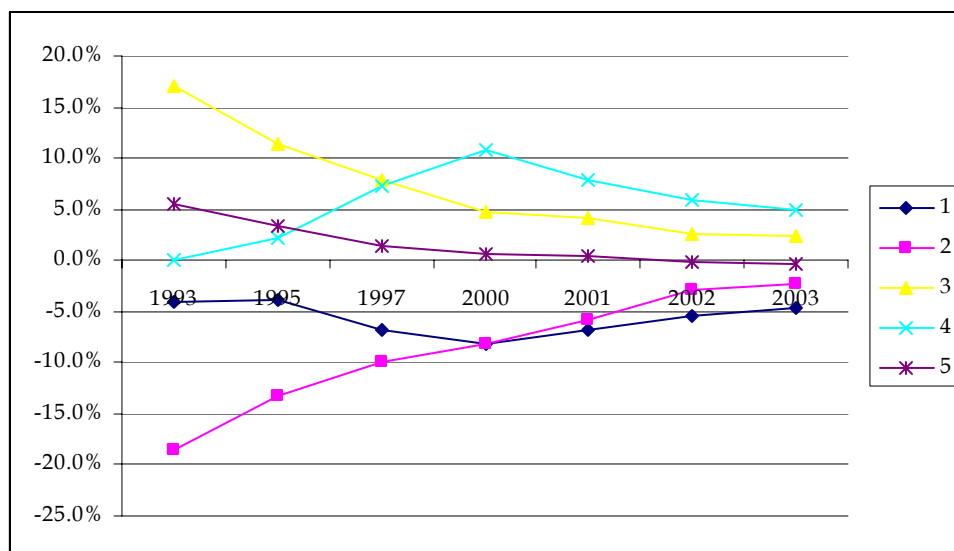
Figure VIII-6 Net export of Estonia to the EU in each cluster of the Neven's classification
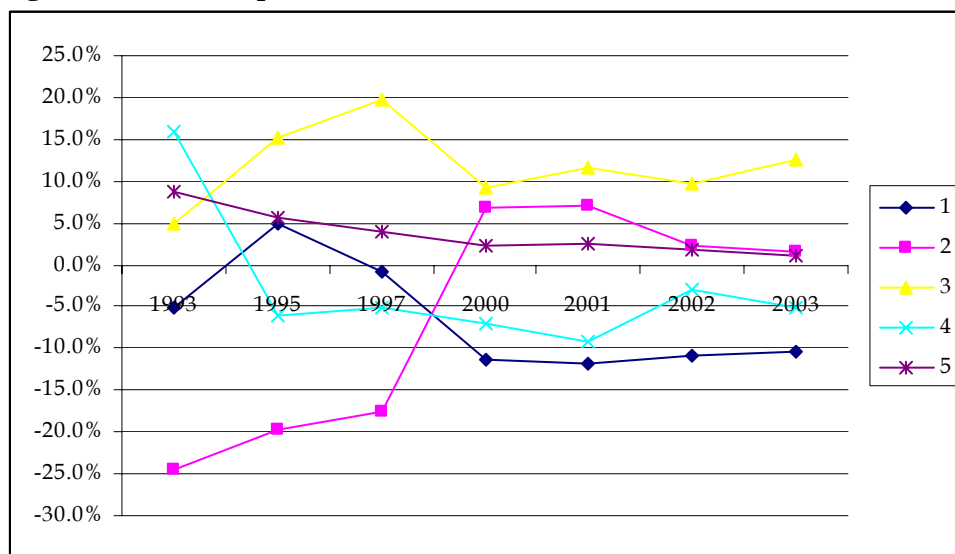

