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KRISTINA TOMING

The impact of integration with the European Union on the international competitiveness of the food processing industry in Estonia

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INTRODUCTION

Motivation for the research

The Estonian food industry has been operating under controversial economic conditions from the beginning of the 1990s. On the one hand, its main trading partners often protected their markets from imports with high tariffs and quantitative barriers, reducing export opportunities for Estonian food producers. On the other hand, Estonian food producers faced fierce competition from imports on the domestic market as a result of Estonia's highly liberal trade policy.[1] Furthermore, imports were often made more competitive due to subsidies being granted, while Estonia offered no such support for its domestic food industry. The choice of a liberal trade policy was part of the general economic stabilisation policy after re-gaining independence; however, it posed heavy pressure on the domestic food industry. At the same time, this situation singled out companies that were able to cope with market forces, and hence, created an efficient food processing industry in Estonia.

With accession to the EU on 1 May 2004, the Estonian food processing industry gained access to the Single Market of the EU. For an industry with a small domestic market, this was of crucial importance. At the same time, access to the EU market required large investments from the Estonian food processing industry, in order to comply with EU product and hygiene standards.

Accession to the EU also provided an additional impetus for Estonian food processing industry exports to the third countries. On the one hand, barriers to Estonian exports to the third countries decreased as Estonian foodstuffs became subject to the same trade concessions as the rest of the EU. On the other hand, EU export subsidies started to apply to Estonian food companies.

On the import side, important developments also occurred. With accession to the EU, Estonia implemented the Common Commercial Policy of the EU, which includes common external tariffs (CET) and other non-tariff trade barriers on imports from third countries. As a consequence, the competitive position of identical import products on the Estonian market deteriorated, while the price of imported raw materials and intermediates increased. Concurrently, the export subsidies paid to producers from the "old" EU countries when exporting to Estonia disappeared, lowering their (price) competitiveness in the Estonian market. The introduction of the system of administrative prices within the Common Agricultural Policy (CAP) of the EU nevertheless also affected the domestic producer prices.

This shows that the direct and indirect effects of joining the EU on the Estonian food processing industry are very complex and contradictory, and therefore, deserve a systematic scientific analysis.

[1] Only in 2000, were low import tariffs on agricultural products and processed food introduced.

The current research limits itself to the food processing industry, defined as Division 15 of NACE (manufacture of food products and beverages).[2] The food processing industry was one of the main sectors affected by EU accession, as trade in foodstuffs was only completely liberalised after Estonia joined the EU. In other economic sectors, a free trade agreement was already in effect before accession. The deeper analysis of the sub-sectors of the food industry concentrates on three first-stage food processing industries: meat, fish and dairy processing. These industries are directly affected by the agricultural and fishery policies of the EU, since they process the output of basic agricultural production. Second stage industries, such as bakery, confectionery and beverages, on the other hand, utilise semi-finished processed goods.[3] The study does not concern basic agricultural farms.

The focus of the study is at the industrial sector level. This is justified by the fact that "This is a level that interests policy-makers and businessmen alike because it is a level at which they can see concrete policy actions having effect" (Traill, Gomes da Silva 1996: 152). Compared to the competitiveness of firms and countries, the concept of the competitiveness of an industry is considerably less well developed, not least because of the fact that an industry does not possess independent decision-making ability.

Competitiveness as such is seen from the perspective of product markets, leaving out the issue of competitiveness with regard to production factors. The study does not question *whether* the Estonian food processing industry is competitive or not; it aims to find out *how* its competitiveness has developed as a result of the country's accession to the EU. The study is not concerned with the impact of integration on consumers' welfare or overall economic welfare.

The novelty of this study lies mainly in three aspects. The first aspect is methodological. To the author's knowledge, there are no studies that have combined the concept of the competitiveness of an industry and the theory of regional integration to assess the impact of joining an economic union on the competitiveness of an industry.

Second, there are no comprehensive studies conducted on the post-integration effects of Estonia's accession on the competitiveness of the food processing industry, as the period as a member of the EU is still quite short. Given Estonia's relatively recent accession to the EU, the few existing earlier studies on the impact of EU integration have only considered the *ex-ante* effects of accession. This makes this study the first attempt to systematically analyse the actual changes in the competitiveness of the Estonian food processing industry as a result of EU accession. Nevertheless, the study recognises that

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[2] Nomenclature générale des Activités économiques dans les Communautés Européennes (NACE) is a statistical classification of economic activities in the EU. The classification consists of Sections and Subsections (alphabetical codes), Divisions (2-digit codes), Groups (3-digit codes) and Classes (4-digit codes).

[3] See Jansik (2001) for a further explanation of first-stage and second-stage processing industries.

many of the effects of accession to the EU may not have occurred yet, and can be considered only after sufficient time has passed.

Third, the study considers a case in contrast to the cases used in mainstream theoretical and empirical studies. The regional economic literature mostly focuses on the initially protective countries joining an economic union; however, the case of Estonia is the opposite: the initial extreme liberalism was replaced by a more protective and regulative economic system as a result of EU accession. This can provide interesting theoretical as well as empirical insights into the impact of regional integration on the competitiveness of industries.

The aim and research tasks of the thesis

The aim of this study is to assess how accession to the EU has influenced the competitiveness of the food processing industry in Estonia. For this purpose, the following research tasks are set up:

1) in order to create a framework for analysing the competitiveness of an industry, the concept of competitiveness and its definitions are introduced;
2) the main indicators developed to measure competitiveness of an industry are discussed;
3) the main determinants of the competitiveness of an industry are pointed out, while the main emphasis is put on the role of regional economic integration in determining the development of the competitiveness of an industry;
4) in order to study the impact of accession to the EU, changes in the policy environment affecting the food processing industry in Estonia are presented;
5) developments in the competitiveness of the Estonian food processing industry on the main export markets are identified;
6) in order to estimate the general effect of EU accession on exports from the NMSs to the EU-15 and to compare the performance of the Estonian food processing industry with general trends, an econometric analysis based on the difference-in-difference approach is conducted, which also allows to investigate the factors underlying export performance;
7) changes in the competitiveness of the Estonian food processing industry on the domestic market concurrent to accession to the EU are explored;
8) the impact of EU accession on the earnings and profitability of the Estonian food processing industry is studied, summing up the competitiveness performance of the industry both on export and domestic markets;
9) in order to better understand the main factors behind the influence of EU accession on the competitiveness of the food processing sector in Estonia, interviews are conducted with representatives of some of the main milk processing companies in Estonia.

The structure of the thesis

The dissertation consists of two main parts. The first, theoretical, part of the thesis aims at identifying the appropriate concept for analysing the competitiveness of an industry in a small open economy within the framework of regional economic integration. The first sub-chapter discusses the many facets of competitiveness and identifies the definitions of competitiveness important in the application under consideration. It also lists and discusses the main indicators extensively used in the economic literature for measuring competitiveness at industry level. The second sub-chapter classifies the determinants of the competitiveness of an industry, while particular attention is paid to the role of government policies as an important determinant of the environment affecting competitiveness. A "filter" model of industry competitiveness is developed, which distinguishes between competitiveness potential and competitiveness performance. The theory of regional economic integration is introduced to understand the changes in the determinants of competitiveness due to a country's decision to join a regional trade block.

The second, empirical part of the dissertation aims at determining the impact of EU accession on the competitiveness of the food processing industry in Estonia. This is done by relying on the "filter" model of competitiveness developed in the first part of the dissertation, as well as the various ways of measuring competitiveness introduced in the first part. The first sub-chapter here provides an overview of the role of and developments in the food processing industry in Estonia, focusing on three sub-sectors of the industry: the manufacturing of milk, meat and fish products. Accession-concurrent changes in the economic policies affecting the food processing industry are discussed, and subsequently, the research hypotheses for the dissertation are established. Also, previous studies dealing with the impact of EU accession on the competitiveness of the food processing sector are briefly presented.

The second sub-chapter of part two deals with the impact of EU accession on the Estonian food processing industry on export markets. Thereby, export markets are divided into three parts, consisting of the old member states of the EU, the new member states of the EU and the third countries. In order to map the Estonian food processing industry's position in EU markets in a broader context, the changes in the competitiveness of the chosen food processing subsectors on the markets of the EU-15 are compared with the respective subsectors in the other new member states of the EU. In order to estimate the general effect of EU accession on exports from the NMSs to the EU-15 and to compare the performance of the Estonian food processing industry with general trends, an econometric analysis based on the difference-in-difference approach is conducted. This also allows us to investigate how some other factors, related to competitiveness potential, have influenced trade with the EU-15.

The third sub-chapter focuses on the competitiveness of the Estonian food processing industry on the domestic market. Price effects that occurred in the domestic market after Estonia joined the EU are analysed. Changes in import

and domestic producer prices directly indicate whether the Estonian food producers have gained or lost competitiveness on the domestic market vis-à-vis foreign competitors. Aspects of competitiveness that incorporate competitive performance both on the domestic as well as export markets – the ability to earn and profitability – are tackled in the fourth sub-sector of part two.

However, so far, the thesis has dealt with industry-level indicators that only show competitive performance and, to some extent, also competitive potential. In order to better understand the underlying factors of success or failure in penetrating export markets as well as maintaining competitive position on the domestic market, interviews have been carried out with representatives of a number of leading milk processing companies in Estonia. The milk processing industry was chosen due to the high importance of exports and its relatively good export performance before accession to the EU.

The structure of the study is illustrated in Figure I.1.

Limitations

The *ex-post* evaluation of the impact of EU integration on the competitiveness of the Estonian food processing industry is a challenging task for several reasons. Firstly, the period of analysis is too short to allow researchers to fully and thoroughly evaluate the impact of integration, as Estonia joined the EU only in May 2004. Therefore, much of the necessary statistical information is not available yet. Furthermore, the impact of EU accession can only be fully observed after a longer period of time since many integration-associated effects only occur over the long term. This is especially the case with the dynamic non-price effects of integration related to investments in product quality and innovation.

Secondly, integration into the EU is a very complex process, spanning many years and different stages of trade liberalisation, which should, ideally, all be taken into consideration.

Thirdly, the period of integration into the EU has partly coincided with the transformation from the Soviet command economy to a market economy. This fact refers to the difficulty in deciding which effects are related to Estonia's EU accession and which to its transition from one economic system to another.

Fourth, there is a serious problem related to the comparability of the data before and after May 2004, as the system of foreign trade data collection changed with accession to the EU. Trade data on transactions between the EU countries are now based on statistical reports (Intrastat), which only include enterprises with a large trade turnover. Although the total trade volumes are estimated using statistical methods, it is possible that trade within the EU is systematically under-recorded.

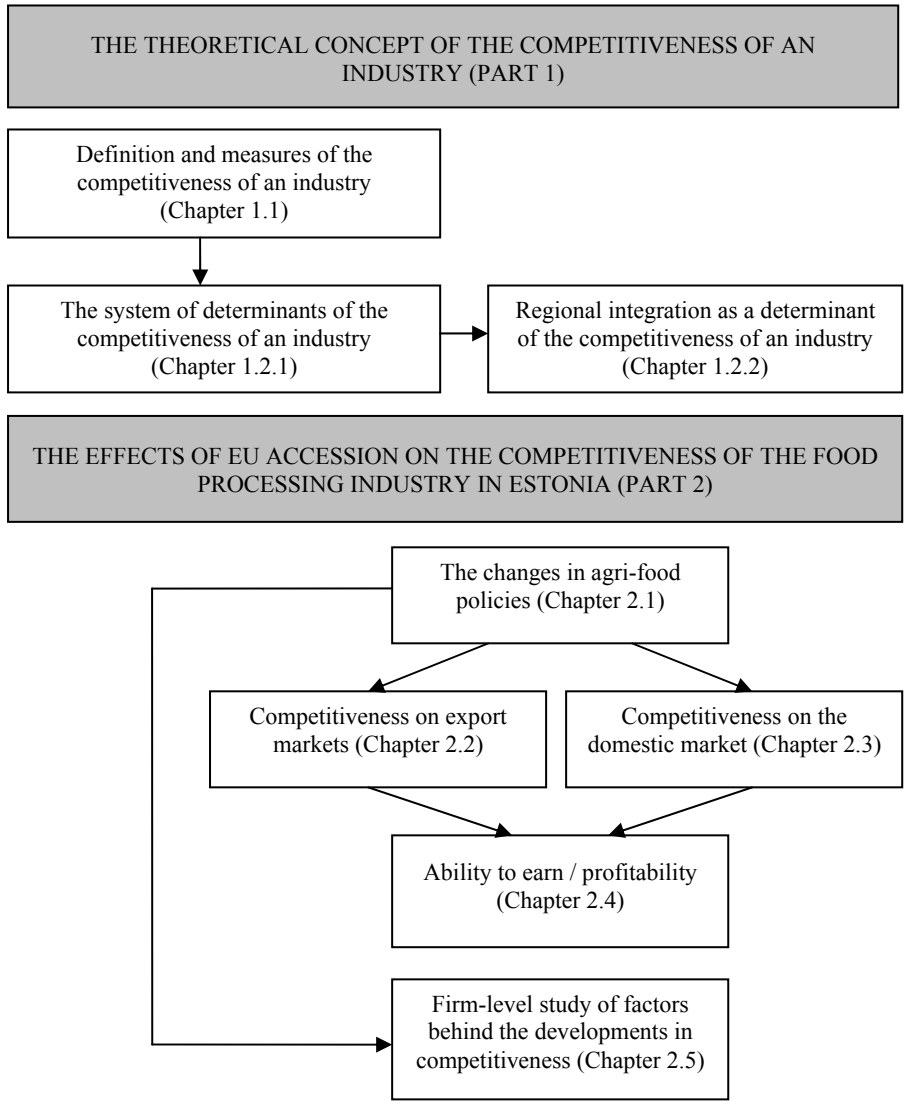

Figure I.1. The structure of the thesis (author's figure)

Finally, this dissertation focuses on the competitiveness of an industry on product markets, while the aspect of competitiveness on factor markets is only touched upon very shortly in the theoretical part of the dissertation. In order to develop a full picture of the impact of accession to the EU, in an ideal case, this aspect of competitiveness should also be taken into account. This is especially the case when analysing the effect of integration on the industry's ability to earn, which forms as a result of competitiveness on both product and factor markets. Nevertheless, including the aspect of factor markets would go beyond

the volume limits of the dissertation. Furthermore, the fact that the main interest of this dissertation lies in the international competitiveness of an industry, allows us to neglect aspects of factor markets.

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All the mistakes and errors found in this dissertation are the responsibility of the author.

1. THE THEORETICAL CONCEPT OF THE COMPETITIVENESS OF AN INDUSTRY

1.1. The definition and measurement of the competitiveness of an industry

1.1.1. Industry as a subject of competitiveness and the definition of the competitiveness of an industry

1.1.1.1. Industry as a subject of competitiveness

The term "competitiveness" is widely used in economic literature, yet no general or universal agreement has been reached on how to define competitiveness, and the concept itself is somewhat ambiguous. There is disagreement not only about the correct definition of competitiveness, but also about its measurement as well as the interpretation of the results of measurement. The multiplicity of definitions and ambiguity concerning the term "competitiveness" are partly due to the fact that competitiveness is a broad and synthetic concept, which has a strong economic policy dimension and can be considered at different levels of analysis. For example, one can distinguish between one-dimensional and multi-dimensional, unilateral, bilateral and multilateral, static and dynamic, positive and normative, deterministic and stochastic, and finally, actual and potential competitiveness. Depending on the subject of competition, further distinction can be made between microeconomic (single producers or industries) and macroeconomic (economy-wide) concepts.[4] Given the multitude of possible levels of competitiveness, any attempts to reach a universal concept of competitiveness are useless, and a proper concept of competitiveness should reflect the purpose of the analysis.

In this study, the central subject of the concept of competitiveness is an industry. In the following, the aspects of economic competitiveness, which are important for understanding the essence of the competitiveness of an industry, are selected and systematised in order to qualitatively determine and quantitatively measure their level and dynamics.

Before turning to specify the concept of the competitiveness of an industry, however, industry as a subject of competitiveness needs to be defined. That is, however, a difficult task, given the fact that an industry (or an economic sector) can be defined in several ways:

1. From a statistical point of view, an industry consists of a group of establishments engaged in the same, or similar, kinds of production activities (OECD 2010). From each establishment (or firm), only the part producing a given output is embodied. The firms themselves are each other's competitors. According to this approach, an industry is not an

[4] See Siggel (2003) for a thorough overview of different concepts of competitiveness. A good overview of the concept of competitiveness at different levels of analysis is also given by O'Donnell (1997).

independent subject, and its competitiveness is formed from the isolated attempts of individual firms to gain and maintain the competitiveness of the industry's output.

2. From an organisational point of view, an industry consists of institutions covering firms producing similar products (such as entrepreneurial associations, trade unions, educational and consultancy systems, common marketing organisations, etc.). These institutions organise cooperation between firms in order to enhance the competitiveness of the output of the industry, and perform as industry lobbyists in political and government circles.
3. Government institutions help establish an industry by applying regulations to firms producing similar products, and constraints in the area of production, packaging, transport, marketing, consumption and utilisation. These regulations affect each firm within the industry, while forming an industry as an individual subject.

The first aspect described above dominates the literature on competitiveness because this definition is not overly abstract and the available statistics support the choice of this approach in empirical analyses. Therefore, analyses are not only limited to domestically owned firms operating on the domestic market.[5] The common practice of defining an industry through the firms belonging to the industry follows the tradition of national statistics, which include all firms registered in a country and which produce a certain output regardless of their ownership.

Since the empirical part of this thesis deals with competitiveness dynamics in the Estonian food-processing sector, the definition of industry competitiveness developed in the theoretical part of this thesis needs to be adapted for the food processing industry. The food processing industry itself is one part of the much larger agri-food chain, comprising many actors at different levels of the chain. The interaction between these actors and the role of the food processing industry within the agri-food chain and the larger context are illustrated in Figure 1.1. The food processing industry uses inputs from the farm sector, and processes them, but it also obtains inputs and materials from the machine industry, construction sector and other domestic industries. In addition, some of the inputs and intermediate products used in the food-processing industry are imported. The government also plays an important role in the functioning of the food processing industry by creating a regulatory environment within which the industry operates.

[5] Porter (1990), for example, emphasises the importance of foreign-owned firms that have shifted their strategic, creative and ownership control along with their production activities.

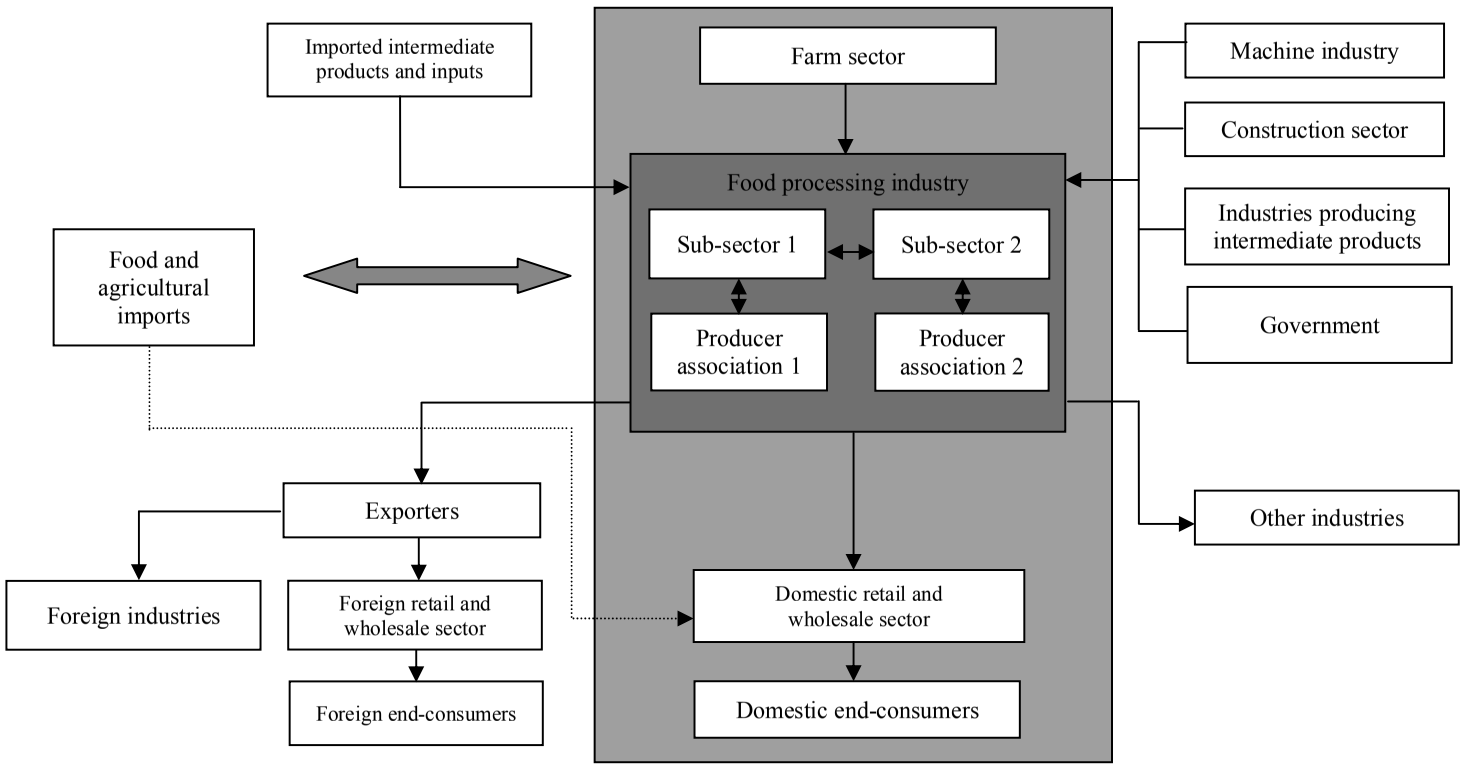

Figure 1.1. The agri-food chain (simplified version; author's figure)

The food processing industry sells its processed production on the domestic and export markets, which reach end-consumers either through the retail and wholesale sector or through exporters, respectively. Additionally, some exports may not be directed towards end-consumers, but as intermediate inputs in foreign industries. In both domestic and export markets, the food processing industry competes with the food processing industries of other countries.

Compared to the competitiveness of firms and countries, the concept of the competitiveness of an industry is considerably less developed. One of the reasons for this is definitely the fact that, as opposed to firms and countries, industries do not possess the independent ability to make decisions. Furthermore, the essence of an industry can be understood in many ways, and this has led to a multiplicity of approaches to determining the competitiveness of an industry.[6] This study attempts to systematise the different approaches existent in the literature, and to build a complete concept of the competitiveness of industries.

When attempting to define competitiveness at industry level, however, one can encounter serious problems. First of all, defining what an industry is, as demonstrated earlier, by no means results in a clear unified concept. The definition of an industry is rather the result of technical agreements, and can differ across different classifications.[7] Second, the tight links between industry, firms and the national economy complicate a clear specification of competitiveness at industry level and cause overlapping concepts. As many authors (e.g. O'Donnell 1997, Porter 1990) emphasize, competition takes place between firms and not between countries or industries.

Nevertheless, this does not imply that the only valid object of analysis would be the competitiveness of firms. As shown by O'Donnell (1997) and Porter (1990), there are two-way links between the competitive advantage of firms and the characteristics of a nation. On the one hand, the success of individual firms can contribute to the prosperity of the nation, although economic theory does not say very much on this issue. On the other hand, the characteristics of a country can influence the realisation of the competitive advantage of a firm.

Porter argues that competition takes place between firms, but countries have a competitive advantage in specific industries or industry segments. This means that the national environment does not directly affect firms, but industries and industry segments (O'Donnell 1997: 54). Furthermore, O'Donnell (1997: 63) concludes that "Although competition takes place between firms, and competitiveness is an attribute of firms, the mutual interaction between firms and the environment in which they operate justifies measurement and analysis at levels other than firm, such as the country or region, the industry and the product."

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[6] In many studies concerning competitiveness at the industry level, authors even avoid clearly defining competitiveness, and instead use different indicators and determinants for explaining the essence of competitiveness.

[7] There are many different classifications of industries, used by specific organisations or countries. For example, for classifying statistically the economic activities, the EU uses NACE system, US uses NAICS, and the United Nations uses ISIC system, which, however, are overlapping.

This argument directly refers to an industry as an individual subject of competitiveness, and strongly supports the choice of the level of analysis made in this thesis. Analysing competitiveness at industry level makes it possible to draw conclusions about the impact of a certain economic policy, while analysing firms separately would not provide a picture of the impact of policy across an economy. Furthermore, industry-level data is often most available and also internationally comparable. Most of the studies on competitiveness assess the performance of an industry by using an aggregate of all the outputs produced in that industry, or by considering its most important commodities and products (Frohberg, Hartmann 1997a: 6).

The concept of competitiveness at industry level is, however, tightly related to the concept of competitiveness at firm level as well as at country level. On the one hand, an industry consists of individual firms and the competitiveness "tools" of an industry coincide with those of individual firms (i.e. price and quality), while on the other hand, the competitiveness of an industry in product markets is equivalent to the competitiveness of a nation within a specific industry in international comparisons.

However, the terms need to be separated. First, an industry as a subject of competition can be more than just the sum of individual firms belonging to that industry (as discussed above). Second, an improvement (or deterioration) in the competitiveness of an industry does not necessarily translate into an improvement (or deterioration) of the competitiveness of the country as a whole. A good example of the latter is the view that a declining market share in high technology industries and an increasing market share in less sophisticated products indicates a decline in the competitiveness of a country (Buckley *et al.* 1988: 180).

Third, average industry figures cannot be used when drawing conclusions about the competitiveness of firms belonging to the industry or the lack of it, as competitiveness has different implications for an individual firm than for the sector as a whole. An industry can be, as van Berkum (2004: 2) points out, competitive even when some firms belonging to that industry are doing badly. On the other hand, an industry can be uncompetitive even if there are firms that are doing well.

In order to define the competitiveness of an industry, the question of who the industry competes with and what the object of competition is, needs to be answered. Competition as such refers to the contradictory interests of different subjects, and hence, competitiveness reflects the position of one subject relative to some other subject(s). Competitiveness can be defined either in a narrow or in a broad sense, as pointed out by Reiljan and Kulu (2002: 9). In the narrow sense, competitiveness refers to conditions where the interests of competing subjects are contradictory; implying that achievement of an aim by one subject excludes the achievement of the aim by another subject (the zero-sum game). In the broader sense, however, competitiveness may not be exclusive, and the achievement of the aim by one competing subject does not make it impossible

for another subject to achieve its aim (non-zero-sum game). Instead, for example cooperation can bring benefits to both competitors.

In addition, there are two more features that are important to keep in mind while analysing competitiveness. First, competitiveness is a relative term, and must be therefore assessed relative to some yardstick or criterion (another industry within the same country, the same industry in another country, another point in time, etc.) (Traill, Gomes da Silva 1996: 152). Second, emphasis should be placed on the dynamics of performance – it is not enough if an industry is more competitive than its competitors at one point in time. It must do that in a sustainable way by enhancing or at least retaining its position over time.

In general, an industry is involved in two types of competition (see Table 1.1). First, an industry is competing with other industries (economic sectors) for production resources such as land, labour, capital and so on. This kind of competition can be defined as internal competition if the competition takes place between industries within a national economy. However, an industry can also compete for production factors with industries from other countries, where the production factors can either be domestic or foreign. This type of competition can be called external competition on factor markets.

Table 1.1. Division between the external and internal competitiveness of an industry depending on the competitors

	Product markets	Factor markets
External	Vis-à-vis similar foreign industries (and industries where products are substitutes)	Vis-à-vis foreign industries
Internal	Vis-à-vis other domestic industries (if products are substitutes)	Vis-à-vis other domestic industries

Source: author's table.

Second, an industry competes with identical industries from other countries for customers in the product markets, whereas product markets can be either domestic or foreign (export) markets. This type of competition on product markets can be defined as external or international competition, since the competition is between similar industries based on different countries. In principle, another type of competition on product markets is also possible, although studies of competitiveness seem to have completely neglected this: in domestic and foreign product markets, industries can compete with other industries from the home or foreign countries if there exists substitutability between the products produced by the respective industries. However, for this type of competition to be significant, an industry needs to be defined at a relatively narrow level (e.g. poultry meat versus bovine meat). However, given the relatively low importance of this type of competition, it will not be considered in this thesis.

The domestic market itself can be considered at a national (economy-wide) or local level (some specific area within a national economy). Export markets can be defined depending on whether competitiveness is considered on a global or regional spatial scale, where the latter refers to some specific region, for example, the EU or Central Europe (see Figure 1.2 for the division of competition between different markets).

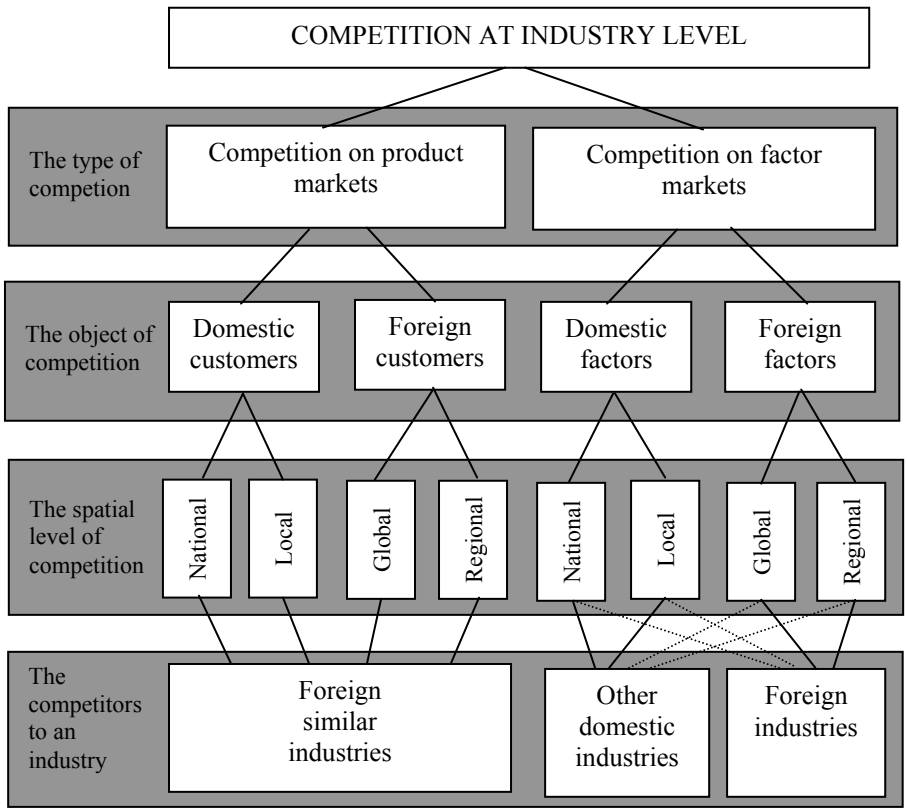

Figure 1.2. The classification of types, objects and spatial levels of competition between industries (author's figure)

Based on the characteristics of an industry as a subject of competitiveness discussed above, the next sub-chapter will define the competitiveness of an industry.

1.1.1.2. The definition of the competitiveness of an industry

As noted above, competitiveness refers to the existence of some "success" or superiority relative to competitors, which can either exclude or not exclude competitors from achieving the same goal. Hence, a proper definition of the

competitiveness of an industry should indicate what is considered as being superior to competitors. Nevertheless, it is not sufficient to possess superiority, this also needs to be realised – in other words, it is not enough to have the potential for competitiveness, this potential needs to be transferred into a competitiveness performance.[8] Ezeala-Harrison (1999) distinguishes between two terms – competitive advantage and competitiveness. He notes that competitive advantage itself needs not necessarily imply competitiveness. Competitive advantage represents a relative advantage that a country's industries have in terms of their ability to operate profitably within a competitive environment. It is a static potential that may or may not lead to competitiveness and economic growth. Competitiveness, on the other hand, is a dynamic concept, that refers to the state of the ongoing maintenance of competitive advantage, and hence, necessarily translates into economic growth. However, the achievement of competitive advantage is necessary for achieving competitiveness (Ezeala-Harrison 1999: 49, 69).

The competitiveness of an industry in the factor markets, hence, reflects its attractiveness to production factors, while the desirability of the production of the industry in the eyes of the customers is identical with the industry's ability to penetrate product markets. In a broader sense, competitiveness reflects the industry's ability to earn, while the ability to penetrate markets and the ability to attract resources are the necessary (but not sufficient) conditions for that. Indeed, for an industry to earn profits, it must, on the one hand, be able to sell its output, while on the other hand, it must also guarantee that it can produce this output in an efficient way by employing the appropriate production factors on the best terms. An industry that is only able to sell its products at market with prices that do not cover its (factor) costs (i.e. the industry operates at a loss) cannot be considered competitive, since this situation is not sustainable in the long run. Hence, the ability to earn reflects competitiveness in both types of markets.

A similar approach has been chosen by Trabold (1995: 169), who considers the ability to earn as the highest aspect in the "hierarchy of competitiveness", resting on the ability to sell products, to attract production resources and to adjust to changing socio-economic conditions. The latter aspect (ability to adjust) can be argued to be captured in the dynamics of the ability to sell and the ability to attract rather than standing as an independent component in the hierarchy of competitiveness – if an industry is not able to adjust to the changing conditions of the environment within which it is operating, then this is most probably also reflected in its (in)ability to sell products and attract resources (especially over the long term). As noted by McGeehan (1968: 255), an industry's competitiveness is determined not only by its ability or willing-

[8] Buckley *et al.* (1988) also add a third dimension — competitiveness process, which characterises the process of how the potential is managed in order to achieve a superior performance.

ness to sell within individual territorial and product groups, but also by its ability to adapt to changes in geographical and commodity trade patterns.

In economic literature, there is a multitude of definitions of industry competitiveness that support this concept; however, often no clear distinction between the different aspects of competitiveness (ability to sell, attract and earn) is made.[9] The ability to penetrate markets is definitely the dominant recurrent aspect in competitiveness concepts found in the literature, often accompanied by the criterion of earning at least the opportunity costs on resources employed (e.g. Freebairn 1986: 2; Ash, Brink 1994: 265) or the absence of unemployment (e.g. Boyle, 2004: 1). This can be considered an attempt to include the ability to attract resources into the definition of competitiveness.[10] Ezeala-Harrison (1999: 57) emphasizes the role of attracting foreign capital as a prerequisite for being able to produce and market products of standard or superior quality at lower prices (than competitors). Many authors emphasize the ability of an industry to earn profits in addition to the penetration of markets (e.g. Ezeala-Harrison 1999: 57; Martin *et al*. 1991: 1456; Siggel 2003: 7; Cho 1994), which is identical to an industry's ability to earn. However, the ability to earn in these approaches is seen rather as a characteristic of equal value with the aspects of ability to sell and attract, and not as an aspect of competitiveness that incorporates the other two aspects.

Some authors also define the competitiveness of an industry via its (unit) cost level (e.g. Ezeala-Harrisson 1999: 44), which can be seen as partly related to the ability to earn profits (as profits are defined as the difference between the price and unit costs). However, this approach is rather insufficient. An industry can have lower unit costs than its counterparts in other countries, but if it is not able to sell its products or does so at prices that result in no profits or lower profits compared to its counterparts, the performance of the industry cannot be considered to reflect high competitiveness (even though it might have the potential for it). As emphasized by Miner (1994: 235), the practice of defining the ability to earn profits and penetrate markets as competitiveness is most appropriate for an individual firm or an industry sub-sector, but cannot be directly applied to an industry as a whole which consists of many firms that differ in terms of their structure and operations.

Concerning the static and dynamic aspects of competitiveness, not all definitions of competitiveness reflect the importance of dynamics. Nevertheless, there are many authors who particularly emphasize the role of the dynamics or sustainability of competitiveness by considering a time horizon in their approaches (e.g., Ash, Brink 1994: 265; Martin *et al.* 1999: 1456; Cho 1994).

Most of the definitions of industry competitiveness presented in the literature do not directly distinguish between domestic and exports markets, and some

[9] As a result of the ambiguity in defining an industry, these definitions are often applied to industries and individual firms in parallel.

[10] Yet, often the definitions of the competitiveness of an industry only consider product markets, totally neglecting the importance of production resources in competitiveness.

even concentrate solely on export markets, completely neglecting the domestic market. This argument is supported by the increasing globalisation of the market place, and is especially relevant for small countries which have a limited domestic market and for which foreign trade is relatively more important than for larger countries. It can be indeed argued that from an industry's point of view, it does not matter whether the industry earns its profits mainly from domestic or export markets. On the other hand, an industry can be competitive on the domestic market and uncompetitive on export markets, and vice versa. While competitive on one export market, the industry may not possess competitiveness on some other export market. In addition, it is possible to "exclude" the domestic market to a certain extent from the global market using trade barriers, and in this case, the competitiveness on the domestic market is of limited value for the competitiveness of the industry in general.

On the other hand, Swann and Taghavi (1992: 3) argue that the lack of competitiveness on domestic markets may be an even more serious issue than the lack of competitiveness on export markets. This suggests that in order to analyse an industry's competitiveness, both the domestic market and export markets need to be taken into account.

Concluding the discussion above, the static competitiveness of an industry as an individual subject of competition can be considered as a two-level phenomenon and can be defined as the ability to earn profits through the ability to penetrate product markets relative to the same industries from other countries, and to attract the factors of production relative to the other industries within the same country or industries (including the same industry) from other countries (see Figure 1.3). These two abilities themselves depend on certain factors, which determine the competitiveness of the industry (this will be discussed in Chapter 1.2).

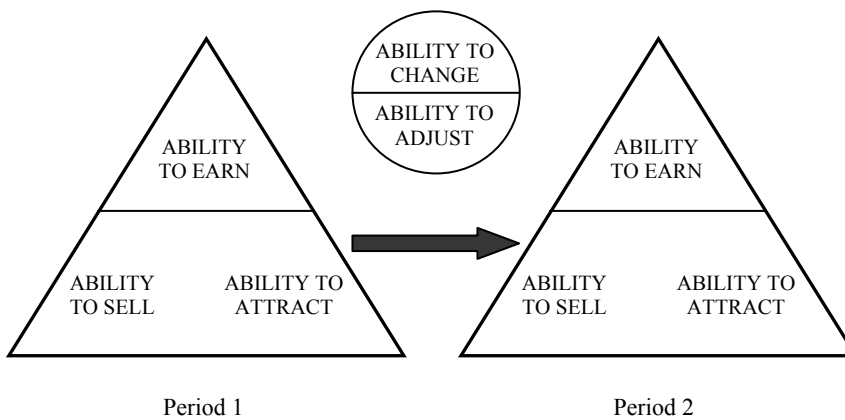

Figure 1.3. The two-level concept of the competitiveness of an industry (author's figure, modified from Reiljan, Tamm, 2005: 14; Trabold, 1995: 182)

This is a static depiction of the competitiveness of an industry in a certain period. If the factors of competitiveness change during time, then the ability to sell products and the ability to attract production factors in the next period depend on the industry's ability to react to changes in the environment. An industry can adjust to the new environment, however, if it can also pro-actively change – for example, through a shift in specialisation patterns – which can be considered as superior to the ability to adjust. While the ability to adjust can be considered as a passive reaction to a change in competitiveness factors, the ability to change is an active strategy. The ability to earn profits in period 2, in turn, depends on the ability to sell and attract in that period.

In the following, this study will focus on the external competitiveness of an industry in product markets, leaving out the issue of competition in factor markets (as well as internal competitiveness in product markets). This type of competitiveness can be called "international competitiveness" referring to the fact that the domestic industry is in competition with foreign industries. For simplicity, the term "competitiveness" is used in parallel with the term "international competitiveness". In the following sub-chapters, the options for measuring international competitiveness are discussed and a system of indicators of competitiveness in an industry is developed based on the approach to the international competitiveness of an industry established above.

1.1.2. The options for and problems related to the measurement of the international competitiveness of an industry

1.1.2.1. A system of indicators of the international competitiveness of an industry

In defining the competitiveness of an industry, it appeared that competitiveness is a complex and diverse phenomenon. This suggests that measuring the impact of regional economic integration on the competitiveness of an industry is also a difficult task, and requires a clear quantitative specification of competitiveness indicators.

The competitiveness of an industry in product markets can be considered as a two-level phenomenon, as identified in sub-section 1.1. The competitiveness of an industry is revealed as its ability to earn profits, which, in turn, is a result of its ability to sell products.[11] This implies two aspects important for measuring competitiveness. First, the indicators for a quantitative measurement of competitiveness need to reflect the two-level phenomenon of competitiveness. Second, there cannot be a single indicator of an industry's competitiveness, but rather a system of indicators needs to be developed.

[11] However, it must be emphasised that the ability to earn profits also depends on an industry's competitiveness in factor markets; that is, its ability to attract production factors and resources, as discussed in the previous sub-chapter.

In Table 1.2., the main indicators corresponding to the ability to sell and earn are given. These can be considered from the static and dynamic perspective. Considering the ability to sell, two types of indicators can be distinguished: indicators relevant when analysing competitiveness in export markets, and indicators reflecting competitiveness in the domestic market.

Table 1.2. The classification of indicators of competitiveness for an industry

	The level of competitiveness	The dynamics of competitiveness
Ability to sell		
Export markets	Export value/volume	Export growth
	Export market share	Change in export market share
Domestic market	Sales value/volume	Sales growth
	Domestic market share	Change in the domestic market share
	Balance of trade	Change in balance of trade
Ability to earn		
	Profits	Change in profits
	Value added	Change in value added
	Price-cost margin	Change in price-cost margin

Source: author's table

Most of the literature concerning industry competitiveness in export markets utilise market share in the export market as an indicator of ability to sell, which illustrates the fact that in a narrower sense, competitiveness is an exclusive notion: if the market share of an industry from one country increases, then the market share of the identical industry from another country must fall. These indicators can be considered at the global or regional level, depending on which geographical scale the analysis is conducted at.

In the domestic market, the respective indicators of the ability to sell are the absolute volume or value of domestic sales and its dynamics, and the market share of the domestic industry. In addition, the balance of trade, which combines the domestic and export markets, can be considered as a relevant measure of ability to sell, as it demonstrates the industry's ability to export relative to its exposure to competition from imports.

The ability to earn, on the other hand, can be measured using indicators related to an industry's earnings and profitability. These include an industry's net or gross profits, the level of value added and price-cost margins. In the dynamic sense, the change in the level of profitability indicators measures competitiveness.

In the following, these competitiveness indicators are discussed in more depth. The next sub-sections focus on the potential for quantitatively measuring

the ability to sell and the ability to earn, and discusses the main problems related to measuring competitiveness.

1.1.2.2. The measurement of an industry's ability to sell

As pointed out in the previous sub-section, indicators related to the ability to sell mainly involve the quantity and value of an industry's sales, both in absolute as well as relative terms. While the absolute volume and value of exports and domestic sales and the balance of trade as well as the changes in these indicators over time are straightforward, there exists a large number of different indicators of market shares in the literature, which also need a further exploration.

A vast number of studies concerned with competitiveness at industry level focus on market shares. These measures are in general calculated for single products or product groups. They are usually used for international comparisons, but can be also applied to compare the competitiveness of different regions within a country (Frohberg, Hartmann 1997a: 7).

The most extensively employed indicator of an industry's export market share is the Revealed Comparative Advantage (RCA) index introduced by Balassa (1965: 106):

$$(1) \qquad RCA_{ij} = \left({X_{ij}}/{\sum_i X_{ij}} \right) / \left({\sum_j X_{ij}}/{\sum_i \sum_j X_{ij}} \right),$$

where X_{ij} represents exports of sector j from country i.

According to the RCA index, a country has a comparative advantage in a particular product, if its exports of the product, relative to the world exports of the product, are larger than the country's market share in total exports (Siggel 2003: 13).[12] The RCA index can be modified so that the comparative advantage can be studied with respect to a certain country or a group of countries.

Since the market share can be larger due to subsidies and price distortions, Siggel (2003: 13) argues that the RCA index is a measure of competitiveness rather than comparative advantage, although its name refers to the latter. Hence, a value of RCA higher than one indicates that competitiveness is revealed.