Figure VIII-7 Net export of Hungary to the EU in each cluster of the Neven's classification
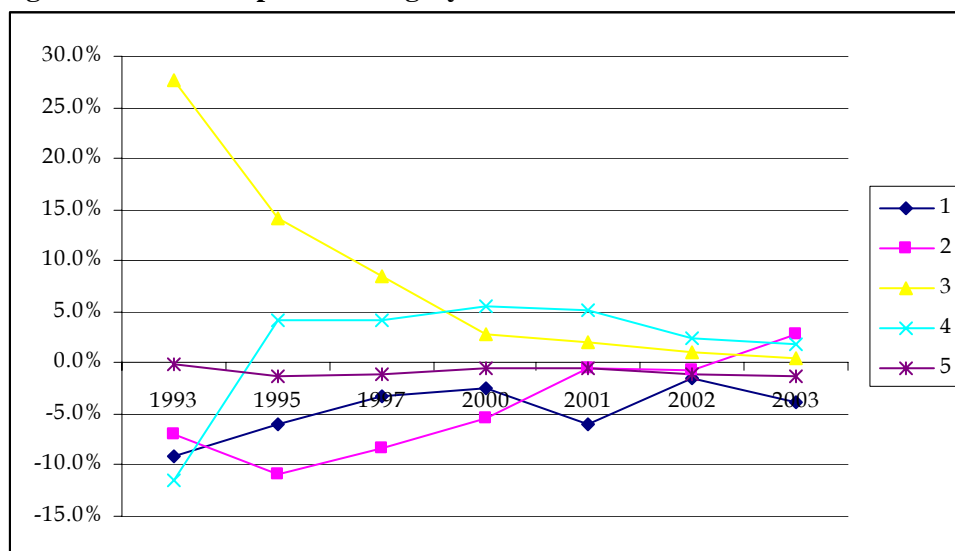

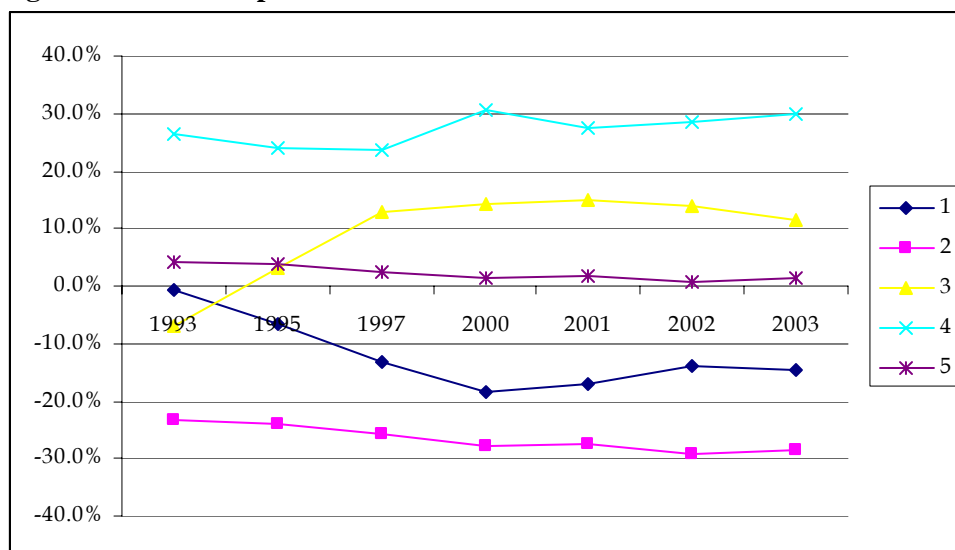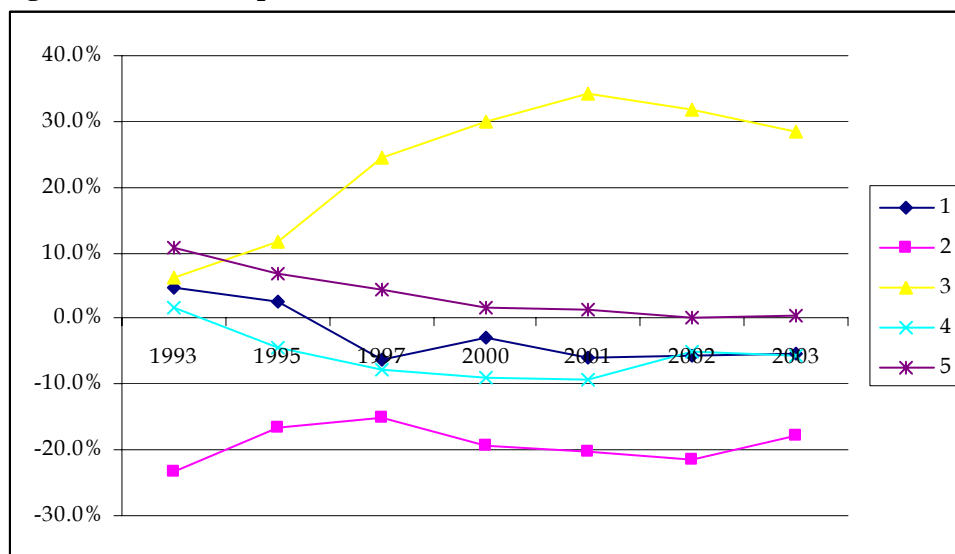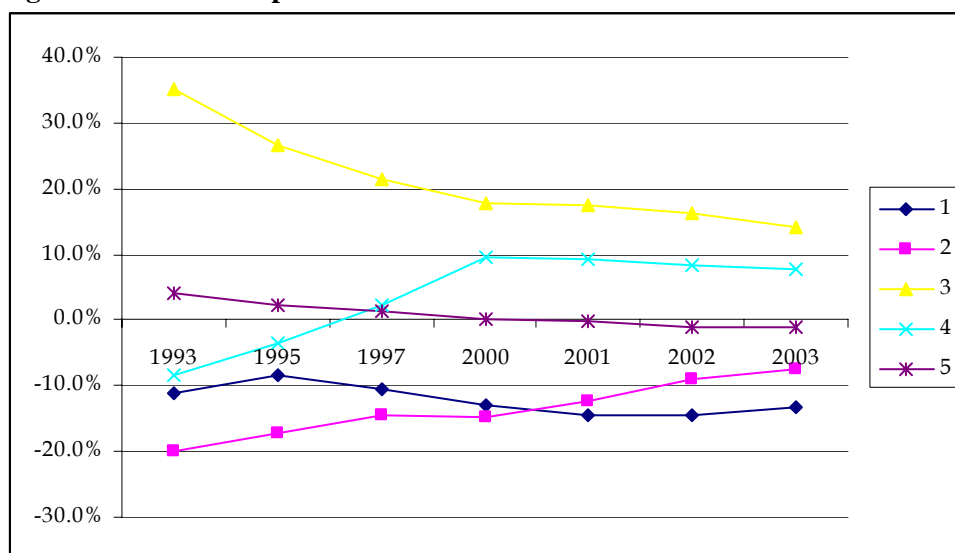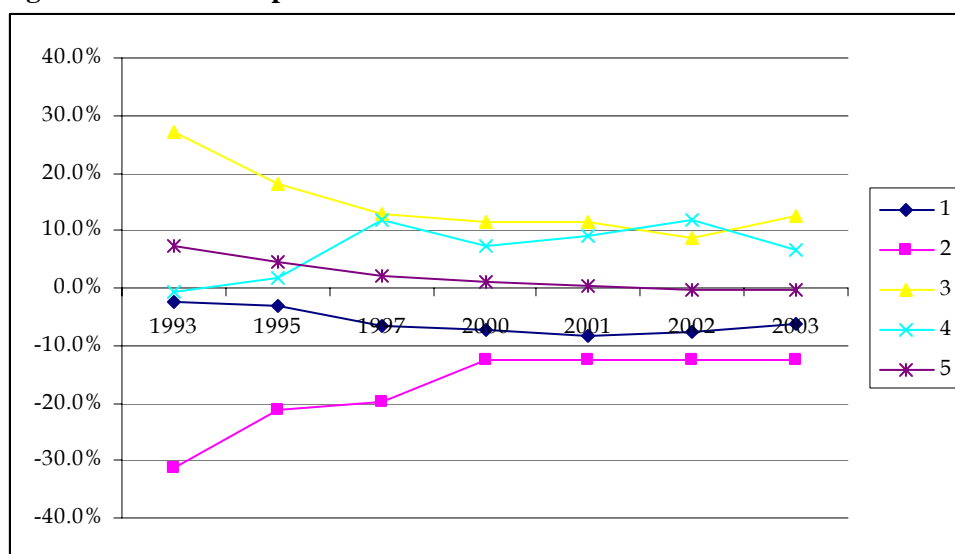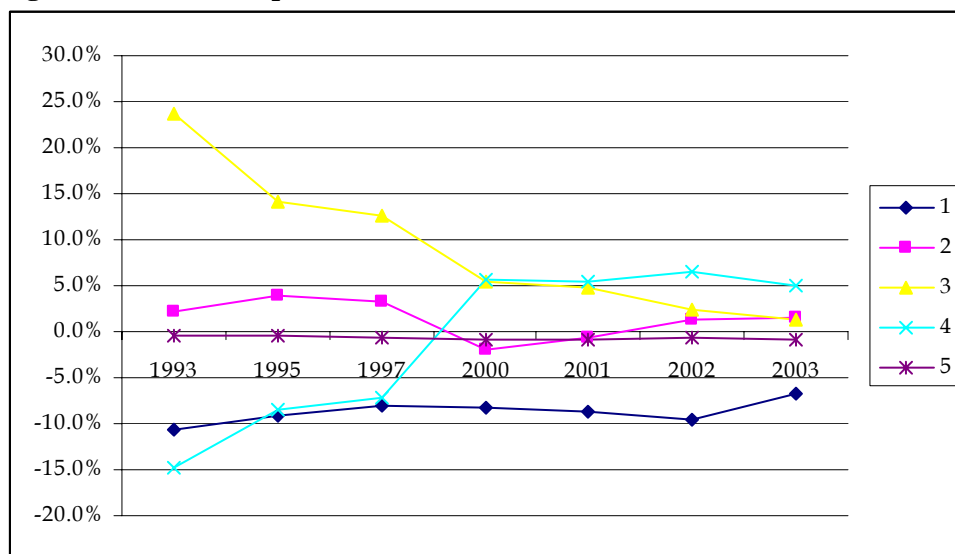