[12] Traditional trade theory explains trade patterns as a consequence of comparative advantage, which is defined as differences among countries in relative costs and prices. The paradigm of comparative advantage states that a country should specialise in the production of those goods or services for which it possesses comparative cost advantage over others, and then trade these goods for those of other countries. Comparative advantage itself can be explained by the differences in total factor productivity (Ricardo model) or in relative factor endowments across countries (Heckscher-Ohlin model) (Lundberg, Wiker, 1993: 63).

However, it can be argued that the RCA index is rather a measure of export specialisation than competitiveness, unless it is used in a dynamic sense.

There are many indices of competitiveness derived from the RCA index, which either additionally take into account imports (e.g. Vollrath 1991) or include also other forms of international economic involvement than trade (see e.g. O'Donnell 1997; Traill, Gomes da Silva 1996)(some of these indices are shown in Appendix A.1). [13]

For instance, Traill and Gomes da Silva (1996: 159–165) use indices that, in addition to trade, encompass foreign direct investments (FDI) to assess the international performance of the food, drink and tobacco industry in a number of European countries.[14] They conclude that the levels obtained by using the modified indices differ significantly from those obtained with conventional indices. Furthermore, and more importantly, the trends in competitiveness measures can differ substantially. This shows that different measures of competitiveness can give very different signals about the competitiveness, and therefore, a careful selection of indicators is fundamental to the measurement of competitiveness.

However, Traill and Gomes da Silva (1996) also admit that the interpretation of the modified measures is not straightforward and demands caution, since FDI can be affected by macroeconomic variables and because motives for FDI vary between firms. FDI can substitute for as well as complement exports as well as imports. Thus, the trade and international production components may be interrelated in complex and unpredictable ways. In addition, some of the data needed to calculate the indices can be very difficult to obtain (e.g. estimates of the value of output produced by the total world FDI in an industry) (Traill, Gomes da Silva 1996: 164).

Market share measures often show large annual fluctuations due to structural changes, which makes the interpretation of indices more complicated. Pitts *et al.* (1995) argue that the indices cannot be compared across countries, since the size of a country affects their values. An RCA value would be higher (hence, indicating higher competitiveness) for a small country exporting a certain good at the same volume level as a large country. However, Frohberg and Hartmann (1997a: 9) object to that criticism claiming that it is much more difficult for a small country to reach the same volume of exports than a large country, and hence, the size of the country should be taken into account in competitiveness measures.

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[13] Frohberg and Hartmann (1997a: 8) argue that indices that take into account both exports and imports should be preferred, as indices that take into account exports or imports solely, can give misleading results in the existence of intra-industry trade. An example of a country mainly engaged in transit illustrates that point — in this case, the RCA index would indicate a high level of competitiveness, which would be purely artificial (Pitts *et al.* 1995: 8).

[14] In addition to foreign trade, other forms of international involvement by firms have grown in importance (such as licensing, franchising, joint ventures, strategic alliances, international production).

Another commonly accepted measure of competitiveness performance is export market share (XMS), which compares a country's exports in a given industry relative to global exports of that industry (Traill, Gomes da Silva 1996: 155):

$$XMS_i = \left({}^{X_i}/_{X_{iw}}\right) \times 100, \quad (2)$$

where X_i denotes the value of national exports of industry i, and X_{iw} is the value of total world exports of industry i. The market under consideration can range from small local markets to the world market. For example, one can consider a country's export market share on the EU market.

The Net Export Index (NX) also takes into account imports (Balassa, Bauwen 1988; via Traill, Gomes da Silva 1996: 155). Here, the net exports of a country in a given industry are compared to the production of the country in that industry:

$$NX_i = \left\{\frac{X_i - M_i}{Y_i}\right\} \times 100, \quad (3)$$

where X_i is the value of national exports of industry i, M_i is the value of national imports of industry i, and Y_i is the value of the production of industry i.

The Net Export Index is similar to the Net Export Orientation Ratio, suggested by Martin *et al.* (1991). The only difference lies in the fact that in the latter indicator, the average of domestic production and consumption is used as a denominator. The sign of this indicator shows whether an industry is a net exporter or net importer, while the absolute size of the measure displays the relative importance of trade (Martin *et al.* 1991: 1456).

Another commonly used approach to studying the external competitiveness of an industry, which also takes into account dynamics, is the Constant Market Share (CMS) method (see, e.g. Chen *et al*. 1999; Feldman 1994; Hoen, Leeuwen 1991). In analysing export performance, the CMS method has an advantage in taking into account the composition of a country's exports both in terms of export goods as well as export markets (Feldman 1994: 7).

The CMS method proceeds from the assumption that if a country's competitiveness with respect to a certain export good remained the same, its market share would have to be constant as well. Therefore, any difference in the actual change in the exports of the country and the sum of market competitors (i.e. reference group) would have to be a result of either a change in export composition (i.e. structural effect) or competitiveness (Chen *et al.* 1999: 150). The competitiveness effect is hence the difference between the actual export change and the structural effect, the latter of which assumes constant market shares and unaltered competitiveness.

The CMS analysis decomposes the growth in exports traditionally into four components, the first three of which together constitute the structural effect (Feldman 1994: 7; Hoen, van Leeuwen 1991: 369):[15]

1) scale effect, resulting from the expansion of world exports;
2) commodity effect, which is the result of a country exporting commodities for which demand is growing at a different pace (slower or faster) than for total world exports;
3) regional effect, which is the result of a country exporting to markets for which demand is growing at a different pace (slower or faster) than for the total world;
4) competitiveness effect as a residual.

Consequently, the CMS identity can then be formulated as follows (the elements in the formula correspond to the four mentioned effects respectively):

$$\Delta q = s^0 \Delta Q + \left(\sum_i s_i^0 \, \Delta Q_i - s^0 \Delta Q\right) + \left(\sum_i \sum_j s_{ij}^0 \, \Delta Q_{ij} - \sum_i s_i^0 \Delta Q_i\right) + \sum_i \sum_j Q_{ij}^1 \, \Delta s_{ij} \quad (4)$$

where:
q – a country's total export value,
Q – total world exports,
Q_i – the world's total exports of commodity i,
Q_{ij} – the world's total exports of commodity i to destination j,
s – a country's share in total world exports,
s_i – a country's share in total world exports of commodity i,
s_{ij} – a country's share in total world exports of commodity i to destination j,
Δ – the change in the two periods,
and superscripts *0* and *1* refer, respectively, to the beginning and the end of a discrete time period.

The competitiveness effect, hence, measures the difference between the actual increase in a country's total exports and the increase that would have occurred had the country maintained its export share in each destination with respect to each commodity (Chen *et al.* 1999: 152). An increase (decrease) in competitiveness is indicated by the positive (negative) value of the competitiveness effect term.

The indicator can be modified to measure export competitiveness with respect to certain goods and/or certain geographical markets. Instead of using the total world exports, some authors have applied the CMS model for the decomposition of the export growth of a country with respect to a certain reference group. For example, Feldman (1994) has assessed Germany's export performance with respect to the group of OECD countries; Hoen and van

[15] Different authors have assigned somewhat different names to these effects; see, e.g., Feldman (1994).

Leeuwen (1991) have analysed the competitiveness of exports from the countries of the Council for Mutual Economic Assistance (CMEA) and newly industrialised countries (NICs) to Western Europe, while Chen *et al.* (1999) have decomposed China's export growth with respect to 10 country groups, divided according to their relevance in China's exports.[16]

In the domestic market, the competitiveness of an industry can be measured as a ratio of the domestic industry's sales in the total consumption of the respective products in the domestic country (i.e. the Domestic Market Share Ratio – DMR):

$$DMR_i = \left({}^{DS_i}/_{C_i}\right) \times 100, \tag{5}$$

where DS_i denotes domestic sales by industry i, and C_i the total domestic consumption of the production of industry i.

The DMR index can take values from zero to one. Straightforwardly, the higher the DMR, the higher the (static) competitiveness of the industry in the domestic market. An increase (decrease) in the DMR indicates an improvement (a deterioration) in the domestic industry's ability to sell (competitiveness) in the domestic market relative to its competitors from abroad.

Alternatively, the Import Penetration Ratio (MPR) can also be used:

$$MPR_i = \left({}^{M_i}/_{C_i}\right) \times 100, \tag{6}$$

where M_i denotes the imports of the production of industry i, and C_i the total domestic consumption of the production of industry i.

As the MPR index is the opposite of the DMR index ($MPR=1–DMR$), an increase (decrease) in the MPR indicates a fall (an improvement) in the domestic industry's ability to sell (and hence, competitiveness) in the domestic market.

The market share indicators based on trade data embody many advantages. First of all, the costs of marketing and transport to and from the port of entry are taken into account. Second, using trade data, demand and supply responses are considered simultaneously (Frohberg, Hartmann 1997a: 7).

However, market share as an indicator of competitiveness must be used carefully, since its accuracy in evaluating the existence or lack of competitiveness can be questioned, in particular in the case of export markets. First, market share relates the size of the market to the size of the industry. So, if the total market is increasing, the market share measure could indicate a loss in competitiveness even if the output of the industry is actually increasing (but slower than the total market) (Ash, Brink 1994: 265). The other countries might simply become more international, importing and exporting a higher percentage of their GDP (Francis 1989: 10).

[16] The latter analysis covered two sub-periods in order to assess the impact of trade policy reform on the performance of China's exports of agricultural products and foodstuffs.

Second, a country's share in world trade can decline due to the entrance of new countries, formerly closed to international trade, while the country still retains a high level of exports (Francis 1989: 10).

Third, a country can lose its share of world markets because of its lower growth rate, while maintaining the share of exports in total GDP (Francis 1989: 11). In this case, its falling share of world markets reflects slower growth rather than a lack of competitiveness.

Fourth, a country may lose market share simply because it is not able to meet world demand because of its low production capacity (Fröhlich 1989: 23).

A further issue related to market share indicators has been emphasized by Buckley *et al.* (1988: 182), who claim that export market share as a measure of competitiveness fails when market share is maintained through drastic price cutting, which could have a negative effect on an industry's profitability and its long term performance.

The first four arguments especially hold in the case of a small country like Estonia. The share of its industries in the world market or even in regional markets, such as the EU market, are minor and any change in the output of other countries can affect the market share of Estonian industries considerably. Therefore, in the case of a small country, export market share indicators should be combined with the absolute value or volume of the exports or the change in the composition of exports when assessing competitiveness.

In measuring an industry's competitiveness in the domestic market, market share indicators can be equally controversial. For instance, Francis (1989) has pointed out that a rise in import penetration can indicate a loss in competitiveness, but can also be due to other reasons such as economic growth or a government policy choice to balance a current account surplus at a higher exchange rate (Francis 1989: 10–11). The relative price of imports is a complementary, although not perfect, measure of competitiveness on the domestic market, as a fall in the price of imports compared with the price of domestic products can also reflect that the domestic industry is losing its domestic market share to imports.

In terms of export competitiveness, the measure of export market share and the absolute volume of exports can be improved by an accompanying analysis of the composition of exports with respect to the level of value added. The fact that demand for foodstuffs is characterised by low income and price elasticity (Ezeala-Harrison 1999) seems to affirm that low prices, and hence, price competitiveness, cannot be the key to long-run success for the food processing industry. In the case of bulk commodities and raw materials, price is definitely the most decisive factor of demand. However, for high value-added (processed) products, non-price characteristics such as quality, brand name, innovation, product differentiation and after-purchase services become more important.[17] Their demand enjoys higher income and price elasticities and can, thus, lead to

[17] Nevertheless, even niche products can be very close substitutes for the products of other competitors/countries.

a sustainable long-run competitiveness. Increased exports of processed products increase value added, income and provide jobs in manufacturing (Reed 1994: 83). Hence, for an industry in a small country with a limited domestic market, the ability to export products with high value added is key to long-run sustainable growth and profitability.[18] If a country is able to sell products of higher quality and value-added level, it is also able to earn higher profits. This ability depends on price factors, such as costs on the one hand, and from non-price factors, such as product quality and reputation, on the other.

One approach to studying the intertemporal development of the quality and value-added composition of food exports is the comparison of price differences assuming a positive relationship between quality and prices, as suggested by Hoen and van Leeuwen (1991) and Aiginger (1997). For example, Majkovič *et al.* (2007) have investigated Slovenian agri-food trade patterns before and after accession to the EU, using unit values of exports and imports combined with the trade balance to measure competitiveness. The authors assume that differences in prices reflect quality differences. If the unit value of a country's exports is below the unit value of its imports while trade is in surplus, the country is considered to possess price competitiveness. On the other hand, if trade is in deficit despite low export prices, this is a sign of structural problems. If the export unit value of a country is higher than that of its imports, while the quantity exported exceeds the quantity imported, the country is believed to be successful in quality competition. However, high export unit value combined with a trade deficit indicates a lack of price competitiveness (Majkovič *et al.* 2007: 213–214).

From trade statistics, unit values can be calculated; however, the approximation of price levels using unit values is not without problems. In trade statistics, the commodity groups consist of composite goods, and therefore, changes in unit values can result both from price changes as well as from structural changes (i.e. changes in the composition of the commodity group). Hence, the unit values can be biased.

Furthermore, in interpreting changes in unit values as changes in quality levels or levels of value added, the influence of pure price changes should be eliminated (Hoen, van Leeuwen 1991). This problem is especially apparent when considering the large fluctuations in the unit prices of agricultural products and foodstuffs. The changes in Estonian export prices are directly dependent on the development of the world market and EU market prices, as

[18] However, MacDonald and Lee (1994: 193) discredit the standard argument that puts preference on exports of high value-added products, claiming that value-added exports are beneficial only if country possesses a comparative advantage in high value-added activities. In the opposite case, a country should export bulk commodities. Similar view is also expressed by McCalla (1994: 321), who even calls this standard view a "silly proposition". However, the authors acknowledge the difficulty of determining the products a country has a comparative advantage in, since "the mix of products actually traded is driven by a combination of underlying comparative advantages and distortions introduced by government interventions." (MacDonald, Lee, 1994: 193)

Estonian food processors are price-takers on Western markets (a small country effect). Hence, the fluctuations in the world market prices as well as the changes in the EU administrative prices for agri-food products (e.g. beef, skimmed milk powder, butter) and domestic inflation should ideally be separated from the impact on the value-added level of exports.[19] Elimination of the effect of price fluctuations and inflation is, however, complicated given the absence of price indices calculated for individual products (or product groups) and the possibility that the application of any broad-based price index would result in inaccurate estimates of unit values.

Another way to analyse changes in the level of value added in exports is to consider changes in export volumes for products at different processing levels. However, this is not a perfect measure either since the available trade data is usually not sufficiently detailed, which does not allow us to distinguish between products of clearly low or high processing levels. Furthermore, there are many ways to classify agricultural products and foodstuffs according to their value-added content. The United States Department of Agriculture, for example, distinguishes between bulk commodities and high-value products (HVP) (Whitton 2004). The latter group is divided into three subgroups consisting of raw HVP, semi-processed HVP, and processed HVP. According to this approach, all meat products (excl. fats) and dairy products belong to the last group. Similarly, Reed (1994: 85) differentiates between bulk commodities (which are unprocessed), high-value unprocessed products (oriented towards end-consumers), intermediate products (i.e. semi-processed) and highly processed products.[20]

However, a very different approach has been chosen by Winger *et al*. (2003). In their analysis of the level of "added-value" products in New Zealand's food exports, representatives of the food industry were asked to define HS (Harmonised System) 10-digit code level product groups as either "added value" or "commodity". Products could be categorised as value added in terms of type, processing methodology, storage regime or market. If industry representatives described a product group as incorporating both value-added products and commodities, a financial value analysis was applied to find the proportion of added value products within the product group. The financial value analyses basically involved the calculation of the unit values of exports for each 10-digit product group over all destinations and for each market separately. Any market with a unit value higher than the average figure for all markets was considered a value-added market. In the opposite case, the market was seen as a commodity. By summing up the total value of all "value-added markets" within a specific

[19] The fact that Estonian food processing companies are price takers on the EU market allows us to consider the domestic inflation effect as less important when considering exports.

[20] This approach is closely linked to "the four economies of agriculture" introduced by Abbott and Bredahl (1994).

product group, the total value of value-added products in that product group was derived.

In this approach, value added is not viewed in terms of the level of processing of products or their distance to consumers, but rather in terms of shareholder value. According to the authors, this ensures that the value-creating technology incorporated into minimally processed food is taken into account. However, the direct adoption of the above method poses many caveats, such as the ambiguity around the definition of value added, the questionable value of the criterion for value-added markets in the case of countries having different purchasing power levels as well as the potential price distortions due to the existence of trade barriers, and the reliability of the appraisal of industry representatives from a highly developed country (New Zealand) in the case of a small country of lower developmental level (Estonia). Therefore, assessing changes in the level of value added according to the processing level is considered a more suitable approach within the framework of this analysis.

Based on the discussion above, the following indicators of the ability to sell will be utilised in the empirical part of this dissertation: absolute export value and volume, the export market share indicator, the decomposition of exports according to its value added level, the ratio of the domestic industry's sales in the total consumption in the domestic country, the Import Penetration Ratio and the relative price of imports.

1.1.2.3. The measurement of the ability to earn of an industry

As discussed above, an industry's ability to earn is characterised by its profitability. Profits can be considered as a measure that incorporates both price and quality aspects of competitiveness, since they capture information about both the price-cost margins as well as the customers' appraisal of the products sold.[21] Tharakan *et al.* (1989) argue that profits are a forward-looking indicator of economic performance since investments concentrate in sectors that are profitable (Tharakan *et al.* 1989: 41). An industry with a high profitability also has good competitive potential, which implies that it is able to improve its competitive position in the future (Viaene, Gellynck 1998: 149). An unprofitable industry fails in the long run; hence, the sustainability of profitability is what matters. Hence, profits not only show the actual competitiveness performance, but are also linked to competitiveness potential.

Compared to the large number of indicators of the ability to sell, economic literature is relatively poorer in terms of measures of an industry's ability to earn. Nevertheless, a few indicators can be found. Tharakan *et al.* (1989), for example, use gross profits as a direct measure of profitability. The authors econometrically estimate gross profits as a share of the turnover of 77 industries

[21] One can argue that the more customers appreciate a product because of some non-price attribute it incorporates, the more they are willing to pay for that product, hence, ensuring higher profits to the seller of the product.

in Belgium over 6 years on independent variables reflecting the determinants of comparative advantage based on factor proportions theory (Heckscher-Ohlin-Samuelson (HOS)) (capital and labour intensity), indicators neglected in the classical HOS theory, such as economies of scale and the degree of concentration of production, tariffs and non-tariff barriers to trade, and the degree of openness in the economy.[22]

Martin *et al.* (1991), on the other hand, suggest value added as a proper, though indirect measure of profits for an agribusiness industry that buys raw materials, processes them and resells them in different forms. The authors suggest using value added relative to the number of workers, sales, expenditure on wages, or the number of establishments in this industry, for a comparison with the same industries in other countries (Martin *et al.* 1991: 1456). Their approach is supported by Abbott and Bredahl (1994: 16), who argue that value added counts as the returns to those entities who are directly concerned with competitiveness – labour, capital and the government. In terms of a national economy, the profitability of an industry not only depends on the pure profits it generates, but also on the employment and income the industry generates for the domestic economy. Hence, measures of value added should be preferred to measures of pure profits in the assessment of the competitiveness of an industry.

As an alternative proxy for the profitability of an industry, but related to value added, is the price-cost margin. Ezeala-Harrisson (1999) relates price-cost margins (or mark-ups) directly to the competitive advantage of an industry, claiming that the industry can be considered as internationally competitive if and when the firms belonging to the industry maintain a positive growth rate of aggregate competitive advantage, which itself refers to the relative advantage that a country's industries have regarding their ability to operate profitably within a competitive environment. Hence, the level of price-cost margin itself does not indicate competitiveness, what matters is its dynamics over time.

There are two main definitions of price-cost margins (PCM) often used in the literature (European Commission 1996; Schmalensee 1989; Sleuwaegen, Yamawaki 1988):

(7) $$PCM1 = \frac{VA-LC}{VA},$$

(8) $$PCM2 = \frac{VA-LC}{S},$$

where VA denotes value added, LC stands for labour costs and S refers to sales.

[22] As an alternative to profits, the authors also use the Balassa index of RCA as a measure of competitiveness, however, they recognise that trade regressions reflect distorted patterns of trade, whereas profit regressions show the patterns of competitiveness "more or less as the market reveals it" (Tharakan *et al.* 1989: 56). The reason for this is that the subsidies paid by the government distort the foreign trade figures in the RCA index, but profits reflect the fact that domestic competition cancels out the subsidy effect.

While the first indicator has been often used to study the link between profitability and concentration, the latter is more in conformity with the theoretical concept of profit-sales-ratio.

Yet, in the industrial organisation (IO) literature and in the theory of economic integration, price-cost margin is considered an indicator of market structure and efficiency. A fall in price-cost margins as a result of competitive pressure indicates a loss in the market power of firms within the industry and consequently, an increase in their efficiency, which itself can be associated with competitiveness. Thus, as regards competitiveness, price-cost margins can give ambiguous signals. On the one hand, increased margins indicate higher profitability and hence, higher income for the industry. On the other hand, a rise in price margins can be a sign of a decline in efficiency within the industry, which can result in a loss in long-run profitability. This significantly complicates the interpretation of the results, but gives important insights into the matter of competitiveness. Nevertheless, from the short-term perspective of the industry, however, a rise in price margins refers to higher profitability, and hence, an increase in its competitiveness over time.

Profitability is directly related to the performance of an industry both in domestic and foreign markets, irrespective of changes in market size, and is, therefore, free of the problems that are characteristic to market share indicators. Buckley *et al.* (1988) even argue that profitability could be "the single most important measure of competitive success" and "long-run profitability is essential for survival". However, a bare indicator of profitability does not allow us to distinguish between competitiveness in the export and domestic markets, and thus, needs to be used in combination with indicators of the ability to sell.

The measurement of an industry's profitability, however, poses some problems. First, firms within an industry may be willing to undergo a short-run loss in profits in order to achieve a long-run growth. Second, profitability at industry level does not show the distribution of profitable and unprofitable firms within the industry. For example, an industry can consist of one very large profitable company and a large number of unprofitable micro-companies, and due to the dominance of the profitable firm, the summed profitability of the industry might be positive. However, it is not clear whether this kind of industry can be considered profitable from the macroeconomic perspective.

Third, Hazledine (1994) points out the ambiguity of the results when combining indicators of profitability and ability to sell. He asks whether an industry with high profits but low market share is less competitive than an industry with low profits but high market share.

Fourth, according to industrial organisation (IO) theory, as mentioned before, profitability in a mature industry is rather a sign of market power, and higher profits are related to economic inefficiency. Therefore, profitability should not be seen as an objective, but as a constraint, in so far as profits should sustain the activities of the firm or the industry (Hazledine 1994: 242–243). Finally, as in the case of the indicators of the ability to sell, different indicators

of profitability can give different results, making the interpretation of the results rather difficult.

The studies conducted on the competitiveness of an industry often do not measure competitiveness based on its defined notion, but rather based on the different (individual) factors behind competitiveness. This practice, however, is misleading, as it does not directly measure the actual competitiveness, but rather the potential for competitiveness. The next section aims to identify factors that determine the competitiveness of industries, and given the aim of this study, the main focus is on the determinants of competitiveness – and the role of regional economic integration within this framework – in the food processing industry.

1.2. The determinants of the international competitiveness of an industry and the role of regional economic integration

1.2.1. The determinants of the competitiveness of an industry

1.2.1.1. The system of competitiveness determinants

Given the definition of the (external) competitiveness of an industry developed previously, the aim of Chapter 1.2.1. is to specify the factors that determine whether an industry is potentially competitive or not, and whether this potential has transformed into actual competitiveness (i.e. competitiveness performance).

In the literature, there are quite a few examples of attempts to systemise factors determining competitiveness at industry level (e.g. Abbott, Bredahl 1994; Porter 1990; Cho 1994) (see Appendices A.2 and A.3). However, the difficulty of this task is well illustrated by White (1994: 310), who claims that "whatever level of aggregation competitiveness is defined, its determinants are nearly infinite." Basically, all the factors stemming from inside the industry that determine its competitiveness, plus everything that constitutes the environment within which it is operating, may affect its competitiveness.

The competitiveness literature distinguishes between two categories of factors shaping an industry's competitiveness in product markets (i.e. the ability to sell and earn profits) – determinants which are internal to the industry, and factors which are external to the industry.[23] The former of these will be discussed in this sub-chapter, while the latter is touched upon in the next sub-chapter.

In order to identify the internal determinants of an industry's competitiveness, factors controllable by the industry need to be specified. According to the

[23] Alternatively, these determinants can be called micro and macro level factors, respectively, as noted by Ezeala-Harrison (1999: 56). The author considers micro level factors as a necessary condition for international competitiveness, whereas macro level parameters form a sufficient condition for a country's industry to achieve competitiveness.

definition of an industry as a subject of individual competitiveness, it seems reasonable to assume that the internal factors controllable by the industry not only include factors characteristic to the firms constituting the industry, but also some additional factors that characterise the existence of the institutions and interactions between the firms within the industry.

The competitiveness literature is extremely rich in the area of factors determining firms' success vis-à-vis their competitors (e.g. Martin *et al*. 1991; Rugman, Verbeke 1990; Van Duren *et al*. 1994, and many others). For example, among factors controllable by individual firms, Martin *et al.* (1991: 1456) consider the following to be the most important for their competitiveness: firm's strategy, products, technology, training, internal R&D, costs and links (see also Appendix A.4 for the whole system of competitiveness determinants proposed by Martin *et al*. 1991).[24] Rugman and Verbeke (1990: 49) consider the core skills and know-how that firms possess as firm-specific advantages, which create potential for competitive advantage firms may gain in the market, either based on cost or differentiation. However, these firm-specific advantages translate into competitive advantage only through the effective formulation and implementation of competitive strategies.

Technology and innovations as the determinants of the competitiveness of an industry (and of firms) have been pointed out by many authors. According to Porter (1990), for example, a nation's competitiveness depends on the capacity of its industries to innovate and upgrade. Boyle (2004: 2) claims that competitiveness depends over time on the capacity to vary output levels, which depends on current technology and the capacity for scale enhancement, technological and product innovation.

Although O'Donnell (1997: 50–51) emphasizes outward investments by firms of peripheral regions as an increasingly important aspect of competitiveness (or the lack of it), we argue that (at least in the case of transition economies) the magnitude and pattern of inward FDI for peripheral regions is still a more important factor of competitiveness.

Research on the factors internal to an industry that go beyond firm-specific determinants have attracted considerably less attention in economic literature. Some insights into this matter can be found in Porter's work (Porter 1990), where the interaction of firms within an industry is part of the set of factors called "firm strategy, structure and rivalry" within the framework of the famous "national diamond" (see Appendix A.3).[25] In addition to competition between firms within an industry, these factors include the co-ordination of export

[24] Based on the factors of competitiveness controllable by a firm, the government, quasi-controllable factors and uncontrollable factors, Martin *et al.* (1991) identify seven "drivers" of competitiveness, which interact with each other: productivity, technology, products, inputs and costs, industry structure, demand conditions and links (Martin *et al.* 1991: 1458). The determinants of competitiveness affect the competitiveness of a firm not directly, but through these "drivers".

[25] For modifications of the Porter model, see e.g. Rugman and D'Cruz (1993), Cartwright (1993), Rugman and Verbeke (1998), Moon *et al.* (1998).

activities among firms in the industry in order to achieve economies of scale and scope (Cartwright 1993: 69), the existence of lobby groups (e.g. industry associations) in order to ensure sufficient bargaining power in domestic and foreign markets, or the existence of supporting and related industries, as suggested first by Porter (1990) and later supported by many other scholars.

The external determinants of competitiveness, which are outside the control of the industry, and which constitute a business environment for the industry, include factors determined by national governments (domestic and foreign), factors that are only partly controlled by governments (i.e. quasi-controllable factors, as they are referred to by Martin *et al.* (1991) and van Duren *et al.* (1994)), and factors that are uncontrollable.[26] The role of uncontrollable factors such as climate and endowment with natural resources has been recognized and extensively analysed in the literature, whereas their role is often considered in the context of comparative advantage (to give only a few examples: Balassa, Bauwens 1985; Lundquist, Olander 1999). In addition, the distance to the main (world) markets is an important competitiveness factor not controllable by the industry or the country, and this factor is especially relevant for the food processing industry given the potentially fast perishability of its products.

Quasi-controllable factors, on the other hand, consist of, for example, world market prices, exchange rate movements, which affect an industry's relative costs vis-à-vis its foreign counterparts, or the country of origin effect, which the country can partly influence with its innovation, education and export policy. Martin *et al.* (1991: 1457) consider input prices, demand conditions and the international trade environment as only indirectly controllable by governments (or firms).

Most of the previous studies on competitiveness have recognized the role of domestic as well as foreign policies in the development of the competitiveness of an industry. It is not only the internal resources and strategies of firms and the efficiency of the institutions that determine the competitiveness of the industry in domestic and foreign markets. Governments can, to a large extent, influence the development of the competitiveness of industries with their economic policy.

Governments can affect the competitiveness of an industry in two ways: directly and indirectly. Direct measures are implemented to regulate the business environment of a specific industry. Such measures include producer and consumer subsidies, price controls, taxes, the regulatory environment – which determines the rules and constraints that firms face (e.g. environmental, health and sanitary requirements), and can, thus, influence their competitiveness – and

[26] It must be noted that factors controlled by government that co-determine the competitiveness of an industry may not be completely out of the control of an industry. Namely, given sufficiently strong producer associations and lobby groups, an industry may be able to influence the decisions of politicians in forming an economic policy environment for the industry. In this way, overlap between the internal and external determinants of competitiveness is possible to a certain degree.

finally, trade policy – tariffs and quantitative restrictions and taxes – which is a special case of government regulations set on products crossing national borders (Abbott, Bredahl 1994: 25–26; Martin *et al.* 1991: 1456; Schiff, Valdes 1998).

The indirect impact of governments on the competitiveness of an industry stems from policies and measures, which are not specifically targeted on a given sector. Nevertheless, these can strongly influence the incentives for the industry (vis-à-vis other industries). These measures include policies concerning industrial protection, interest rates, exchange rates, and other fiscal and monetary policies (Stiff, Valdes 1998), R&D policies (Martin *et al.* 1991: 1456), marketing and distribution channels, which also encompass transport networks and economic ties with other countries, infrastructure and externalities, including public goods such as public works, education and utility regulation (Abbott, Bredahl 1994: 26).

Not all of the factors are of the same importance for food and agricultural products (although they matter for competitiveness). In the case of the food industry, government policies and regulations are particularly extensive given concerns about consumer and animal health. The following government policies have been found to mainly affect the competitiveness of the food processing industry: industrial, competition, trade, investment, R&D policies, and agricultural policy, which affects the prices of inputs (raw materials) into the food industry, and the location of production and trade (Traill 1998: 54–55). In addition, energy policy, taxation, and education and research policies are of high importance. In recent years, environmental policy has gained significantly in importance.

As noted above, it is not only the domestic government's policies that influence an industry; also foreign governments can affect the competitiveness of the industry, mainly via their trade policies. The influence of a foreign country's trade policy can differ depending on the value-added level of an industry or its products, as often the bureaucratic barriers to trade are higher in the case of high added value products compared to commodities (e.g. the EU preferential trade system with CEECs before accession favoured agricultural commodities as the bureaucracy related to the application of export/import licences for high value added products was more extensive than in the case of commodities). Especially for a small or less developed country, the role of the policies of foreign countries is often decisive as it determines potential access to export markets as well as the strength of competition from imports. For instance, the practice of tariff escalation by many developed countries implies that exports of high processed level food products by developing countries to the developed world are relatively more hindered than exports of low value-added raw products. This in turn impedes the long-run income growth and competitiveness of the agri-food industry in less developed countries.

Another example of the policy of a foreign country obstructing exports is the requirement by the EU that imports of processed foodstuffs comply with high hygiene and structural standards, which also affected food-processing industries in the new member states of the EU. Nevertheless, government regulations in

the form of strict product, safety and environmental standards are considered to promote competitive advantage by stimulating domestic demand and pressuring companies to improve the quality of their products and upgrade their technology (Porter 1990). Foreign trade removes constraints that limited domestic market demand might place on an industry's ability to expand production. However, an industry must have a stable export demand in order to expand domestic output and create or expand employment opportunities. Therefore, to be competitive, the products must be priced at more affordable prices on export markets relative to those of trading partners, but they must also meet international quality standards.

The output of the food processing industry varies greatly in the level of added value and distance from end-consumers. This implies that the importance of different determinants of competitiveness varies with the type of product, which makes it nearly impossible to select determinants that matter most for the whole food processing industry. Hence, the evaluation of the competitiveness of the food industry should take into account the stage of processing of the food products concerned. This view is supported by Abbott and Bredahl (1994: 26), who introduce the notion of "four economies of agriculture", distinguishing between four types of agricultural production, based on the degree of substitution among traded and non-traded inputs, the links between primary production and end-users, the relative importance of product versus process technology, and the resulting level of value added (Abbott, Bredahl 1994: 27):[27]

1) production of an undifferentiated primary commodity (which has no or only a limited link between production and end-user characteristics in final consumption);
2) production of differentiated primary products (with some link between production and end-use characteristics in final consumption);
3) conversion of primary products and commodities into semi-processed products;
4) conversion of primary and semi-processed products into processed products ready for end-consumption.

Following this taxonomy, the authors point out that in the case of undifferentiated primary commodities (and to a certain degree, in the case of differentiated primary products), factor endowments and natural resources, cost-reducing technologies, infrastructure, and trade policy are of high importance. In the case of consumption-ready products and semi-processed products, on the other hand, factors such as human capital, managerial expertise, quality-en-

[27] MacDonald and Lee (1994) similarly distinguish between four types of agricultural products and foodstuffs: bulk commodities, high-value unprocessed foods, semi-processed products and highly processed products. Bulk commodities are, for example, grains and oilseeds; raw materials include cotton and tobacco; high-value unprocessed foods include eggs, nuts, fresh fruits and vegetables; semi-processed products include flour, oilseed products, meats; highly processed products are, for example, prepared and preserved meats, dairy products, bakery products and prepared foods (MacDonald, Lee 1994: 197).

hancing technologies, firm structure, product characteristics and non-price factors such as maintenance and services, as well as various technical barriers to trade (such as product standards and sanitary regulations) are of greater importance (Abbott, Bredahl 1994: 28–29) (the ranking of the importance of individual factors according to Abbott and Bredahl is given in Appendix A.5). Although the authors do not explicitly emphasize the role of the policies of foreign governments, this aspect can also be included among factors such as trade policy and product standards and regulations.

Figure 1.4 summarizes the discussion of the determinants of an industry above, and places the various approaches of studies on competitiveness factors based on neoclassical economics, industrial organisation and strategic management, in the context of the food processing industry.

1.2.1.2. The "filter" model of the competitiveness of an industry

A portion of the measures implemented by governments can distort international trade. According to the WTO, "trade is distorted if prices are higher or lower than normal, and if quantities produced, bought and sold are also higher or lower than normal – i.e. than the levels that would usually exist in a competitive market" (WTO 2010). These measures include various trade restrictions to imports such as tariffs and quotas, export subsidies and other methods used to make exports artificially competitive, and domestic support that has a direct effect on production and trade by raising or guaranteeing prices and income for producers.[28]

Factors internal to an industry coupled with uncontrollable factors and factors controlled by governments that do not distort trade determine the potential of competitiveness, meaning a competitive advantage that makes the products of a national industry vis-à-vis foreign competitors more appealable to customers – either through their price advantage or quality – and that potentially helps the industry to increase its profits – either through its cost or productivity advantage or a superior technology. These measures can hence be called the "real" determinants of competitiveness.[29]

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[28] In WTO terms, government services such as research, disease control, infrastructure, food security, direct payments under environmental and regional assistance programmes are forms of government support which do not have a direct impact on production and trade, and are, hence, not trade distorting (WTO 2010).

[29] Similarly, Siggel (2001, 2003) distinguishes between two groups of factors: the "real" sources of competitiveness (which determine comparative advantage) and distortions in the prices of products and factors of production, which determine competitive advantage. These distortions are often policy-induced (e.g. subsidies, market price premia and exchange rate misalignments), and may either enhance or diminish competitiveness. According to Pitts and Lagnevik (1998), comparative advantage refers to whether a country can produce and sell products in domestic and foreign markets without government subsidies (Pitts, Lagnevik 1998: 3).

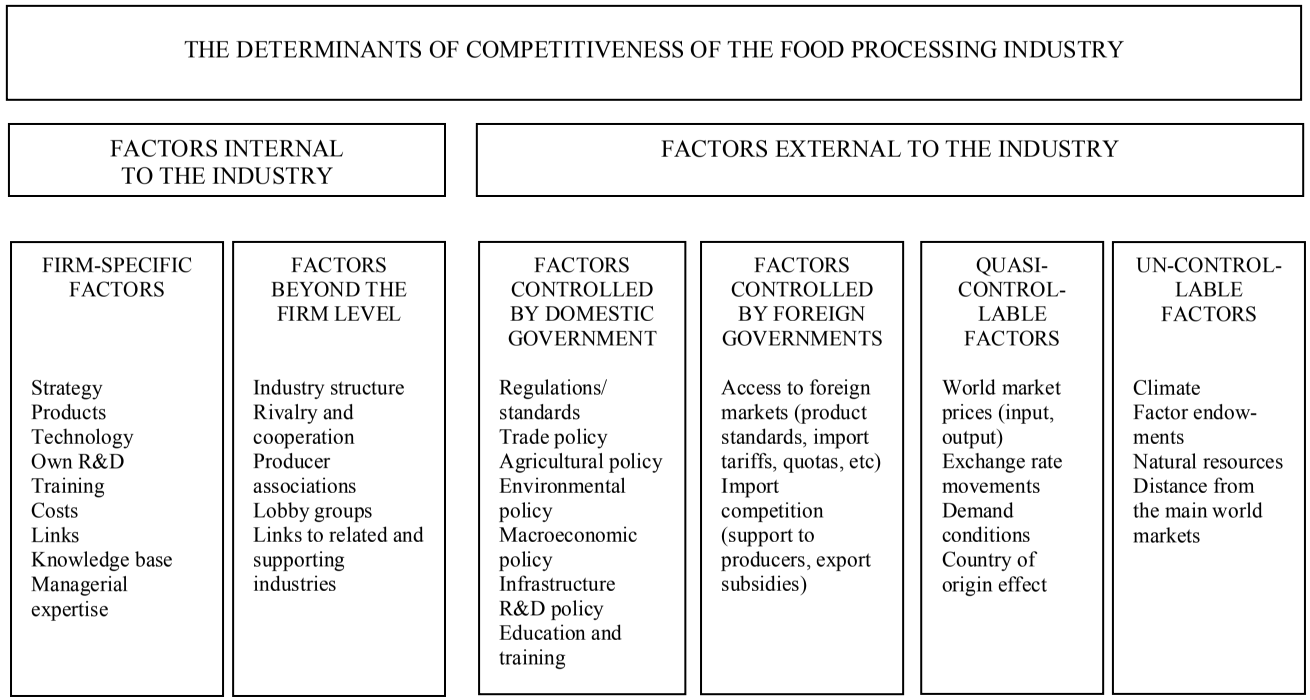

Figure 1.4. The system of the determinants of competitiveness in the food processing industry (author's figure based on Abbott, Bredahl 1994; Martin *et al.* 1991; Porter 1990; Rugman, Verbeke 1990; Schiff, Valdes 1998)

Trade-distortive public policy measures, on the other hand, constitute a "filter" which determines whether this competitiveness potential will materialise into an actual competitiveness performance or not (see Figure 1.5). In other words, government policies can help (or impede) transform competitive potential – which is itself based on "real" drivers of competitiveness such as relative cost level, productivity, technological progress – into actual competitiveness performance.

Figure 1.5. The "filter" model of competitiveness (author's figure)

In particular, governments' choice of foreign trade policy can have a significant impact on an industry's competitiveness in domestic and export markets. For example, a country may possess strong competitiveness potential due to its cost and technological advantage, but if foreign countries protect their domestic markets with extensive trade barriers, this potential may not materialise as actual competitiveness performance. Similarly, if a domestic government does not use any counter-balancing measures to protect its domestic market from subsidised imports, this can impede the domestic industry from realising its competitiveness potential on the domestic market. On the other hand, an industry that does not possess any significant competitiveness potential may gain foreign markets with the help of export subsidies, even though this raises the question of whether this competitiveness is sustainable over the long term. These examples show the direct effect of policies on the competitiveness of an industry.

However, the same policies can have an indirect effect on the competitiveness of an industry via affecting the incentives of firms belonging to the industry. For example, Ezeala-Harrison (1999) discusses the role of alternative trade policies for the international competitiveness of firms. The author differentiates between three types of strategic trade policies, which are called inner-orientation (import substitution), outer-orientation (export substitution) and inner-outer orientation (regional integration) trade policies. The author shows that an import substitution trade policy that includes the taxation of imports with tariffs contradicts the achievement of international competitiveness since

the country's products would have a greater import-competing ability with foreign products on the domestic market. Tariffs raise the prices of imports, which lessens the incentive of import-competing industries to achieve greater efficiency of operation. Furthermore, the inner-orientation policy would most probably lead to retaliations from trading partners and hence impair export possibilities. Instead, "a domestic firm must be exposed to import competition to enable it to develop a necessary comparative advantage" (Ezeala-Harrison 1999: 143). This aspect can be carried over to industry level – an industry must be exposed to import competition in order to become more competitive. Ezeala-Harrison (1999: 144) concludes that the best trade policy for a country, in order to gain and maintain international competitiveness, is the policy of open and unrestricted international trade.

This shows that a trade policy measure, which direct effect on the competitiveness of an industry is positive, can have a negative indirect effect on the competitiveness via changes in the incentives of firms belonging to the industry, and vice versa. Other examples of policies impeding competitiveness emphasized in economic literature are protective measures and government subsidies to some economic sectors, which lead to social costs and market distortions (Hyvönen, Kola 1998: 258).

Furthermore, government subsidies, import tariffs and other restrictions can, although artificially, raise a domestic industry's short-term profitability. Higher profitability, in turn, indicates higher competitiveness. This shows the controversial nature of the impact of trade policy on competitiveness measured in terms of profitability. Still, in the long run, exposure to import competition and the concurrent increase in efficiency can outweigh the short-run positive impact of import barriers on profitability.

On the other hand, if a country is applying unilateral free trade, while its domestic industry is faced with tariffs and other trade barriers on its exports to partner countries, it liberally sets its industry in a worse situation than its counterparts abroad. Furthermore, the situation is worsened if the trade partners support their industries while the domestic government does not intervene. Hence, trade policy should not be passive; it should seek to open new markets in other countries and address emerging industries and possible problems. According to Porter (1990), when domestic exporters are faced with trade barriers in another country, the government should strive to dismantle the barriers rather than regulate imports or exports. Yet, this strategy may be more suitable for a large high-income country with high negotiation power in international affairs. A small country, however, may not be able to influence political decisions in other countries, and then the country should rather adopt countermeasures to protect national industries against unfair competition.

As discussed above, the competitiveness of an industry is also reflected in its ability to adapt to the changing economic and political environment, which can foster its ability to gain product markets, and consequently, earn profits. An example of a changing environment, which can alter the determinants of competitiveness, is the integration of a country into an economic union, such as acces-

sion to the Single Market of the EU. This aspect is touched upon in the next Chapter.

1.2.2. Economic integration as a determinant of the international competitiveness of an industry

1.2.2.1. The role of economic integration within the framework of the "filter" model of the competitiveness of an industry

When a country participates in economic agreements and trade blocks with other countries this is a special case of a government policy affecting an industry's competitiveness. These can include the formation of free trade agreements, customs unions and common markets.[30]

The emergence of regional trade blocks, and especially the creation of the European Economic Community in 1958 and its subsequent deepening and enlargement have motivated a large amount of theoretical as well as empirical studies dealing with the economic effects of regional economic integration for participant countries as well as for the rest of the world.[31] The creation of the Single European Market (SEM) has significantly contributed to our understanding of the impact of economic integration on the competitiveness of economic sectors. The aim of the SEM was to create a large market where firms could take advantage of economies-of-scale, grow in efficiency and gain competitiveness vis-à-vis competitors outside the single market (Traill 1996: 63).

There is a large number of studies dealing with the potential and actual economic effects of the removal of the remaining trade barriers on trade between EU member countries (e.g. Baldwin *et al.* 1997; Corado, de Melo 1985 and 1986; Hine 1989; Sapir 1992; European Commission 1996).[32] In the

[30] A free trade agreement refers to a situation where the partners dismantle all visible barriers on trade between them, but countries continue to apply individual trade policies vis-à-vis third countries outside the free trade agreement. A customs union includes, in addition to the abolition of trade barriers between member countries, the implementation of a common trade policy towards third countries. A common (single) market can be considered the highest form of trade integration, also including the abolition of "invisible" trade barriers between member countries, which go beyond the traditional trade barriers such as tariffs and quantitative restrictions.

[31] The theory of regional economic integration can be considered as developed in three separate phases. The first phase in the 1950s and 60s was based on traditional customs theory, assuming perfect competition and homogeneous goods (the main contributors: Viner, Meade, Johnson). The second phase in the late 1970s and early 80s introduced imperfect competition, economies-of-scale and heterogeneous products into the analysis (Krugman, Dixit and Norman, Lancaster)(see e.g., Krugman 1979). The third phase (in the late 1980s) focused on the dynamics of the effects of integration on investment and growth (Romer, Lucas).

[32] Trade barriers can be grouped into five categories: 1) tariffs, 2) quantitative restrictions (quotas), 3) cost-increasing barriers, 4) market-entry restrictions, 5) market-distorting subsidies and practices (Emerson *et al.* 1988: 21). Tariffs and quotas are

following, the impact of economic integration on the competitiveness of an industry is analysed from the point of view of a small country (respectively to the situation in Estonia), which is joining a common market with, on the one hand, countries of a higher level of development (EU-15), and, on the other hand, with large countries of the same level of development (the Central and Eastern European countries, CEECs).[33]

The impact of regional economic integration on the competitiveness of an industry within a country can be considered from two different aspects of integration: the abolition of trade barriers as a result of economic integration, and the implementation of common rules and policies that apply to everyone within the territory of the regional integration agreement (e.g. an industrial policy, a common trade policy towards third countries, etc.).[34] The former effect results in an opening up of markets in partner countries belonging to the regional agreement, but also in an opening up of the domestic market to competitors from partner countries. The latter, on the other hand, potentially includes changes in policies directly applicable to the industry, and/or in policies that regulate the overall economy. The impact of introducing new common policies can be directly considered as a change in government policies affecting competitiveness (see sub-section 1.2.1), while the aspect of market opening via the abolition of trade barriers is a subject of the theory of regional economic integration.[35]

Within the framework of the "filter" model of competitiveness, dismantling trade barriers implies direct changes to the "filter" while the aspect of introducing new policies may result in both changes to policies that distort trade – and hence, belong under the "filter" – as well as policies that do not distort trade and impact the industry's competitiveness via "real" determinants of competitiveness (see Figure 1.6).

Both of these aspects influence the environment the industry operates within directly by enhancing or impeding its costs and prices and, hence, its ability to

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traditional trade barriers; while the latter three groups of barriers usually stem from government regulations and are considered invisible barriers since they do not directly restrict trade, however, hinder it with excessive and obscure requirements. Together with quotas, they constitute non-tariff barriers (NTBs).

[33] Even though EU enlargement in 2004 also included Latvia, Lithuania and Slovenia, which are countries of a relatively similar size to Estonia, and Cyprus and Malta, which are relatively smaller countries, the aspect of forming an economic union with countries of similar size and level of development is not considered here. As regards Latvia and Lithuania, the accession to the EU did not result in significant changes in the trade regime vis-à-vis these countries due to the existence of the Baltic Free Trade Agreement prior to accession to the EU.

[34] Hansen and Nielsen (1997) call these aspects of integration negative and positive integration, respectively.

[35] Some of the most prominent works in the area of regional economic integration stem from Viner (1950), Meade (1955), Lipsey (1957), Johnson (1965), Winters (1987), Baldwin and Venables (1995), and many others.

earn, and can be considered the determinants of competitiveness external to the industry. However, the opening up of markets and changes in government policies can also influence the incentives of firms within the industry (e.g. to lower costs, to raise productivity, to innovate), and so contributing to the competitiveness of the industry. Hence, regional integration can also affect the determinants of competitiveness internal to the industry, although this effect might not occur immediately, as opposed to integration-led changes in the external determinants of competitiveness.

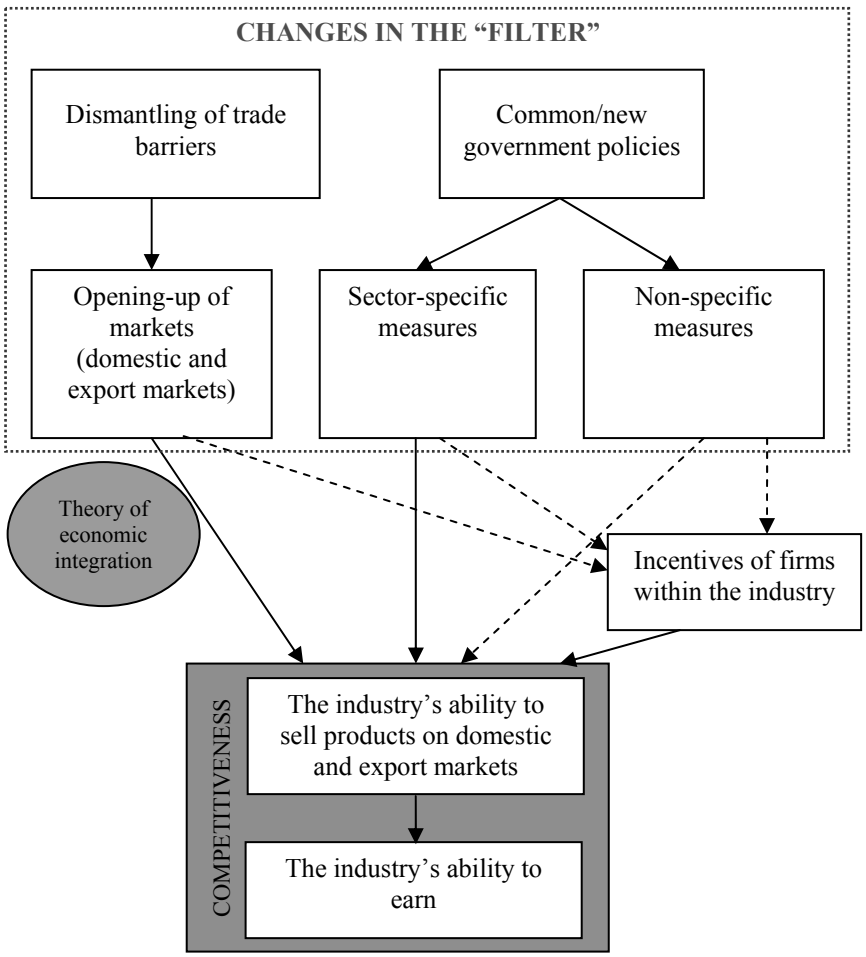

Figure 1.6. The main channels of the impact of regional integration on the competitiveness of an industry within the framework of the "filter" model of competitiveness (author's figure)
Note: Dashed arrows refer to an indirect effect as opposed to a direct effect.

To summarize, accession to a regional trade block influences an industry therefore via two channels: the direct change in the competitive environment, and the change in the incentives of firms belonging to the industry. In terms of the above-introduced "filter" model of competitiveness, this means that regional economic integration directly affects the "filter" (i.e. government policies that influence the relative price of trade) through which competitive potential will be transformed into competitiveness (performance), while it also indirectly influences the competitiveness through its impact on the "real" determinants of competitiveness potential (see Figure 1.7). These two processes are discussed more thoroughly in the following sub-section.

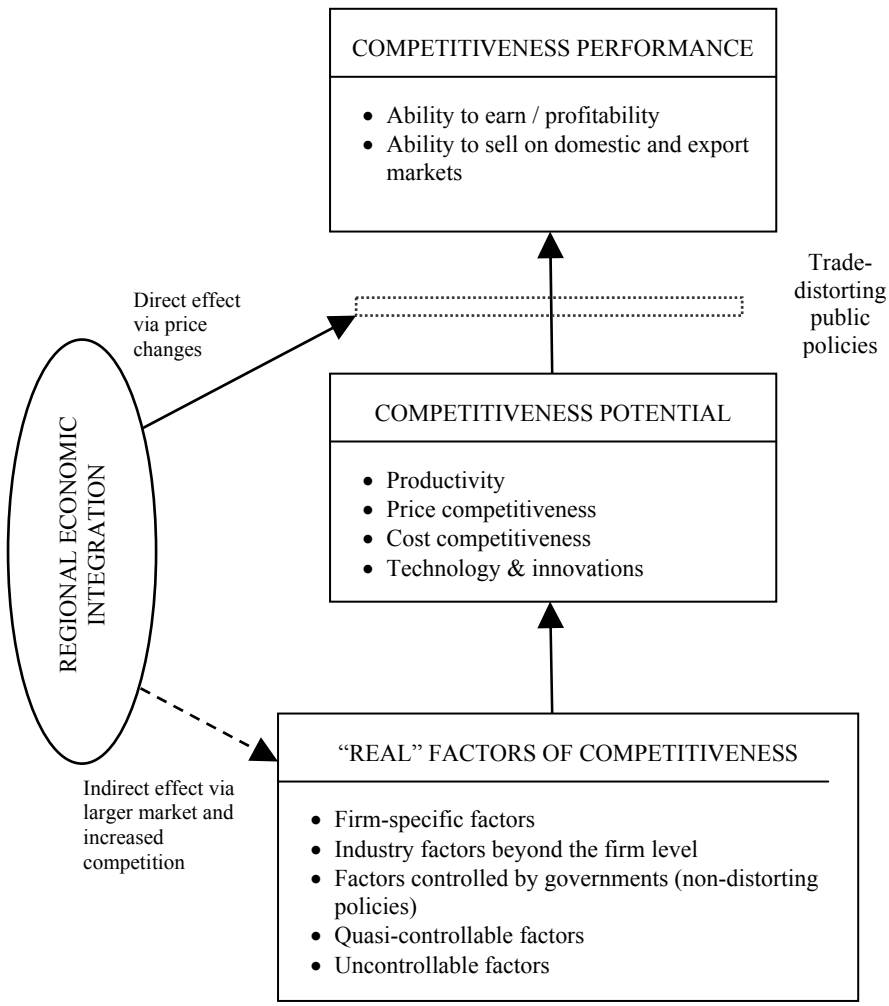

Figure 1.7. Regional economic integration within the framework of the "filter" model of competitiveness (author's figure)

1.2.2.2. The mechanism of economic integration as a determinant of competitiveness

The completion of the internal market and the accompanying removal of tariffs and non-tariff barriers (NTBs) can have significant effects on the competitiveness of an industry, both in the short term and in the long term. In analysing the impact of removing trade barriers, the literature on regional economic integration mainly distinguishes between three types of effects (Allen *et al.* 1998: 442; Emerson *et al.* 1988: 28; European Commission 1996: 59):[36]

1. The direct economic effect of removing or lowering trade barriers is the change in the prices of traded goods (and consequently, in the patterns of production and trade). This effect occurs in the short term.
2. The indirect effects on efficiency and costs, which stem from the increased competition and market enlargement due to the removal of market barriers. These can be especially important in sectors where many countries produce the same products and where home markets are initially poorly competitive.[37]
3. The long-run effects which result from the positive impact of enhanced competition and market size on innovation and technological progress (also called dynamic effects).

Within the framework of the "filter" model of competitiveness, the first effect therefore refers to changes in the "filter" while the latter two are related to changes in firms' incentives, and therefore, the "real" factors of competitiveness.

The interconnections between the above-mentioned effects are illustrated in Figure 1.8, based on the study by Emerson *et al.* (1988).[38] The removal of tariffs and NTBs leads directly to lower initial costs of production, exports and imports (e.g. due to the removal of bureaucratic obstacles to imports, the use of less expensive intermediate inputs, or a reduction in packaging and labelling costs), which pass to lower prices. At the same time, further effects from the removal of barriers occur simultaneously through two channels – larger market size and increased competition – which both influence the incentives of firms within the industry.[39]

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[36] These studies considered the removal of NTBs within the framework of the completion of the Single Market Program of the EU.

[37] Catinat (1988: 344–345) calls the effects related to the improvement in the efficiency as "supply-side effects". He also stresses the role of economic integration as an engine for more efficient allocation of resources, and factor mobility as a result of specialization in line with traditional international trade theory based on comparative advantage. However, given the fact that this thesis only deals with the competitiveness in product markets, this aspect of integration is neglected here.

[38] Even though the author considered these effects originally within the framework of the reduction of NTBs, the same effects also apply in the case of tariffs.

[39] Allen *et al.* (1998) call the effects that arise from the intensified competitive pressure from imports as a result of the abolition of trade barriers "supply-response effects", reflecting the impact of increased competition on the incentives of domestic producers.

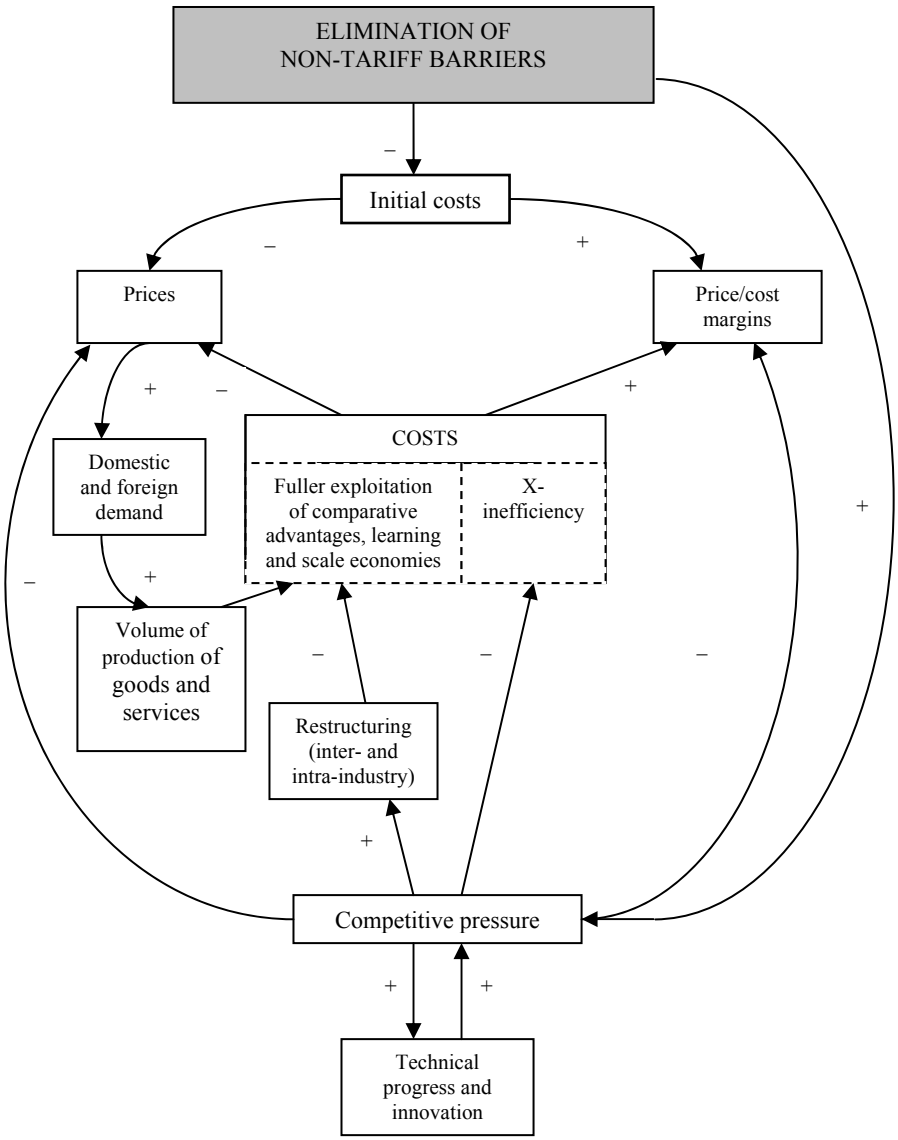

Figure 1.8. Integration and the effects of the size of markets (Source: Emerson *et al.* 1988: 125)
Note: The sign "+" indicates an increase and the sign "–" indicates a decrease.

The direct effect of economic integration

The direct effect of integration – via change in the prices of traded goods as a result of removing or lowering trade barriers – covers both better access to the domestic market for competitors as well as an opening up of export markets for the domestic industry, whereas the latter is of a particular importance for a small

country with relatively low income levels. If a country joins a trade block with another country of higher developmental level, and this results in higher export possibilities for the partner country, the domestic industry can earn higher profits on sales just because the price level in the partner country is higher than in the domestic market (reflecting higher incomes), or the demand in the export market is focused on products of higher value added (or quality), which are related to higher price levels. This occurs without any rationalisation of the production process and can be called an income effect, given the impact of pure price changes.

In the case of the food industry, joining an economic union does not necessarily mean a (significant) geographical enlargement of export sales. This is because of the short shelf life of food products, which determines potential export markets. This aspect is especially important in the case of high value added products directed towards end-consumers, which secure higher income for the producers.[40]

The effect of a larger market

The initial reduction in prices and costs leads to higher domestic and foreign demand, and hence, enhances the volume of goods produced, allowing for a better exploitation of economies of scale, scope and learning, and hence, lowering the average cost of production (Emerson *et al.* 1988: 123–124). [41] Facilitating access to the markets of partner countries enables firms to take advantage of economies-of-scale especially in the case of small countries, where the small domestic market has been hindering efficiency improvements.

Enlargement of the market is often accompanied by firms increasing investments in production runs or firm size, price "wars" by reducing production costs, and eliminating the least productive firms which can no longer cover their costs at market prices (Catinat 1988: 346). Of course such a price war can have significant negative effects, putting pressure on profits and undermining the ability and willingness to invest. However, as a result of the better exploitation of economies-of-scale, firms should become more efficient and gain market share both within the regional integration area as well as on external markets (Sachwald 1994: 6).[42]

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[40] To a certain extent it is possible to extend geographical distances by extending the shelf-life of products with the help of preservatives, but this may reduce the competitiveness of the product in the eyes of consumers.

[41] Economies of scale refers to the increased efficiency associated with increasing (or decreasing) the scale of production, while economies of scope is associated with improvements in efficiency due to increasing (or decreasing) the scope of the marketing and distribution of different types of products. Economies of learning, on the other hand, characterize the fact that producers learn from experience, which results in improved efficiency.

[42] The experience of 15 years that followed the creation of the European Common Market allows Owen (1983) to conclude that the firms that were most productive at the time when barriers to trade were dismantled, maintained their initial advantages also after the creation of the Common Market (Owen 1983; via Catinat 1988: 346).

In addition to the enlargement of export markets, intensified imports can also induce scale effects. When domestic firms are faced with intensified competition from imports, they may seek to invest in larger and more efficient production units. Production units that are too small and inefficient are eliminated due to increased competition. However, Emerson *et al.* (1988: 143) conclude from studies carried out on the impact of European integration on various (older) member states that the explanatory power of exports on the size of production units is systematically greater and more significant than that of imports.

The effect of economies of scale is not equally important in all industries. For most of the branches in the food industry, economies of scale are not of high importance due to the high transportation costs relative to the unit value of a product (European Commission 1996: 50; Traill 1996: 63). Nevertheless, market integration can have an effect on plant size in the food industry through a more general rationalisation of production structures and external expansion of firms in the form of mergers and buy-offs, joint ventures and other alliances. Emerson *et al.* (1988: 135) also claim that a wider geographical market can encourage the creation of multi-plant firms in industries where transport costs are high and which will undergo considerable restructuring in the form of mergers, joint ventures, and so on, affecting non-technical economies of scale (not directly related to production costs, but to marketing, R&D, management, financing, etc.).

Furthermore, the scale (i.e. the size of a firm or a plant) is not always crucial. First, there can be other sources of inefficiency not related to the suboptimal size of a firm (or a plant). Second, higher-quality niche products are mostly produced by smaller plants at higher costs, indicating that the average firm size is not an ideal indicator of the performance of the food industry. In addition, integration will not immediately lead to the full exploitation of economies of scale. To fully exploit economies of scale takes time and requires adjustments in the allocation of resources (Emerson *et al.* 1988: 132).

The increase in competition

The effects of integration are not limited to the better exploitation of economies of scale. The removal of trade barriers limits the cost of entering the markets of member states, and therefore encourages free competition. This phenomenon is commonly known as the "competition effect", reflecting the strengthening of competition or weakening of monopoly power.[43] Baldwin and Venables (1995: 1611) call this effect the "pro-competitive effect", stressing the fact that not only actual, but also potential competition can enhance efficiency. Levinsohn (1993) calls this effect "imports-as-market-discipline", as it refers to how domestic industries, which may have reaped oligopoly profits in a protected domestic market, are forced to behave more competitively when faced with

[43] It does, however, not mean that integration will bring about perfect competition (Emerson *et al.* 1988: 145).

intensified competition from imports.[44] Therefore, potential competition, or freedom of market entry, can also induce efficiency gains.

There are many authors who stress the importance of productivity in determining competitiveness.[45] Since productivity relates output to inputs (defined as the level of output per unit of input used), it represents a measure of efficiency with which the factors of production are used (Felipe 1999: 4). Productivity growth in an industry can be achieved by reducing inefficiency within the industry. If the sector is inefficient, it means that it is using more resources and production factors than required by a particular technology in order to achieve a given level of output, or that with a given level of resources and factor inputs, the industry is producing less output than would be feasible.

There are many approaches to measuring efficiency. Many scholars (e.g. Van Duren *et al.* 1994: 53) suggest using labour productivity as a measure of efficiency. Labour productivity is related to the most important production factor, and it is relatively easy to measure. However, labour productivity only indicates the partial productivity of labour, and reflects how efficiently labour is combined with other factors of production (such as capital and intermediate goods) rather than measuring the change in technical efficiency (OECD 2001: 15). This can give misleading results about productivity as labour can be substituted by other inputs, such as capital. As a measure of efficiency, total factor productivity (TFP), which takes into account all factors of production, has found more support in economic literature (e.g. Lee, Tang 2000). TFP refers to the factors other than accumulation in capital and labour, not explicitly accounted for in the production function, but which contribute to the generation of output (such as education, managerial capabilities, organisational competence, R&D, increasing returns to scale, embodied technical progress, diffusion of technology, factors of sub-structural rigidities associated with the patterns of ownership or the labour market, unequal access to information among firms, etc.) (Felipe 1999: 6–7; Barros 2002: 316). Since outputs and inputs are measured in different units, the TFP index rather than its level is normally used (Boame, Obeng 2005: 105).[46]

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[44] Intensified competition from imports, however, means that the domestic firms (and hence, the domestic industry), can lose its domestic market share (while gaining market share in export markets).

[45] However, it is important to stress the difference between productivity and competitiveness. Productivity is a measure of the average level of output per unit of resource employed, and hence is associated with the internal capability of an industry. Competitiveness, on the other hand, is the relative standing of the industry relative to its competitors and trading partners (Ezeala-Harrison 1999: 60). What matters for an industry's competitiveness is the relative competitive position in the international market, not just the absolute amount of productivity (Cho, Moon 1998).

[46] In the economic literature, there are three main approaches to measuring the TFP (or efficiency) of an industry: 1) growth accounting/index-based measures (e.g. Islam *et al.* 2005; Moomaw, Williams 1991); econometric approaches (e.g. Beeson 1987; Harris, Trainor 2005); and 3) a distance function/production frontier methodology, which can

The increase in competition forces firms to eliminate X-inefficiency, which, in turn, leads to lower unit costs.[47] Enhanced competition creates an optimal industry structure because low-performing companies disappear and the survivors obtain larger market shares (Viaene, Gellynck 1999: 128).[48] This implies that concentration should increase, which is in turn associated with economies of scale and high productivity, and hence, higher profits.

However, high profits in the case of high concentration can reflect both higher productivity as well as higher prices as a result of monopolistic competition. Thus, the increase in competition should also ensure that cost reduction passes on to consumer prices. This is expected to be reflected in a fall in price-cost margins, which is especially pronounced in sectors previously with monopoly power. However, price-cost margins can be considered as a measure of an industry's profitability, and thus, intensified competition would rather impede the competitiveness of an industry on the domestic market. Nevertheless, better export opportunities, improved efficiency due to scale effects and dynamic effects can increase an industry's competitiveness on export markets.

The outcome of a trade policy change on productivity can differ across industries and depending on the size of a firm or plant. For example, Fernandes (2007) has demonstrated using data on Colombian manufacturing plants that the impact of trade liberalization is stronger for plants in less competitive industries and for larger plants. The trade liberalization effect on plant productivity mainly relates to increased imports of intermediate inputs, skill intensity and machinery investments, in addition to output reallocations from less to more productive plants (Fernandes 2007: 54). Similarly, Pavcnik (2002: 252) attributes industry-level improvements in productivity as a result of trade liberalization to improvements in productivity within plants, the exit of less efficient plants, or to a reshuffling of output and resources from less to more productive plants. Her study of Chilean manufacturing firms during the period 1979–1986 shows that trade liberalization improves productivity in import-competing sectors relative

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be further decomposed into parametric (e.g. Boame, Obeng 2005; Brasili, Maccarini 2003; Bjurek, Durevall 2000; Curtiss 2002; Hailu, Veeman 2003; Jayanthi *et al.* 1999; Zawaliñska 2004) and non-parametric approaches (e.g., Brasili, Maccarini 2003; Coelli *et al.* 2005; Coelli, Rao 2005; Cricelli *et al.* 2002; Mitra 2000; Salim 2003).

[47] X-inefficiency refers to a firm's internal efficiency, not directly related to the production process, and comprises inefficient staff, obsolete equipment, excessive expenditure, etc, and is mostly related to the existence of monopolistic structures (see Catinat 1988: 348).

[48] Müller and Owen (1985: 178) argue that there are two dimensions that need to be taken into account when assessing the benefits of trade and economic integration on a country: 1) the reallocation of production resources away from industries which the country had comparative disadvantage in towards industries the country possesses comparative advantage in; 2) the reallocation of resources within industries, away from smaller, less efficient plants towards larger, more efficient plants. In the analysis of the competitiveness of an industry, the latter aspect is of more interest; while the former aspect is more related to the concept of competitiveness at country level.

to plants in the non-traded goods sector, while plants in the export sector did not experience any improvements in relative productivity after the trade liberalization (Pavcnik 2002: 264).[49] This result can reflect the fact that the productivity level was high in the export sector compared to the non-export sector already before the trade liberalization, and the trade policy shock in the export sector was not as remarkable as in the import-competing sector.

Yet, theoretical trade literature also predicts that if trade liberalization reduces the market share of domestic producers in the domestic market without expanding their export possibilities, the fall in trade protection can also reduce producers' incentives to invest in improved technology and efficiency (Pavcnik 2002: 245–246). Hence, the sources of efficiency gains are not ensured by nor limited to the increased competitive pressure from imports. Theoretical as well as empirical literature suggests that firms that enter export markets gain new knowledge and expertise, which in turn leads to improvements in their efficiency and productivity; a phenomenon called "learning-by-exporting" (De Loecker, 2007: 70).[50] Hence, expanding export opportunities due to regional integration can also give rise to efficiency gains within an industry. The scope for improvements in efficiency (as well as quality of products) is expected to be especially significant in the case of a country joining an economic union with countries of relatively higher development and income level (De Loecker 2007: 83).

However, the positive correlation between exports and the productivity of a firm can be related to a potential selection bias. This means that more productive firms are more likely to engage in export activities and be able to compete in international markets (De Loecker 2007: 70). Furthermore, the selection bias is probably especially relevant in the case of emerging economies, where the exit and entry rates of firms are relatively high, and unproductive firms are more likely to exit the market and be replaced by new more productive firms (De Loecker 2007: 71).

Empirical research largely confirms the relationship between market structures and price margins. The extent of the price-cost margin depends on many factors, including the degree of concentration in an industry, the extent of economies of scale in the industry, a firm's perceived elasticity of demand for their products, and the nature of competitive interaction among firms (Allen *et al.* 1998: 447). Economic integration and an increase in the degree of competition, as a result of the opening up of the markets to foreign competitors, can affect each of these factors, and thus, change the price-cost margins as well as the number and the size of firms in the industry.[51] There is broad evidence that

[49] Plants belonging to an industry (based on four-digit ISIC classification) with the ratio of imports to the total domestic output of that industry that exceeded 15% were classified as import-competing. Plants in an industry with exports exceeding 15% of its total output were defined as export-oriented. The rest of the plants belonged to the non-traded goods sector (Pavcnik 2002: 256).

[50] See the sources cited in De Loecker (2007) for further references.

[51] Several studies on the efficiency and competition effects of the creation of the European Internal Market also concentrate on mergers and acquisitions (e.g. European Commission 1996).

the gap between prices and unit costs are positively related to the degree of concentration in an industry, the market shares of firms, the height of barriers to entry and the degree of product differentiation (Emerson *et al.* 1988: 155–156). Competition, on the other hand, represented by the import ratio, has a negative effect on price-cost margins; Jacquemin (1982) has shown that the greater the degree of concentration in the domestic industry, the greater the effect imports have on price margins.

Field and Pagoulatos (1996), on the other hand, have found that imports can also have a positive impact on price-cost margins. They relate this finding to intra-firm imports and a potential collusion between domestic and foreign producers, which outweighs the competition-intensifying role of imports (Field, Pagoulatos 1996: 195). However, their analysis was based on 43 US manufacturing industries during 1972–1987, which means that the results found in the case of a large country may not be automatically generalised for a small country.

The dynamic effects of economic integration

Increased competition has non-price effects, encouraging firms to improve their organisational structure and the quality of their products and implement product and process innovations, which all enhance their competitiveness. In the face of decreasing prices, firms are forced to innovate, or exit the industry. This latter effect is especially relevant in the long run, and is also referred to as a "dynamic effect" of economic integration (Emerson *et al.* 1988: 123–124, 157). This effect clearly emphasizes the importance of increased competition in inducing continuous dynamism in the behaviour of firms, as opposed to effects which only have a static impact (e.g. the removal of trade barriers reduces production costs once and for all) (Catinat 1988: 349).

Similarly, the opening up of export markets can also induce dynamic effects. Uchida and Cook (2005: 271) emphasize the crucial role of exposure to international markets and the resulting competitive pressure in facilitating technological development. This means that improved export possibilities also force firms to innovate in order to maintain and gain market shares in export markets. The impact of innovations and improvements in the quality and attractiveness of products to consumers on the competitiveness of an industry is straightforward, as it also makes it possible to maintain or increase the level of profits in the industry (i.e. price-cost margins) under the conditions of increased market penetration via imports. However, maintaining (or increasing) profitability requires that the domestic industry innovates constantly.

The effects of regional economic integration on the competitiveness of an industry

The effects of entering a regional integration agreement in domestic and export markets are summarized in Figure 1.9. Economic integration and the concurrent opening up of markets are expected to enhance the export competitiveness of an industry; however, the results for competitiveness on the domestic market are ambiguous. Intensified competition from imports has two facets for a domestic

industry. On the one hand, intensified competition from imports leads to an improvement in efficiency and innovations, which enhances competitiveness (the approach by Emerson *et al.* 1988, and European Commission, 1996). This effect is positive both for producers as well as from the macroeconomic perspective. On the other hand, however, domestic producers may, at least in the short run, face a negative effect of integration, as the intensified competition means lower domestic market shares and hence, lower profits (on domestic sales) for them. The producers who cannot cope with increased competition may go bankrupt. Although the overall economic efficiency in an industry increases, the closing-down of some of the companies can inevitably cause socio-economic problems in the form of unemployment. Nevertheless, if the abolition of import barriers and the accompanying decline in prices leads to lower costs of imported intermediates, this has a positive impact on the industry's competitiveness.

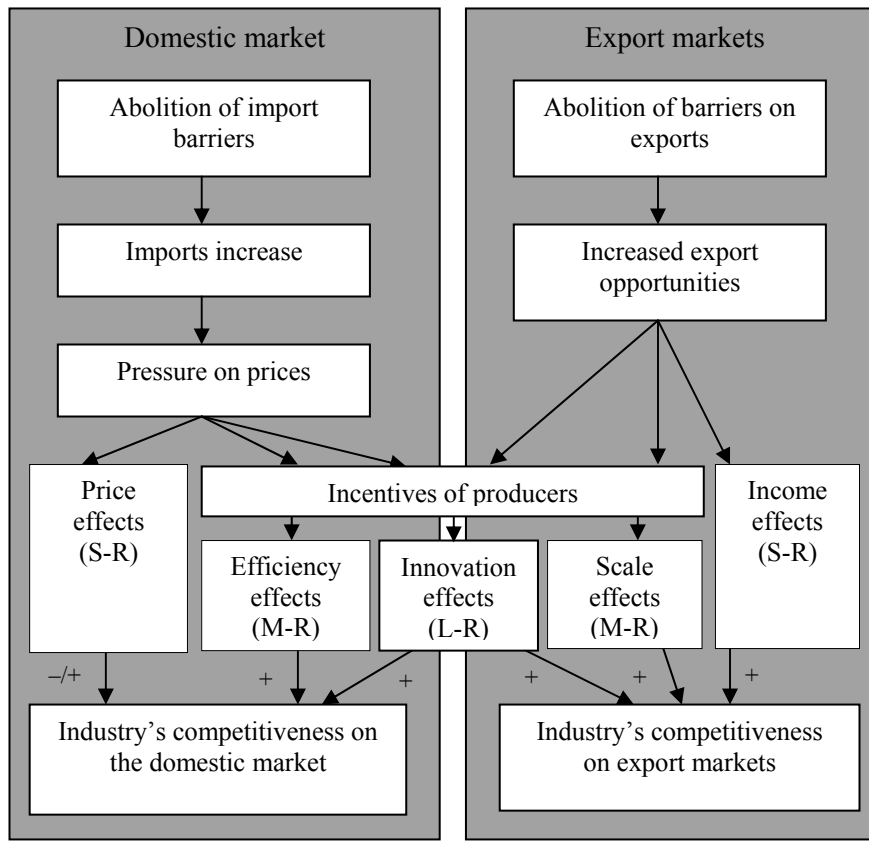

Figure 1.9. The impact of regional economic integration and the opening up of domestic and export markets on the competitiveness of an industry (author's figure)

Table 1.3 shows how the individual integration effects affect the components of the competitiveness of an industry. Price effects occur as a removal of trade barriers directly changes the prices of tradables, and through the changes in the prices of intermediate goods, they also affect the industry's cost level. Similarly, income effects influence the prices an industry sells its production at, but here the price changes occur through the opening up of markets with potentially higher price levels that were closed to the industry before. Efficiency and scale effects directly affect an industry's costs, and finally, innovation effects directly affect the quality (including novelty and other non-price aspects of products) of an industry's production and possibly also its costs if the innovation occurs in production processes. In addition, innovation effects can also change the prices the industry can charge for its production as the consumers may be willing to pay more for products of higher quality.

Table 1.3. The impact of integration effects on the different components of the competitiveness of an industry

	Ability to sell		Ability to earn	
	Price	Quality	Price	Costs
Price effects (domestic market)	X		X	X
Income effects (export possibil.)	X		X	
Efficiency effects				X
Scale effects				X
Dynamic effects	(X)	X	(X)	X

Source: author's table

The scope of different integration effects can differ depending on the characteristics of the industry as well as on the country under consideration. Also, the size of the country matters. On the one hand, industries in a small country benefit relatively more from integration and the accompanying reduction in trade costs than industries in a large country, since usually a larger share of their output is exported. Hence, the impact of removing market barriers also affects a larger proportion of their production. On the other hand, industries in a small country can also "suffer" more from increased competition from imports, since there are relatively many firms in a large economy which all increase their exports to the small country (Baldwin, Venables 1995: 1618).

Table 1.4 identifies the importance of integration effects emphasized in the literature for a small country depending on whether it is forming a common market with countries of a higher level of development, or with countries of a similar level of development, but relatively larger market size.

The impact of regional integration on the competitiveness of an industry can, however, differ across countries depending on their initial conditions and their relative distance from the (main) consumer markets. If joining an economic

union implies the creation or adoption of new common policies that makes the country's industry more open to imports from third countries, and consequently, increases efficiency through changes in firms' incentives, then its competitiveness vis-à-vis the third countries is rather expected to advance over the long term. However, in the short term, a loss in domestic market share due to increased imports can lead to a loss in profitability, and hence, competitiveness.

On the other hand, if the country was perfectly open to trade already before joining the economic union, the competition from imports is not expected to intensify much, and hence, the competition and innovation effects of integration are also expected to be small. If, however, the export possibilities were relatively limited before the integration, improved export opportunities may increase producers' incentives to innovate. In addition, income effects and scale effects can be considerable.

Table 1.4. The importance of integration effects on the competitiveness of an industry in a small country

Integration effects	A small country joining an economic union with…	
	…countries of higher development level	…large countries of similar development level
Price effect (domestic market)	Importance depends positively on the initial level of market barriers	Importance depends positively on the initial level of market barriers
Income effect (export markets)	Very important as the price level in the highly developed country is usually higher / Very important if able to sell higher value added products	Less important if price levels in the countries are similar; however, income effect might be very important in terms of export volume
Competition effect (efficiency)	Competition might be especially relevant in terms of product quality	Competition might be especially relevant in terms of prices/costs (pressure on price-cost margins)
Scale effect	Less important if the export markets are small and mature	Very important, especially if the export markets are not mature
Dynamic effects	Very important	Important

Source: author's table

Also, the distance from the main markets matters for the industry's competitiveness.[52] As trade barriers become lower after the abolition of border barriers, transportation costs become relatively more important in the production and

[52] This aspect is especially relevant in the case of Estonia, which can, due to its geographical location, be considered as a peripheral country. The aspects of competitiveness of a peripheral country have been studied, for example, by O'Donnell (1997).

marketing of goods. Countries whose firms have access to larger/nearer markets gain the advantage of lower marketing costs (Ezeala-Harrison 1999: 149). This aspect emphasizes that different countries can experience very different outcomes of regional integration.

Proceeding from the above-mentioned effects, economic integration and the accompanying removal of market barriers can thus influence the competitiveness of an industry in a small country in the following ways:

1. Increased opportunities to gain export markets due to reduced trade costs as a result of the removal of trade barriers and opening up of foreign markets, thus increasing the industry's competitiveness on foreign markets. Earning extra profits from sales abroad is especially probable in the case of export markets in countries with higher income levels, and hence, price levels.
2. A reduction in the industry's domestic market share due to the opening up of the domestic market to foreign competitors, which may result in a fall in the competitiveness of the domestic industry on the domestic market. Price competition may be intensified especially on imports from large countries of a similar development level, because their industries are presumably larger and can gain market shares in the small country relatively easily. Import competition from countries of higher development level may be intensified mainly because of their products possessing higher quality or other non-price characteristics.
3. In the short and medium term, better access to export markets allows the industry to increase production runs and thus, better exploit economies of scale, resulting in a fall in unit costs. This implies that at a given price level, the profitability of the industry would increase.
4. Intensified competition (both effective and potential) puts downward pressure on price-cost margins on the domestic market, and hence, potentially lowers the industry's profits. Hence, competitiveness falls. This effect can be relevant especially in the case when a small country forms an economic union with large countries of the same development level. Loss of profits on the domestic market can, however, be compensated for by higher profits on export sales.
5. Intensified competition, on the other hand, forces firms within the industry to improve their level of efficiency in order to withstand competition and maintain profits, hence, enhancing competitiveness.
6. Over the long term, an industry's productivity and the quality of an industry's products improve through restructuring and investments in innovations. This implies a potential increase in the industry's competitiveness.

The net effect of economic integration on the competitiveness of an industry is ambiguous, with its sign and the scale depending, on the one hand, on the initial level of trade barriers vis-à-vis the members of the trade bloc as well as initial conditions vis-à-vis third countries relative to the policies conducted within the trade bloc, and on the other hand, on the relative size and income level of the other countries within the trade bloc.

1.2.2.3. The options and challenges related to the measurement of the impact of regional integration on the competitiveness of an industry

Studies dealing with the impact of regional integration on the competitiveness of an industry can be divided into *ex-ante* and *ex-post* studies. The former studies are concerned with the potential impact of (the future or ongoing) integration on the competitiveness of an industry, while the *ex-post* studies aim at specifying and measuring the actual impact of the integration (already taken place) on competitiveness.

As a consequence of the different time-perspectives, the methods of the studies differ greatly. In general, the *ex-ante* studies dealing with the potential impact of regional integration on competitiveness, have utilised two types of approaches:

1. Studies that measure an industry's competitiveness through its determinants or indicators of competitiveness potential, and make predictions about potential developments in competitiveness through the impact of integration effects on these determinants or indicators (e.g. unit costs, prices, productivity, etc.). An extensively utilised indicator of the potential of competitiveness is, for example, the Domestic Resource Cost (DRC) ratio.
2. Studies that directly address potential developments in the indicators of competitiveness as a result of economic integration, such as market share, exports and the profits of industries.

In the economic literature dealing with the *ex-ante* competitiveness of industries in CEECs, the first type of studies largely dominate. A number of the *ex-ante* studies on the impact of integration utilise partial or general equilibrium models.[53] In the partial models, only the direct effects on the industry under consideration are studied, while general equilibrium models also take into account the links between different economic sectors, and hence, are able to calculate – in addition to the direct effects on the industry under consideration – indirect effects of integration, which reflect chain reactions in economic sectors. However, even though general equilibrium models can give a very valuable insight into the possible effects of integration, these have not been extensively used in studies concerned with the accession of CEECs to the EU, since these models require very extensive data that is often not available due to short time-series and the transitional nature of these economies.

There are many studies that have used the Domestic Resource Cost (DRC) measure in predicting the impact of EU accession on CEECs within the framework of the Policy Analysis Matrix (PAM) (e.g. Banse *et al.* 1999, Gorton

[53] Other methods used in *ex-ante* analyses of competitiveness include econometric models, accounting methods and calculations of different indicators of competitiveness potential such as the Domestic Resource Cost ratio (DRC) (Frohberg, Hartmann 1997a: 10–14).

et al. 2000 and 2006, Kavčič *et al.* 2003, Hein 2005).[54] Using the DRC index makes it possible to assess the ability of CEEC producers to operate profitably when faced with EU tradable input and output prices with the costs of the factors of production measured in terms of their domestic opportunity costs within the CEE country (Gorton, Davidova 2001: 191).

Even though the DRC criterion has been used extensively and it has proved to be a highly useful analytical tool when market and shadow prices diverge, it also has some shortcomings. Although the DRC indicates the existence or lack of competitiveness potential, it nevertheless cannot explain the historical forces behind the pattern of competitive advantage or suggest likely developments in the future.[55]

In the *ex-post* studies, the impact of economic integration on the competitiveness of an industry can be directly measured using differences in the industry's market shares, sales and profits before and after accession to an economic union. For example, as a result of a reciprocal abolition of trade barriers on imports, an industry in a home country would experience an increase in its exports to partner countries, and an increase in imports from partner countries. This is accompanied by a loss in its market share in the domestic market to its counterparts from partner countries, but in return, the industry would gain market share in partner countries. However, most of the studies found in the literature, which have dealt with the *ex-post* analysis of integration effects on the competitiveness of an industry, tend to measure integration effects and deduce the implications for competitiveness from these results rather than look at the competitiveness itself (e.g. European Commission 1996).[56] This is partly due to the complexity of and the ambiguity around the concept of the competitiveness of an industry.

In analysing the effect of regional integration on competitiveness, it is important to distinguish to what extent the changes in the competitiveness have been caused by the integration, and to what extent by the changes in the determinants of competitiveness not (directly) related to the regional integration. In principle, two main approaches can be found in the empirical literature to control for other factors not related to integration effects and to estimate the pure effects of integration when using econometric models. The first approach utilises a dummy variable technique to capture the effects of integration (Allen *et al.* 1998). In this case, a set of dummy variables is used as explanatory variables, distinguishing the post-integration period from the period

[54] Kavčič *et al.* (2003) have assessed the impact of joining the EU and adopting the CAP on the competitiveness of the Slovenian agricultural sector, by using the DRC measure in the framework of a partial equilibrium model and the Policy Analysis Matrix (PAM).