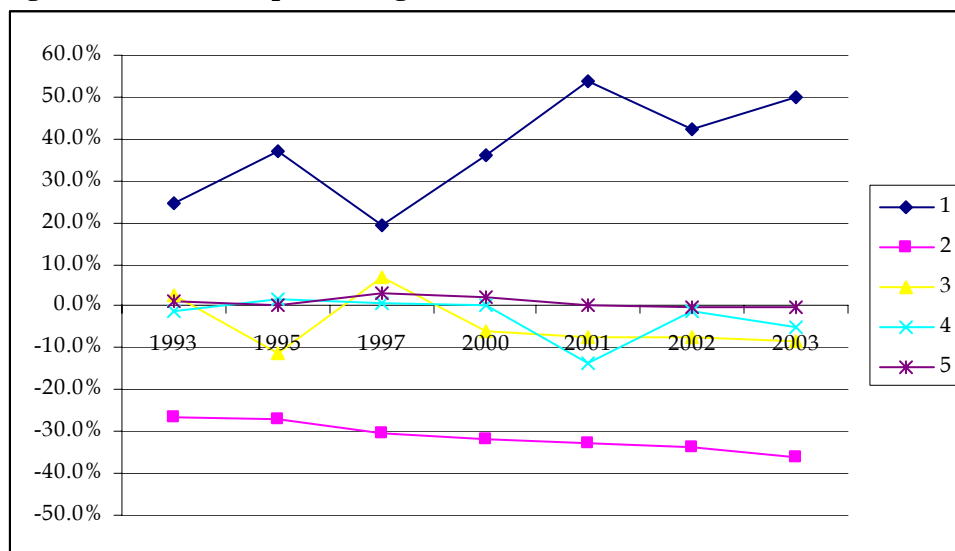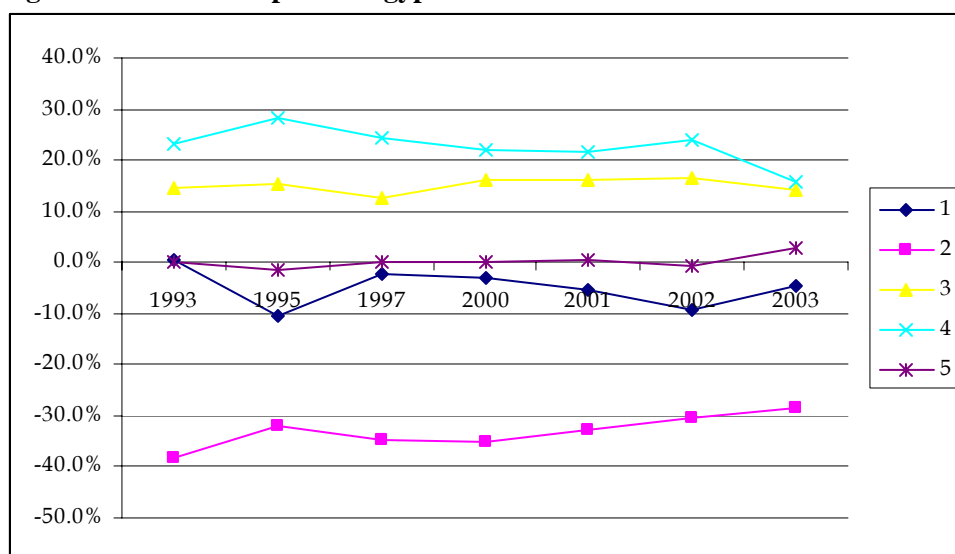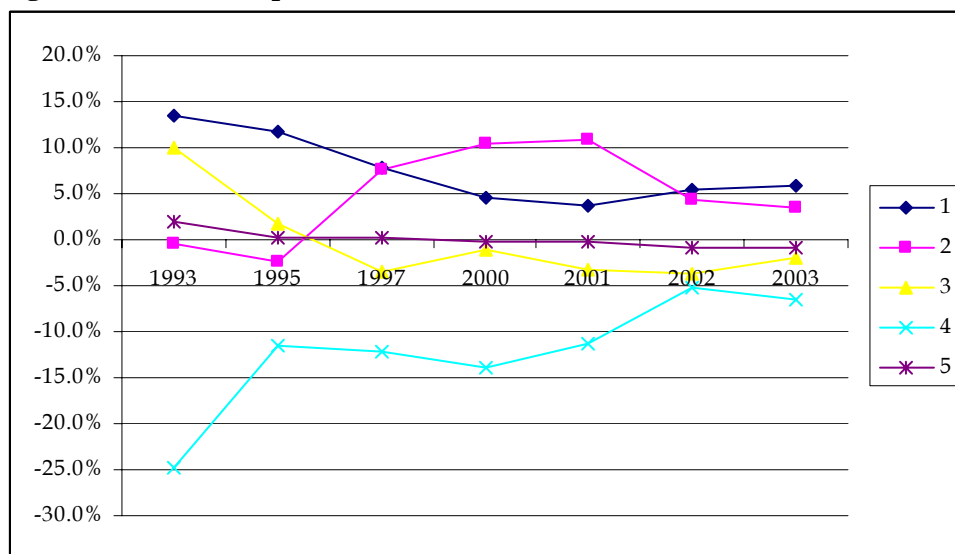**Figure VIII-8 Net export of Latvia to the EU in each cluster of the Neven's classification**