[55] For the critique of the DRC approach, see e.g, Frohberg and Hartmann 1997a; Gorton, Davidova 2001; Nishimizu, Page 1986; Viaene, Gellynck 1999.

[56] To the obvious reasons there exists a much larger number of *ex-post* studies on the impact of the completion of the Single Market Program (SMP) on the industries in the EU-15 countries compared to the impact of EU accession on the CEECs.

before integration took place. However, the challenge with using dummy variables is that these will capture all factors not controlled for in the regression, and can thus, either overstate or understate the impact of integration. Therefore, all possible factors affecting the dependent variable should be properly controlled for.

The second approach encompasses the use of explanatory variables that directly characterise integration. These variables can be, for instance, tariff levels, quotas and so on. The effect of integration is then captured in the change in the value of the variable in the post-accession period compared to the period before integration. The impact of integration can then be measured using a structural break analysis, or a residual approach. The latter has been chosen, for example, by Koukouritakis (2006), who utilises a simultaneous equations model for export demand and export supply to estimate the effects of Greek export performance caused by EU accession. The impact of accession is assumed to be captured in the residual between actual and estimated variables.

The analysis becomes more complicated if one wants to distinguish between the direct effects of lowering trade barriers (such as changes in the patterns of production and trade) and indirect effects, which stem from the intensification of competition (such as the fall in price-cost margins, improvements in efficiency and scale effects) and which do not usually occur immediately after integration. The latter problem has been solved by Allen *et al.* (1998), for example, by utilising a two-equation econometric approach with imperfect competition between firms operating in markets for differentiated products.

2. THE EMPIRICAL ANALYSIS OF THE IMPACT OF EU ACCESSION ON THE COMPETITIVENESS OF THE FOOD PROCESSING INDUSTRY IN ESTONIA

2.1. The characteristics of the Estonian food processing industry and the accession-induced policy changes

2.1.1. The characteristics of the food processing industry in Estonia and the level of analysis

Of all industrial sectors in Estonia, the manufacture of food products has been the most strongly affected by the processes of economic transformation and integration into the EU. The share of food processing in total manufacturing has been constantly declining since 1993 when the food industry reached its peak in the post-Soviet period, forming 46% of manufacturing output (see Figure 2.1). By 2003, this share had declined to only 17.7%, followed by a further fall to 14.9% by 2007. This trend has been mainly due to slower growth in food industry production compared to the output of the manufacturing industry as a whole.

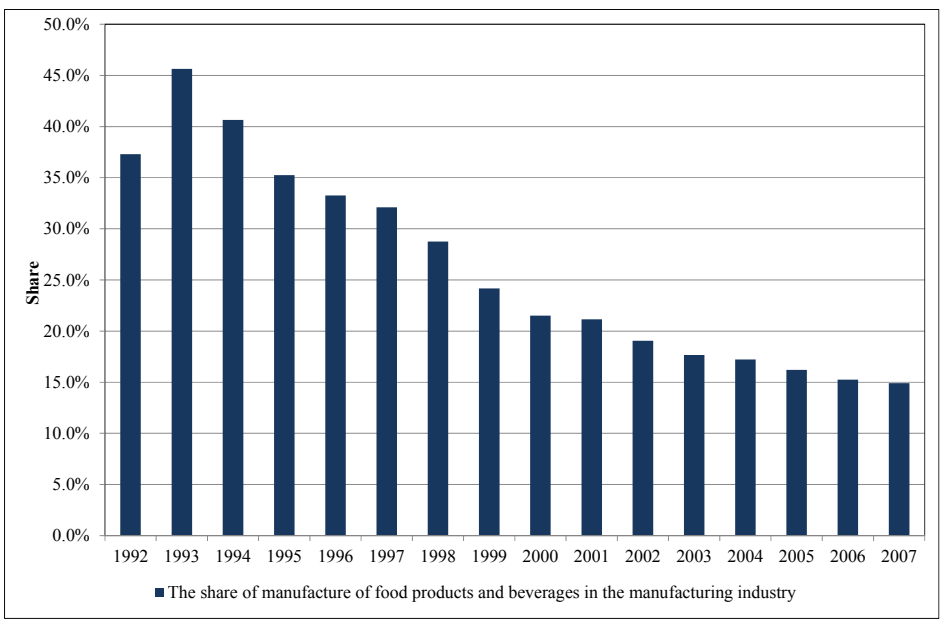

Figure 2.1. The share of the manufacture of food products and beverages in manufacturing production in Estonia, 1992–2007 (Source: Statistics Estonia 2010; composed by the author)

In 2007, the dairy industry accounted for the largest share of food processing output (26.5%), followed by the meat industry (19.1%) and beverages (19.1%).

The fish processing industry was the fifth largest sector with a share of 7.4% in 2007 (see Figure 2.2 and Appendix A.6). The meat industry has experienced a relatively strong fall in its share since 1992; however, has re-gained its importance since 1998. The fish industry has experienced a rather sharp fall since 2001, while the share of the manufacture of dairy products increased quite remarkably in 2003–04, to its highest level for 1992–2004.

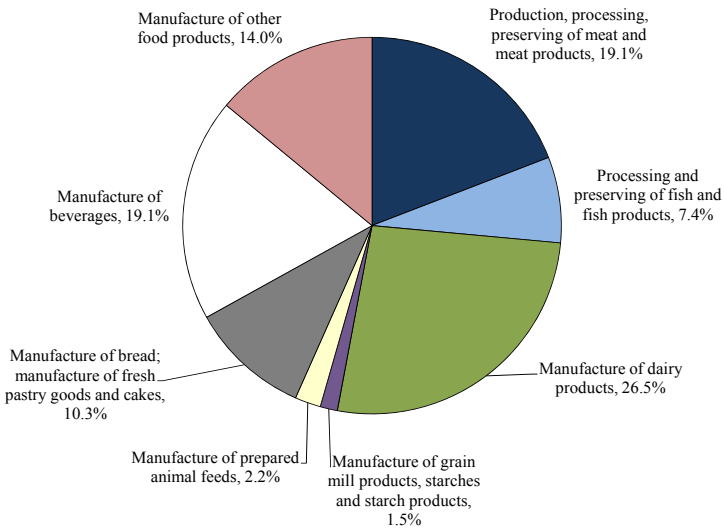

Figure 2.2. The structure of the Estonian manufacture of food products and beverages in terms of output in 2007 (Source: Statistics Estonia 2010; composed by the author)

Exports undoubtedly play the largest role in the case of the processing of fish products, accounting for more than 75% of total sales for 1995–2007 (see Appendix A.7). Only in 1999 and 2004–2005 did this figure fall below 70%, where these two falls can be associated respectively with the Russian crisis in 1998 and Estonia's accession to the EU in 2004. Exports play an important role also in the case of the dairy industry, where exports account for around one third of total sales. The meat processing industry ranks as number four after the manufacture of beverages in terms of the importance of exports. During 1995–2007, exports made up on average of almost 12% of total sales in the meat industry.

Given the share of the total manufacturing output as well as the importance of exports, three food processing sub-sectors were chosen for further analysis: the manufacture of dairy products, meat processing and fish processing. Despite the high share of the manufacturing of beverages, this was left out of the analysis as it was not directly influenced by the changes in trade as well as agricultural and fishery policies concurrent to the accession to the EU.

This dissertation analyses the competitiveness of the Estonian food processing industry within the framework of accession to the EU – a change in the competitive environment affecting the industry. Industry level is seen here as a proper level of analysis for several reasons. First, analysis at industry level permits us to generalise the impact of EU accession for a large set of companies. Second, it allows us to neglect the detailed interactions between domestic companies, and concentrate on the impact of accession. Third, much of the available data is given at the level of industry. Since the aim of the analysis is to assess the impact of a policy change, and not the underlying factors of competitiveness in the Estonian food processing industry, the concern is rather competitiveness in the context of market distortions, and real comparative advantage as a concept is not considered.

Nevertheless, competitiveness at industry level is tightly associated with factors at firm as well as country level. In addition, the output of an industry is the products it produces. Therefore, industry and product statistics are used in parallel in this study. This is done in order to achieve the best results taking advantage of all the data available. For example, trade data is given at the most detailed level on the basis of products, while financial and production statistics are available at industry level. In addition, the study utilises information based on interviews at company level, since most of the factors underlying the impact of EU accession cannot be detected in official statistics.

Food processing companies in Estonia have not actively entered foreign markets by establishing themselves there or by acquiring firms abroad. Far the most dominant way of entering foreign markets has been by exporting. This eases the analysis of competitiveness to a large extent allowing us to concentrate on trade data, since there is no need to take into account other foreign activities, such as outward foreign direct investments, partnerships, franchises, licenses, etc.

Nevertheless, there are relatively more examples of foreign direct investments (FDI) in the Estonian food processing industry, although the primary processing industry has experienced relatively less FDI compared to the secondary processing industry.[57] This study also considers companies based on foreign capital as part of the domestic industry, as first of all, these companies are reflected in the official industry statistics. Second, foreign-owned companies are important sources of employment and income for a large percentage of the population in Estonia. Third, this study is not concerned with the links between ownership and competitiveness, and this allows us to ignore the ownership

[57] According to the article 32 of the Law on Privatisation, which mainly concerned the privatisation of state-owned grain mills, milk and meat processing enterprises, priority in the privatisation process was given to processing co-operatives, which were formed by family farms, household plots and co-operatives with the same product specialisation and which used inputs produced by the upstream sector or produced agricultural products for processing. This eliminated foreign investors from tenders involving milk and meat enterprises in the 1990s. (OECD 1996: 26)

question. In addition, a large part of the FDI in the Estonian food industry leaves strategic and creative control in the hands of the Estonian subsidiary.

The analysis covers the period from 1999 to 2009, of which, five years illustrate the period before Estonia joined the EU and six years characterise the situation as a member of the EU. In some cases, other periods are considered, mainly based on the availability of statistical data. The analysis only covers the short-run and medium-run aspects of economic integration, as the period of analysis is still too short to draw any plausible conclusions about the long-term impact of EU accession.

The analysis starts with an overview of the changes in the competitive environment induced by accession to the EU. Thereafter, the competitiveness performance of the Estonian food processing industry on export and domestic markets before and after EU accession is analysed, and the competitiveness performance on both markets is summarised via indicators showing the industry's ability to earn. Finally, the factors behind developments in competitiveness performance (and potential) are explored at company level based on the example of the milk processing industry.[58] This part of the analysis consists of interviews with some milk processing companies, where the companies were asked about factors at firm level as well as industry and country level.

2.1.2. EU accession-induced changes in the policies affecting competitiveness in the food processing industry

In Figure 2.3, the system of factors affecting the competitiveness of an industry (see Chapter 1.2.1.) is re-introduced. However, here, the factors affecting the Estonian food processing industry are divided into those prevailing before Estonia's accession to the EU and those in effect after accession. This study is interested in the impact of changes in public policies that can help or impede transforming competitiveness potential into actual competitiveness performance; in other words, the "filter" as introduced in Chapter 1.2.1, and therefore, the focus is on factors controlled by governments – especially factors directly affecting trade and production. With accession to the EU, Estonia had to abandon many of its own policies and adopt the policies of the EU. This also included the Common Agricultural Policy (CAP), the Common Fisheries Policy (CFP) and the Common Commercial Policy (CCP) of the EU, which regulate the agri-food sector within the EU and its relations with the rest of the world.

[58] Manufacture of dairy products was chosen as an example due to its high importance in the total food industry as well as the role of exports in sales.

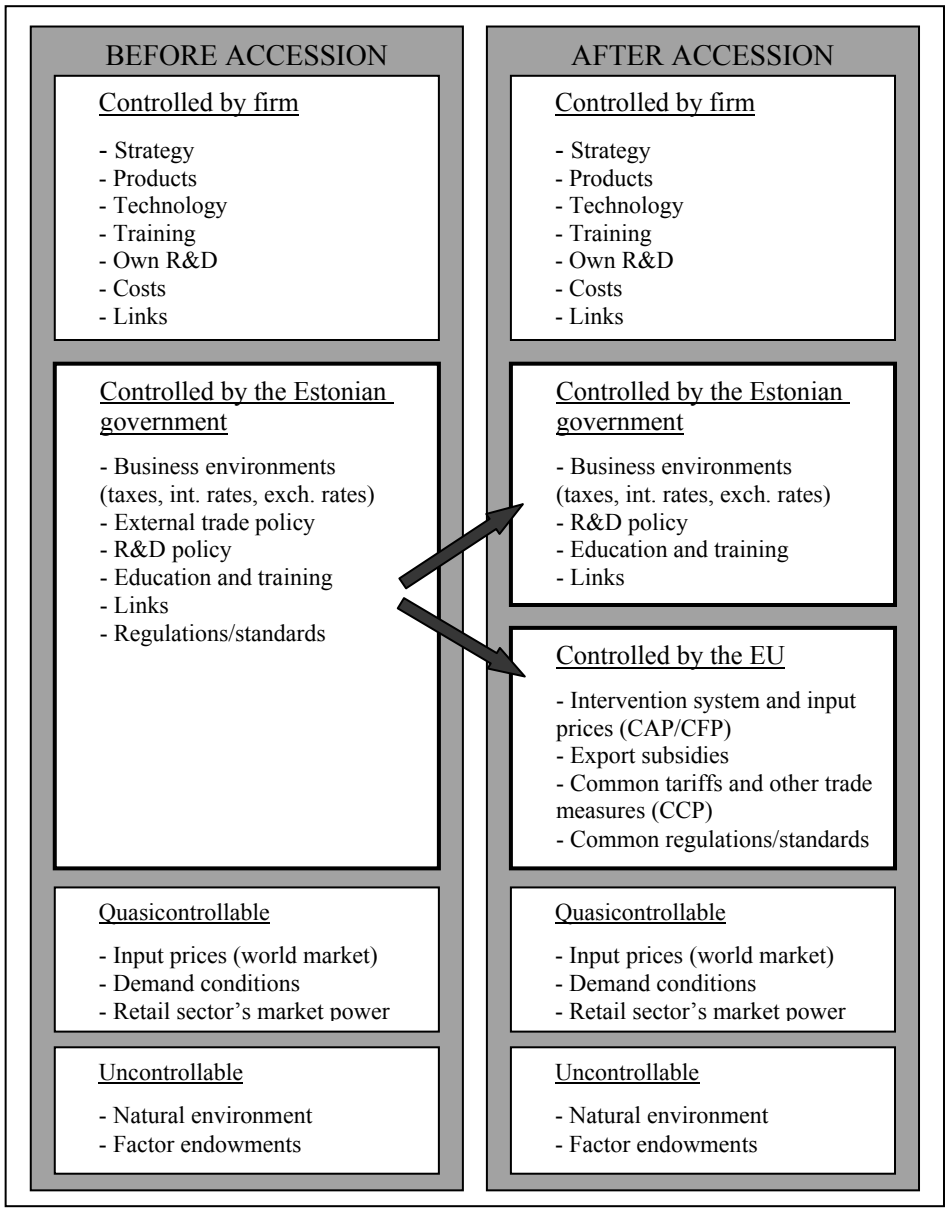

Figure 2.3. Factors affecting the competitiveness of the Estonian food processing industry before and after accession to the EU (author's figure, based on Martin *et al.* 1991: 1457)

Since the beginning of the 1990s, the Estonian food industry has been operating in rather exceptional and controversial economic conditions. The export opportunities of Estonian food producers were often limited because their trading

partners protected their markets with import tariffs and quotas. On the domestic market, as a result of Estonia's highly liberal trade policy, Estonian food producers have had to face fierce competition from importers. Also, due to subsidies, imports were often more price competitive, whereas the Estonian government did not support its domestic food industry. Only in 1998 were direct payments to producers of some agricultural products implemented, and in 2000, low tariffs on agricultural and food imports were introduced. These tariffs, however, only applied to a small share of Estonian trade partners. The absence of significant import tariffs meant that the prices of foodstuffs and agricultural products in Estonia were equal to low and distorted world market prices.

The choice of a liberal trade policy was part of the general economic stabilisation policy after re-gaining independence; however, it imposed a heavy pressure on the domestic food industry. On the other hand, this situation singled out the companies that were able to cope with (distorted) market forces and managed to create an efficient food processing industry in Estonia.

However, neither the economic policy prevailing in Estonia before its accession to the EU nor the trade policies implemented by its main trade partners fostered the Estonian food processing industry's competitiveness in either export markets or the home market. A solution to this problem was expected to be accession to the EU and the accompanying change in the competition environment created by the economic policy.

The Estonian food processing industry's trade relations with the EU have developed in rather different circumstances compared to those of other economic sectors. Formal trade relations between Estonia and the EU started on 1 January 1995, when Estonia and the EU concluded the Association Agreement (aka the Europe Agreement), which also embodied a free trade agreement. However, agricultural products were left out of the free trade agreement, although other goods of Estonian origin were granted tariff-free entry to the EU market. At the same time, the Estonian government did not apply tariffs or other trade barriers against imports from EU countries. Yet, as a result of the free trade agreement, the EU provided some concessions for Estonian agricultural exports, gradually lowering and abolishing tariffs and increasing the amounts of Estonian agricultural products and foodstuffs allowed to enter the EU (i.e. quotas). Nevertheless, the preferential quotas were not fulfilled by Estonia (except for milk products).

Frohberg and Hartmann (1997b) have studied the causes behind the lack of success of the Association Agreements for the CEECs, which in many cases also hold for Estonia, concluding that, compared to agricultural imports from the EU, the poor performance of the CEECs' exports of agricultural products and foodstuffs to the EU can be explained by many internal and external factors, such as the appreciation of the real exchange rate throughout the 1990s and thereafter, which, while favouring imports, made exports from the CEECs relatively expensive and uncompetitive on the world market; inefficient food industries with overcapacities; agricultural policies implemented by the CEECs; the 1992 reform of the CAP, and the agreement reached at the Uruguay Round that increased market access for all third countries to the EU, thereby reducing

the relative advantage that the CEECs had been enjoying under their bilateral agreements with the EU.

One of the reasons for the under utilisation of preferential quotas was certainly the lack of quality and insufficient sanitary standards in the CEECs that made it difficult to export foodstuffs to the highly sophisticated and demanding consumer markets in the EU. The preferential quotas, at the same time, were relatively small, which impeded investments in stricter product standards by the food industry.

However, as argued by Frohberg and Hartmann (1997b), the design and the content of the Association Agreements can be partly why the preference quotas were under utilised. The annual quotas allocated to exports of foodstuffs from the CEECs were spread evenly over four quarters of the year, and unfulfilled quotas could not be compensated for in a later quarter by exporting more. In addition, the required import licences issued by the European Commission for the preferential quotas could only be applied for by importers (established in the EU).

However, in order to be issued a licence, which was only valid for a specified period, the importers were required to pay a certain deposit. If nothing was imported during that period, the right to import expired and the importer lost the deposit. This shows how risky it was to import under the conditions of the preferential arrangements, and this was especially the case in the first years of the agreements when business relationships between the EU and the CEECs were not well established, and also indicates the high bureaucratic cost of importing from the CEECs. Furthermore, the system of quotas was especially obstructive for exports of high value-added consumer products due to their short shelf life.

With Estonia's accession to the EU on 1 May 2004, the last remaining formal barriers on Estonia's exports to EU countries were abolished. In addition, accession to the EU also reduced the burden of bureaucratic barriers. This means that besides formal trade barriers (i.e. tariffs and quotas) non-tariff barriers to trade (NTBs) were also dismantled between Estonia and the other EU countries. Studies prior the completion of the European Single Market (e.g. Emerson *et al.* 1988: 35, 67) identified the NTBs for the food processing industry to be particularly related to administrative barriers, product standards and technical regulations. For example, these included the restrictions in the use of some specific ingredients, regulations related to the content of a product and its description, packaging and labelling, and specific import restrictions, related, for example, to health regulations. In addition, frontier delays and costs as well as tax discrimination were identified. [59]

[59] Within the framework of Estonia's accession to the EU, it is indeed the NTBs that matter most, since tariffs on trade with foodstuffs between Estonia and the old as well as new EU countries were already abolished before formal accession. However, tariffs still matter with respect to third countries.

The removal of NTBs, although less apparent than the abolition of tariffs and quantitative restrictions, can have a highly significant impact on the competitiveness of the Estonian food industry on the markets of the old EU member countries. Moreover, the removal of NTBs in the form of border checks also improved access to the markets of other new member states in the EU. Proceeding from that, the first proposition of the study is formed:

Proposition 1. The abolition of the last remaining barriers to exports to EU markets, led to a considerable increase in Estonian food processing industry exports to the EU (trade creation effect).

However, the opening up of the EU market was not without costs for the Estonian food processing industry. Accession was accompanied by the requirement to comply with the EU's strict hygiene and structural standards. According to the Food Act – a law that was passed in 1999 and took effect in 2000, to make Estonia's legislation conform to the *acquis communautaire* of the EU – enterprises engaged in the production and processing of foodstuffs had to bring themselves into conformity with the structural and hygiene requirements laid down by the above Act by 1 January 2003. This resulted in large investments by the food processing industry; however, the low number of enterprises who had fulfilled the requirements by the beginning of 2003 forced the deadline to be extended until the end of 2003. At the same time, enterprises were striving to obtain the right to export their products to EU markets, as conformity to the requirements of the Food Act did not automatically lead to approval by the EU.[60]

Most of the investments were made in 2002 and 2003 (see Figure 2.4). In total, 284 thousand EUR were invested during 2000–2004, and most of the investments were made in machinery and equipment (46%), and buildings and facilities (35%). By far the largest investments in absolute value were undertaken by the dairy industry, followed by the meat industry. For comparison, data for 2005–2008 is also given.

Table 2.1 provides the ratio of investments in tangible assets compared to net sales. It can be seen that on average, the meat industry has invested relatively more than the fish and dairy industries, although the timing of the investments by the meat processing units prior accession to the EU lagged behind the fish and dairy industries. In the latter two industries, investments culminated in 2002.

[60] It must be noted that it was the position of the Estonian government that Estonian producers should gain access to the single market of the EU immediately, without any transition period.

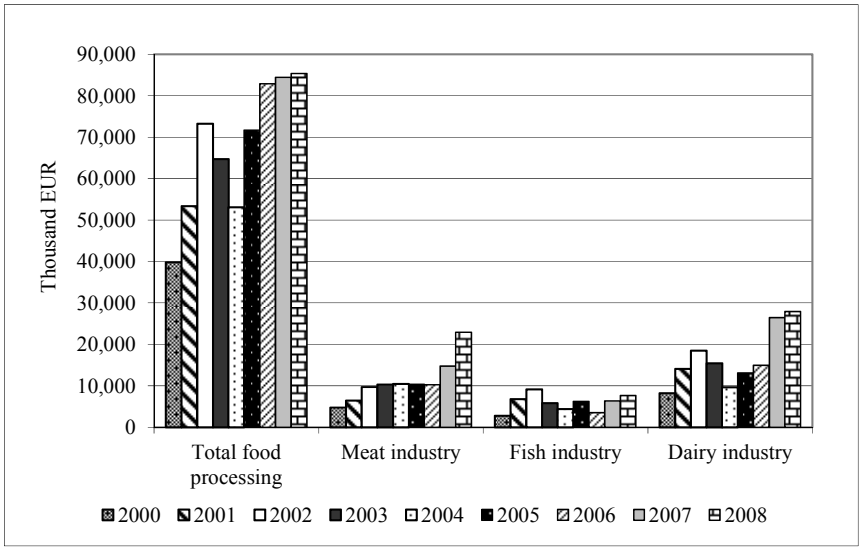

Figure 2.4. Investments in fixed assets in the Estonian food processing industry, 2000–2008 (Source: Statistics Estonia 2006, 2010)

Table 2.1. The ratio of investments in tangible assets to net sales, (%)

	Total food processing	Meat industry	Fish industry	Dairy industry
2000	5.1	4.4	2.7	3.6
2001	6.1	5.1	5.1	5.6
2002	8.1	7.2	7.9	7.8
2003	7.2	7.4	5.7	6.5
2004	5.2	7.0	4.4	3.1
2005	9.6	6.4	6.9	5.3
2006	10.2	5.6	3.6	5.7
2007	9.2	7.1	7.2	8.9
2008	8.2	9.7	7.3	9.1
Average 2000–2004	6.3	6.2	5.2	5.3
Average 2005–2008	9.3	7.2	6.3	7.2

Source: Statistics Estonia 2006, 2010; author's calculations

Table 2.2 reports the compliance of food production units with the Food Act and with EU standards (which gave the right to export to the EU) for 1998–2004. The fall in the total number of firms has partly been the effect of the harmonisation of Estonia's legislation with EU rules, as a result of which firms were forced to invest in heavy structural, sanitary and hygiene (as well as

product safety) standards in order to either comply with the Food Act by 2003 or exit the business. As a result, concentration in the food industry increased.

Table 2.2. Conformity to the structural and hygiene requirements in the Estonian food processing industry, 1998–2004

	1998	1999	2000	2001	2002	2003	2004
Total No of enterprises							
Meat industry	281	284	278	219	143	135	139
..large capacity	17	17	17	15	13	14	16
..low capacity	264	267	261	204	130	121	123
Dairy industry	41	41	44	38	38	41	42
Fish industry	125	127	135	109	97	95	96
Approved by The Food Act (from 2001) [a]							
Meat industry				7	n.a.	79	139
..large capacity				1	n.a.	7	16
..low capacity				6	n.a.	72	123
Dairy industry				n.a.	n.a.	38	42
Fish industry				n.a.	n.a.	77	96
Confirming to the EU requirements							
Meat industry	0	0	0	0	0	2	16
Dairy industry	2	4	7	11	14	15	15
Fish industry [b]	14	18 (10)	25 (13)	27 (13)	36 (14)	41 (10)	50 (11)

Source: Estonian Ministry of Agriculture, various yearbooks

Notes: [a] Initially, all food processing units had to confirm to the hygiene rules laid down in the Food Act by 1.01.2003. However, because many enterprises did not meet the requirements by that date, an extension was given to bring the units into conformity within 2003.

[b] The numbers in brackets refer to vessels that meet EU requirements – these are vessels where processing also takes place, mainly located on the Atlantic Ocean.

Table 2.2 clearly shows that even though the EU abolished tariffs and increased quotas faced by Estonian food exports, the EU market was still relatively closed because only a few producers were entitled to sell their products on the EU market (e.g. until 2003, no meat processing units in Estonia fully met the EU requirements and were therefore not permitted to export to the EU). Firms that satisfied the Food Act but were not confirmed by the EU were only allowed to sell their products on the domestic market. Throughout the whole period, the fish industry led by having the largest number of enterprises possessing the right to export to the EU.

Even though the fulfilling of the requirements laid down in the Food Act and by the EU put a heavy financial burden on the food processing firms, some of the finances for the necessary investments were received from SAPARD (measure 2) investment support. During the period 2002–2005, 18.5 million EUR was paid out to the Estonian food processing industry. The largest share of that was allocated to the meat industry (41%), followed by the fish industry (31%) and the dairy industry (27%) (see Table 2.3). From that amount, 75% was paid by the EU and 25% from the national budget. So far, however, only a few investments associated with environmental regulations have been made. With Estonia's accession to the EU, SAPARD investment support was replaced by the National Development Plan (NDP). From the latter, the food processing industry was pre-assigned 11.4 million EUR as investment support for 2004–2006.

Table 2.3. SAPARD investment support to the Estonian food processing industry, 2002–2005 (million EUR)

	2002	**2003**	**2004**	**2005** [a]	**Total 2002–2005**	**Share (%)**
Total food manufacturing	4.8	5.0	7.0	1.6	18.5	100.0
Meat industry	2.4	2.7	2.4	0.1	7.6	41.2
Dairy industry	1.6	0.9	1.3	1.3	5.0	27.3
Fish industry	0.8	1.4	3.3	0.3	5.8	31.4

Source: Estonian Agricultural… 2006

Notes: [a] During 2004–2005, no applications for support were accepted; only facilities were paid out.

Strict hygiene, structural and product safety standards will result in higher short-run production costs. This, however, does not (necessarily) reduce the respective industry's competitiveness. On the contrary, investments in the abovementioned standards will enhance competitiveness in the long run due to improvements in product quality and safety, which is especially relevant in the case of products with high value-added. This leads to the second research proposition of the study:

Proposition 2. The significant investments in EU hygiene and product standards undertaken by Estonian food processing companies and the abolition of the last remaining barriers on exports to the EU have resulted in changes to the export structure – exports of foodstuffs indicate an increase in the share of processed consumption-ready foodstuffs.

Exports of higher value-added products can improve the sustainability of the Estonian food processing industry's competitiveness by securing long-term profitability and providing more jobs. Furthermore, in the case of bulk products, the Estonian food sector is competing for the EU market (as well as for other foreign markets) with production from developing countries. However, the rapidly increasing labour costs in Estonia raise the cost of production, which clearly refers to the inability of the Estonian food sector to compete (based on cost advantages) with developing countries (or very cost-efficient countries) in the long term in the market for bulk products. In the case of high value-added products, on the other hand, non-price parameters such as quality and differentiation become more important, enabling firms to gain markets despite increasing production costs. Furthermore, given Estonia's rather remote location with respect to large consumer markets in Europe and hence, potentially large transportation costs, transportation makes up a smaller proportion of the value in the case of high value-added products than bulk raw products, giving a relative cost advantage in favour of value-added products.

Accession to the EU not only opened up the EU markets, but it also brought changes to the trade regime towards countries not belonging to the EU (i.e. third countries). Estonian trade relations with countries not belonging to the EU became subject to the EU's Common Commercial Policy and the system of trade agreements with the EU's partner countries. This meant that countries had to apply the same rules to imports from Estonia as to the other members of the EU. For the Estonian food processing industry, this mainly involved three important changes:

1. Russia had to abolish double-tariffs applied on imports from Estonia, which were first applied in 1995 and had been in effect for exactly 9 years.
2. The free trade agreement regulating trade between Estonia and the Ukraine, which also embodied free trade in agricultural products and foodstuffs, had to be abolished. As the EU did not have a free trade agreement with Ukraine, Estonian food exports to Ukraine faced tariffs from May 2004, applied by Ukraine to EU countries.
3. From May 2004 on, the EU export subsidies paid on exports of agricultural products and foodstuffs directed to third countries also applied in Estonia.

The first aspect was definitely a positive development for the Estonian food processing industry, given the size and the income growth potential of the Russian market. The second aspect, on the other hand, resulted clearly in the loss of the Ukrainian market, which was an especially important destination for Estonian exports of fish products. The third aspect, however, can be considered positive from the perspective of Estonian exporters, although the use of export subsides can be argued to be trade-distorting and welfare-reducing from the international perspective. Under the Common Agricultural Policy, minimum price levels for certain farm products are set to encourage farmers to continue food production.

These minimum levels often exceed the world price level, and as a consequence, the EU needs to pay the difference between the minimum price level and the world market price in order to export the respective products to third countries. This is done via export subsidies (i.e. export refunds). Export refunds vary over time, by product sector and by the products made thereof. Furthermore, they may differ across destination countries (European Commission 2011a).

In Table 2.4, the value of EU export refunds on exports of milk and meat products to non-EU countries paid out in Estonia during 2004–2009 is given (no export subsidies apply to fish products). During this period, a total of EUR 12 158 399 of export refunds was paid to the Estonian milk processing industry while the respective figure for the meat processing industry was only EUR 2 785 (Estonian Agricultural… 2011).[61] As the table shows, the milk industry received the bulk of the export subsidies, and the value of the subsidies exceeded 20% of the value of exports for 2004–2006. However, in 2007 and 2008 export subsidies were only equivalent to 14.4% and 0.5% of the export value respectively, likely reflecting the high world market prices from the first half of 2007 until the second half of 2008, followed by a further surge in dairy prices in the fourth quarter of 2009, which made it less necessary to pay export refunds.

Table 2.4. Export subsidies paid to the Estonian food processing industry during 2004–2009

	Milk processing industry			Meat processing industry		
	Value of exports (EUR)	Value of export subsidies (EUR)	Export subsidies as % of export value	Value of exports (EUR)	Value of export subsidies (EUR)	Export subsidies as % of export value
2004*	6 807 452	1 449 800	21.3%	808 021		0.0%
2005	10 246 530	3 178 199	31.0%	1 295 796	144	0.0%
2006	15 794 556	3 202 656	20.3%	2 416 707	1 707	0.1%
2007	21 147 422	3 038 812	14.4%	1 919 145	934	0.0%
2008	20 456 486	99 971	0.5%	2 612 668		0.0%
2009	23 102 802	1 188 961	5.1%	3 076 906		0.0%

Sources: Dataset DS-016893, Estonian Agricultural… 2011; author's calculations
Note: * Export value refers to full year 2004, while export subsidies were only paid out during 27.08.2004 – 31.12.2004.

[61] Nevertheless, in 2010, the Estonian meat processing industry received EUR 59 560 of export subsidies while the milk processing industry was paid refunds of EUR 773 073 (Estonian Agricultural… 2011).

Slightly more than 80% of all export subsidies paid during 2004–2009 were paid on exports to Russia in both industries. Combining that with the abolition of double-tariffs on Estonian exports to Russia suggests that Estonian food exports to Russia should have increased significantly after accession to the EU.

Combining the three aspects introduced above, the third research proposition is formed:

Proposition 3. Estonia's accession to the EU and the accompanying adoption of the Common Commercial Policy of the EU led to an increase in Estonia's food processing industry exports to third countries.

In the Estonian domestic market, important changes in the competitive environment occurred after accession. The domestic market is influenced by two types of policies: policies regulating the domestic market directly, and policies regulating imports, which however, are tightly interrelated and act as part of the same price system. In that respect, accession to the EU led to the following changes:

1) implementation of EU administrative prices in the Estonian agri-food sector;
2) elimination of EU subsidies on agricultural exports from the EU-15 to Estonia;
3) adoption of EU common external tariffs (CET) on imports from third countries.

On EU exports of certain agricultural products and foodstuffs to Estonia, any differences between internal EU market prices and world market prices were covered via export subsidies (i.e. paid as export refunds). This made the prices of products from the EU artificially lower than internal market prices. Table 2.5 provides the rates of export subsidies granted by the EU on exports of agricultural products and processed food to Estonia in 2001. This was the range of the artificial advantage in prices of imports from the EU, which Estonian producers had to compete with.

Table 2.5 also shows the minimum and maximum producer prices in the old member states of the EU in 2001, and the average producer prices in Estonia (due to data availability, the producer prices for Estonia are presented from 2000). It can be seen that export subsidies were especially relevant for butter and sugar, where the subsidy was close to actual producer prices. At the same time, according to its accession agreement with the WTO, Estonia was not allowed to use any export subsidies.

In accordance with the principles of the common market, export subsidies had to be abolished by the time of Estonia's accession to the EU. In 2002, the EU removed export subsidies for unprocessed agricultural products (except for rice and sugar) exported to Estonia. However, export subsidies for processed food remained in effect until 1 May 2004. This meant that imports of processed food from the EU were expected to become more expensive after accession, hence, losing their artificial competitive advantage over Estonian producers.

Table 2.5. EU export subsidies and producer prices in the EU and Estonia for selected agricultural products[d]

	EU export subsidy, Jan–Feb 2001 (EUR/t) [a]	EU-15 producer price, 2001 (EUR/t)		Estonian producer price, 2000 (EUR/t)
		Min	Max	
Beef [b]	161	1,588	3,233	1,141
Pork [b]	0	1,427	1,687	1,486
Poultry	0	1,234	1,942	…
Skimmed milk powder	150	505 [c]	977 [c]	177 [c]
Butter	1,680	2,999	4,849	177 [c]

Sources: Commission Regulations (EC) No 66/2001, No 152/2001, No. 1871/2004; Eurostat; Statistics Estonia 2005

Notes: [a] Granted for EU agricultural and food exports to Estonia
[b] Carcass weight for calves/pigs
[c] Producer price of whole drinking milk
[d] No export subsidies apply to fish products

With accession to the EU; Estonia also had to abandon its foreign trade policy and adopt the full range of EU common external tariffs, which led to a significant increase in tariffs on imports from third countries. Table 2.6 shows the structure of tariffs applied in the EU and in Estonia before and after accession. For Estonia, 2003 is chosen to show the data on tariffs before accession to the EU; and for the EU, 2004 is chosen because with accession, Estonia had to adopt the EU tariffs from 2004 onwards. As a comparison, tariff data from 2008 is also shown to highlight the fact that the EU has reduced its tariffs for agricultural imports slightly during 2004–2008.

It can be seen from the table that the simple average tariff rate applied in the EU in 2004 was twice as high as the MFN[62] tariff rate applied in Estonia in 2003, whereas Estonia did not apply any tariffs to non-agricultural imports. The table also reveals that the bound tariff rate for agricultural products in Estonia was higher than that in the EU (21.9% and 16.7%, respectively).[63] Nevertheless, the tariffs actually applied in Estonia were somewhat lower, although the differences were not remarkable.

[62] The most-favoured-nation (MFN) principle refers to the rules of non-discrimination in the WTO. MFN implies that every time a country lowers a trade barrier or opens up a market, it has to do so for the same goods or services from all its trading partners. Yet, some exceptions are allowed. For example, countries can set up a free trade agreement that applies only to goods traded within the group, discriminating against goods from outside, or they can give developing countries special access to their markets.

[63] The bound rate refers to the maximum tariff rate allowed by the WTO.

Table 2.6. Structure of customs tariffs in the EU and Estonia (%)

	Estonia			EU		
	MFN 2003	**2003 bound rate**	**2004 applied rate**	**2004 bound rate**	**2008 applied rate**	**2008 bound rate**
Simple average tariff rate	3.3	10.2	6.5	6.5	5.6	5.5
Agricultural products (HS01–24)	14.4	21.9	16.6	16.7	16.0	15.9
Non-agricultural products (HS25–97)	0	6.8	3.7	3.7	4.0	3.9
Duty-free tariff lines (% of all tariff lines)	88.0	16.0	26.9	26.8	na	25.3

Sources: WTO 2004, 2009b.

However, one has to keep in mind that this is only a simple average, not weighted with import volumes, and can hence be misleading. The last row in Table 2.10 provides some insight into that matter: 88% of all tariff lines applied in Estonia were actually duty-free, whereas the same indicator for the EU was only 26.9% in 2004. Furthermore, the percentage of duty-free lines applied by the EU to agricultural products was even lower, 18.8% (WTO 2004: 42, 163). According to the calculations by the Estonian Ministry of Agriculture, the trade-weighted average tariff level applied by Estonia was only 0.57% in 2000.

Furthermore, whilst the average tariff on all agricultural products and processed food in the EU exceeded the average tariff applied in Estonia by only about two percentage points, the range of tariffs applied by the EU was much larger. The maximum import tariff applied by the EU was 209.9% (dairy products), while the highest tariff imposed by Estonia was "only" 59% (meat and cereals) (see Appendix A.8 for tariffs for different product groups in the EU in 2004 and in Estonia in 2002). Yet, for some product categories, the average tariffs applied by Estonia were actually higher than in the EU (e.g. meat, edible vegetables, products of the milling industry, preparations of meat and fish). However, the low weighted average tariff in Estonia reveals that most imports came from the EU and from countries that had free trade agreements with Estonia.

The increase in import tariffs, on the one hand, made imported products more expensive relative to domestic foodstuffs, on the other hand, it also increased the cost of imported raw materials for the Estonian food processing industry.

As regards fish imports, the adoption of EU tariffs certainly implied an increase in the price of imported raw materials, as the average import tariff increased from 0% prior to accession to an average of 12.2% in 2004 before dropping to 9.8% in 2008 (see Appendix A.8). Prior to accession, the Estonian fish industry was able to import tariff-free raw fish from Russia and Norway,

which was sold after processing to EU markets. Given the fact that the EU already gradually lowered and removed tariffs on Estonian fish products prior accession and demand from the EU was strong, the opportunities to export to the EU-15 were rather good. After accession, however, the possibility to import tariff-free raw materials from third countries disappeared, increasing the production costs of processors.

However, every three years, the EU establishes – within the framework of the CFP – autonomous tariff quotas (ATQs) for certain fish and fish products which allow a certain quantity of a product to be imported into the EU at a reduced tariff rate – typically, 0%, 4% or 6%. The ATQs help increase the supply of the raw materials, which the EU fish processing industry is dependent on, at times when EU supply, is insufficient to meet demand (European Commission 2011b). However, due to high bureaucracy, only large fish processing enterprises are able to use these quotas, and none of the Estonian fish producers – which are mainly small and medium enterprises – have benefitted.

Thus, there were, in principle, two kinds of factors that could lead to increases in prices of imported foodstuffs in Estonia after accession to the EU. First of all, imports from third countries were expected to become more expensive due to the adoption of EU tariffs, leading to a shift in demand away from imports from third countries (i.e. trade diversion). Secondly, imports from the EU were predicted to become more costly after export subsidies were removed. Consequently, the fourth research proposition can be formed:

Proposition 4. Due to the introduction of the EU import regime on agricultural products and foodstuffs, and the abolition of export subsidies on products from EU countries exported to Estonia, Estonian products became relatively more price competitive in the domestic market.

However, this effect may have been partly lessened due to the fact that accession to the EU also implied the adoption of the Common Agricultural Policy (CAP) in Estonia, as a result of which the prices of domestically produced goods were expected to converge to the level of EU administrative prices set by the CAP. In most cases, these were higher than the prevailing producer prices in Estonia.

The EU applies an intervention purchasing system on skimmed milk powder, butter, beef and pig meat and some cereals, ensuring a price floor for the producers, below which the price in the EU market does not fall.[64] From these, Estonia only applied an intervention system on skimmed milk powder (SMP) and butter.

During the period 1 July 2004 – 30 June 2005, the intervention prices for SMP and butter were 30.55 EEK/kg and 47.76 EEK/kg respectively.[65] At the

[64] For beef and pig meat, basic prices apply. For fish products, minimum producer prices are set.

[65] 1 EEK = 1/15.6466 EUR

same time, the prevailing producer prices in Estonia for SMP and butter were 27.45 EEK/kg and 36.42 EEK/kg (data for May 2004; Estonian Institute… 2004a), constituting 90% and 76% of the EU intervention price, respectively. Although the producer price for SMP in Estonia was quite close to the intervention price, the intervention system would still work as a valuable income insurance tool in the case of a fall in world market prices. The introduction of the intervention system, hence, could have two types of implications for the competitiveness of the Estonian food processing industry:

1. For the producers of SMP and butter, this meant a one-time increase in prices, and thereafter, a fixed minimum market price and an ensured demand. This has a short-term direct effect on competitiveness in the form of increased profits, but can also have a longer-term indirect impact through ensuring a certain level of profitability at a given cost level.
2. For processors using agricultural products under intervention as input, this meant an increase in costs and hence, loss in cost competitiveness.

In addition, the adoption of EU milk quotas as well as direct payments to agricultural producers in Estonia also influence the competitiveness of the Estonian food processing industry, mainly through the requirements on the quality of milk subject to quotas and support. In principle, the introduction of milk quotas could have a negative impact on competitiveness were the quotas binding. However, the quotas allocated to Estonia have not been fulfilled, and hence, have not constituted obstacle to the milk processing industry. Nevertheless, taking into account that these measures influence the food processing sector only indirectly, they are not considered in the proceeding analysis.

Considering all the short- and medium-run aspects of accession to the EU, it is not easy to predict the impact on the ability to earn (or profitability) for the food processing industry. On the one hand, better export opportunities, lower competitive pressure from imports and the implementation of EU administrative prices on some processed products should increase the sector's profitability. On the other hand, the CAP-induced increases in input prices and the loss of some main export markets put pressure on the profitability of the Estonian food processing sector. However, despite the short-term cost burden, accession-induced improvements in export possibilities, the improved price competitiveness of domestic producers in the domestic market as well as the implementation of EU administrative prices for some agricultural products in Estonia are also likely to improve domestic producers' profitability at least in subsectors that are not affected by the abolition of the free trade agreement between Estonia and Ukraine. As a result, the fifth research proposition can be formed:

Proposition 5. The changes in economic policies concurrent to Estonia's accession to the EU enhanced the ability to earn of the Estonian food processing industry.

Table 2.7 summarises the changes in policies affecting the food processing industry as a result of Estonia's accession to the EU. It is clear that many of these policy changes can both enhance as well as impede competitiveness, and the final outcome is left for empirical analysis.

Table 2.7. A summary of the accession-induced policy changes affecting the competitiveness of the Estonian food processing industry

Change in policy	Enhancement of competitiveness	Impediment to competitiveness
Implementation of EU SPS requirements	General quality of products increased	Costly
Removal of export quotas on Estonian foodstuff exports to the EU	Practically it is now possible to export unlimited volumes to the EU, if demand exists	
Application of subsidies on Estonian exports to third countries	Eases exports to third countries	Increased bureaucracy
Removal of subsidies on EU-15 exports of agricultural products and foodstuffs to Estonia	Unfair competition from imports from the EU ceased	Increased price of imported inputs
Implementation of EU import tariffs	Makes imports from third countries more expensive and hence, less price competitive	Increased price of imported inputs
Implementation of EU intervention system	Ensures certain income and demand for producers	Increased bureaucracy; additional quality requirements on products; input price increase for the processing industry
Adoption of EU milk quotas	Ensures high quality (domestic) raw material	Limits the availability of domestic raw material if the quota is binding*
Income support to Estonian farmers	Ensures high quality (domestic) raw material	

Source: author's table

Notes: *Nevertheless, milk quotas allocated to Estonia have not been fulfilled and in general, EU milk quotas are being increased annually before being phased out by 1 April 2015.

The next sub-chapter deals with overall developments in Estonia's trade with agricultural products and foodstuffs followed by an analysis of the competitiveness of the milk, meat and fish processing industries on the main export markets and the domestic market in Chapters 2.2. and 2.3. respectively.

2.1.3. Trade patterns before and after the accession to the EU

Since 1995, Estonia's trade in agricultural products and foodstuffs has been in deficit, and the deficit has in general followed a downward trend over the years.[66] This has been largely the result of the trade policy pursued in Estonia, which opened domestic markets to subsidised imports from abroad, leaving domestic industry without any protection. Only during 2000–2001, did exports grow faster than imports, partly as a result of the introduction of tariffs on agricultural imports in 2000 and partly as a result of the re-direction of exports away from Eastern markets towards Western markets after the 1998 Russian crisis. Accession to the EU in 2004 boosted both Estonian exports and imports of foodstuffs, however, exports increased at a faster pace than imports in 2004–2008 (only with the exception of 2007), or at least the annual fall in exports was slightly smaller than in imports (in 2009) (see Appendix A.9).

The balance of trade for milk products has been positive during the whole period of 1999–2009 (see Figure 2.5) This trade balance has in general followed an upward trend with the only exceptions being 2003 and 2008–2009, with the latter likely reflecting the effect of the global economic recession. As for total trade in agricultural products and foodstuffs, EU accession in 2004 seems to have boosted exports as well as imports, with export growth exceeding growth in imports for 2004–2006.

Trade with meat products, on the other hand, has been in deficit for the entire period of 1999–2009, with the gap deepening during 2004–2008 (see Figure 2.6). Indeed, EU accession seems to have had an immediate boosting effect on imports, whereas export growth has only picked up after a time lag. Nevertheless, the pace of growth in exports has exceeded that of imports for 2006–2009.

[66] The following analysis is based on the Harmonised System (HS) trade categories.

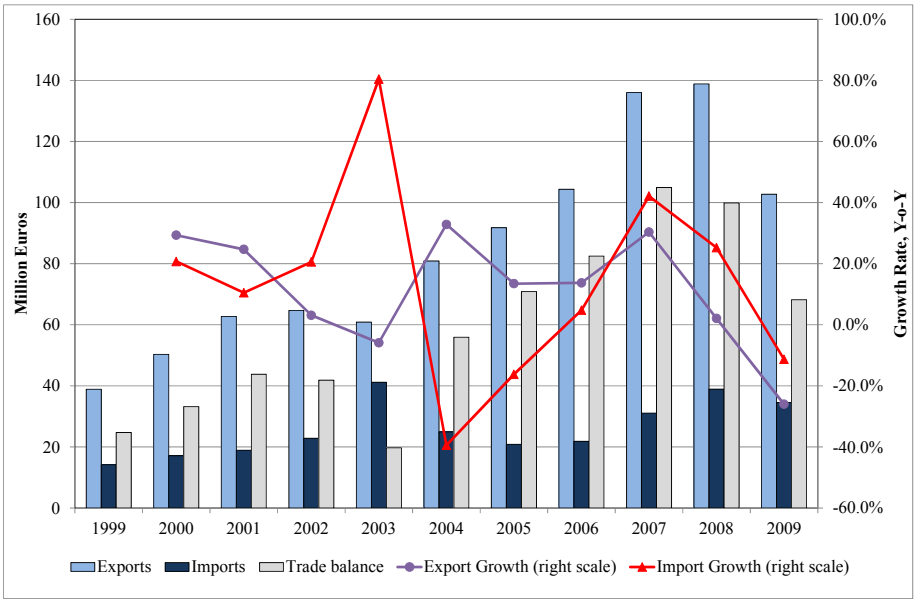

Figure 2.5. Trade with milk and milk products for 1999–2009, absolute values and annual growth rates (Source: Dataset DS-016893; author's calculations)

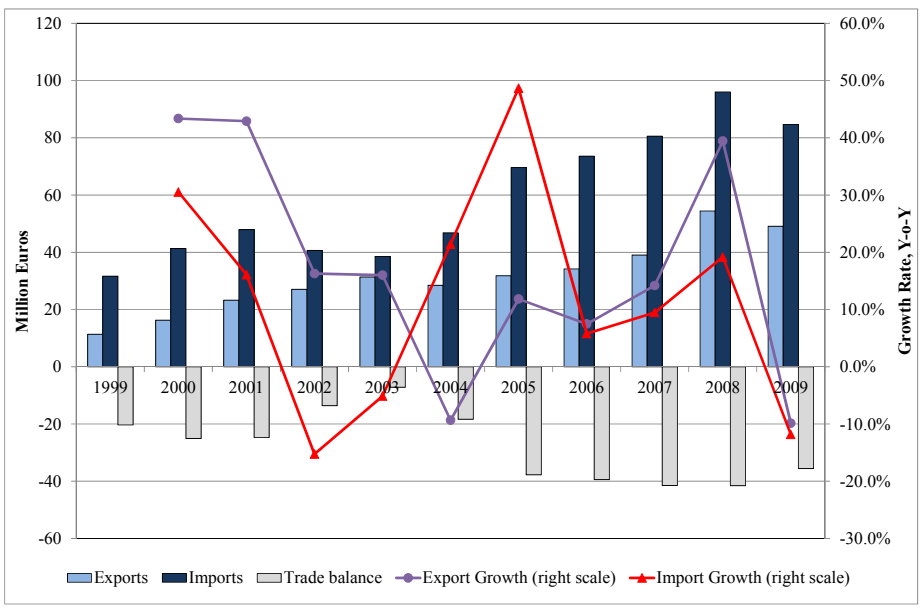

Figure 2.6. Trade with meat and meat products for 1999–2009, absolute values and annual growth rates (Source: Dataset DS-016893; author's calculations)

As with milk products, trade with fish and fish products has been in surplus through 1999–2009; however, the surplus has been declining through 2001–2008 as import growth has outpaced growth in exports (see Figure 2.7). After four years of consecutive decline, Estonian exports of fish products picked up in 2005; however, they entered a negative growth zone again in 2007.

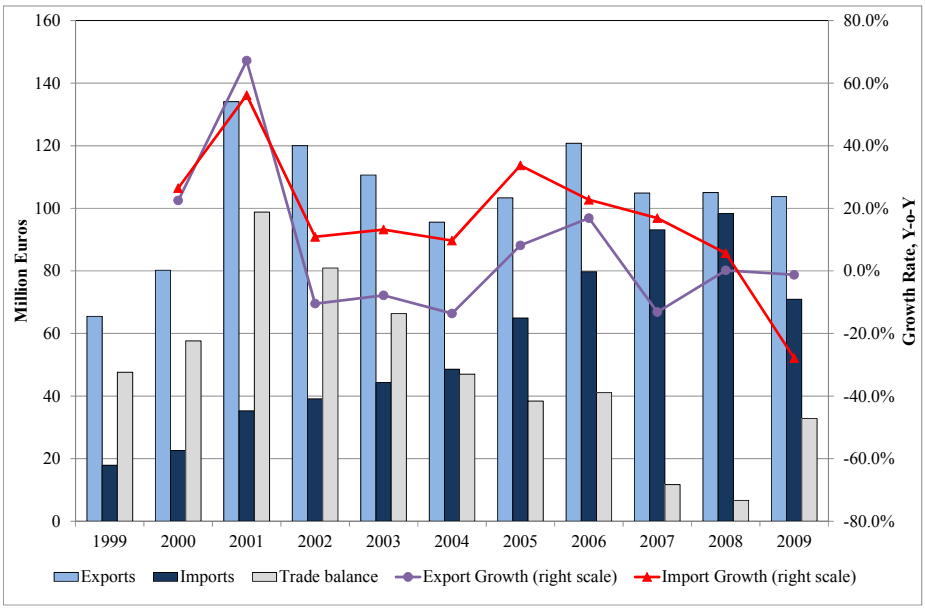

Figure 2.7. Trade with fish and fish products for 1999–2009, absolute values and annual growth rates (Source: Dataset DS-016893; author's calculations)

Accession to the EU in 2004 also had a significant effect on the structure of trade partners, although trade patterns had already changed during the integration process. The role of the EU-15 as a destination for Estonian milk products (in terms of trade volume) had increased from 23.5% to 74.4% through 1999–2003 (see Appendix A.10). However, in 2004–2009, the role of the EU-15 in exports started to decrease and dropped to only 37.1% by 2009, to the advance of the other new member countries that joined the EU in 2004 (NMSs), whose share increased from 23.1% in 2003 to 40.9% in 2009, and third countries, from 2.5% in 2003 to 22.0% in 2009.

In the case of meat products, rather different developments occurred. The share of the EU-15 in Estonia's exports increased from a mere 0.8% in 2003 to 16.2% in 2009. This was accompanied by a drop in the role of the NMSs (from 93.7% in 2003 to 73.6% in 2009) and an increase in the share of non-EU countries (from 5.5% to 10.2%).

Non-EU countries accounted for the bulk of Estonia's fish exports prior to accession to the EU, and their share has increased slightly after accession (from 83.6% in 2003 to 87.9% in 2009). This has been at the expense of exports to the EU-15 and NMSs, whose share has declined respectively from 6.9% to 4.9% and from 9.4% to 7.2% during the same period.

In terms of imports, the EU-15 has been Estonia's main source of imported meat and fish products and this has increased since Estonia's accession to the EU (from 65.6% in 2003 to 72.1% in 2009 in the case of meat products and from 41.0% in 2003 to 44.1% in the case of fish products; see Appendix A.11). Similarly, the importance of the NMSs has increased considerably through 2003–2009, leading to a trade diversion away from the third countries. In 2003, non-EU countries accounted for 20.3% of Estonia's imports of meat products and 50.4% of imports of fish products. By 2009, the respective shares had fallen to a mere 0.3% and 23.1%.

In the case of milk products, the share of the EU-15 had fallen from 46.9% in 1999 to only 6.1% in 2003, to benefit the NMSs. Accession, however, brought an increase in the EU-15's market share, and by 2009, the old members of the EU accounted for 40.0% of Estonia's imports of milk products (by volume). This was accompanied by a fall in the relative importance of the NMSs and the third countries. The market share of the former group of countries fell from 74.0% in 2003 to 57.7% in 2009 (although an immediate increase to 83.9% occurred in 2004). At the same time, the latter group accounted for only 2.3% of Estonia's milk imports in 2009, which compares with 19.9% in 2003.

Hence, preliminary comparative analysis suggests that Estonia's accession to the EU brought an increase in exports to third countries, although EU countries (EU-15 and NMSs) still account for the bulk of exports (except for fish products where the third countries clearly dominate). While milk exports seem to have grown, especially in the markets of the new members of the EU, the importance of the old members has increased in Estonia's exports of meat products. On the import side, a trade diversion towards the old members of the EU (or in general, EU members) has occurred.

This was an expected result, as with membership Estonia adopted a more protectionist foreign trade policy towards countries outside the EU, while the increasing share of non-EU countries in Estonia's exports points to the impact of the abolition of double-tariffs on exports to Russia.

In the next sub-chapter, an overview of previously conducted studies dealing with the competitiveness of the Estonian food processing industry within the framework of EU accession is presented, before turning to the analysis of the competitiveness of the Estonian food industry on the main export markets in Chapter 2.2.

2.1.4. Previous studies of the competitiveness of the Estonian food processing industry

Even though there are numerous studies assessing the competitiveness of the food industries in other Central and Eastern European countries (CEECs), there are not many studies conducted on the impact of EU accession on the Estonian food processing industry to date. Results based on other CEECs, however, cannot be in most cases generalised for Estonia, since the agricultural and trade policies applied in Estonia have differed from other CEECs significantly.

Nevertheless, there are a few *ex ante* studies dealing with the impact of EU accession on the agri-food sector in Estonia (e.g. Fock 2000, Hein 2005, Riik *et al.* 2002, Roth 2001, Selliov 2002, Tamm 2002, Toming 2002, Varblane *et al.* 2001, Varblane *et al.* 2002, Varblane *et al*. 2003). The empirical focus of these studies, however, has largely been on the welfare effects of integration and imports while no study explicitly analyses integration effects on exports. Some of these studies are only descriptive, not providing a deeper insight into the expected changes, or they occupy themselves with issues not directly of interest in the context of the present study (e.g. the adoption of direct payments to farmers). Therefore, only a few of them will be considered here.

Only a very small number of the studies deal with the competitiveness of the Estonian food industry within the framework of EU accession. One example of a study analysing the competitiveness of Estonia's agri-food sector is Reiljan and Riik (2003). The authors measure the existence or lack of competitive advantage in selected product groups in 2001 using the relative export advantage (RXA), relative import penetration (RMP) and relative trade advantage (RTA) indices. The authors conclude that Estonia had a competitive advantage in the case of most milk products, and that the milk sector was competitive even despite the uneven competition conditions due to the distorting market and trade policies of its partners (Reiljan, Riik 2003: 50–51). However, in the case of meat production, only sausages revealed a competitive advantage (Reiljan, Riik 2003: 51).

Reiljan and Tamm (2005) follow the approach taken by Reiljan and Riik (2003), and use the same competitiveness indices for 2003. Their findings suggest that in 2003, Estonia had a competitive advantage in most of the milk products (with some exceptions such as uncondensed milk and whey), and in the production of pork, sausages and canned meat. The production of beef and poultry was shown to be uncompetitive (Reiljan, Tamm 2005: 46). The authors suggested that the competitiveness of the milk sector was because of relatively low procurement prices due to the lack of market power among Estonian milk farmers. However, this competitiveness, based on prices, was predicted to cease after Estonia's accession to the EU and the accompanying implementation of the EU intervention system (Reiljan, Tamm 2005: 49). At the same time, the lack of competitiveness in the beef sector was attributed to the fact that even though producer prices in Estonia were below EU producer price levels, beef was a side-product of milk production in Estonia, as a result of which its quality

was not comparable with the quality of the EU cattle raising. Consequently, Estonia had no licence for exporting beef to the EU (Reiljan, Tamm 2005: 48). The authors also concluded that without trade distortions, the Estonian agricultural sector would be very competitive, given the fact that in the case of reciprocally open markets, Estonia's trade balance for agricultural products and foodstuffs had a large surplus (Reiljan, Tamm 2005: 59). The study did not include fish products.

Hein (2005) has analysed the competitiveness of the Estonian milk sector (including both farm level and the processing industry) using a Policy Analysis Matrix (PAM), which utilises the Domestic Resource Cost Ratio (DRC) and the Private Cost Ratio (PCR), which refer to comparative advantage and competitiveness, respectively. The study dealt with competitiveness and comparative advantage before EU accession, based on data for 2000–2004. The study concluded that milk farms have been in general competitive throughout the whole period (except in 2000), while the results for the milk processing sector are more mixed.

The author divided milk processing enterprises into export oriented (bulk commodities) and domestic market oriented (high value-added consumer products), which allowed her to conclude that export oriented milk processing companies were in general more competitive than companies oriented towards the home market (which were in general uncompetitive) for 2002–2004 (Hein 2005: 101). She explained this phenomenon using the differences in efficiency levels, but also with the fact that export oriented producers face higher prices on export markets (mainly the EU). At the same time, the companies oriented towards the domestic market experienced stable output prices, the level of which was, however, limited by the purchasing power of domestic consumers (Hein 2005: 101–102). However, the analysis pointed out the comparative disadvantage of the milk processing companies for 2002–2004, which allowed the author to predict that over the longer term, considering the liberalisation of the CAP, the situation for export oriented companies may become unfavourable. This is also supported by the author's finding that export oriented companies have lost competitiveness during the period, while companies oriented towards the domestic market have slightly gained in competitiveness (Hein 2005: 102).

To estimate the competitiveness of the Estonian milk sector after accession to the EU, Hein (2005) assumed the introduction of EU intervention prices on some milk products. She found that the competitiveness of the Estonian milk processing sector would worsen after accession to the EU, whereas this worsening would be especially remarkable in the case of domestic market oriented companies (Hein 2005: 111).

However, there are no studies previously conducted which assess the impact of EU membership on the food industry in Estonia *ex post*, making this dissertation the first attempt to analyse the actual impact of EU accession on the competitiveness of the food processing industry in Estonia.

2.2. The impact of EU accession on the competitiveness of the Estonian food processing industry on export markets

2.2.1. Competitiveness on the EU-15 markets

2.2.1.1. Changes in export volumes and the value-added level of exports

With Estonia's accession to the EU in 2004, the last remaining formal barriers on Estonia's foodstuff exports to the EU were abolished. As a consequence, one would expect Estonia's foodstuffs exports to the EU-15 to increase. We can ask whether the significant investments in stricter hygiene and product standards that raised costs and compelled many smaller firms to exit have been compensated for by better export opportunities to the large EU market and resulted in enhanced competitiveness for the Estonian food processing industry. To answer this question, we will look at the changes in trade volumes, but also assess changes in the trade structure according to the value-added (or processing) level of exports.

Figure 2.8. depicts the developments in Estonia's exports of milk, meat and fish products to the EU-15 for 1999–2009. As the figure shows, there was an immediate increase in the value of exports of all products in 2004 – the year of accession – compared to 2003. Exports of fish products, however, actually dropped 3.1% in terms of quantity in 2004 compared to a year earlier. Milk exports had followed a steady upward trend since 2001, however, in the case of meat exports, a considerable increase occurred in 2004.

During 2003–2009, the value of Estonia's milk exports to the EU-15 increased on average 1.3% per year and fish exports increased 0.7% per year, while meat exports grew 50.5%. In terms of quantity, milk exports fell on average 0.1% per year and fish exports dropped 4.5% per year; nevertheless, meat exports grew by a strong 66.9% (although the high growth rate partly reflects a very low initial level of exports prior to accession, which itself partly mirrors the fact that Estonia is not self-sufficient in meat production).

However, the data for 2008 and 2009 is likely to reflect the impact of the global economic recession that resulted in a sharp drop in international trade, and indeed when considering the period 2003–2007, Estonia's exports to the EU-15 increased in all categories. The value of milk exports increased on average 15.0% per year (8.8% in terms of quantity), while meat exports grew 66.5% (93.4% in terms of volume) per year. An increase in fish product exports was less significant at a 4.4% (1.4% in terms of quantity) average annual pace. Nevertheless, the export value of milk products in 2007 is somewhat biased, as 2007 was characterised by very high world market prices for dairy products (see Appendix A.12), which is also reflected in a higher growth rate for export value compared to export volume. In the case of meat products, the price hike came relatively later, in 2008 (see Appendix A.13).[67]

[67] Unfortunately, a similar price index was not available for fish and fish products.

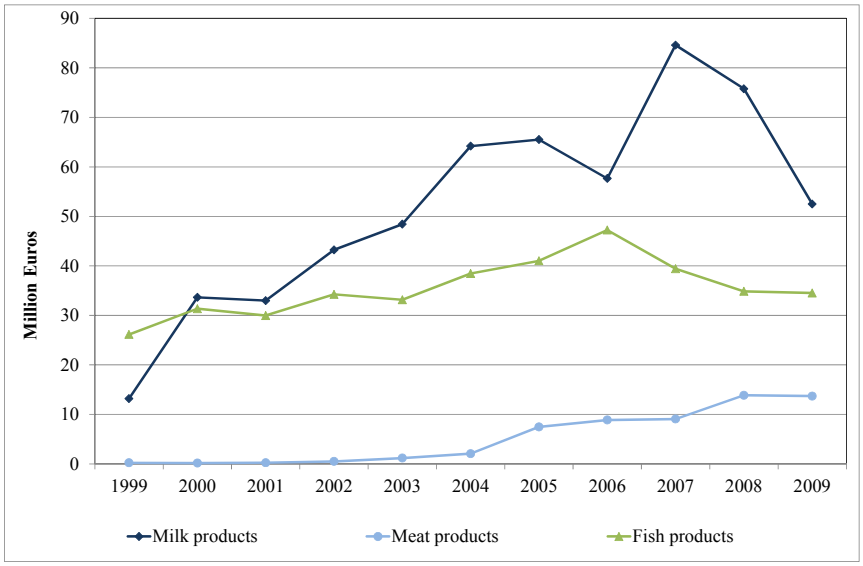

Figure 2.8. The developments in the value of Estonian milk, meat and fish exports to the EU-15 for 1999–2009 (Dataset DS-016893; author's calculations)

During the period 1999–2003, Estonia's exports of milk and milk products to the EU-15 grew on average 38.5% (26.9% in terms of quantity) per year, hence export growth actually lost momentum after accession in 2004. Exports of fish and fish products grew 6.1% (3.0% in terms of quantity) per year during the pre-accession period, similarly signalling that export growth lost steam. Only exports of meat and meat products seem to have been boosted by accession, with an average annual growth rate of 66.5% (93.4% in terms of quantity) for 2004–2007 compared to a pre-accession growth rate of minus 52.4% (-6.9% in terms of quantity) for 1999–2003.

Consequently, Estonia's export market share (as introduced in sub-chapter 1.1.2.2) in the EU-15 market for milk and meat products (in terms of quantity) increased respectively from 0.18% and 0.00% in 2003 to 0.22% and 0.02% in 2007, before dropping to 0.15% in 2009 in case of milk products. Nevertheless, Estonia's market share with respect to meat products continued to increase reaching 0.03% in 2009 (see Appendix A.14). For fish products, Estonia's market share in total EU-15 imports dropped slightly from 0.11% in 2003 to 0.10% in 2007, followed by a deeper fall to 0.07% in 2009.

However, developments in export volumes alone are not sufficient when drawing conclusions about the level of competitiveness. The question is whether Estonian exports of foodstuffs indicate an increase in the share of processed consumption-ready foodstuffs, or whether primary and semi-processed products constantly dominate trade?

Taking into account the characteristics of the three industries under consideration, and assuming that a higher level of processing and proximity to

end-consumers generally indicate higher value-added, the classification of agricultural and food products applied by van Berkum (1999) is followed here. Transferring the SITC (Standard International Trade Classification) codes used in the abovementioned approach to the HS codes, the main product groups (at a 4-digit level) in Estonian exports of foodstuffs are presented in Table 2.8 according to their levels of processing.

Table 2.8. The classification of products according to their processing level [a, b]

	Primary products mainly for industrial use	Primary products mainly for household consumption	Processed products mainly for industrial use	Processed products mainly for household consumption
Meat processing	0201, 0202, 0203, 0204, 0206, 0207	–	–	1601, 1602
Dairy processing	0401	–	0402, 0404, 0405,	0403, 0406, 2105
Fish processing	0302, 0303, 0304	–	–	1604, 1605

Source: van Berkum, 1999 (author's modifications)

Notes: [a] The HS4 codes contain the following product groups: 0201 – fresh or chilled bovine meat, 0202 – frozen beef, 0203 – pork, 0204 – meat of sheep or goats, 0206 – edible offal, 0207 – poultry, 0302 – fresh or chilled fish, 0303 – frozen fish, 0304 – fish fillet, 0401 – milk and cream, 0402 – concentrated milk and cream, 0403 – yoghurt, 0404 – whey, 0405 – butter, 0406 – cheese and curds, 1601 – sausages, 1602 – prepared and preserved meat (e.g. ham), 1604 – prepared and preserved fish, 1605 – prepared and preserved crustaceans, molluscs and other aquatic invertebrates, 2105 – ice cream.

[b] The original table by van Berkum (1999) did not include fish products.

Although milk, meat and fish are considered primary products mainly for household consumption, it is likely that the largest part of Estonia's exports of these products do not reach households directly, but is processed/repacked by local processors before reaching end-users. Concentrated milk (mainly in the form of milk powder), butter and whey are considered processed products mainly for industrial use, while sausages, ham, yoghurt, cheese, ice cream and prepared or preserved (tinned) fish belong to the group of processed products mainly directed to end-consumers.

However, this division must be considered with caution since products belonging to the latter group do not, often, directly reach the end-consumers, although the situation has started to change. However, the available statistics do not reflect this issue. For example, in the earlier years of accession, Estonian cheese was mostly sold to the EU-15 countries as a commodity, which will be either used in catering establishments (such as restaurants and pizzerias) or

repacked and sold under importers' brand names (or a private-label). Yet, in recent years, the share of cheese directed towards end-consumers has started to play a larger role in exports (Saron 2011).

Furthermore, in Estonia's exports of the product group HS 1604 preserved (canned) fish of Baltic herring and sprats dominates (especially as regards exports to non-EU countries), which has a low unit value compared to most of the exported fresh or chilled fish which is produced from fish species of higher value. Furthermore, even though the product group HS 1604 belongs to the group of "processed" products it is questionable whether this type of fish product entails higher value-added compared to, for example, the production of chilled fish fillet. This is especially the case for exports to Russia and Ukraine, where price is the main competitiveness determinant. From consultations with industry experts, it turned out that Estonian exports of the product group HS 1604 to countries such as Russia and Ukraine actually do not contain much human labour and the level of added value is minimal (Ulmas 2011). Nevertheless, it can be assumed that exports of products belonging to the above-mentioned product group to the EU-15 nevertheless encompass a somewhat higher level of value-added, although the profit margin of these products compared to chilled fish made of species which have higher value (price) might be lower.

The product groups given in Table 2.8 each embody many different products that can be of different processing levels. Therefore, to obtain reliable conclusions, data for the exports of the industry sectors involved was analysed at an HS 6-digit level. The data was obtained from the Eurostat foreign trade dataset DS-016893 (EU25 Trade Since 1995 By HS6), available online.

However, there is a problem related to the comparability of data before and after May 2004, as the system of foreign trade data collection changed with Estonia's accession to the EU. Trade data on transactions between the EU countries is now based on statistical reports (Intrastat), which only includes enterprises with a large trade turnover. Total trade values are estimated using statistical methods, and the difference between the total estimated export values and the collected export values are given at the 2-digit chapter level only. Following consultations with the experts from Statistics Estonia, these differences between the estimated and collected values were proportionally divided between 4-digit product groups.[68]

Ideally, the analysis of value-added level should be based on trade values adjusted using detailed price indices. However, price indices were available only at an aggregated level, which proved to be insufficient for the analysis.[69] In order to abstract from pure price changes, such as the steep increase in

[68] The difference between estimated and collected trade data is only available in terms of the value of trade and not in terms of quantity. In terms of quantity, only collected trade volumes are reported.

[69] The lack of availability of sufficiently detailed price indices was especially pronounced in the case of the inter-country comparison in sub-chapter 2.2.1.2.

agricultural prices in 2007, trade volumes in terms of quantity were considered instead.

The results of the analysis are given in figures 2.9–2.11 and Appendix A.15. The figures clearly indicate that Estonia's EU accession remarkably eased access to the EU-15 market for processed milk products for household consumption the share of which has grown from 29.1% in 2003 to 49.8% in 2009 (see Figure 2.9). This increase was at the expense of processed milk products for industrial use, the share of which has fallen from 67.5% to 44.7% during the same period. In addition, primary milk products slightly gained in importance, from 3.4% to 5.5%.

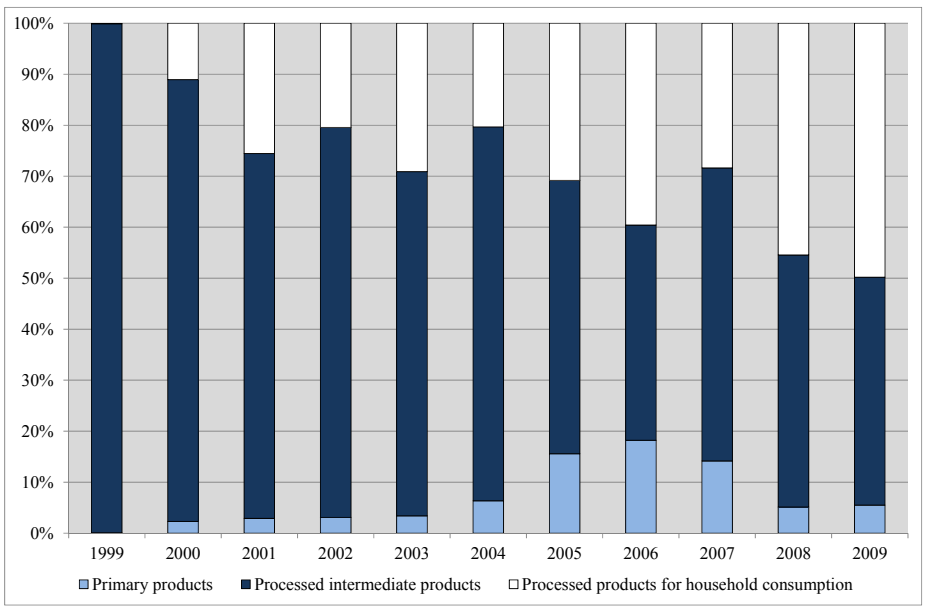

Figure 2.9. The composition of Estonia's milk exports to the EU-15 (Dataset DS-016893; author's calculations)

Looking at the absolute volumes of exports, exports of processed products for household consumption (yoghurt, cheese) have increased 69.6% through 2003–2009, whereas exports of yoghurt in particular have increased considerably (by 34 times). At the same time, exports of processed intermediate milk products such as milk powder and butter have fallen by 34.3% through 2003–2009, while exports of primary products have increased 61.3% (though still at relatively low absolute levels compared to the other two categories). It must be noted, however, that the increase in the share of processed intermediate products in 2007 was due to the high prices of butter and milk powder, which resulted in a higher share of these products in production and exports, and consequently, a lower share of cheese and yoghurt.

For the Estonian meat industry, a shift towards unprocessed exports occurred after Estonia's accession to the EU. In 2003, the share of unprocessed meat products was 64.9%, which increased to 83.5% in 2009 (see Figure 2.10). This was a result of a 28-fold increase in the exports of unprocessed meat compared to the "mere" ten-fold growth in exports of processed meat products.

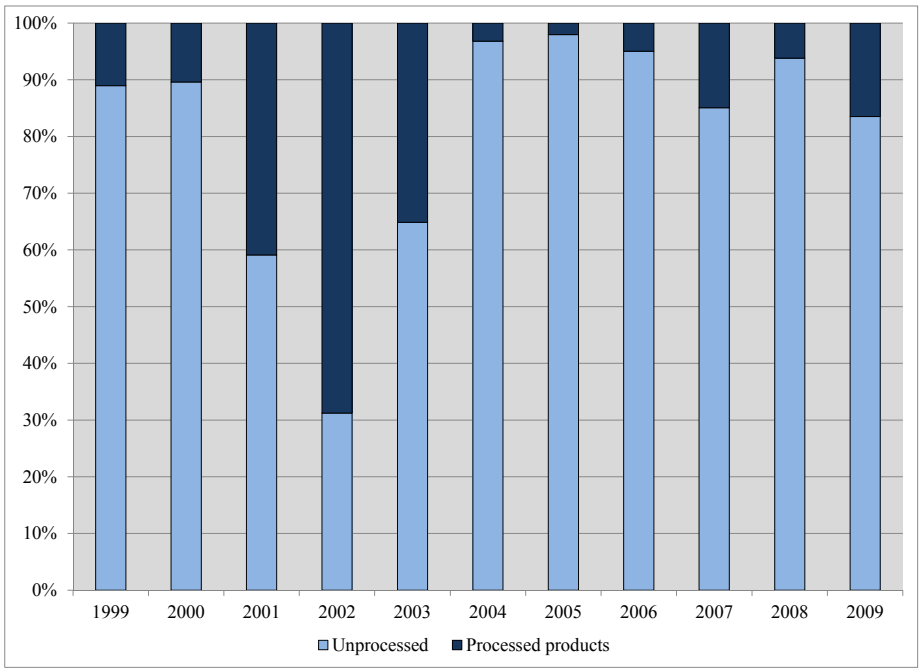

Figure 2.10. The composition of Estonia's meat exports to the EU-15 (Dataset DS-016893; author's calculations)

In the case of Estonian fish exports to the EU-15, a slight shift towards products of higher processing level has occurred since accession to the EU. In 2003, processed products constituted 28.2% of total fish exports to the EU-15, while this figure was 34.3% in 2009 (see Figure 2.11). However, as discussed above, it is not entirely clear whether this is a desirable result given the low value of the products belonging to the group "processed products". Nevertheless, it can be assumed that at least compared with exports to non-EU countries, the level of value-added of processed fish products exported to the EU-15 should be higher. This shift in the composition of exports was accompanied by a relatively low increase in the absolute volume of exports, which is in clear contrast to the meat industry, and to a lesser extent, also the dairy industry.

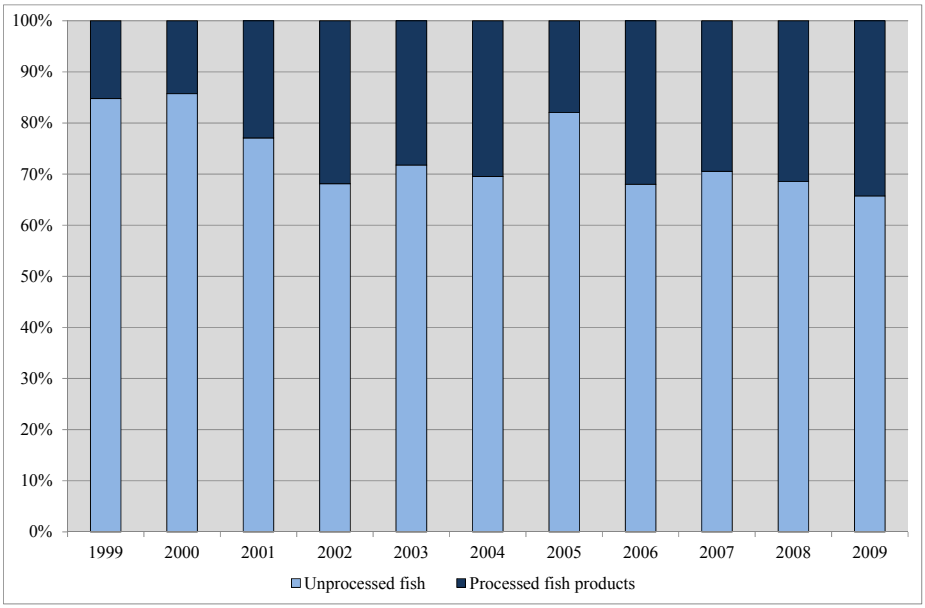

Figure 2.11. The composition of Estonia's fish exports to the EU-15 (Dataset DS-016893; author's calculations)

From these figures we can conclude that accession to the EU reinforced the importance of the EU-15 countries in Estonian agri-food exports, although this development had already started during the pre-accession period. The analysis shows that accession to the EU was accompanied by a shift in Estonian milk exports to the EU-15 towards higher value-added products, directed towards households. Despite a fall in 2008 and 2009 (which partly reflects the impact of the recent global economic recession), export volumes of milk products have followed a solid upward curve since 2003.

Meat exports, at the same time, have received a boost from accession, with an average annual growth rate of 66.9% through 2003–2009. However, this has not been accompanied by a shift in exports towards processed products. Exports of fish and fish products did not experience any (significant) growth in absolute export volumes, yet a shift towards higher processing level of exports occurred, however it is not clear whether this was a positive result.

Even though the milk processing industry has been rather successful in finding markets for their high value-added consumer products in the old member states of the EU, we can conclude that EU membership has not fully facilitated access to the EU-15 markets for high value-added products and enabled the Estonian industry to reap the benefits of the wealthy consumer market, or the growth of exports of high value-added products has been slower than the growth of exports of lower value-added levels. Milk products are also the only product group for which the trade balance has been constantly in surplus for Estonia.

However, the results of the analysis are highly sensitive to the classification of products, and hence, should be considered with caution. In addition, it is hard to tell the extent to which these changes in exports were due to accession to the EU, and to which extent to developments that would have occurred without accession. In order to solve the latter problem, an econometric analysis is conducted in sub-chapter 2.2.1.3; however, before turning to the results of that analysis, the export performance of the Estonian milk, meat and fish processing industries is compared with the respective industries from the other NMSs.

2.2.1.2. Estonian food exports in inter-country comparison

The previous chapter showed that EU accession had different implications for Estonia's exports of milk, meat and fish products. However, the question arises whether these changes were due to the high or low competitiveness of the Estonian food processing industry in the EU-15 market, or whether they were characteristic of integration itself.

When considering EU-15 imports from the NMSs alone, Estonia's export market share in the case of milk products declined from 13.32% in 2003 to a mere 2.29% in 2007, before dropping further to 1.46% in 2009 (see Appendix A.16). This was despite the 8.8% annual growth in export volume to the EU-15 through 2003–2007 and suggests that milk exports from other NMSs have increased more during the post-accession period. In the case of meat products, Estonia's share in EU-15 imports from NMSs increased from 0.07% in 2003 to 0.56% in 2009. When we consider fish imports from the NMSs to the EU-15, Estonia's share dropped from 7.59% in 2003 to 3.51% in 2007 and 2.30% in 2009. This suggests that Estonia has done relatively better than the other NMSs only in the case of meat exports. At the same time, Estonia's market share in the case of meat products is still very low.

A value-added analysis similar to the one presented in the previous chapter was undertaken for other new member states (the Czech Republic, Hungary, Lithuania, Latvia, Poland, Slovakia and Slovenia), and the results were compared to developments in Estonian exports.[70] Export data from the other NMS was similarly based on Eurostat's Dataset DS-016893 (EU25 Trade Since 1995 By HS6), ensuring the best possible level of comparability.[71]

Figure 2.12. depicts developments in the absolute volumes of milk exports to the EU-15. A preliminary assessment suggests that exports have indeed increased faster since 2003 than during 1999–2003, which can (at least partly)

[70] Malta and Cyprus were excluded from the analysis because of their small size and very different economic structure, which proved incomparable with Estonia. The analysis did neither cover Bulgaria and Romania that joined the EU first in 2007.

[71] For Poland and Slovakia, no data was available on HS6 level for 1999–2003, therefore data on HS4 level for the period prior EU accession was used instead.

be attributable to accession to the EU. [72] In fact, Estonia was the only country for which growth in export volumes actually lost momentum in the post-accession period, and which registered the lowest average annual growth for 2003–2007. Hungary and the Czech Republic in particular have experienced a remarkable increase in export volumes, with an annual growth rate exceeding 100%. Hungary and Lithuania, which in 2003 exported less milk products to the EU-15 than Estonia, had overtaken Estonia already by 2004. [73]

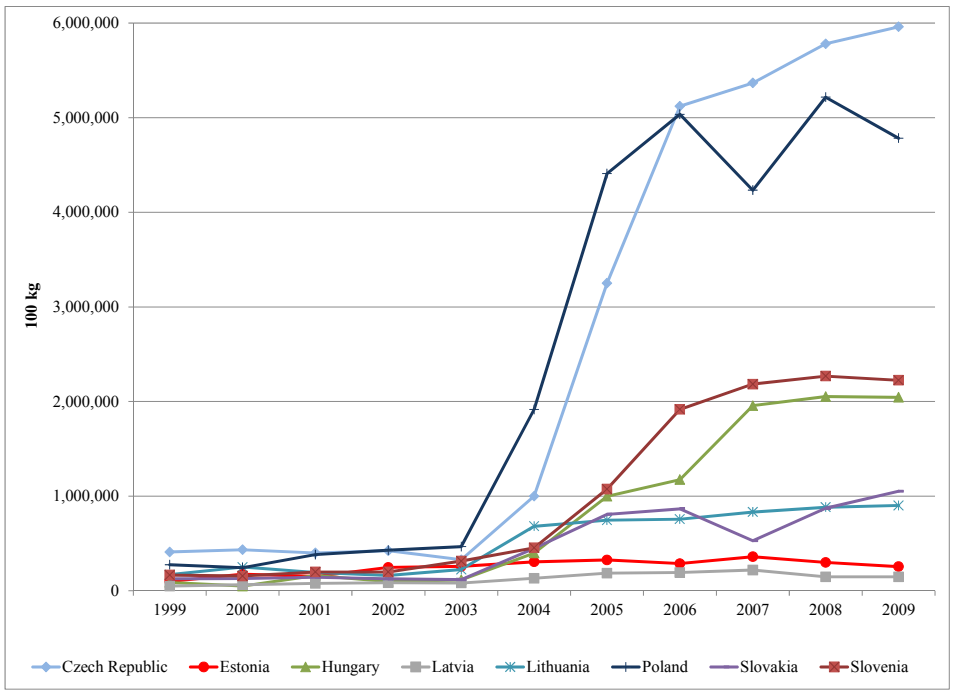

Figure 2.12. The development in export volumes of milk and milk products from the NMSs to the EU-15 for 1999–2009 (Dataset DS-016893; author's calculations)

[72] The comparison of pre-2004 and post-2004 export growth rates showed that with a few exceptions, exports have generally grown annually relatively faster in the post-accession period. However, due to significant annual fluctuations in export values in the case of many NMSs, there can be a bias in the average annual growth rates in the two periods, which makes the comparisons of growth rates implausible.

[73] The export figures could be distorted by the fact that accession to the EU induced producers and traders to accumulate large stock reserves just before accession, and which were, in the case of the milk processing industry, probably most significant in Estonia (Saron 2006). However the latter only influences export volumes immediately after accession and should not have any impact on trade patterns over the longer term.

However, a decomposition of exports shows that Estonia is the only NMS that has experienced an increase in the share of processed products for household consumption in exports in 2009 compared to 2003. Estonia was also the country with the highest share of household-oriented products in milk exports in 2009 (see Figure 2.13). The share of processed products for industrial use declined in the Czech Republic, Estonia, Hungary and Slovenia, but increased in Latvia and Lithuania. In 2009 compared to 2004, the respective indicator for Poland dropped but increased for Slovakia. Only Latvia has a smaller share of primary milk products in total milk exports than Estonia, while primary products accounted for more than 80% of 2009 milk exports from the Czech Republic, Hungary and Slovenia. The share of primary products in milk exports increased in all countries except Lithuania and Slovakia.

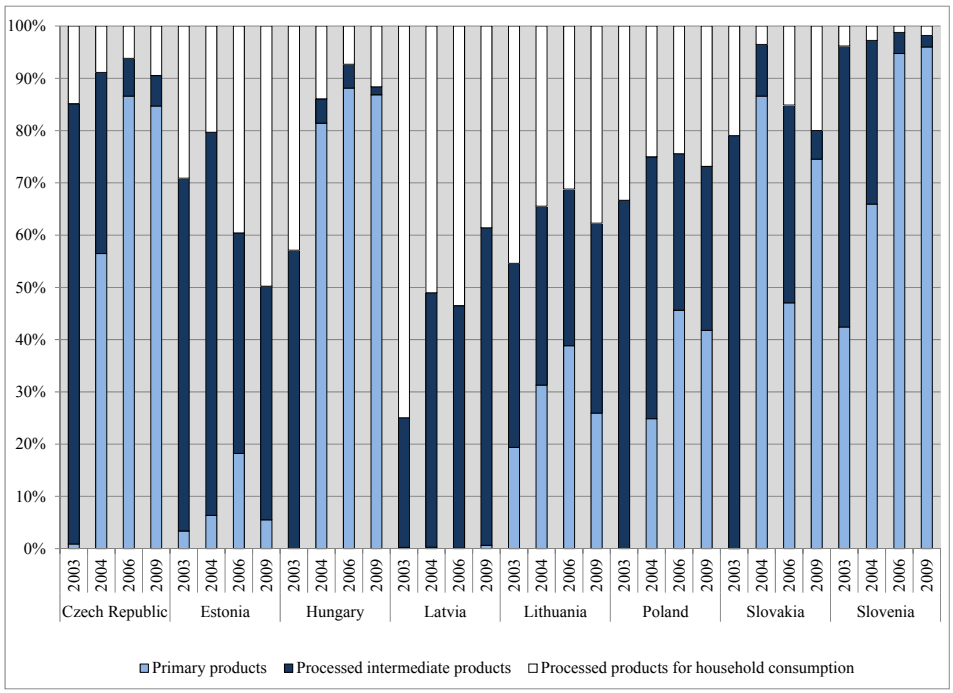

Figure 2.13. The composition of milk exports from the NMSs to the EU-15 for 2003–2009 (Dataset DS-016893; author's calculations)

In the case of meat exports, the average annual growth rate of exports has increased in the post-accession period compared to the pre-accession period for all countries except Hungary and Slovakia (see Figures 2.14 and 2.15). Only Latvia and Lithuania have experienced a higher post-accession growth rate than Estonia.[74] However, Estonia and Lithuania are the only NMSs where exports have undergone a shift towards a lower share of processed products (see Figure 2.16).