Figure VIII-9 Net export of Lithuania to the EU in each cluster of the Neven's classification

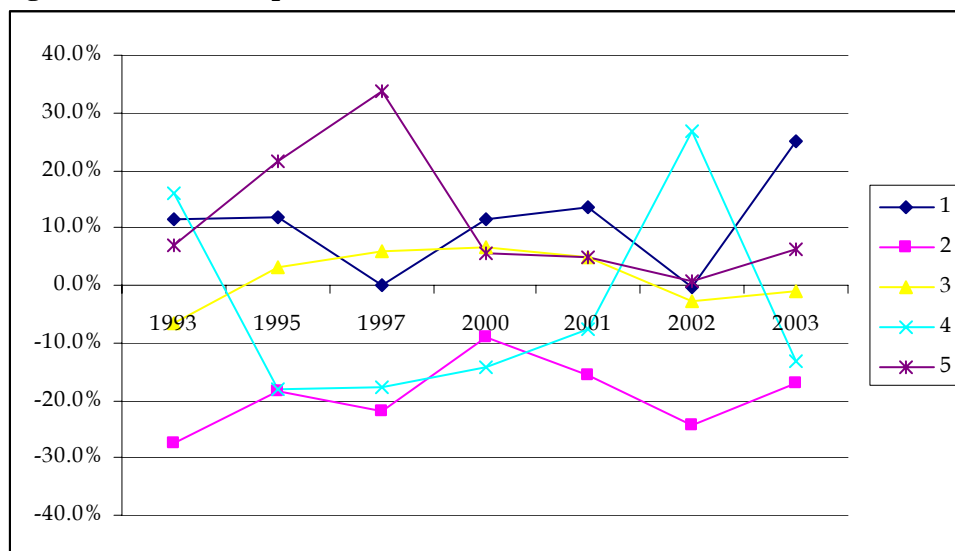**Figure VIII-10 Net export of Poland to the EU in each cluster of the Neven's classification**