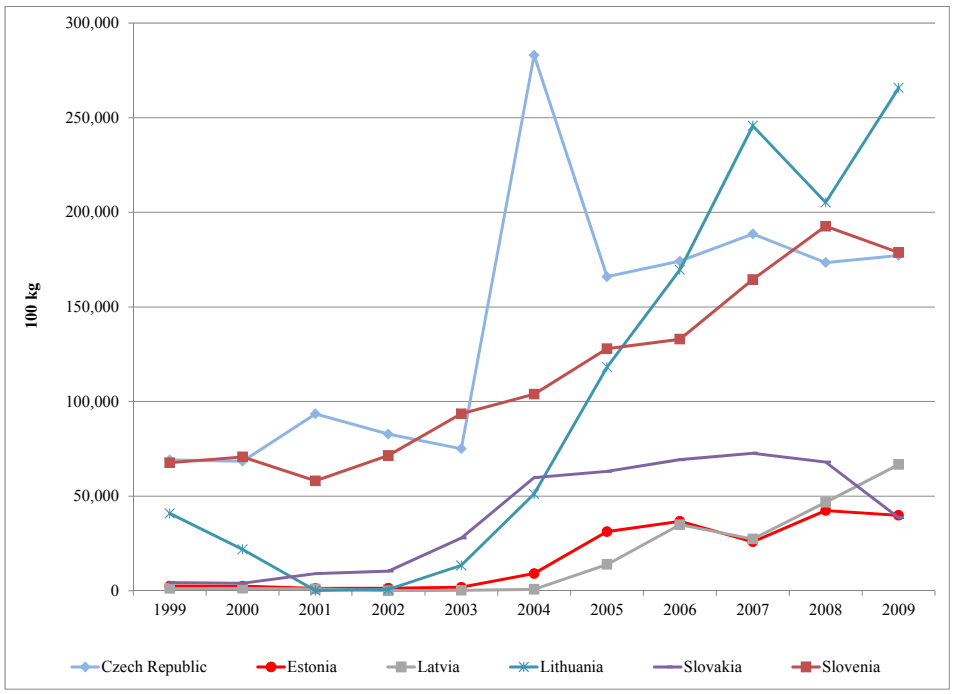

Figure 2.14. The development in export volumes of meat and meat products from the NMSs to the EU-15 for 1999–2009 (Dataset DS-016893; author's calculations)

[74] Latvia's exports of processed meat products to the EU-15, however, were marginal before 2004, which explains the unusually high increase in exports after accession.

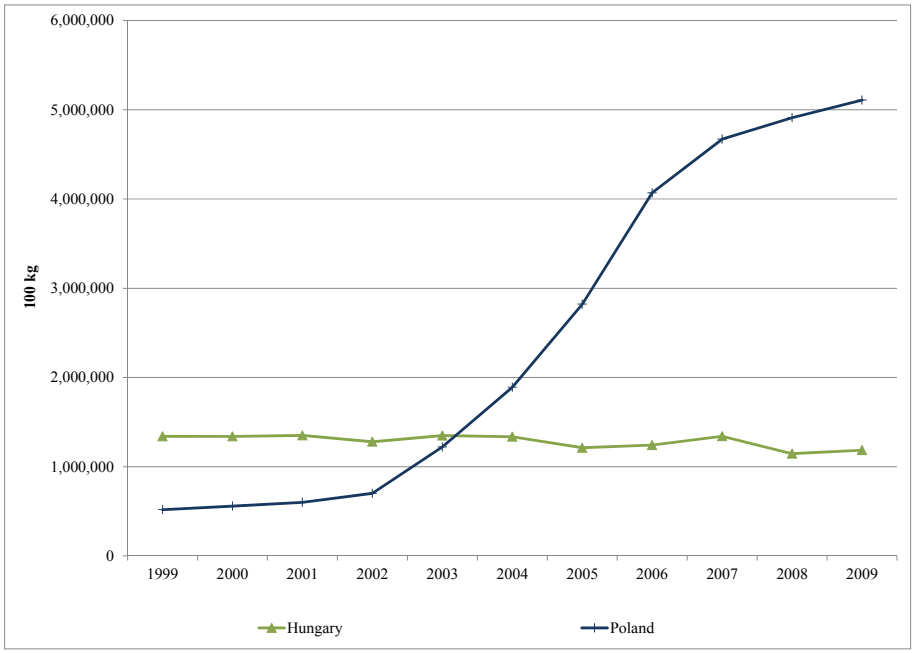

Figure 2.15. The development of Hungarian and Polish export volumes of meat and meat products to the EU-15 for 1999–2009 (Dataset DS-016893; author's calculations)

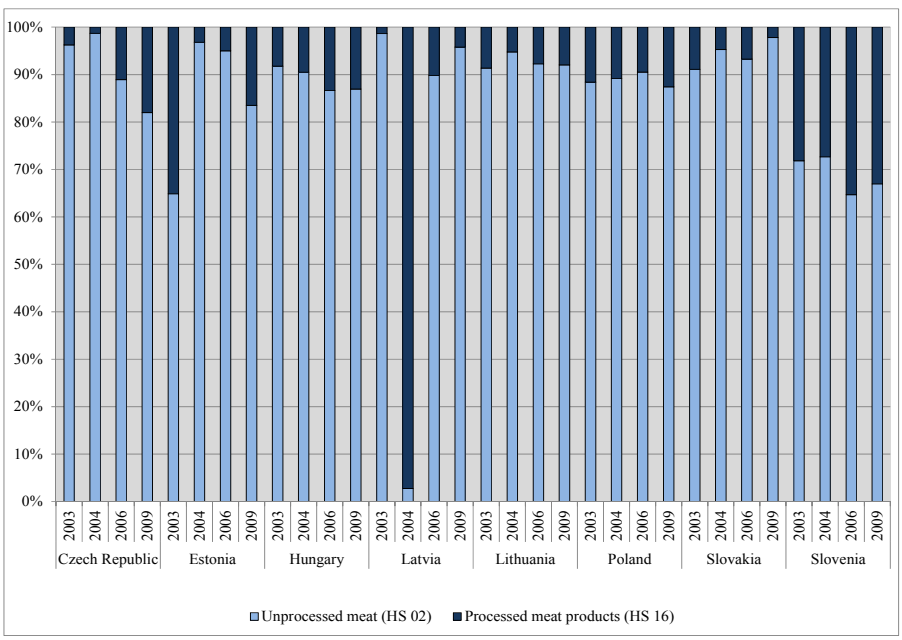

Figure 2.16. The composition of meat exports from the NMSs to the EU-15 for 2003–2009 (Dataset DS-016893; author's calculations)

Exports of fish and fish products seem to have gained access to the EU-15 markets only in the case of Latvia and Lithuania (see Figure 2.17). In addition, fish exports from Poland, which has a large imported input-based fish industry, have increased considerably (see Figure 2.18). For other NMSs, accession to the EU has not been accompanied by any considerable increases in fish exports to the EU-15. The developments in the processing level of exports are mixed, with the Czech Republic, Estonia, Latvia and Slovakia registering an increase in the share of processed fish products in total exports, while Hungary, Lithuania, Poland and Slovenia experienced a decrease in the share of processed products in exports (see Figure 2.19).

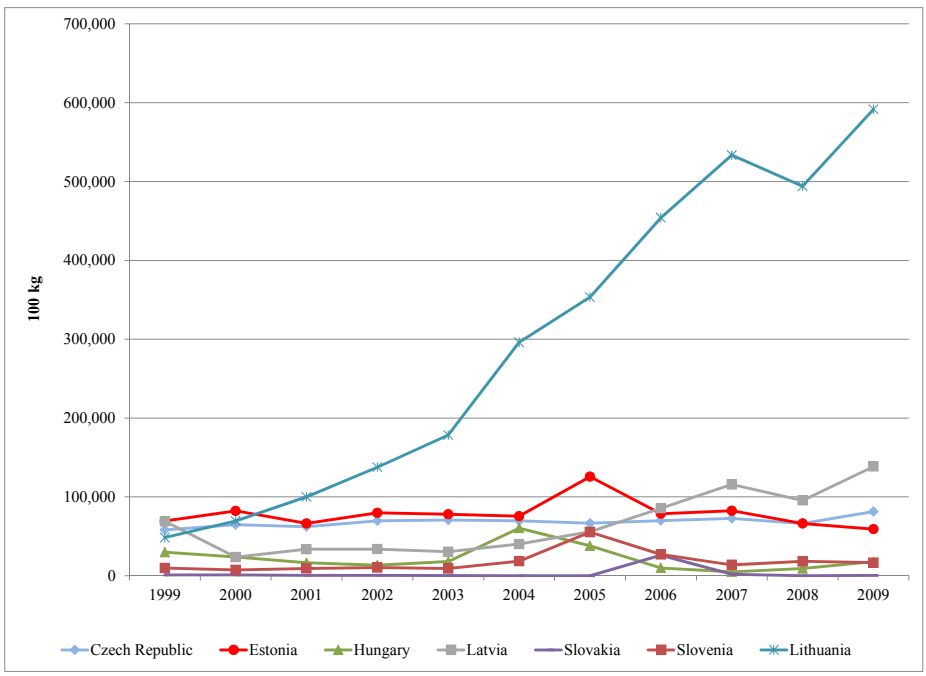

Figure 2.17. The development in export volumes of fish and fish products from the NMSs to the EU-15 for 1999–2009 (Dataset DS-016893; author's calculations)

Hence, the inter-country comparisons show that the Estonian milk processing industry has not seen growth rates in the absolute volume of exports to the EU-15 as high as other NMSs; however, Estonia clearly stands out as the only country to have been successful in gaining access for highly processed products for household use. Although Estonia has seen the third-highest growth in post-accession volume of meat exports, this has not been accompanied by a shift in export structure towards products with higher added value, which signals that the other NMSs have been able to take better advantage of the opening up of the EU market. Some of the countries that have seen the highest growth rates for

fish products in volume terms (Lithuania, Poland) have also experienced a shift towards unprocessed products. However, the results of the analysis are sensitive to the classification of products.

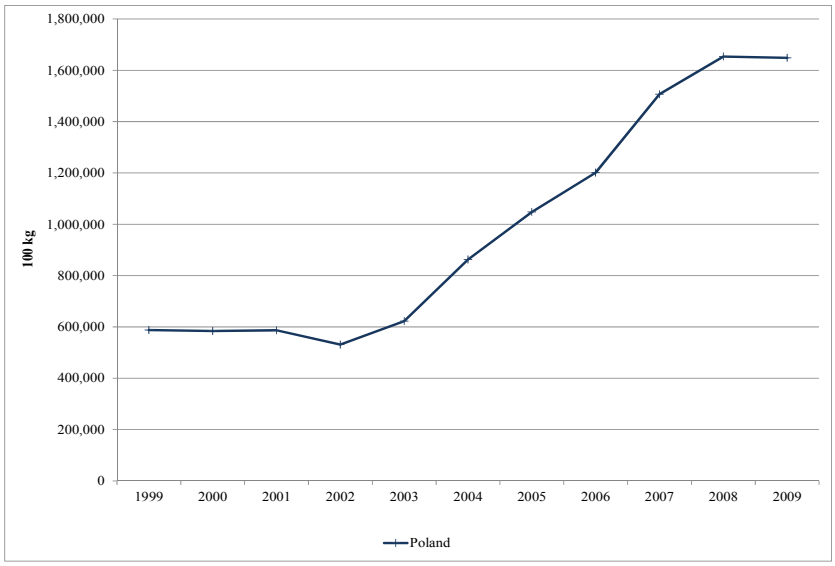

Figure 2.18. The development of Polish export volumes of fish and fish products to the EU-15 for 1999–2009 (Dataset DS-016893; author's calculations)

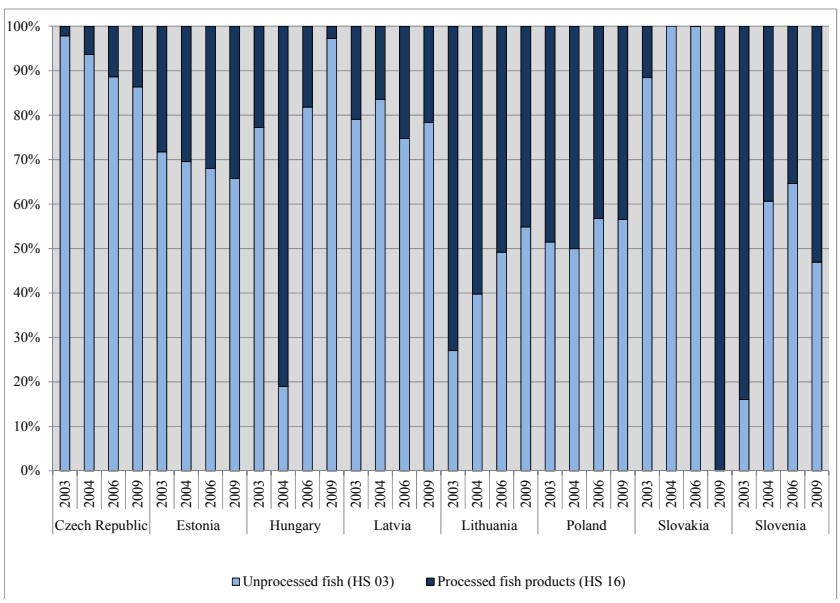

Figure 2.19. The composition of fish exports from the NMSs to the EU-15 for 2003–2009 (Dataset DS-016893; author's calculations)

In order to understand and explain the different export developments in the NMSs, further analysis is required. Differences in national economic structures and institutions have a profound impact on the competitiveness of different countries. It can be argued that relative production and marketing costs and distance from EU-15 markets, at least partly explain why countries have experienced different trade patterns. By lowering trade barriers, regional integration may either enhance or impede the international competitiveness of industries and firms. As trade barriers are lower, transportation costs become relatively more important in the production and marketing of goods. Countries whose firms have access to larger markets can take advantage of lower marketing costs (Ezeala-Harrison 1999: 149).

This aspect suggests that different countries can experience very different outcomes of regional integration. For example, when we compare a small initially liberal peripheral country such as Estonia and a large rather protective country close to the core markets, such as Poland, we would expect Poland to gain relatively more from the same type of integration. In addition, the relative closeness to the main consumer markets can affect the decisions of successful international food manufacturers entering the market of a particular country. For example, the leading French food manufacturer, Danone, set up a milk processing production unit in Poland. Furthermore, we can assume that the differences in the agricultural and foreign trade policies pursued by countries prior accession to the EU are some of the key determinants of the diverse developments in exports patterns.

2.2.1.3. An econometric analysis of the effect of EU accession on NMS exports to the EU-15

As mentioned earlier, the changes in volumes of export from the NMSs to the EU-15 that coincided with accession could at least partly be a result of some other factors not related to accession. Exports could have increased as a result of some common time trends, for example, related to the natural increase in demand from the EU. In order to estimate the effect of EU accession and the accompanying abolition of remaining formal market barriers on exports from the NMSs to the EU-15, an econometric analysis based on a difference-in-difference (D-in-D) strategy is conducted. This approach enables us to estimate the impact of EU accession, equivalent to a reduction in trade barriers – and consequently, costs – while also allowing us to investigate how some other factors, related to competitiveness potential, have influenced trade with the EU-15. This allows us not only to draw conslusions about the general impact of EU accession on NMS exports to the EU-15 but also compare the performance of the Estonian food processing industry with general accession effects. To measure the impact of EU integration, a D-in-D approach has been used, for

example, by Böwer and Turrini (2009), Hornok (2010), Overesch and Rincke (2009).[75]

The treatment group consists of eight NMSs (the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia), while Bulgaria and Romania are chosen as the control group. The control group needs to be as similar as possible to the treatment group in terms of the pre-treatment characteristics and trends. Despite the economic backwardness of these two countries relative to the eight CEECs that joined the EU in 2004, these countries have experienced similar preferential trade relations with the EU as the treatment group within the framework of European Agreements, before joining the EU in 2007. Moreover, there is a rather limited choice for the control group, as Central European countries that are not yet members of the EU differ considerably from the countries that joined the EU in 2004 in terms of their economic structures and institutions.

Figures 2.20 presents average real exports of milk, meat and fish products respectively to the EU-15 for the treatment and control groups. The comparison of the developments of average exports in the two groups suggest that exports of the treatment and control group have followed quite similar trends prior to 2004 in the case of meat products, strengthening our methodological approach. However, less similarity in the pre-treatment trends can be found in the case of milk products and in particular in the case of fish products, which suggests that the results of the analysis must be considered with caution.

[75] Of these, only Hornok (2010) focuses on the effect of EU accession on trade between the NMSs and the EU-15. Unfortunately, the author looks at industries other than the food processing industry, so the results of her study cannot be compared with the results of this dissertation.

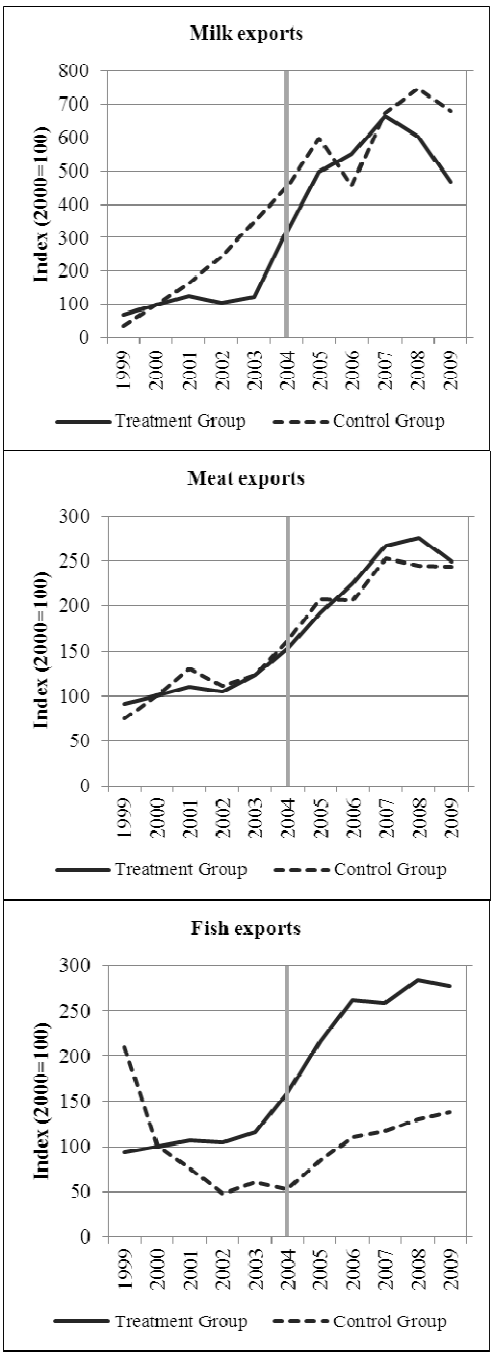

Figure 2.20. Average exports of milk, meat and fish products to the EU-15 for the treatment and control group (deflated using EU-27 consumer price indices), 1999–2009 (Source: Eurostat)

Description of the data

In order to test for the trade effects of EU accession, an industry-level panel data set is constructed based on the Eurostat statistics database, available online. In accordance with the choice of food industry sub-sectors in the rest of this dissertation, data for the meat, fish and milk processing industries is used. As industry-specific results are of interest, the analysis is conducted for each industry sub-sector separately instead of a pooled model, even though this results in fewer obervations and allows to include fewer explanatory variables to the model.

The effect of EU accession is estimated on the basis of three main indicators of the competitiveness of an industry on export markets: real exports from NMSs to the EU-15 (the value of exports, deflated using EU-27 consumer price indices), the volume of exports from NMSs to the EU-15 (in quantitative terms) and the share of high value-added products for household consumption in total exports. The use of general EU-27 consumer price indices (separately for milk, meat and fish products) for calculating real exports can be criticized for not taking into account the fact that exports consist of many different product groups which prices may have followed different developments. Unfortunately, price indices at a more detailed level were not available.[76] Given the potential bias due to the use of a general price deflator, I also use the volume of exports (in quantitative terms) in the analysis. The export market share measure is left out of the analysis here as this is very tightly related to the volume of exports (in sub-chapter 2.2.1.1. I defined export market share as a share of the country's exports in total imports of the EU-15 in quantitative terms). I use the volume of exports from each NMS to the EU-15 total (not looking at exports to individual EU-15 countries).

In the case of the meat and fish industries, the indicator of the share of high value-added products for household consumption is replaced by the share of processed products in the total export volume. However, as for Estonia, the unit values of exports of fish products belonging to the group of processed products from the other NMSs to the EU-15 are in general lower than the unit values of exports under the category "unprocessed products". This is important to keep in mind when interpreting the results of the regression analysis.

I control for the size of the exporting country by including the country's (log) real GDP in the model. In addition, the (log) real effective exchange rate (REER) is included as a competitiveness factor external to an industry. Additionally, I control for competitiveness factors internal to an industry such as the (log) apparent labour productivity (defined as gross value added per person employed), (log) unit labour costs (ULC, measured as the personnel cost divided by the production value of the industry) and (log) relative export prices (measured as the ratio of the country's trade-weighted export prices to the

[76] The presumption that NMS companies are in general price takers on the EU-15 market justifies the use of the common EU-wide consumer price index for calculating real exports.

average of the trade-weighted export price for NMSs in the EU-15 market).[77] The latter two measures are proxies for cost competitiveness, while productivity represents a measure of the efficiency of production. The (log) ratio of investments in tangible assets to the value of production was used as a proxy for the capital intensity of production, and hence, higher technological level.

Industry-specific data on R&D expenditure which would have served as an indicator of non-price competitiveness was only partially available, which led to the problem of too few observations in the model, and was therefore not used in the analysis. Unfortunately, no comparable data was available with regards to industry structure in the different countries (e.g. market concentration rate).

In order to control for time-invariant unobserved heterogeneity between countries, a fixed effects model is used. The country-level fixed effects take into account all country-level factors that are constant over time, such as factor endowments as well as the general institutional framework of the food processing industry. Fixed effects estimation allows the unobserved effect to be correlated with observed variables. Hence, the fixed effects method allows consistently to estimate partial effects in the presence of time-constant omitted variables that can be arbitrarily related to the observable variables (Wooldridge 2002, p. 266). However, fixed effects suffers from the drawback that it does not allow to distinguish effects of time-constant observed variables from the time-constant unobserved variable. Hence we cannot include time-constant variables such as a country's distance from the main consumer markets in the set of explanatory variables.

Possible time trends are controlled for by adding time dummies to the model. It is also assumed that the time dummies capture the effects of a gradual trade liberalisation within the framework of the Europe Agreements that already occurred before accession to the EU. In order to control for the effect of Slovenia's adoption of the euro in 2007, as well as Bulgaria and Romania's accession to the EU in 2007, respective dummies are added.

Annual data for the period 2000–2007 is used, as this was the period for which most comparable data was available. However, in order to identify the trade effect of accession, one needs to know exactly when this effect appears. The eight CEECs joined the EU on 1 May 2004 (i.e. in the middle of the year). This raises the problem of how to treat 2004, as our data is based on annual frequency. Furthermore, there might be an anticipation effect in the data since the decision on accession was already made public in 2003. Hence, part of the accession effect may have already occurred in 2003.

In order to overcome these problems, we have modified our baseline regression by following a similar approach to Hornok (2010) and only include odd years between 2000 and 2007 in the estimation. As a result, the restricted dataset contains data for two years of the pre-accession period (2001 and 2003) and two years of the post-accession period (2005 and 2007).

[77] Similarly, Allard (2009) uses relative prices – defined as the ratio of foreign competitors' prices to domestic exporter prices – as a measure of cost competitiveness.

The short post-treatment period in the model means that our model only captures short-term effects of accession, which mainly include the direct effects of integration as discussed in the theoretical part of this dissertation. The indirect effects of integration, stemming from changes in the incentives of firms as a response to the altered policy environment, mainly occur over the longer term as it takes time for firms to adjust.

In Appendix A.17, descriptive statistics of the data are given.

Methodology

In order to test for the effect of EU accession on exports from the NMSs to the EU-15, the following standard version of the difference-in-differences regression model using Fixed Effects (FE) for each industry under consideration was estimated:

(9)

$$Y_{it} = \alpha_i + \gamma(EU_{2004} \times D_t) + \sum_{j=1}^{k} \beta_k X_{kit} + \tau_t + \delta EUR_{it} + \theta(EU_{2007} \times C_t) + \varepsilon_{it},$$

where index *t* indicates time and *i* indicates countries. Y_{it} is a dependent variable and is either the value of real exports from a NMS to the EU-15, the volume of exports from a NMS to the EU-15 or the share of high value added/processed products in exports (in terms of quantity). On the right-hand side, α_i captures the unobserved country-specific time-invariant effects, X_k denotes other control variables (GDP, real effective exchange rate, labour productivity, unit labour costs, relative export prices, investments in tangible assets) and τ_t denotes the time dummies, which control for similar business cycles across countries. The coefficient γ captures the treatment effect and is hence the focus of interest. ε_{it} is an error term with conventional properties.

The term of interest, $EU_{2004} \times D_t$ is the interaction of the dummy for the years of EU membership (D_t) and a set of dummy variables indicating which group the country belongs to (the treatment or control group; EU_{2004}). Hence, the term $EU_{2004} \times D_t$ takes the value unity if the year is 2004 or beyond and if a country belongs to the treatment group (i.e. countries that joined the EU in 2004).

The term EUR_{it} is a dummy variable equal to unity if the national currency of a country is the euro. Hence, its value is equal to unity only for Slovenia in 2007. The term $EU_{2007} \times C_t$ is a dummy variable with a value of 1 for countries from the control group (Bulgaria, Romania) in 2007.

In many cross-sectional datasets, the variance for each of the panels differs. In order to solve this problem, models were estimated adjusting the standard errors and test statistics so that they were valid in the presence of arbitrary heteroskedasticity.

Estimation results

The results of the regression analysis for the effect of EU accession on real exports (the value of exports deflated using the respective price indices), the volume of exports and the share of high value added products (or processed

products in the case of the meat and fish industries) in exports from the NMSs to the EU-15 are presented in Tables 2.9–2.11.

Our results indicate that EU accession had a positive and statistically significant effect on the real exports as well as the volume of exports of milk and meat products from the NMSs to the EU-15, where the accession effect is especially pronounced in the case of the meat sector. However, no EU accession effect could be detected for the fish sector. The coefficients of the treatment effects show around a 38.5% (39.5%) increase in real exports (the volume of exports) of milk products following accession, and a 169% (191%) increase in real exports (the volume of exports) in the case of meat products. No EU effect was evident on the share of high-value added or processed products in exports. The latter confirms the results of the descriptive analysis of the previous sub-chapter.

Table 2.9. Estimation results – the effect on real exports, 2000–2007

	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_i$	0.385 *	(1.89)	1.695 ***	(3.85)	-0.107	(-0.27)
Log(GDP)	-5.096 ***	(-4.05)	17.806 ***	(4.25)	-1.280	(-0.42)
Log(REER)	-0.709	(-0.88)	0.516	(0.28)	-0.544	(-0.47)
Log(labour productivity)	-0.026	(-0.11)	0.708	(1.13)	0.050	(0.10)
Log(ULC)	-0.146	(-0.35)	-0.549	(-0.60)	0.494	(0.82)
Log(average export price)	0.391 *	(1.87)	1.469 **	(2.50)	-0.120	(-1.36)
Log(investment)	-0.006	(-0.03)	-0.092	(-0.37)	0.034	(0.16)
D_01	0.446 ***	(3.54)	-1.963 **	(-2.09)	-0.148	(-0.60)
D_02	0.614 ***	(2.97)	-3.425 **	(-2.49)	-0.205	(-0.53)
D_03	1.067 ***	(3.73)	-3.527 ***	(-2.74)	-0.012	(-0.02)
D_04	1.751 ***	(4.70)	-5.419 ***	(-3.24)	0.097	(0.09)
D_05	2.493 ***	(5.70)	-6.070 ***	(-3.55)	0.414	(0.33)
D_06	2.973 ***	(5.76)	-7.250 ***	(-3.59)	1.429	(0.75)
D_07	3.607 ***	(5.74)	-8.561 ***	(-3.57)	1.089	(0.58)
d_eu2007	(dropped)		(dropped)		(dropped)	
D_euro	0.141	(0.86)	-0.180	(-0.57)	(dropped)	
Constant	69.745 ***	(4.75)	-171.124 ***	(-3.79)	30.225	(0.91)
Country effects	yes		yes		yes	
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	70.21	(0.000)	20.99	(0.000)	3.64	(0.036)
Within-group R2	0.8849		0.7623		0.5428	

Source: author's table

Note: the values of t-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

The coefficient for GDP is positive and statistically significant only in the case of real exports and the volume of exports in the meat sector, indicating that larger countries tend to export more meat products to the EU-15. At the same time, real exports and the volume of exports of milk products is negatively associated with the value of GDP indicating smaller countries tend to export relatively more milk products to the EU-15 compared to large countries.

Table 2.10. Estimation results – the effect on the volume of exports, 2000–2007

	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_i$	0.395 *	(1.93)	1.908 ***	(4.36)	-1.396	(-1.64)
Log(GDP)	-5.110 ***	(-3.96)	17.868 ***	(4.26)	4.151	(0.84)
Log(REER)	-0.730	(-0.92)	0.542	(0.30)	0.201	(0.09)
Log(labour productivity)	-0.038	(-0.17)	0.697	(1.10)	0.208	(0.37)
Log(ULC)	-0.141	(-0.34)	-0.567	(-0.60)	0.579	(0.54)
Log(average export price)	-0.607 ***	(-2.91)	0.470	(0.80)	-0.782 **	(-2.03)
Log(investment)	0.012	(0.07)	-0.084	(-0.33)	-0.369	(-1.25)
D_01	0.389 ***	(3.30)	-2.001 **	(-2.13)	-0.474	(-0.78)
D_02	0.739 ***	(3.68)	-3.482 **	(-2.50)	-0.739	(-0.97)
D_03	1.132 ***	(3.79)	-3.486 ***	(-2.69)	-1.010	(-1.12)
D_04	1.935 ***	(4.99)	-5.361 ***	(-3.19)	-0.928	(-0.63)
D_05	2.763 ***	(6.18)	-6.192 ***	(-3.59)	-2.631	(-1.18)
D_06	3.298 ***	(6.15)	-7.298 ***	(-3.60)	0.446	(0.18)
D_07	3.772 ***	(5.71)	-8.613 ***	(-3.57)	-0.589	(-0.19)
d_eu2007	0.119642		(dropped)		(dropped)	
D_euro	(dropped)	(0.73)	-0.203	(-0.65)	(dropped)	
Constant	69.437 ***	(4.68)	-172.894 ***	(-3.82)	-28.938	(-0.19)
Country effects	yes		yes		yes	
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	105.12	(0.000)	15.23	(0.000)	7.44	(0.004)
Within-group R2	0.9275		0.7422		0.6352	

Source: author's table

Note: the values of t-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Surprisingly, the coefficient for the REER is positive and statistically significant in the model for the share of high value-added products in the case of the milk industry. Even though price is not the main determinant of demand for high value-added products, the positive sign of the REER coefficient is nevertheless difficult to explain. Similarly, the coefficient for the REER is positive and statistically significant in the model for the share of processed products in the case of the fish industry, which is, however, in line with what was expected as the value of fish products under the category "processed products" is actually relatively low compared to products under the category "unprocessed products" and hence, also price sensitive. Through 2000–2007, the real effective exchange rate (REER) for Estonia increased by a cumulative 15.7%, which was the fourth largest increase after Slovakia (54.5%), Hungary (33.1%) and the Czech Republic (27.4%). Hence, the relatively high appreciation of the REER in Estonia has been a disadvantage vis-à-vis some other NMSs when exporting to the EU.

Table 2.11. Estimation results – the share of high value-added or processed products in exports, 2000–2007

	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_i$	-5.395	(-1.07)	-4.612	(-0.51)	-8.216	(-0.47)
Log(GDP)	22.694	(0.80)	-84.661	(-1.47)	-59.390	(-0.42)
Log(REER)	35.072 **	(2.31)	-49.338	(-1.22)	145.106 **	(2.16)
Log(labour productivity)	2.312	(0.29)	-13.354 ***	(-5.31)	-37.320	(-1.65)
Log(ULC)	-6.171	(-1.14)	-4.274	(-0.28)	13.111	(0.78)
Log(average export price)	19.566 ***	(3.99)	2.273	(0.52)	5.473	(0.81)
Log(investment)	0.878	(0.29)	12.727 *	(1.97)	4.197	(0.55)
D_01	4.290	(0.68)	18.509 **	(2.12)	17.840	(0.95)
D_02	-2.158	(-0.24)	36.320 **	(2.53)	22.508	(0.94)
D_03	2.736	(0.32)	26.809 *	(1.90)	31.877	(1.01)
D_04	-2.672	(-0.25)	38.332 *	(1.92)	46.855	(1.17)
D_05	-1.827	(-0.16)	47.473 *	(1.81)	73.798	(1.06)
D_06	-4.174	(-0.32)	59.690 *	(1.89)	54.228	(0.79)
D_07	-7.288	(-0.46)	69.372 *	(1.79)	54.595	(0.64)
d_eu2007	(dropped)		(dropped)		(dropped)	
D_euro	2.203	(0.26)	0.269	(0.04)	(dropped)	
Constant	-453.768	(-1.35)	1,079.268	(1.61)	-93.772	(-0.06)
Country effects	yes		yes		yes	
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	291.38	(0.000)	4.32	(0.016)	5.60	(0.010)
Within-group R2	0.5424		0.2743		0.4205	

Source: author's table

Note: the values of t-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Labour productivity seems to only affect the share of processed products in meat exports (with a negative coefficient), while unit labour costs do not appear to have any statistically significant effect at all. The average price of exports is positively associated with real exports of milk and meat products as well as the share of high value-added products in milk exports; nevertheless, it is negatively related to the volume of milk and fish exports. The negative coefficient of average export prices in the model with the volume of exports suggests that exports of milk and fish products from the new member states are still oriented towards lower value added bulk commodities, in which case, price is the most important factor of competitiveness. At the same time, the positive coefficient of relative export prices in the model with the share of high value added milk products reflects the fact that higher value added products in general are related to higher prices. Countries that export relatively more to the EU-15 in terms of volume tend to be more oriented towards low value added (primary and intermediate) products.[78] The use of general EU-27 consumer price indices for

[78] Among the countries in our dataset, Estonia ranked number two in terms of the relative export price in 2007. This is reflected in the fact that Estonia's milk exports to

calculating real exports does not take into account this kind of "composition effect" in exports. Unfortunately, price indices at a more detailed level were not available.

Investments in tangible assets have a statistically significant coefficient only in the model with the share of processed products of meat exports. This indicates that the heavy investments made in the meat industry have paid off in terms of better access to the EU-15 market for products involving higher levels of processing. Sharing a common currency with the EU does not seem to have any impact on exports (however, it must be kept in mind that we only have one observation, which is not equal to zero for this dummy). The dummy variable controlling for the EU enlargement in 2007 was dropped from the model.

As mentioned earlier, the accession of the 8 NMSs to the EU already became publicly known in 2003. In order to test whether there was any anticipatory EU effect, I include a dummy in the model which takes the value of unity for countries that joined the EU in 2004 for the years from 2003 and onwards. The results are given in Table 2.12. Here I only focus on the effect of EU accession (the full list of regression results can be obtained from the author on request). No anticipatory accession effect could be detected in the case of real exports, although the inclusion of a dummy for the anticipatory effect increased the value of the accession effect for milk exports while decreased the effect for meat exports.

In regard to the volume of exports in quantitative terms, there was a positive anticipatory effect in the case of the meat industry. In fact, a considerable part of the accession-led increase in the volume of meat exports occurred in anticipation. In addition, there was a statistically significant negative anticipatory effect in the case of the volume of fish exports. In the case of the share of high value added products in exports, the inclusion of an anticipatory effect in the model resulted in a statistically significant negative accession effect for the milk sector; nevertheless, the anticipatory effect itself was statistically significant and positive indicating that in anticipation of the accession, exports of the NMS became more oriented towards high value added products; however, after accession the reverse occurred.

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the EU-15 are characterised by a relatively high share of high value-added products. However, the absolute volume of Estonia's milk exports to the EU is relatively low.

Table 2.12. Estimation results – model with anticipatory effect

	Real exports					
	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_t$	0.630 ***	(2.74)	0.990 ***	(3.20)	-0.083	(-0.22)
$EU_{2004}*D_t(-1)$	-0.350	(-1.05)	1.150	(1.63)	-0.050	(-0.08)
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	33.05	(0.000)	5.84	(0.006)	6.15	(0.007)
Within-group R2	0.8891		0.7708		0.5429	
	The volume of exports					
	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_t$	0.739 ***	(3.29)	1.140 ***	(3.75)	-0.789	(-0.94)
$EU_{2004}*D_t(-1)$	-0.493	(-1.50)	1.253 *	(1.76)	-1.295 *	(-2.02)
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	18.87	(0.000)	74.51	(0.000)	25.37	(0.000)
Within-group R2	0.9327		0.7529		0.6523	
	The share of high value-added/processed products in exports					
	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_t$	-12.646 *	(-1.92)	-4.548	(-0.58)	3.891	(0.21)
$EU_{2004}*D_t(-1)$	10.377 ***	(4.63)	-0.104	(-0.01)	-25.810	(-1.38)
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	54.67	(0.000)	2.96	(0.052)	2.82	(0.071)
Within-group R2	0.5628		0.2743		0.4422	

Source: author's table

Note: the values of t-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

I also conduct a difference-in-difference analysis for the period only including odd years during 2000–2007. Basically, I test the effect of EU accession for a dataset with bi-annual data covering the years 2001, 2003, 2005 and 2007. In this way, I seek to solve the problem of the timing of accession (as discussed above). However, including only odd years in the model resulted in statistically insignificant treatment effects except for a positive effect for the volume of milk exports, and will not be reported here.

Robustness tests

In order to check for the robustness of the main results of our analysis, three modifications to the baseline estimations are performed. First, I conduct the difference-in-difference analysis for 2000–2006. In this way, I am able to exclude from the model the possible impact of Bulgaria and Romania's accession to the EU in 2007. The results of this analysis are given in Table 2.13. Compared to the results of the analysis covering the period 2000–2007, only

one considerable change has occurred: the coefficient for the treatment effect has become statistically insignificant in the case of real exports of milk products. However, the coefficients for the treatment effects in the case of meat exports are somewhat larger here than in the case of the model covering the full period, 2000–2007, while the opposite is true in the case of the volume of milk exports.

Table 2.13. Estimation results – model for the period 2000–2006

			Real exports			
	Milk exports		Meat exports		Fish exports	
EU_{2004}*D_t	0.290	(1.51)	1.963 ***	(3.91)	-0.124	(-0.24)
Number of obs.	61		61		46	
Number of countries	10		10		9	
F-stat (p-value)	6.83	(0.003)	23.65	(0.000)	4.50	(0.020)
Within-group R2	0.8593		0.7548		0.5587	
			The volume of exports			
	Milk exports		Meat exports		Fish exports	
EU_{2004}*D_t	0.345 *	(1.79)	2.202 ***	(4.36)	-1.733	(-1.61)
Number of obs.	61		61		46	
Number of countries	10		10		9	
F-stat (p-value)	140.30	(0.000)	16.90	(0.000)	3.25	(0.050)
Within-group R2	0.9138		0.7310		0.6436	
	The share of high value-added/processed products in exports					
	Milk exports		Meat exports		Fish exports	
EU_{2004}*D_t	-5.652	(-1.52)	-7.675	(-0.67)	-2.953	(-0.16)
Number of obs.	61		61		46	
Number of countries	10		10		9	
F-stat (p-value)	17.02	(0.000)	11.98	(0.000)	10.20	(0.001)
Within-group R2	0.5427		0.2793		0.4403	

Source: author's table

Note: the values of t-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Second, regressions were conducted to test for the treatment effect as if the NMS-8 had joined the EU in 2002. However, this "placebo experiment" resulted in statistically insignificant treatment effects for all dependent variables except for real exports of fish products (see Table 2.14). This suggests that the main results of my baseline model – except for the fish industry – are most probably indeed a result of accession to the EU and not driven by other sources of heterogeneity across country groups that could have already been present before accession.

The positive effect of the "placebo accession" on fish exports suggests that in the case of fish exports, the main impact of EU integration may have already

occurred before accession to the EU, likely driven by a gradual liberalisation of trade between the candidate countries and the EU. Looking at the example of the Estonian fish processing industry, export relationships with the EU had already been established before 2004. At the same time, Estonian producers, highly dependent on imported raw fish, could benefit from tariff-free access to imported raw material (due to Estonia's liberal foreign trade policy). However, with accession to the EU, EU common external tariffs applied to imports of raw fish resulting in an increase in the cost of inputs and hence, loss in price competitiveness.

Table 2.14. Estimation results – model with a "placebo" effect (as if accession in 2002)

	Real exports					
	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_t(-2)$	-0.142	(-0.36)	2.300	(1.54)	0.607 **	(2.21)
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	118.87	(0.000)	40.50	(0.000)	17.31	(0.000)
Within-group R2	0.8739		0.7489		0.5625	
	The volume of exports					
	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_t(-2)$	-0.113	(-0.29)	2.459	(1.59)	-0.948	(-1.37)
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	141.42	(0.000)	58.12	(0.000)	7.37	(0.004)
Within-group R2	0.9201		0.7208		0.6000	
	The share of high value-added/processed products in exports					
	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_t(-2)$	-1.056	(-0.29)	-2.545	(-0.34)	-10.766	(-0.70)
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	79.79	(0.000)	3.67	(0.027)	6.52	(0.006)
Within-group R2	0.5294		0.2717		0.4199	

Source: author's table

Note: the values of t-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

The third modification is motivated by the fact that the period of EU membership for the 8 NMSs considered has coincided with strong economic growth and subsequent increase in demand in Russia, which might have diverted some potential exports away from the EU-15 and towards Russia. Therefore, I add a dummy variable to the regression for countries that are or can be considered to be neighbours of Russia (Estonia, Latvia, Lithuania and Poland). Similarly to Hornok (2010), the Russian dummy is interacted with the

dummy for EU membership (i.e. the dummy takes a value of 1 for the countries that joined the EU in 2004 for the period 2004–2007). The results of the regression are given in Table 2.15.

Table 2.15. Estimation results – model with a dummy for Russian neighbour

	Real exports					
	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_t$	0.444 **	(2.30)	1.134 **	(2.62)	-0.109	(-0.29)
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	11.15	(0.000)	11.14	(0.001)	4.13	(0.024)
Within-group R2	0.8857		0.7799		0.5428	
	The volume of exports					
	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_t$	0.449 **	(2.31)	1.343 ***	(3.12)	-1.252	(-1.67)
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	147.60	(0.000)	9.86	(0.001)	3.44	(0.042)
Within-group R2	0.9280		0.7611		0.6359	
	The share of high value-added/processed products in exports					
	Milk exports		Meat exports		Fish exports	
$EU_{2004}*D_t$	-2.619	(-0.43)	-2.546	(-0.55)	-1.352	(-0.05)
Number of obs.	70		70		52	
Number of countries	10		10		9	
F-stat (p-value)	106.51	(0.000)	6.29	(0.004)	12.92	(0.001)
Within-group R2	0.5525		0.2768		0.4255	

Source: author's table

Note: the values of t-statistics in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

The inclusion of the dummy for Russia as a neighbour resulted in statistically significant positive coefficients of the respective dummies in the models with real exports and the volume of exports of meat products. This was accompanied by a decline in the magnitude of the accession effects for meat exports. Even though the dummy for Russia as a neighbour was not statisticaly significant in the model with real exports and the volume of exports of milk products, the inclusion of the dummy resulted in an increase in EU effect estimates, indicating a trade diversion away from the EU and towards the Russian market.