Figure VIII-11 Net export of Slovakia to the EU in each cluster of the Neven's classification

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Figure VIII-12 Net export of Slovenia to the EU in each cluster of the Neven's classification

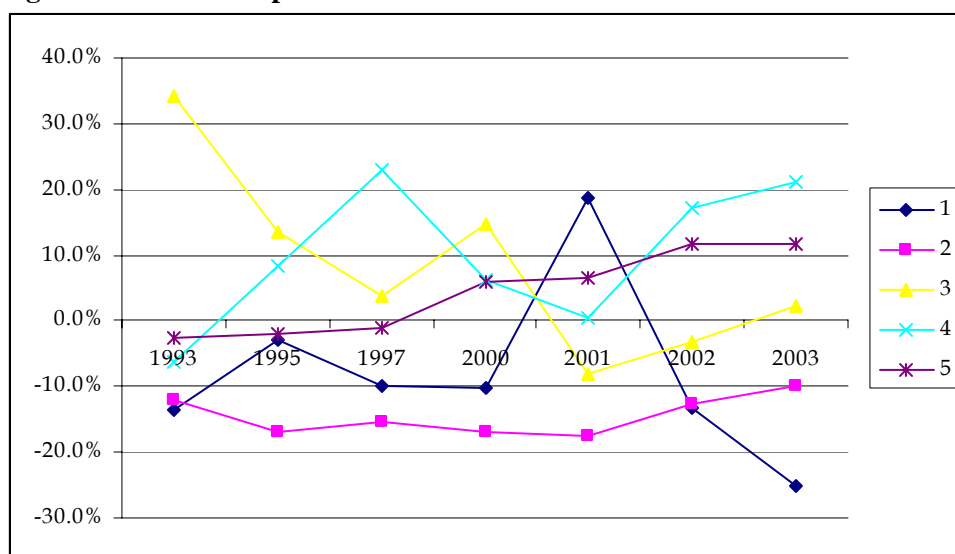**Figure VIII-13 Net export of Algeria to the EU in each cluster of the Neven's classification**

Figure VIII-14 Net export of Egypt to the EU in each cluster of the Neven's classification

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Figure VIII-15 Net export of Israel to the EU in each cluster of the Neven's classification

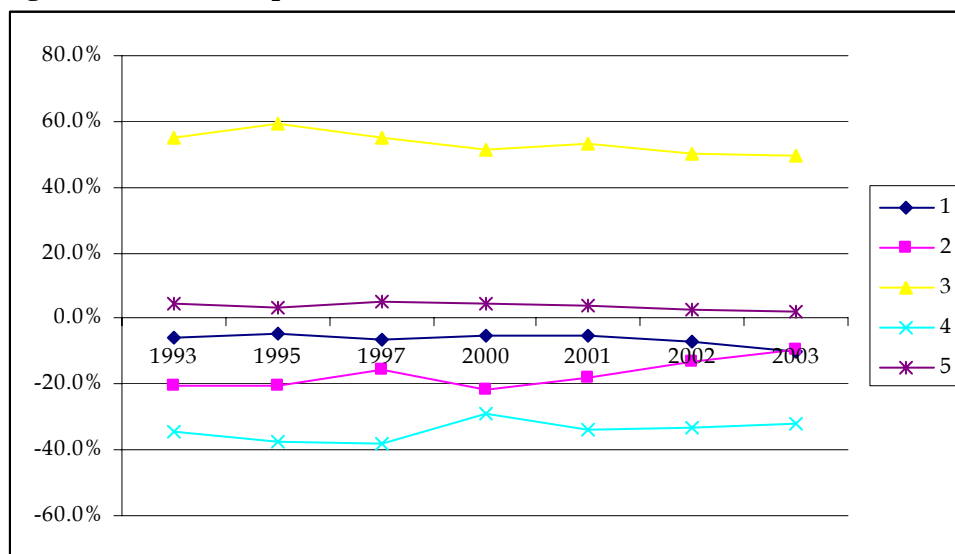**Figure VIII-16 Net export of Jordan to the EU in each cluster of the Neven's classification**