To conclude, the results of the regression analysis based on the difference-in-difference approach and covering the 8 NMS that joined the EU in 2004 as a treatment group and Bulgaria and Romania, which joined the EU in 2007, as a control group, indicate that EU accession has had a positive statistically significant effect on exports of milk and meat from the 8 NMSs to the EU-15.

In general, EU accession seems to have had a relatively stronger effect on exports of meat products. However, our model did not detect any effect of accession to the EU on fish exports, which can be partly related to the low statistical significance of the model and the potentially inappropriate choice of the control group. Including anticipatory effects in the model showed that part of the accession effects already occurred before accession, in particular concerning the volume of meat and fish exports as well as the structure of milk exports to the EU-15. Adding a dummy characterising whether the NMSs are neighbours to Russia did not change the results significantly; nevertheless it did show a trade diversion effect away from the EU-15 in the case of milk products.

2.2.1.4. Problems and challenges in penetrating EU markets

Winning export markets in Western countries is no doubt a difficult task. In terms of volume, the EU food market is mature and demand for food grows only moderately (CIAA 2006: 32). In addition, brands are particularly important for the food industry. Although price also remains an important determinant of food purchase decisions, other non-price factors, such as quality, pleasure and convenience, are increasingly gaining importance (CIAA 2006: 9). Besides product quality upgrades as well as investment in production processes and new product development, improvements in the organisation and marketing are crucial (so-called non-technological innovations), which are however difficult to measure.

Regrettably, so far Estonian food processing firms have invested relatively modestly in R&D. According to the Confederation of the Food and Drink Industries of the EU (CIAA), the average ratio of R&D investments in the output of the EU-15 food and drink industry was 0.37% in 2006 (CIAA 2009: 2), whereas the respective figure for Estonia in 2007 was only 0.07% (Statistics Estonia 2010). Although the food industry in general is less innovation oriented than the manufacturing industries on average, these figures clearly indicate that the Estonian food industry is lagging behind.[79] Especially in the case of the Estonian fish processing industry, for many years, investments in product development were very low.

Even though formal trade barriers between Estonia and the EU have been dismantled, national preferences and prejudices remain; for instance, the negative attitude of Western consumers towards foodstuffs from former Eastern bloc countries, or the enhanced market power of retail chains in Western countries and their reluctance to procure foodstuffs produced abroad. In

[79] The backwardness of the Estonian food processing industry in terms of R&D intensity can be further emphasised by the fact that the most innovative EU food producers are themselves lagging behind the food companies of other developed countries. In 2006, the ratio of investments in R&D to total food and drink industry output was above 1% in Japan and reached almost 0.6% in Norway. In the US, the spending on R&D as a ratio to output was around 0.5% in 2006 (CIAA 2009: 2).

addition, advertising expenses and brand loyalty are some of the main determinants in explaining the demand for high-processed foodstuffs (Reed 1994). Due to the inability of Estonian food processors to undertake large advertising campaigns and the difficulty of selling finished products under domestic trademarks, the exports to the EU market remain lower than the actual potential.

Nevertheless, Estonian food processing companies are becoming more and more successful in winning procurements and tenders from Western EU food companies under importer's brand names and retail chains under private labels. Private-label products rely on a retailer's own image and hence, do not require large advertising support. The opportunities to market products under importers' brand names (or private labels), however, can sometimes be complicated due to small production volumes that do not fulfil the orders from the destination country for generic production. Furthermore, in tenders for private-label products, the main determinant is price, which often gives a competitive advantage to food producers from other countries (e.g. Lithuania and Poland), whose average production costs are lower.

In addition, Estonia's relatively remote location renders it difficult to export perishable consumer products quickly to the core markets of the EU. Hence, in the EU-15, the only possible export markets for many high value-added products remain the nearest markets such as Finland. Finland, with its similar consumer taste and some familiarity with Estonian products, is also the main Western export market for Estonian private brand products. However, there have been cases of strong resistance from the local food producers in Finland towards food imports from Estonia.

Consequently, in spite of the fact that integration to the EU removed all formal trade barriers, some invisible obstacles have remained on Estonian foodstuffs exports to the EU-15. Moreover, as the marketing manager of one of the ice cream producers in Estonia put it: "Although accession opened up the EU market, exporting to the old member states requires long-term efforts and good business relations, and the opening up of the market was only a precondition to start this work" (Kõvask 2006).

The situation is somewhat better for food processing companies based on multinational capital that already have an advantage in competing on the EU market, as they belong to the marketing network of their parent companies and share their experience and advanced product development activities (Estonian Ministry of Agriculture 2004). Also, the presence of foreign (EU) retail chains in the Estonian market can improve the chances of Estonian food processing companies entering EU markets with high value-added products directed to end-consumers. To illustrate this point, Figure 2.21 demonstrates the development of Estonian exports of dairy products to the main destination countries between 1999 and 2009. The Netherlands was the main market for Estonian milk exports until 2005. In 2005, the importance of Germany and Finland started to grow while exports to the Netherlands declined considerably. Unit values of exports to the Netherlands have been somewhat lower than to Finland (for example in

2004, for cheese 2 678 EUR/t and 3 099 EUR/t, and for butter 2 458 EUR/t and 2 892 EUR/t, respectively), suggesting exports to the Netherlands have been of lower value-added level than to Finland. The share of the Netherlands has decreased considerably since 2004, indicating a fall in the relatively lower value-added shipments. On the other hand, the importance of exports to Germany has grown considerably up until 2008, with milk powder as the main export article. In recent years, exports to Italy and Austria have also grown.

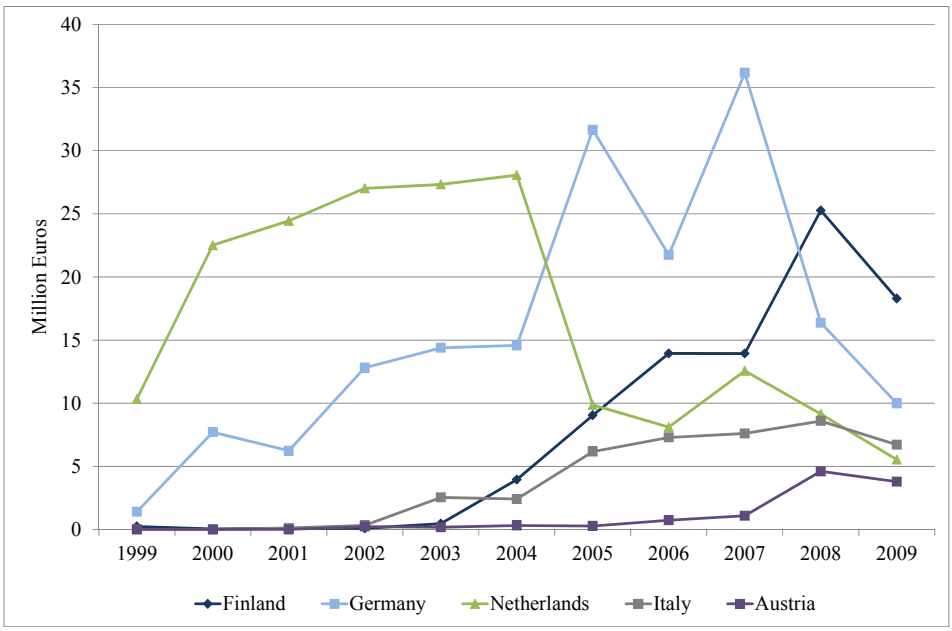

Figure 2.21. The export values of dairy products (HS 04 and 2105) to the main destinations in the EU-15, 1999–2009 (Dataset DS-016893)

At the time of Estonia's accession to the EU, Finland and the Netherlands were the two largest foreign investors in the Estonian dairy industry, owning two and one milk processing company, respectively. However, in reality, milk processing companies based on solely Estonian capital seem to be more successful in entering the EU-15 markets with high value-added products such as yoghurt and curds (sold under private labels). Having a parent company in an EU-15 country can rather reduce incentives to enter EU markets with high value-added products for end-consumers because of the parent company's strategy to protect its production companies in the home country from any imports, including from companies abroad belonging to the same group (Saron 2006).

Similar patterns can be seen in the case of meat products (see Figure 2.22). Until 2004, meat exports to the EU-15 were basically non-existent. Although the role of the EU-15 is still relatively low (in terms of export volume, 16.2% in

2009), meat exports to Finland, Sweden and the Netherlands have grown significantly since 2004. Finland is the main source country of foreign investments in the Estonian meat processing sector, owning four meat processing enterprises and the only poultry producer in Estonia. However, the parent company's reluctance to allow an affiliated company in Estonia to export to the country of the parent company has also been emphasized by the former chairman of the board of the two Estonian meat processing companies owned by Finnish consolidated company – Rakvere Lihakombinaat and Tallegg (Kruusmaa 2006).

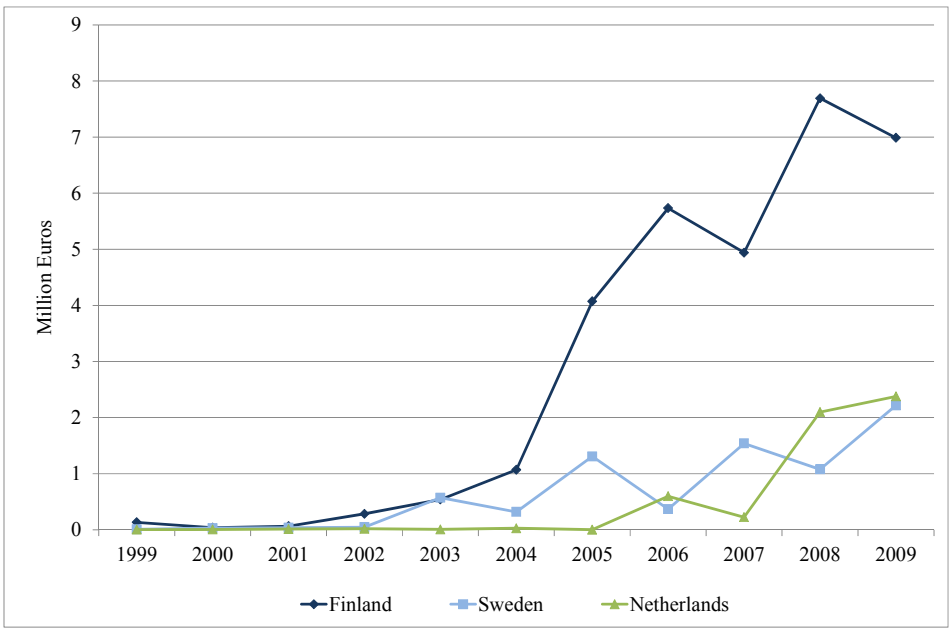

Figure 2.22. The export values of meat products (HS 02, 1601 & 1602) to the main destinations in the EU-15, 1999–2009 (Dataset DS-016893)

Hence, in order to be able to gain markets in the EU for high value-added food-stuffs, Estonian food processing companies need to overcome the remaining "hidden" market barriers, such as the oligopolistic retail sector, and follow the developments in the taste of sophisticated European consumers.

2.2.2. Competitiveness on the markets of the new member states of the EU

Concerning the impact of EU accession on exports to NMSs, Figure 2.23 makes it possible to conclude that EU membership has opened up the markets of NMSs for the Estonian milk processing industry. Indeed, through 1999–2003, the value (quantity) of Estonia's milk exports to the NMSs grew on average by 0.7% (decreased 10.9%) per year, while during the post-accession period, 2004–2009, exports increased at an average annual pace of 15.4% (29.9%).

After the initial fall in exports in 2004 compared to 2003 (which can be associated with an initial export diversion away from NMSs towards the EU-15), the volume of milk exports to the NMSs rose again in 2005 to a level, which was 2.5 times higher than in 2003. Accession seems to have especially boosted exports of primary milk products, while exports of high value-added milk products have increased less although still remarkably. As a result, the share of high value-added and intermediate milk products has fallen in favour of primary milk products (see Appendix A.18).

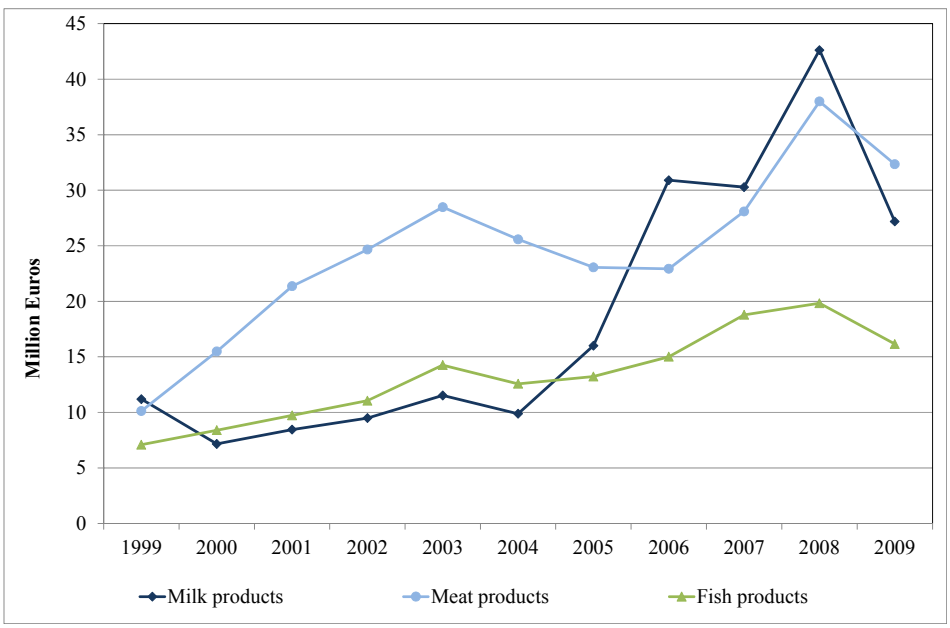

Figure 2.23. Estonia's exports of foodstuffs to NMSs for 1999–2009 (Source: Dataset DS-016893; author's calculations)

On the contrary, the pace of growth in exports of meat and fish products to the NMSs lost momentum after Estonia joined the EU. The value (volume) of meat exports to the NMSs increased on average 29.5% (29.3%) per year for 1999–2003, while the average growth rates for 2004–2009 were a mere 2.1% (0.4%).

However, exports of processed meat have increased, and subsequently also their share in total meat exports has grown.

In the fish industry, similar developments can be observed with the average annual growth rate decelerating from 19.1% in terms of the value of exports (19.0% in terms of quantity) during the pre-accession period to only 2.1% (-1.3%) during the post-accession period. This indicates that EU accession has had a negative effect, if any, on Estonia's fish exports to the NMSs. However, the fall has been considerably lower in the case of processed fish products, as a result of which, the share of processed fish products in exports has increased from 59.3% in 2003 to 69.4% in 2009.

As a result of these developments, the importance of the NMSs in Estonia's exports of milk products has seen a considerable increase from 23.1% in 2003 to 40.9% in 2009 (see Appendix A.10). In fact, the share of NMSs reached 62.8% in 2006, before rebounding to a somewhat more moderate level. In the case of meat exports, the NMSs accounted for 93.7% in 2003, but as a result of increasing exports to the EU-15, their share dropped to 73.6% in 2009. The NMSs' share in Estonia's fish products has been more stable, 9.4% in 2003 and 7.2% in 2009.

Hence, in the case of the NMSs, somewhat different developments in exports occurred compared to exports to the EU-15. While the volume of Estonia's exports of milk products to the NMSs increased considerably faster compared to exports to the EU-15, this was accompanied by a shift towards products with lower value-added in contrast to the EU-15 exports where the share of high value-added products for household consumption increased.

While gaining markets in the EU-15 after accession, meat exports to the NMSs lost pace, although this was accompanied by a shift towards a higher share of processed products. In the case of fish products, as with exports to the EU-15, exports to the NMSs fell, although at a slower pace. Yet, the share of high value-added products is continuously significantly higher in exports to the NMSs than to the EU-15 in the case of meat and fish products.

These developments were coupled with a fall in Estonia's market share in the NMSs. Estonia's market share dropped from 2.65% in 2003 to 1.88% in 2004 in the case of milk products, but gained again during 2005–2008 (see Appendix A.19). In the case of meat and fish products, Estonia's market share in imports for the other NMSs has been constantly decreasing since 2004. Similar developments can be seen when looking at Estonia's share in intra-NMS imports, indicating that Estonia has indeed not been able to reap the benefits of the opening up of the markets in the NMSs (see Appendix A.20).

The fact that the opening up of the markets of NMSs has not had a considerable positive impact on Estonian exports can be associated with improved export opportunities to the EU-15 market, as a result of which, an export diversion away from NMSs has occurred. In addition, as the bulk of exports went to Latvia and Lithuania within the framework of the Baltic Free Trade Agreement prior to accession, the opening up of the markets of other NMSs had less effect on exports. Although the milk processing industry seems to have

gained new export opportunities both in the EU-15 and NMS markets, the NMS markets seem to have opened relatively more to low value-added products.

2.2.3. Competitiveness on the markets of the countries not belonging to the EU

The third countries have not been very significant export markets for the Estonian milk and meat industries, while the bulk of fish exports have been directed towards the third countries (see Appendix A.21)

In general, Estonia's exports of milk and meat products to the third countries gained momentum in the post-accession period (see Figure 2.24). Through 1999–2003, the value (volume) of Estonia's milk exports to non-EU countries declined on average 49.5% (54.1%) per year, which compares with a positive growth pace of 70.4% (60.9%) for 2004–2009. After an initial drop in 2004, meat exports rebounded in 2005 and grew on average 30.7% (36.8% in terms of quantity) per year for 2005–2009. This compares with an average annual growth rate of 14.4% (19.5% in terms of quantity) for 1999–2003. Fish exports, on the other hand, lost in pace in terms of value, with the average annual growth rate dropping from 18.3% in the pre-accession period to a negative rate of 2.9% for 2004–2009. However, in terms of export volumes, growth in fish exports picked up indicating a fall in the unit value of exports.

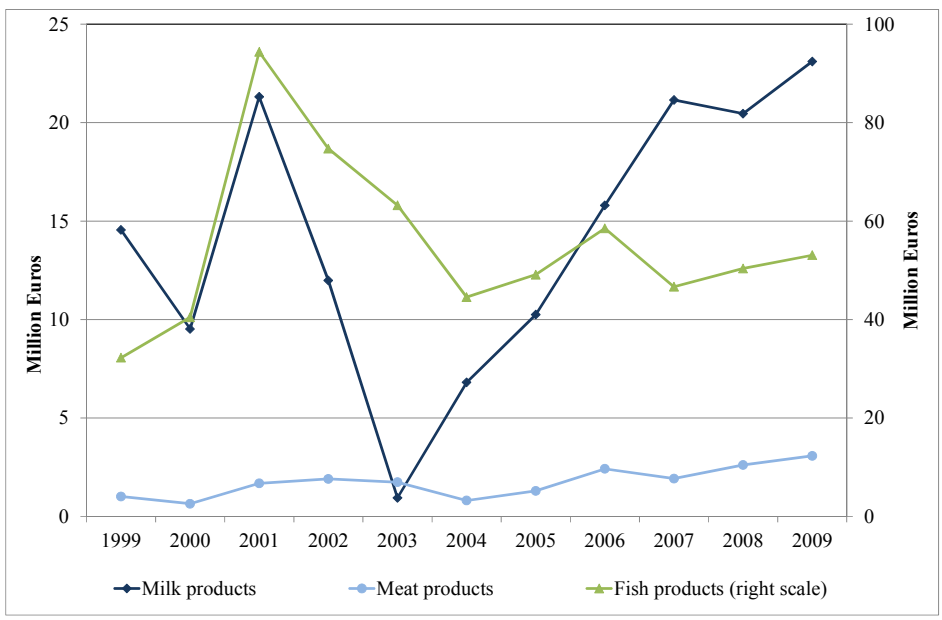

Figure 2.24. Estonian exports to non-EU countries, 1999–2009 (Source: Dataset DS-016893; author's calculations)

The above developments can be mainly associated with changed trade regimes towards two main trade partners – Russia and Ukraine. Together, these two countries accounted for 68.4% of milk exports to non-EU countries in 2003, while their combined share in meat and fish exports to non-EU countries was 62.2% and 85.2%, respectively.

As pointed out in sub-chapter 2.1.2, Estonia's accession to the EU meant that Russia had to abolish double-tariffs on Estonian exports, which resulted in improved export opportunities to Russia. In addition, Estonia's exports of milk and meat products to Russia have benefitted from the EU export subsidies. Figure 2.25 shows that after 2004, Estonia's exports to Russia increased indeed in the case of all considered food processing sectors.[80] Through 2004–2009, milk exports to Russia increased on average 56.7% per year, which compares with an annual fall of 52.0% for 1999–2003. Meat export growth increased from minus 18.0% during the pre-accession period to plus 49.5% for 2004–2009, while the respective figure for fish exports changed from minus 5.6% to plus 7.3%.[81] This suggests that Estonia's accession to the EU and the consecutive changes in the trade regime have indeed enhanced the export competitiveness of the Estonian food processing industry in Russia.

In the case of Ukraine, however, Estonia's accession to the EU brought a deterioration in export possibilities, as the free trade agreement between Estonia and Ukraine, which also covered agricultural products and foodstuffs, had to be terminated. As a result, Estonian exports of milk products to Ukraine ceased completely, while exports of meat products and fish products fell considerably, implying a loss in the competitiveness of the Estonian food processing industry on the Ukrainian market (see Figure 2.26). Ukraine was an especially important market for the Estonian fish processing sector, and therefore, the abolition of the free trade agreement hit the fish manufacturing sector especially hard. Nevertheless, in recent years, fish exports to Ukraine have started to recover, although they have not reached the levels seen before 2004.

[80] In order to abstract from pure price changes, export data in absolute volumes (100 kg) is considered.

[81] A decline in exports in 2007 reflects the political tensions between Estonia and Russia, which occurred after April 2007 when Estonia moved a Soviet-era Red Army war memorial away from the centre of Tallinn. The declining trend in fish exports to Russia through 2006–2008 partly reflects the fact that since the bulk of transactions in Russia are made in US dollars, the weakening of the dollar during that time and the resulting decline in the price of exports made it less profitable to export cheap canned/ preserved fish to Russia. Furthermore, end-2006, Russia constrained fish imports from the EU incl. Estonia, explaining this with falsified accompanying documents and illegal trade.

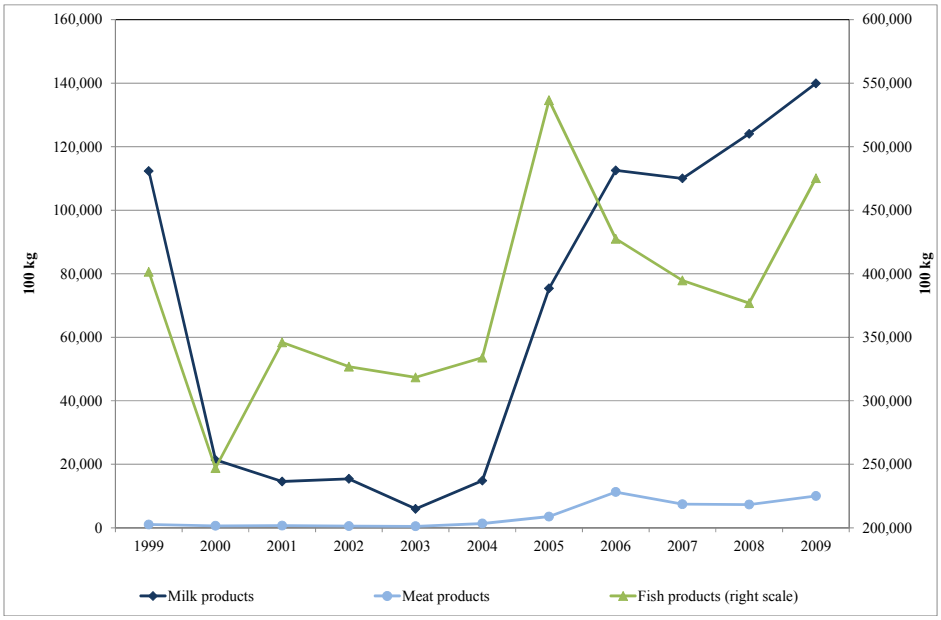

Figure 2.25. Estonian exports to the Russian Federation, 1999–2009 (Source: Dataset DS-016893; author's calculations)

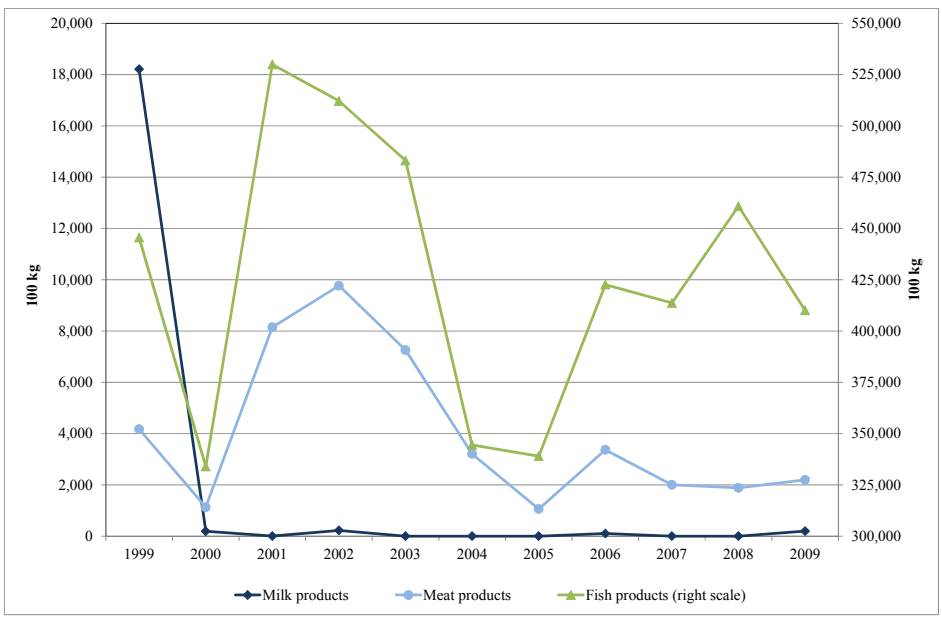

Figure 2.26. Estonian exports to Ukraine, 1999–2009 (Source: Dataset DS-016893; author's calculations)

Considering the structure of Estonia's exports to the third countries, a shift towards unprocessed products has emerged in the case of both meat and fish products (see Appendix A.21). This development, however, can be considered as a positive trend since the bulk of processed meat and fish exports to Russia and Ukraine consist of products with relatively low value. For example, the trade-weighed average unit price of processed fish exports to non-EU countries was EUR 50.82 per 100 kg in 2009, while the unit price of exports to the EU-15 was EUR 537.20 per 100 kg. At the same time, the unit price of processed meat products to non-EU countries was EUR 182.03 per 100 kg (mainly sausages), which compares with an average unit price of EUR 361.79 per 100 kg on exports to the EU-15.

At the same time, exports of milk products have become more oriented towards high value-added consumer products, with the share of processed products for household consumption increasing from 9.6% in 2003 to 33.7% in 2009. This indicates that after accession to the EU, the Estonian milk processing industry has gained non-EU markets not only in terms of export volume, but the composition of exports has also improved towards a higher share of high value-added products.

2.3. The impact of EU accession on the competitiveness of the Estonian food processing industry on the domestic market

2.3.1. The pre-accession estimates of price effects

This sub-chapter deals with the price effects of EU accession, as this has direct implications for the price competitiveness of domestic producers vis-à-vis imports in the domestic market. The accession-led policy changes that induced price effects were introduced in sub-chapter 2.1.2.

Although not directly concerned with the question of competitiveness, a number of studies have dealt with the price effects of EU accession in Estonia.[82] In general, the studies have proceeded from a traditional regional integration theory, which assumes that the short-term (or static) effects of entering a regional economic agreement appear primarily through changes in prices. Part of the studies dealt with the effects of EU integration on import prices only, not applying any economic models to the problem set (e.g. Varblane *et al.* 2001 and Varblane *et al.* 2002). Varblane *et al.* (2001) considered the removal of EU export subsidies, calculating the changes in import prices from the EU by adding the subsidy rate to the price. The authors found that the elimination of export subsidies would result in quite considerable import price increases in some

[82] Since the previous studies have not limited themselves to products from milk, meat and fish processing industries, this sub-chapter covers a broader spectrum of products. In the next sub-chapter, however, only products manufactured in the three industries concerned are considered.

sectors, the highest of which would be in the case of sugar (136% compared with prior to the policy change). Also, import prices of some milk products and cereals were expected to rise significantly – for example, imported butter was to become 83% and acidified milk 47% more expensive; the price of rye and maize was anticipated to rise by 34% and 21%, respectively. The changes in import prices of other products were estimated to be more modest (e.g. canned meat 12%, condensed milk 11%, beef 2.5%, meat sub-products 6%, rice 11%, wheat 7%) (Varblane *et al.* 2001: 38–39). However, as the authors emphasized, these estimated changes in import prices were expected to occur only if the structure and quantity of imports remained unchanged compared to the base year, 2000. Furthermore, the study did not analyse the impact of adopting EU import tariffs.

Another study by Varblane *et al.* (2002) considered, in addition, the introduction of EU import tariffs on agricultural products and processed food in Estonia. The impact of eliminating EU export subsidies was also recalculated. The authors used 2001 import data and calculated new expected import prices assuming that the import structures remained as they were in 2001. They added the EU export subsidy rates to the import prices from the EU, and the EU tariff rates to import prices from countries towards which the EU applied tariffs. Based on these, they found new weighted average import prices. Compared to Varblane *et al.* (2001), some variations existed in the predicted price changes. In most cases, the estimates for price increases due to policy changes had increased (e.g. the import price for sugar was expected to increase by 132–146% and for meat sub-products, by 58%). This was a reasonable result, as the latter study also included the effects of adopting EU import tariffs. Only in the case of butter, was the estimated price increase in the 2002 study markedly lower than in the 2001 study (35.5–46.9% and 83.4%, respectively) (Varblane *et al*. 2002: 81–85). This can be explained by the change in the structure of imports in 2001 compared to 2000, because within one year, the share of the EU in Estonian butter imports decreased more than 2.5 times (imports from the EU were replaced by imports from CEECs). Secondly, during that year, the EU subsidy rate on exported butter decreased slightly.

However, a few studies have applied economic models to quantify not merely the accession-led changes in import prices, but also the changes in consumer and producer prices as well as the impact on economic welfare.

Selliov (2002) used a simple static partial equilibrium model, incorporating the adoption of EU import tariffs and the abolition of export subsidies towards Estonia. Different scenarios were set up differing in terms of the assumed size of the export subsidies, the possible trade diversion as well as whether the EU intervention system also applied in Estonia or not. The models were of single commodity character, and different assumptions of demand elasticities (different values for elasticities as well as different functional forms of the demand) were used. Domestic production was assumed to be inelastic in the short run. Selliov (2002) analysed 4 different commodity groups, in which either the consumption consisted of imports only (sugar), or the imports (mostly) reached final consumption only after re-processing by domestic food producers (beef, poultry

and butter), hence, decreasing the need to account for consumer preferences. The calculations were based on 2001 price and quantity data.

The results of the study differed according to the scenarios used; however, the largest changes in the import and consumer prices were foreseen in the case of butter (price increases in the range of 0–146%) and the smallest in the case of poultry (–1 to +8%). The consumer prices for beef and sugar were expected to change in the range of 0–95% and 130–132%, respectively. The resulting losses in welfare were quite modest, accounting for 0–0.34% of GDP for beef, 0–0.2% of GDP for butter and 0–0.31% for sugar. The welfare loss in the case of poultry was negligible. However, Selliov (2002) also calculated the welfare losses with respect to the product market – that is, the total domestic consumption of a product, and the welfare losses in that case were remarkably higher. For example, the welfare loss in the case of butter accounted for 1–1519% of total butter consumption in Estonia (the respective figures for beef, poultry and sugar were 0–84%, 0–74% and 0–107%).

Tamm (2002) applied a partial equilibrium model to estimate the changes in consumer prices for agricultural products and the accompanying effects on economic welfare in Estonia, as a result of imposing EU import tariffs and abolishing EU export subsidies on the markets of some primary agricultural products (meat, cereals and sugar). As a basis, import data for 1998–2001 was used. Whilst applying different (constant) demand elasticities, the author assumed that domestic supply was inelastic in the short-run. Unfortunately, the author did not calculate the average change in consumer prices (the weighted average of domestic producer and import prices) in percentage terms or report the base prices. Therefore, the results of that study cannot be easily compared with other studies.

Nevertheless, the main findings were similar to other studies, suggesting that the greatest welfare loss would occur in the sugar sector.[83] This can be explained by the fact that sugar is not produced in Estonia and its demand is relatively inelastic. This implies that price increases do not lead to significant falls in consumption. Other sectors characterised by deadweight losses where maize and poultry; somewhat smaller were welfare losses in pork and rye (Tamm 2002: 44–47).

However, the abovementioned study assumed homogeneous goods, hence only modelling inter-industry trade and ignoring an important phenomenon of the real world, that most trade is intra-industry (i.e. a country can be an exporter and an importer of a certain good at the same time). There are two studies that take into account product differentiation (i.e. substitutability between domestic and imported sources of supply) in modelling the adoption of an EU trade regime in Estonia – Fock (2000) and Toming (2002). [84]

[83] The magnitude of deadweight loss varied with the chosen demand elasticities.

[84] However, imports and domestic products in the agricultural sector are often considered as perfect substitutes (see e.g. Rutherford *et al.*, 1997; Goldstein and Khan, 1985), justifying the assumption of homogeneous goods.

Fock (2000) studied the effects of integrating the Estonian agricultural sector into the EU (assuming accession in 2003); however, leaving out the distinction between the effects of adopting EU trade instruments and other factors of integration. He built a demand system based on the behavioural assumption that consumers maximize their utility given prices and a budget constraint. Fock (2000) found that, under various scenarios that were constructed, the retail prices of agricultural products and food were in most cases expected to increase. The model showed that the prices of cereals and poultry would only rise modestly; however, in cases where the producer prices were determined by EU administrative prices, the prices were predicted to increase considerably. The calculations showed that the retail prices of milk and beef would rise by the range of 5–41% and 7–76%, respectively. The lowest margin referred to the total liberalisation of EU agricultural policy (including the WTO negotiations), the highest showed the result of adopting the status quo CAP as it stood in 1999. By now, it is known that the latter scenario did not apply to Estonia, and therefore, will be neglected in what follows. The closest scenario to the real situation, the Agenda 2000, however, predicted price increases by 28 and 38%, respectively. Another example of a considerable price increase was sugar; there, the retail price was estimated to rise by 21–42% (total liberalisation and Agenda 2000 scenarios, respectively) (Fock 2000: 286).

However, these numbers only referred to the changes in retail prices; the increases in producer prices were even more pronounced, ranging to 10–59% for milk, 14–72% for beef and 52–103% for sugar (Fock 2000: 199). This indicates that retail prices could not rise as much as producer prices because of the limited purchasing power of consumers, and that the price margins (the share of the wholesale and retail sector in consumer prices) would fall. The only product predicted to result in a price reduction with Estonia's accession to the EU was pork, as its producer price in Estonia exceeded that in the EU.[85]

Another study, undertaken by Toming (2002), used a one-country partial equilibrium model and applied what is known as the Armington assumption. The study dealt with changes in the import regime for processed food and agricultural products, and the resulting implications on economic welfare in Estonia. There were eight commodity groups analysed: beef, pork, poultry, milk products, wheat, rye, rice and sugar. However, the model by nature was only a single-product model, neglecting any demand and supply interrelationships among agricultural products. Also, any changes in income were ignored, and the domestic supply was assumed to be inelastic in the short-run.[86] A dataset from the original data was constructed, consisting of the quantities and prices of imports subdivided into sectors corresponding to the classification of consumption and domestic production. This, however, led to a very high aggregation level and left out the option of modelling forward and backward links within food supply chains. As

[85] The retail price of pork was expected to fall by 16–17%.

[86] As in Tamm (2002).

the base year, 2000 was chosen, assuming for simplicity that economic relations would change only due to the implementation of EU trade policy and the CAP.

The study predicted quite significant price changes. As a result of EU accession, the import prices of most commodities were predicted to rise by a range of 30% (for poultry) to 140% (for sugar) (Toming 2002: 32). The price increases were due to the fact that EU subsidies for exports to Estonia were no longer granted, and the adoption of the common external tariff led to higher prices for imports from third countries. Also, the import prices of commodities from other new member countries in the EU (i.e. CEECs) were estimated to increase significantly. This was due to the adoption of EU administrative prices (applied to some agricultural products) by these countries. For example, the import price of beef from CEECs was estimated to increase by 68–77% (Toming 2002: 29). However, this shows that product quality differences between the EU-15 and CEECs were neglected.

In addition, the producer prices in Estonia were also expected to rise to the level of EU administrative prices, further and even to a greater extent contributing to overall price increases.[87] For example, the producer price for beef was estimated to increase 2.25 times, and the producer prices for poultry, rye and wheat by 42, 31 and 9%, respectively. As a result, the consumer price for beef was expected to rise by two times, the prices for poultry, rye and wheat by 35–38%, 31% and 10%, respectively. The predicted increase in the average consumer price for milk products was even more pronounced – about 3 times, mainly due to the adoption of EU administrative prices (Toming 2002: 32).[88] Hence, according to that study, domestic production was not able to mitigate the increases in the cost of imported foodstuffs even in cases where it was available. In cases where no domestic production existed, for example, rice and sugar, the increases in import prices were expected to pass fully into consumer prices (the consumer prices for rice and sugar were expected to increase respectively by 2 and 2.4 times compared to the price level in 2000).

Appendix A.22 summarises the studies discussed with respect to the methods, model specifications and problem sets used.

Table 2.16. reports the estimates of changes in import and consumer prices associated with Estonia's accession to the EU and the accompanying adoption of the CAP. As can be seen, the results of different studies vary considerably. However, as the studies have relied on different assumptions about policy changes as well as model specifications, and in addition vary in their chosen product categories (and the level of disaggregation), the results of the different studies cannot be compared directly. Yet, one can conclude that the magnitude of the expected price changes has increased with time. The price effects predicted by Fock (2000) are the smallest compared to the later studies, and the largest price changes have been estimated by Toming (2002).

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[87] This refers again to the fact that quality differences between Estonian products and EU products, to which the administrative prices apply, were neglected.

[88] In Toming (2002), the studied milk products also included butter and other dairy products in addition to fresh milk.

Table 2.16. The predicted price changes due to Estonia's accession to the EU: the results of selected studies

	Studies dealing with import prices only		Partial equilibrium models				
	Varblane *et al.* (2001)	Varblane *et al.* (2002)	Fock (2000)	Selliov (2002)		Toming (2002)	
	Δ import price (%)	Δ import price (%)	Δ consumer price (%)	Δ import price (%)	Δ consumer price (%)	Δ import price (%)	Δ consumer price (%)
Beef	3	0–1	7–38	2–16	0–95	64	112–113
Pork	…	5	-16	…	…	-0.3	0
Poultry	…	…	7–14	-1–13	-1–8	30	35–38
Milk	47	3–43	5–28	…	…	72	209–217
Butter	83	36–47	…	2–56	0–146	…	…
Maize	21	88	…	…	…	…	…
Wheat	7	16	4	…	…	7	9–10
Rye	34	49	…	…	…	34	31
Rice	11	…	…	…	…	102	102
Sugar	136	132–146	21–42	130–132	130–132	139	139

Sources: Fock 2000, Selliov 2002, Toming 2002, Varblane *et al.* 2001, Varblane *et al.* 2002 (author's table)

To conclude, all these studies predicted that accession to the EU would bring considerable import and consumer price increases, and therefore, reduce economic welfare in Estonia, as less competitive pressure (from imports) implies fewer incentives for domestic producers to increase efficiency and improve productivity (as inefficient producers remain in business). However, for domestic producers, increase in import prices gives a competitive advantage. Yet, in the cases where the domestic prices were expected to converge to the level of the EU administrative prices and this implied higher price increases compared to imports, the price competitiveness of domestic producers deteriorated.

2.3.2. The actual immediate changes in import and consumer prices after accession

The import price effects due to Estonia's accession to the EU were expected to be the following:

1) an increase in import prices from the EU-15 as a result of the abolition of export subsidies;
2) an increase in import prices from regions outside the EU towards whom the EU applies import tariffs (e.g. Russia, the United States, Canada, Ukraine).

Concurrently to these price changes, import volumes from the EU-15 and countries, which had no free trade agreements with the EU, were expected to fall. On the other hand, import volumes from the CEEC countries (EU members from May 2004) and non-EU countries, that could export their foodstuffs to the EU free of trade barriers, were anticipated to rise.[89]

In most cases, however, the accession-accompanying changes to the trade regime did not have a significant impact on import prices.[90] The prices followed rather ordinary fluctuations or the effect on import prices was only temporary and the prices quickly returned to their initial levels.[91] Import prices of butter, however, increased slightly in May 2004 compared to one month earlier (the average import price for butter was 25 EEK/kg in April 2004 and 31 EEK/kg in

[89] In the following, only the short-term price effects are considered and analysis of import prices in later years is left out in order to abstract from ordinary price fluctuation effects.

[90] There is a serious problem related to the comparability of the data. Before May 2004, the import data was collected on the basis of source countries. With accession to the EU, the system of data collection changed to become based on destination country, as a result of which, it is not possible to track the real sources of imports when the goods are not entering Estonia directly from the source country, but through another member state of the EU. Therefore, the conclusions hereafter need to be considered with caution.

[91] However, there was a significant increase in the import price for sugar (see Toming, 2006). Since this study focuses on milk, meat and fish processing industries, only product groups belonging to these industries are considered here.

May 2004), and stabilised at an even higher level afterwards.[92] The pre-accession average import price for butter (calculated for the period January 2003–April 2004) was 23 EEK/kg, whereas the post-accession price (for the period May 2004–September 2004) was 36 EEK/kg.

These price increases can be mainly associated with the price developments of imports from the EU after the removal of export subsidies on butter in May 2004. In April 2004, the average import price of butter from the EU was 47 EEK/kg; however, by May 2004, it had increased to as high as 70 EEK/kg (see Figure 2.27).[93]

After the steep initial price increase, the import price for butter from the EU fell to a somewhat lower level; however, still exceeding the pre-accession level (the average post-accession price of butter imports from the EU was 57 EEK/kg compared to the average pre-accession level of 33 EEK/kg). In addition, butter imports from CEECs became more expensive (the post-accession price of butter imports from CEECs was 34 EEK/kg compared to the pre-accession level of 23 EEK/kg).

The volume of butter imports increased before accession (especially from CEECs), indicating the intention on the part of importers to gain from price differences before and after accession. However, as a result of the increase in import prices after accession as well as sufficient stocks being obtained before accession, the volume of butter imports decreased markedly from all sources after Estonia joined the EU (see Figure 2.28).

Only in the case of buttermilk and yoghurt, did the trade volumes follow the expected patterns, although the prices of imports from the EU did not rise. After accession, the volumes of imports from the EU-15 fell somewhat, and the volumes of imports from CEECs rose considerably.

However, import volumes of frozen beef showed reverse patterns – before accession, basically no imports came from the EU, but from May 2004, EU imports became significant (with a lower average import price compared to CEECs). In some cases, the trade volumes showed a steady increase before accession (e.g. condensed and uncondensed milk from CEECs, poultry sub-products from countries that have no free trade agreement with the EU[94]), reflecting the expectations of importers about possible price increases after accession. After accession, import volumes of these products decreased. For example, imports of poultry sub-products from the United States ceased completely.

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[92] The average import price for butter was 38 EEK/kg in September 2004.