Figure VIII-17 Net export of Lebanon to the EU in each cluster of the Neven's classification

Figure VIII-18 Net export of Morocco to the EU in each cluster of the Neven's classification

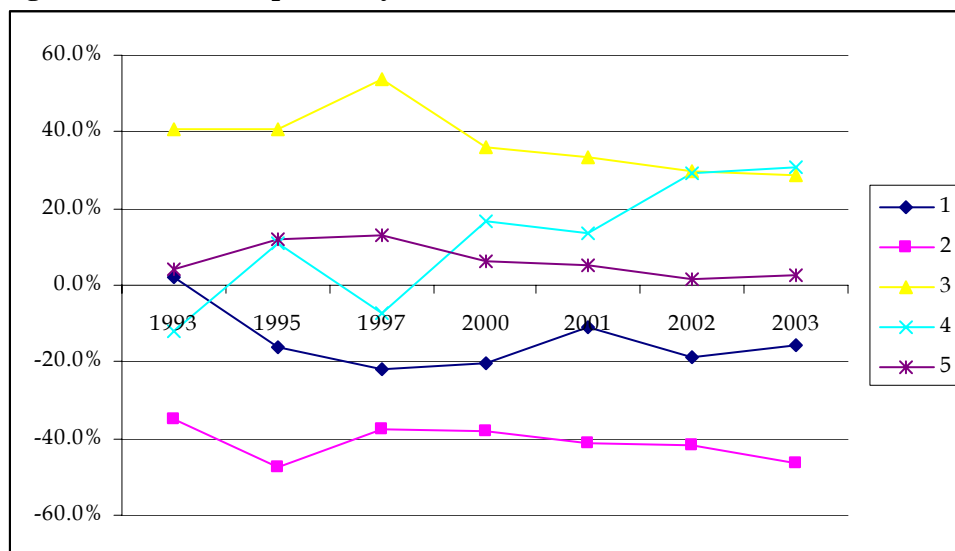**Figure VIII-19 Net export of Syria to the EU in each cluster of the Neven's classification**

Figure VIII-20 Net export of Tunisia to the EU in each cluster of the Neven's classification
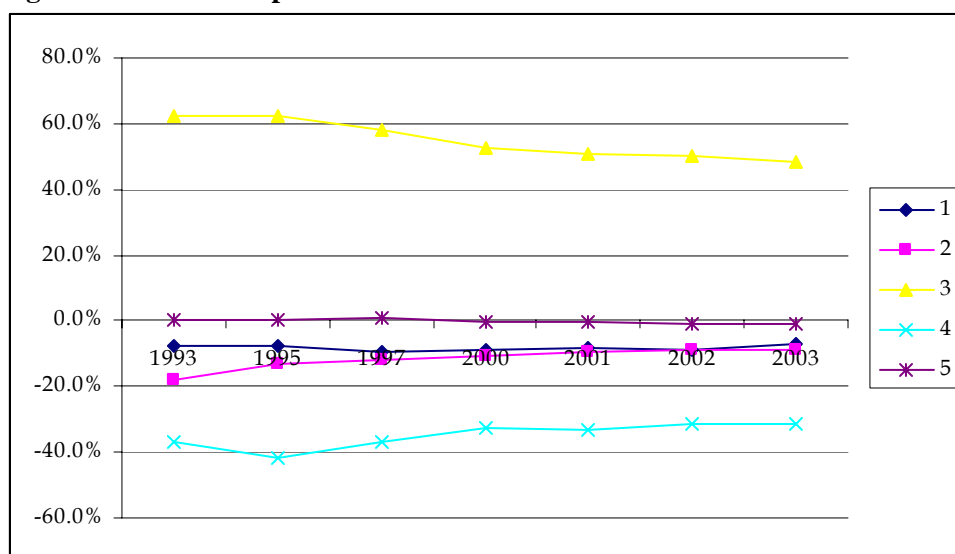
Figure VIII-21 Net export of Turkey to the EU in each cluster of the Neven's classification