[93] The abrupt price changes can also refer to changes in the quality composition of product categories. The prices equal to zero indicate the absence of imports from a country group at a certain time.

[94] Imports of poultry sub-products from the United States increased mostly.

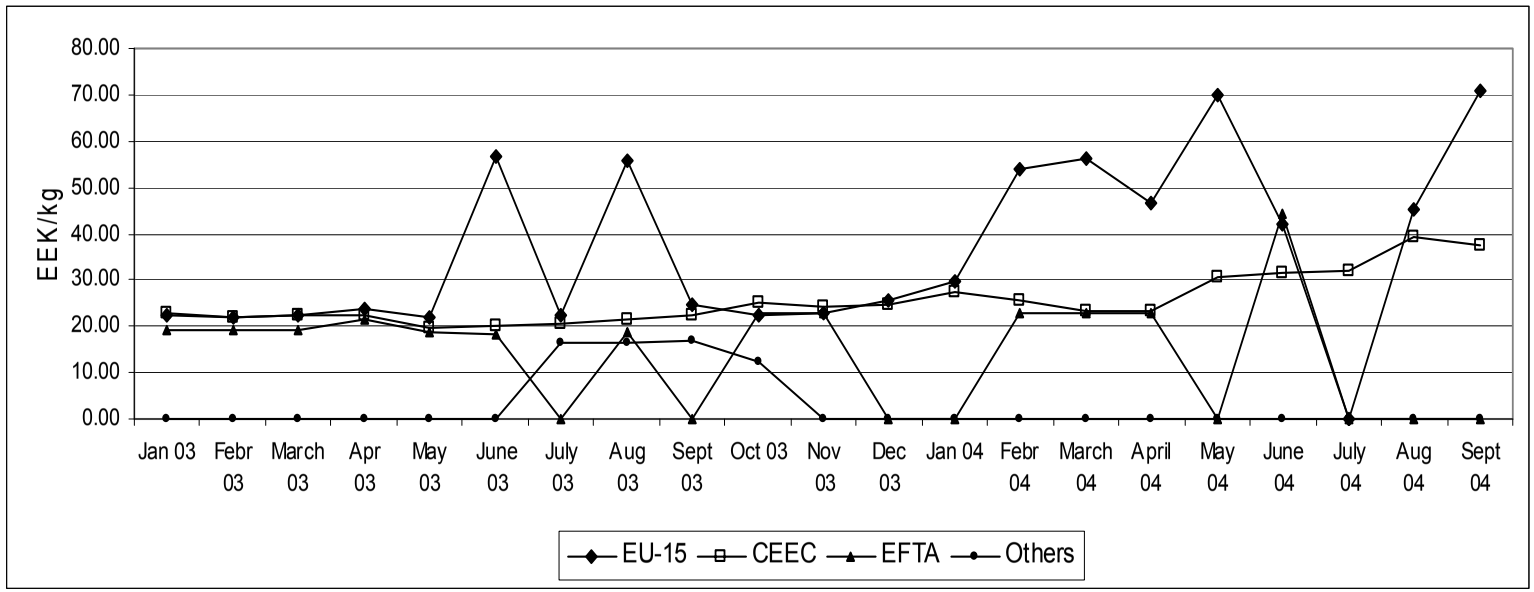

Figure 2.27. Import prices for butter in Estonia, January 2003 – September 2004 (Source: Statistics Estonia 2005; own calculations)
Note: EEK 1 = EUR 1/15.6466

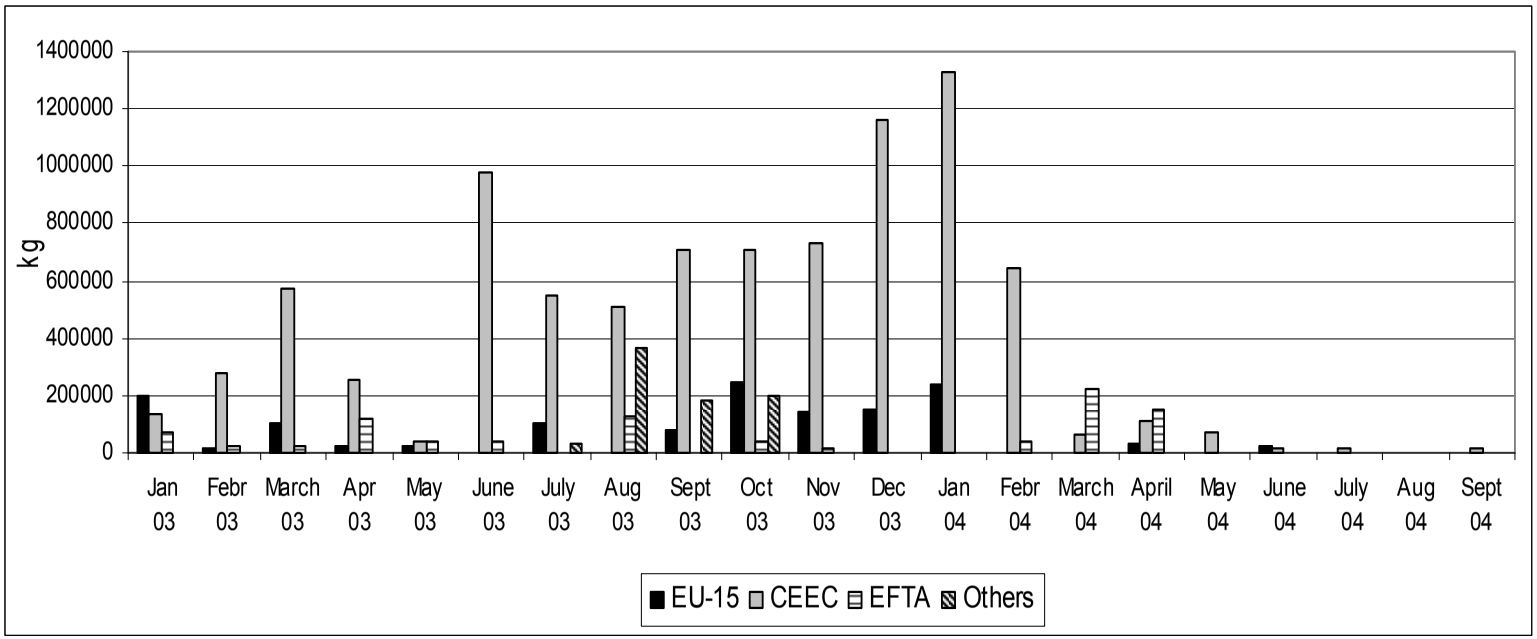

Figure 2.28. The quantity of butter imports, January 2003 – September 2004 (Source: Statistics Estonia 2005; own calculations)

Table 2.17 presents foodstuff prices in Estonian supermarkets before and after accession to the EU. It can be seen that from April to May 2004, the prices of foodstuffs followed rather normal fluctuations.[95] In many cases, the retail prices even decreased compared to the previous month (e.g. milk, cheese, poultry, wheat). However, as Table 2.17 also indicates, many of the price increases already occurred in the pre-accession period. In the case of milk products, the prices already increased before 2004, partly reflecting higher raw milk prices paid to farmers in Estonia as a result of improved export opportunities (Estonian Institute… 2004a: 48). The procurement price for milk in April 2004 was 61% higher compared to its level in June 2000 (see Table 2.18 for procurement and producer prices). As a result, the average retail price for milk increased by 22% during the period June 2000–April 2004. Retail prices for butter and cheese increased during September 2003 to April 2004 by 20% and 7%, respectively.

Nevertheless, the modest immediate price effect of EU accession was followed by more significant price effects over the longer term. By May 2005, the retail prices for butter and cheese had increased by 22 and 7% respectively compared to April 2004. The increase in retail prices was a result of the introduction of the EU market intervention system in Estonia, which in addition to the intervention system also involves exports refunds and import tariffs. For example, the producer prices for butter and skimmed milk powder, which are markets that are highly regulated by intervention purchases, started to rise after accession, and by May 2005 respectively reached levels 18 and 6% higher than in April 2004 (Table 2.18).[96] However, the post-accession increases in retail prices were only partly related directly to accession, as milk prices increased due to higher raw milk prices (increase by 4% during April 2004 to May 2005) and the pricing policy of milk processing companies. Yet, part of the price increases reflected the fact that after accession, subsidised imports from the old EU countries were cut off, and by May 2005, the stocks of cheap imports in the stores had run out.

Also, the prices of animal products increased gradually during the period considered, rather than showing any dramatic price developments after accession to the EU. Compared to June 2000, the retail price for beef in April 2004 had increased by 23% and the retail prices for pork and poultry rose by 9% each. Right after accession, in May 2004, the average retail price for pork increased by 4.5% (compared to April 2004), whereas the prices for beef and poultry decreased slightly (by 0.4% and 1.4%, respectively) (Table 2.18). The effect of EU accession on producer prices for meat was even negative – the procurement prices for beef and poultry fell respectively by 13% and 32% in May 2004 compared to April 2004 (Table 2.18). Yet, the procurement price for pork increased slightly (by 3%) and the procurement price for beef started to increase again in May 2005 becoming nearly 31% higher than in April 2004.

[95] Again, with the only notable exception being sugar (see Toming 2006).

[96] The intervention prices for skimmed milk powder and butter during the period 1 July 2004 – 30 June 2005 were 30.55 EEK/kg and 47.76 EEK/kg, respectively.

Table 2.17. Foodstuff prices in Estonian supermarkets before and after joining the EU

	Price (EEK/kg) [a]						Change (%)				
	June 2000	Sept 2003	Apr 2004	May 2004	Sept 2004	May 2005	Apr 2004/ June 2000	May 2004/ June 2000	May 2005/ June 2000	May 2004/ April 2004	May 2005/ April 2004
Milk 2.5% (l)	6.50	6.44	7.90	7.78	7.94	7.45	21.5	19.7	14.6	-1.5	-5.7
Butter	…	44.64	53.69	54.28	59.72	65.52	20.3 [b]	21.6 [b]	46.8 [b]	1.1	22.0
Cheese	…	71.97	76.70	76.16	78.51	81.89	6.6 [b]	5.8 [b]	13.8 [b]	-0.7	6.8
Pork	66.34	71.53	72.09	75.33	74.14	74.09	8.7	13.6	11.7	4.5	2.8
Beef	61.53	71.90	75.52	75.22	77.59	78.99	22.7	22.2	28.4	-0.4	4.6
Poultry	35.72	38.47	38.85	38.31	38.95	37.76	8.8	7.3	5.7	-1.4	-2.8

Sources: Estonian Institute of Economic Research 2004a, 2004c, 2005

Notes: [a] EEK 1 = EUR 1/15.6466

[b] Price change compared to September 2003.

Table 2.18. Procurement and producer prices for agricultural products and foodstuffs in Estonia before and after joining the EU

	Price[a]						Change (%)				
	June 2000	Sept 2003	Apr 2004	May 2004	Sept 2004	May 2005	Apr 2004/ June 2000	May 2004/ June 2000	May 2005/ June 2000	May 2004/ Apr 2004	May 2005/ Apr 2004
Average procurement price[b] for milk (EEK/kg)	2.37	2.72	3.82	3.85	3.81	3.96	61.2	62.4	67.1	0.8	3.7
Producer price (EEK/kg)											
unskimmed milk powder	26.64	31.33	34.17	33.38	37.63	35.43	28.3	25.3	33.0	–2.3	3.7
skimmed milk powder	23.85	26.88	27.50	27.45	29.56	29.24	15.3	15.1	22.6	–0.2	6.3
milk 2.5% (average)	na	4.38	5.25	5.27	5.39	5.56	19.9[c]	20.3[c]	26.9[c]	0.4	5.9
cheese	38.15	41.24	43.94	43.66	43.53	45.80	15.2	14.4	20.1	–0.6	4.2
butter	25.37	29.94	35.58	36.42	38.66	42.06	40.2	43.6	65.8	2.4	18.2
Average procurement price[b] for pork (EEK/kg)	22.78	18.20	20.61	21.23	23.44	20.96	–9.5	–6.8	–8.0	3.0	1.7
Average procurement price[b] for beef (EEK/kg)	17.19	18.66	18.03	15.70	21.71	23.53	4.9	–8.7	36.9	–12.9	30.5
Average producer price for poultry (EEK/kg)	23.58	27.80	27.80	18.80	19.10	18.62	17.9	–20.3	–21.0	–32.4	–33.0

Sources: Estonian Institute of Economic Research 2004a, 2004b, 2005

Notes: [a] EEK 1 = EUR 1/15.6466

[b] Procurement prices refer to the prices received by farmers.

[c] Price change compared to September 2003.

Unfortunately, no similar data was available for fresh fish and fish products, which means that we cannot make any conclusions about the impact of EU accession on the price competitiveness of the Estonian fish processing industry on the domestic market.

2.3.3. The reasons for the divergence of estimated and actual price effects

As showed above, the actual price effects following Estonia's accession to the EU were in most cases substantially lower than predicted by previous studies. There can be many reasons why these studies overestimated the effect of accession – for instance, the assumptions made in the studies and the base data and product aggregation levels used in the analyses – thus, also making the results of the different studies undertaken difficult to compare. For example, differences in the proportions of different partners in total imports and the structure of the product groups analysed vary between years, and can alter the results many times.

It is somewhat easier to predict the effects of accession on import prices from certain countries, as the only crucial elements in the analysis are the selection of the base year, the sufficient level of product aggregation and the policy parameters. However, as a result of a policy change, the proportion of different import partners within a specific product group will also most probably change, and it is a much harder task to estimate changes in average import prices. This can at least partly explain why the predicted price changes were often overestimated compared to the actual effects.

However, the analysis gets much more complicated when the accession-led effects are studied for consumer and producer prices. This requires the use of more complicated economic models, which rely on economic theory and take into account much more factors and parameters than just a direct policy change. This can also be seen in the deviations of the results of the model from actual price effects after Estonia's accession to the EU, which in many cases exceeded the import price deviations (especially in the case of Toming 2002, where the changes in domestic producer prices for some products were heavily over-estimated). The importance of consistency in the use of the theory and the data as well as the explicit modelling of demand and supply systems can be seen from the fact that the estimations by Fock (2000) were the closest to the actual price effects of EU accession. Based on optimization assumptions, he explicitly derived demand and production functions, as well as assuming imperfect competition in the food processing industry. The other studies (e.g. Selliov (2002), Tamm (2002) and Toming (2002)), on the other hand, assumed perfectly inelastic domestic supply in their models, thereby neglecting any possible changes in domestic production.

As noted by van Tongeren *et al* (2001), the parameters used in behavioural equations in a model determine the response to policy changes, and are hence one of the most crucial elements in policy analysis. The key parameters of a

model are price and income elasticities. In addition, McDaniel and Balistreri (2002) emphasize the role of the substitution (so-called Armington) elasticities in driving the model results. However, there has only been one attempt to estimate demand elasticities for Estonia econometrically because the relevant period for measuring the behaviour of economic agents under market conditions has been too short and probably not free from structural breaks (as is common to transition economies). Selliov and Võrk (2002) used an AIDS (Almost Ideal Demand System) method, and calculated different price and income elasticities for uncompensated demand in five different income groups in Estonia. However, the estimated elasticities in most cases gave a positive sign, which is characteristic of what are referred to as Giffen goods. Yet, taking into account that most food products are considered as necessities, their findings were likely to suffer from poor quality of data, or the model had misspecification errors.

In another study, Fock (2000) calibrated demand elasticities for Estonia. His findings can be considered somewhat more reliable as all calibrated price elasticities of demand had a negative sign and all income elasticities of demand a positive sign. Most of the analyses conducted about Estonia's accession to the EU have utilised the findings of these two studies, or used elasticities calculated for other countries. However, the results of the analyses are only as reliable as the underlying data and parameters.

In addition, Nielsen (1999) underlines the importance of the way the agricultural policy instruments are modelled to determine the outcomes of policy analysis models both in terms of the magnitude of production and trade responses as well as the size and composition of economic welfare changes. However, in the models on Estonia's accession to the EU, the policy changes are all inserted as *ad valorem* or fixed price wedges.

All the models used for assessing Estonia's accession to the EU have neglected the links between the agricultural sector and other economic sectors – that is, the models were partial, not general equilibrium models (GEM). Although there are limitations and disadvantages of using partial equilibrium models, this cannot be the main reason for the poor performance of the models. In principle, the partial models are able to give a more precise and detailed picture of policy effects than GEMs. This is true especially in an environment where the agricultural sector represents only a small share of GDP and hence, the linkages with other sectors are not very strong (the share of agriculture in GDP in Estonia was only 2.6% in 2003).[97]

However, the comparison of real accession-related price changes with the expected price effects is not without problems. For example, the actual consumer prices shown above originate from the database of the Estonian Institute of Economic Research; however, its product groups are not identical to the product groups listed in the official external trade statistics. Yet, the estimates of the studies have mostly been based on the latter. In addition, the

[97] For a discussion of the use of partial or general equilibrium models, see e.g. O'Toole and Matthews (2002), van Tongeren *et al.* (2001).

considered retail prices also include value-added tax, which is not taken into account in the studies. Furthermore, the comparison of actual and predicted price effects is complicated by the change in the collection of import data as mentioned earlier.

Nevertheless, one of the crucial reasons that the studies failed to predict the price effects is that many changes in import prices, associated with many factors, had already occurred prior to actual accession to the EU, and hence, the comparison of price changes immediately before and after the accession date does not show the whole magnitude of real price changes. For example, in January 2000, Estonia introduced import tariffs on agricultural products and processed food.[98] This had a noticeable effect on the trade structure. In 1999, 59% of agricultural imports into Estonia originated from the EU-15, and 18% from the CEECs that joined the EU in 2004 (see Table 2.19). Estonia had free trade agreements with these countries; hence, no tariffs were applied towards imports from these countries (in addition to some other countries, e.g. Ukraine and EFTA members). With the introduction of tariffs on imports from countries that did not have free trade agreements with Estonia in 2000, the imports from the EU-15 and the CEECs increased to 61% and 19%, respectively. On the other hand, the share of other trade partners in Estonian imports of agricultural products and foodstuffs decreased by three percentage points from 23% in 1999 to only 20% in 2000. This phenomenon of change in trade structures because of a policy change (introduction of tariffs) is commonly known as trade diversion.

[98] These tariffs, however, only applied to a minor share of trade partners as Estonia mostly traded with countries it had concluded free trade agreements with.

Table 2.19. Value shares of country groups in Estonian imports of agricultural products and processed food (HS 01–24) during the period 1995 – April 2005 (%)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2004 Jan–Apr	2004 May–Dec	2005 Jan–Apr
CEEC-10 [a]	10	12	11	15	18	19	21	23	27	31	29	32	30
EU-15	66	59	62	60	59	61	60	57	51	56	54	57	59
EU-25 [b]	76	72	73	75	77	80	81	80	78	87	83	88	89
Others	24	28	27	25	23	20	19	20	22	13	17	12	11
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Statistics Estonia; own calculations

Notes: [a] Cyprus, Czech Republic, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic, Slovenia.

[b] EU-25 includes EU member states as of 1 May 2004 (i.e. EU-15 plus CEEC-10).

In the case of dairy products, the import share for countries to which the tariffs were applied fell to 13% in 2000, compared to the previous year's 22% (a drop of 25%). The value of imports from the EU and the other countries that Estonia had free trade agreements with rose by 13% and 100%, respectively. Trade diversion was most clearly discernible in the case of butter and condensed milk (see Figure 2.29).

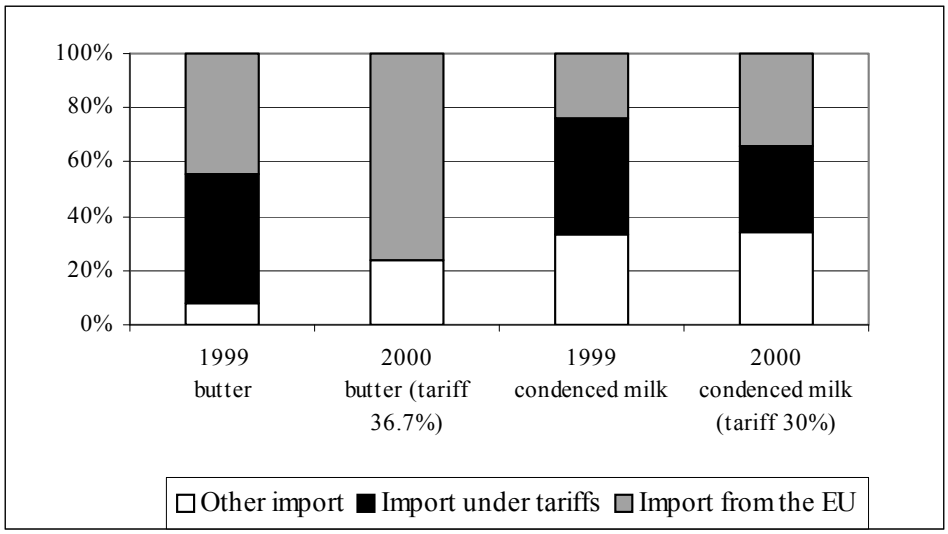

Figure 2.29. Changes in the import shares of different country groups for selected milk products into Estonia after the introduction of tariffs on 1 January 2000 (Source: Varblane *et al.* 2002)

In the case of meat products, imports from the countries affected by tariffs fell by 46%, while imports from the EU and other free trade countries rose by 44% and 33%, respectively. Trade diversion effects were most significant in the case of poultry and meat preparations (see Figure 2.301).

Hence, the actual price effects after Estonia's accession to the EU in May 2004 were smaller because of the trade diversion in 2000 – that is, as a result of the introduction of tariffs, imports have shifted from more expensive partners to less expensive partners.[99] By 2004, most of Estonia's agricultural trade took place with the EU-15 and CEECs (in 2003, the EU member states and candidate countries together accounted for 78% of Estonian agricultural imports), reducing the actual impact of raising the import tariffs to the EU level.

On the other hand, the gradual removal of EU export subsidies on some products already before actual membership mitigated the rise in import prices

[99] The issue of trade diversion after introducing import tariffs in Estonia in 2000 is further discussed in Varblane *et al.* (2001).

from the EU at the accession date. However, as mentioned above, in the cases where EU export subsidies were removed only after the actual accession date (e.g. butter and sugar), the price increases were considerable. As a result, the share for "old" EU members increased from 54% in January–April 2004 to 57% in May–December 2004, and even reached 59% in January–April 2005. Also, the proportion of the "new" EU members increased with accession, from 29% in January–April 2004 to 32% in May–December 2004.

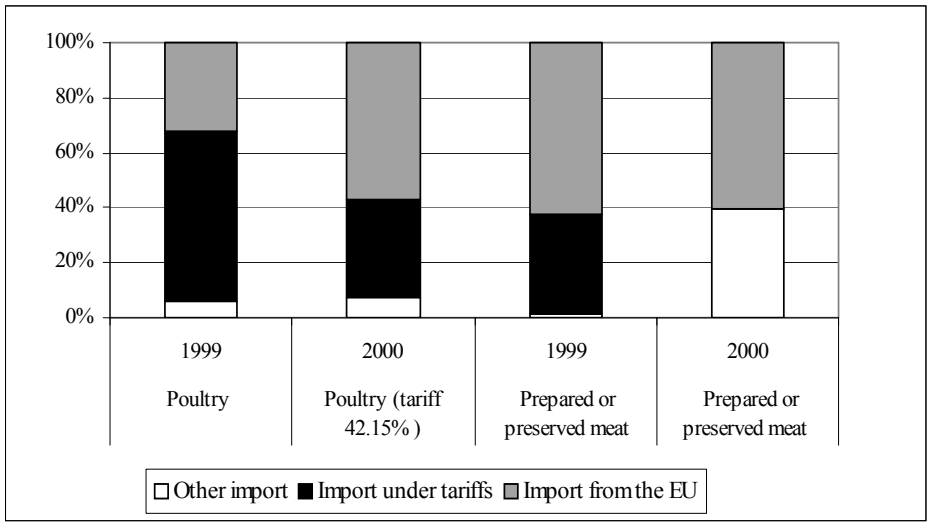

Figure 2.30. Changes in the import shares of different country groups for selected meat products into Estonia after the introduction of tariffs on 1 January 2000 (Source: Varblane *et al.* 2002)

These increases were accompanied by a dramatic fall in the share of imports from other trade partners not belonging to the EU. In January–April 2004, the third countries accounted for 17% of Estonian agricultural imports; however, the same figure for the period May–December 2004 was much lower, only 12% (see Table 2.19). Hence, accession to the EU had to a certain extent a trade divertive effect in Estonia. For example, imports from Russia, Ukraine and the United States – the three main trading partners in Estonian imports of agricultural products that do not have free trade agreements in agriculture with the EU – dropped considerably. In 2003, 3.8%, 2.9% and 3.0% of Estonian imports of agricultural products and foodstuffs from Russia, Ukraine and the United States, respectively. Shortly before accession, the Ukraine's share rose to 3.9%, signalling the anticipation of possible price increases after accession.[100] However, the accession led to a sharp fall in imports from these countries, as a result of which, the share of imports

[100] Imports from the United States remained at the 3% level; however, imports from Russia fell slightly to 3.5% for the period January–April 2004.

from Ukraine and the United States for 2004 amounted to only 2.2% and 1.0%, respectively. The fall in Russia's share in agricultural imports to Estonia was somewhat less pronounced – to 3.2% for 2004.

Finally, the actual price effects remained smaller also due to the liberalisation of EU agricultural and trade policies within the framework of World Trade Organisation (WTO) negotiations. The studies conducted prior to actual accession to the EU often took into account export subsidy rates and import duty rates higher than those actually applied in 2004. For example, the export refund for butter was 1 680 EUR/t in 2001, but only 1 320–1 390 EUR/t in 2004 (Commission Regulation (EC) No 1871/2004). The EU tariffs applied to imports from third countries have dropped considerably – the simple average tariff applied on imports of agricultural products and processed food was 20.8% in 1997, 17.3% in 2000, 16.6% in 2004 and "only" 16.0% in 2008 (WTO 1997, 2000, 2004, 2009a). Furthermore, in 2003, as a result of pressure from EU trade partners within the WTO as well as due to budgetary problems related to EU eastern enlargement, a new reform to the CAP was launched that altered the principles of direct payments to farmers and lowered the administrative prices of some agricultural products. Hence, the trade regime that Estonia had to adopt in May 2004 differed from the one considered in the studies, and the "moving target" nature of the EU integration process made the validity of the ex ante analyses more complicated.

2.3.4. Implications for the competitiveness on the domestic market

Accession to the EU was predicted to result in significant changes in import prices as well as domestic prices, completely changing the competitive positions of domestic producers and their international competitors in the domestic market. However, as demonstrated above, EU accession did not result in significant changes either in import prices nor in the domestic producer prices (with only a few exceptions). Nevertheless, even the small price effects may induce relative changes in competitive positions in the domestic market.

An indicator that measures the price competitiveness of domestic products relative to imports of the same type of products is the relative price of imports. Table 2.20 presents the relative prices of imports of selected milk and meat products in Estonian supermarkets before and after accession to the EU. The critical level here is unity, and the figures above indicate that domestic products are relatively more price competitive compared to imports.[101]

We can conclude that all the domestic milk products considered, with the exception of ice cream, have been relatively competitive before as well as after accession, while only in the case of butter can we clearly conclude that the Estonian producers have improved their price competitiveness after 2004. This is directly related to the removal of EU subsidies on butter exports to Estonia after May 2004. In the case of processed cheeses, however, Estonian producers

[101] It needs to be noted that this indicator assumes a similar quality of domestic and imported products, which is in reality not always the case.

seem to have lost in price competitiveness (although domestic products still cost less than imports). In terms of natural cheese and yoghurt, the immediate impact of accession has been a loss in price competitiveness for Estonian producers; however, the same indicator has increased in recent years suggesting improved competitiveness.

In the case of meat products, Estonian pork, poultry and canned meat are relatively less price competitive than imports, while the opposite is true for sausages and smoked meat. However, after accession, the relative price of imports increased for poultry, sausages and smoked meat while it has clearly been decreasing for canned meat. Basically, all beef sold in Estonia during the period under consideration has been domestic, while the same applies for pork after 2004.

Table 2.20. The relative prices of selected milk and meat products in Estonian supermarkets (price of imports/price of domestic product)

	May 2002	May 2003	May 2004	May 2005	May 2006	May 2007	May 2008	May 2009
Natural cheese	1.58	1.42	1.29	1.38	1.52	1.63	1.36	1.80
Processed cheese	1.40	1.45	1.46	1.36	1.44	1.42	1.27	1.32
Yoghurt	1.22	1.27	1.17	1.19	1.24	1.18	1.22	1.37
Butter	1.34	0.98	1.34	2.43	2.11	2.50	1.59	1.75
Ice cream	0.98	0.97	0.97	0.92	0.95	0.93	1.00	1.16
Pork	0.55	0.56	0.52	na	na	na	na	na
Poultry	0.77	0.60	0.61	0.69	0.86	0.88	0.88	0.85
Canned meat	0.91	0.97	0.94	0.92	0.85	0.88	0.65	0.54
Sausages	0.99	0.98	0.99	1.36	1.20	1.32	1.09	0.67
Smoked sausages	2.02	2.14	2.23	2.08	2.08	2.17	2.01	2.37
Smoked meat	na	na	0.84	na	3.36	1.79	1.61	2.93

Source: Estonian Institute of Economic Research 2009; author's calculations

A good indicator of the competitiveness of the Estonian food processing industry in the domestic market is also the share of domestic versus imported food products in the sales value of Estonian supermarkets, which basically corresponds to the DMR and MPR ratios introduced in sub-chapter 1.1.2.2.[102] The Estonian Institute of Economic Research conducts annual studies on the position of Estonian food products on the domestic market, and according to their data, accession to the EU immediately led to an increase in the share of

[102] The majority of people in Estonia acquire their food from supermarkets.

Table 2.21. The share of domestic and imported food products in the sales value of supermarkets (%)

	Domestic products									Imported products								
	May 01	May 02	May 03	May 04	May 05	May 06	May 07	May 08	May 09	May 01	May 02	May 03	May 04	May 05	May 06	May 07	May 08	May 09
Dairy products																		
Milk	100	100	100	100	100	100	99	99	97	0	0	0	0	0	0	1	1	3
Natural cheese	96	90	89	88	82	80	79	79	82	4	10	11	12	18	20	21	21	18
Processed cheese	61	52	57	53	53	53	55	51	54	39	48	43	47	47	47	45	49	46
Yoghurt	86	85	86	92	93	93	93	93	92	14	15	14	8	7	7	7	7	8
Butter	100	100	100	99	100	100	99	96	92	0	0	0	1	0	0	1	4	8
Curd	98	97	98	99	98	98	98	97	97	2	3	2	1	2	2	2	3	3
Ice cream	87	82	85	89	89	87	88	84	84	13	18	15	11	11	13	12	16	16
Meat products																		
Beef	100	100	100	100	100	100	100	99	95	0	0	0	0	0	0	0	1	5
Pork	90	89	95	97	100	100	100	99	95	10	11	5	3	0	0	0	1	5
Poultry	43	49	45	61	60	64	63	67	74	57	51	55	39	40	36	37	33	26
Canned meat	79	81	85	87	82	77	77	76	80	21	19	15	13	18	23	23	24	20
Sausages	99	99	99	99	99	100	100	100	98	1	1	1	1	1	0	0	0	2
Smoked sausages	99	99	99	99	99	99	98	97	96	1	1	1	1	1	1	2	3	4
Smoked meat	99	99	99	99	99	100	99	98	96	1	1	1	1	1	0	1	2	4

Source: Estonian Institute of Economic Research 2009: 17.

imports in the case of natural cheese and processed cheese, while the market position for domestically produced yoghurt and ice cream improved (May 2004 vs May 2003) (see Table 2.21). Similarly, the share of domestic poultry products immediately increased after accession. Looking at longer term developments, the share of imports in the turnover value of supermarkets has in general increased since 2004 compared to the pre-accession period in the following product groups: milk, natural cheese, processed cheese, canned meat, smoked sausages and smoked meat. At the same time, the position of domestically produced yoghurt, ice cream and poultry has improved, while in the case of other products, no clear trends could be detected.

In Table 2.22, an alternative import penetration ratio measure (MPR) for selected foodstuffs is given. Here, the MPRs are calculated as the ratio of imports to (total) domestic consumption in volume terms; hence, an increase (decrease) in the MPR indicates a fall (increase) in the market share of domestic producers. The difference of MPR ratio in Table 2.22 compared to the MPR ratio shown in Table 2.21 is hence that here, the MPR ratio takes into account total imports (including imported inputs) and total domestic consumption, not only the end-products sold at supermarkets, and it is based on quantitative terms compared to value terms in Table 2.21.

Table 2.22. The import penetration ratio for selected foodstuffs, 2002–2009 (%)*

	2002	2003	2004	2005	2006	2007	2008	2009
Fresh milk products (excl. cream)	na	0.8	0.9	1.0	1.7	3.6	4.4	4.5
Drinking milk	na	0.2	0.3	0.3	0.9	2.4	2.7	2.9
Cream	na	2.7	2.5	2.7	2.4	2.1	2.4	1.2
Concentrated milk	na	100.0	100.0	100.0	75.0	na	76.2	100.0
Whole milk powder	na	60.4	22.2	na	185.7	1400.0	6.1	0.0
Skimmed milk powder	na	65.0	51.4	36.4	36.4	90.5	1.7	0.0
Butter	na	16.4	3.2	0.0	0.0	0.0	1.8	2.7
Cheese	na	14.7	16.9	13.8	7.3	9.1	11.4	12.7
Processed cheese	na	18.2	53.8	39.1	25.0	23.5	31.3	20.0
Meat - Total	46.8	51.0	44.5	48.4	53.7	52.1	51.4	47.8
Cattle	11.4	11.3	14.7	31.3	27.8	26.3	35.0	22.2
Pigs	40.3	46.7	44.2	46.8	53.2	47.9	45.6	44.1
Poultry	72.3	70.5	56.4	60.0	70.8	70.8	69.2	65.5

Sources: Eurostat, Statistics Estonia; author's calculations

Note: * Import penetration ratio is calculated as a ratio of imports to total domestic use of a product (in terms of quantity)

Table 2.22 reveals that after joining the EU, domestic producers have lost their domestic market share to imports in the case of fresh milk products, drinking milk and processed cheese, while gaining market shares in the case of cream, milk powder, butter and cheese. In the case of meat products, the import penetration ratio overall dropped immediately after accession, but picked up again in later years, whereas the increase in ratio of imports to total domestic use of a product has been most remarkable in the case of beef. Obviously, not all the developments in market shares can be attributed to the impact of joining the EU, but some of the changes can at least partly be explained by accession (e.g. a fall in butter imports).

Unfortunately, comparable data was not available for fish products. However, the 110% increase in imports of fish and fish products (in terms of the value of exports) for 2003–2007 compared with a 14.1% decline in the value of sales of the Estonian fish processing industry and a 5.2% drop in exports during the same period indicates that the fish processing industry has lost competitiveness vis-à-vis imports in the domestic market. This is also in stark contrast to the milk processing industry, where imports in value terms in 2007 were down 24.5% compared to the 2003 level. At the same time, the value of sales for the industry increased by 64.5% and exports grew 123.4%. In the case of the meat industry, a 109.0% increase in imports was accompanied by a 52.6% increase in sales and a 24.4% growth in exports.

The fact that Estonian producers have been able to retain their price competitiveness in the domestic market vis-à-vis imports in the case of many products, does not itself explain how this price competitiveness has been achieved. One way to achieve price competitiveness is through efficiency and cost competitiveness. However, price competitiveness can also be achieved by keeping prices low, while sacrificing profits. The next chapter attempts to identify the impact of accession on the ability to earn (profitability) for the three food manufacturing sectors in Estonia.

2.4. The impact of EU accession on the Estonian food processing industry's ability to earn and future developments in EU policies influencing the competitiveness of the food processing industry in Estonia

2.4.1 Developments in the value added and profitability of the food processing industry in Estonia

The development of the food processing industry's earnings and profitability is a measure directly related to the industry's performance on domestic as well as export markets. For a country with a small domestic market, the opening up of a large (export) market with high purchasing power is of vital importance. However, one must keep in mind that the adjustments to EU rules and standards

has been costly, and the main benefits from this can only be seen over the longer term.

As discussed in the theoretical part of this dissertation (see sub-chapter 1.1.2.3), an industry's ability to earn is best measured in terms of its level of value added and price-cost margins.[103] The first of these is defined as the difference between the total sales revenue of an industry and the total cost of components, materials and services, and it corresponds to the contribution of the factors of production, that is, land, labour and capital goods, to raising the value of a product. The price-cost margin is commonly used as an indicator of an industry's profitability.

Figure 2.31. depicts developments in the ratio of value added to sales in the Estonian meat, fish and milk processing industries for 2000–2008. The indicator shows that the relative level of value added in the meat and milk industries has improved since 2001, but worsened in 2004, the year of accession to the EU. This initial negative effect was especially pronounced in the case of the milk industry.

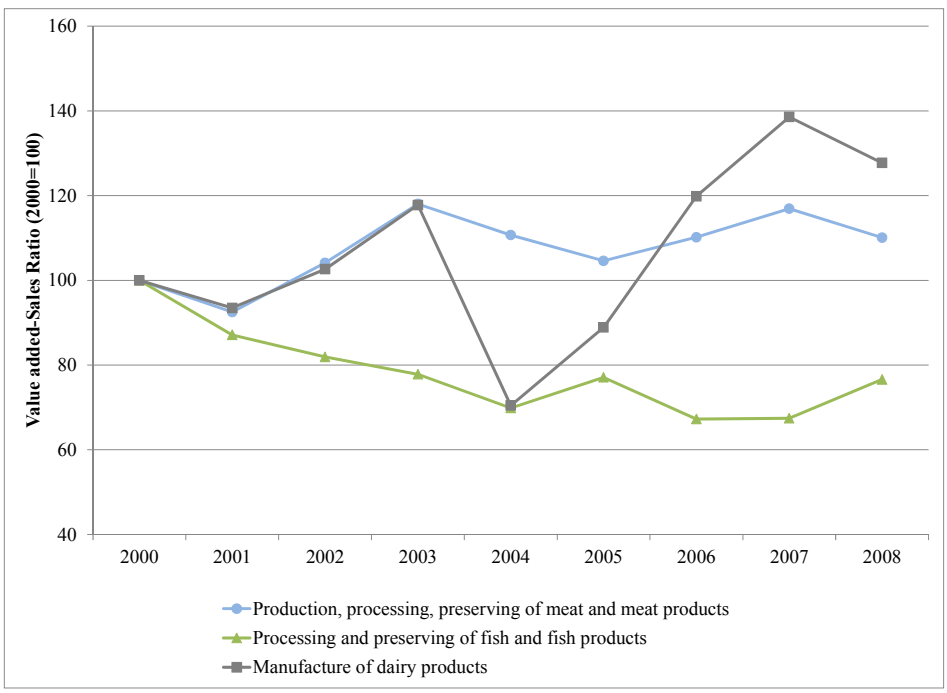

Figure 2.31. The development in the ratio of value added to sales in Estonian food processing industry, 2000–2008 (Statistics Estonia 2006, 2010; author's calculations)

[103] The concept of value added discussed in this chapter differs from the notion of value added touched upon in sub-chapter 2.2.1. Here, value added refers to an industry's gross income, while in the sub-chapter 2.2.1., the term was used to denote a competitive advantage given to a product by adding extras in the manufacturing process, or by tacking on extra products and/or services that result in greater customer acceptance.

The milk industry recovered from the drop in value added a year later, and saw earnings improve through 2005–2007, just before the global economic recession hit the industry in 2008. However, the value added level of the meat industry first picked up in 2006. The fish industry, on the other hand, experienced a continuous decline in the value added ratio through 2000–2004, before slightly recovering in 2005 just to deteriorate further during 2006–2007.

Hence, based on the ratio of value added to sales, it can be concluded that the initial effect of EU accession on all industries considered here was negative; nevertheless, the meat industry and particularly the milk industry have been able to increase their earnings in later years. The fish industry, however, has never reached the same ratio of value added to sales as seen in 2000.

Looking at the profitability of the industry, there are two main definitions of price-cost mark-ups (PCM) often used in the literature (as introduced in sub-chpater 1.1.2.3), the first of which has often been used to study the link between profitability and concentration, while the other conforms more to the theoretical concept of profit-sales-ratio:

$$PCM1 = \frac{VA - LC}{VA},$$

$$PCM2 = \frac{VA - LC}{S}$$

However, one has to keep in mind that price-cost margin as a measure of competitiveness is not without fault. First of all, the results of the analysis of price margins are ambiguous depending on whether the (short-run) perspective of the producers or the approach of IO or regional integration theory is chosen. Second, the data on value added and labour costs underlying the price margin index is not perfect in the sense that the data is compiled at enterprise level, and the enterprise may have manufacturing activities in many sectors. This means that the data for a food industry sub-sector can actually include contributions from other (sub-)sectors.

Figure 2.32 identifies two important turning points in the development of price-cost margins in the Estonian food processing industry. First, after a period of highly liberal trade policy, Estonia introduced tariffs on agri-food imports in 2000, which, however, only applied to a minor share of its trade partners. Nevertheless, as a result, the price margins nearly doubled. This period, however, also coincided with the end of the Russian crisis that escalated in 1998. Second, after Estonia's accession to the EU, the price-cost margins fell (PCM1 by 13% and PCM2 by 25% in 2004 compared to 2003), indicating a loss in profitability, and hence, a deterioration in the competitiveness of the sector.

One of the reasons behind this development is probably the fact that accession to the EU imposed increases in costs (related to both investments in stricter hygiene and product safety standards as well as the increase in the price of intermediate inputs), while price increases were limited by consumer

purchasing power in the domestic market. However, after an initial drop in 2004, the price-cost margins started to climb and achieved a level higher than in 2003 by 2006/07, just before dropping in 2008 to the lowest level since 2004.[104] Since both indicators show qualitatively the same developments, only the PCM2 as a profit-to-sales-ratio is used in the following analysis.

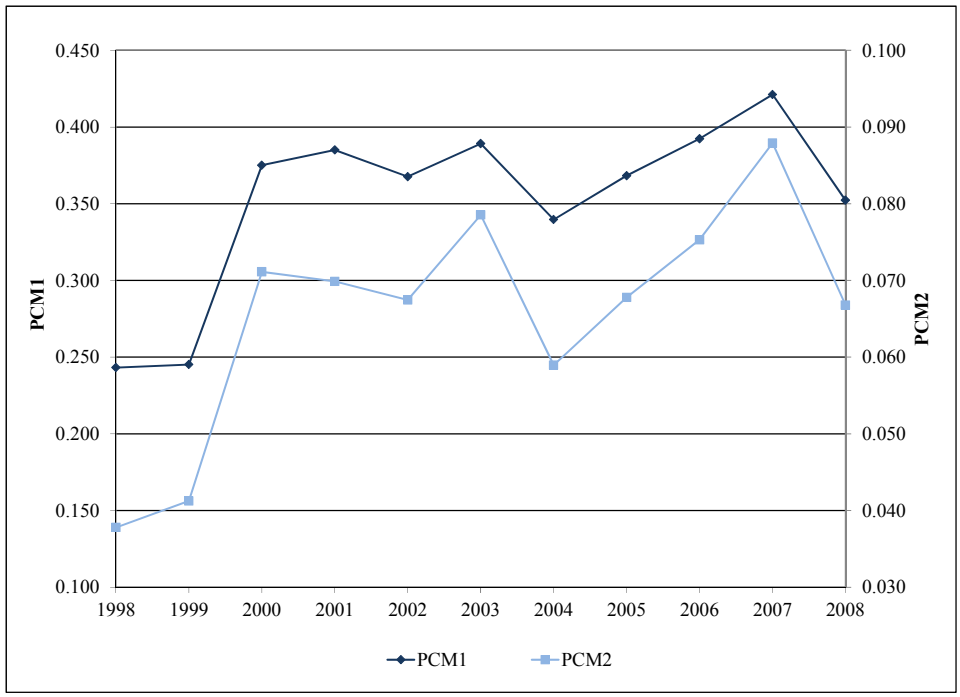

Figure 2.32. The development of price-cost margins in the Estonian food processing industry, 1998–2008 (Statistics Estonia 2006, 2010; author's calculations)
Note: 1998–2007 data for the manufacture of food products and beverages, 2008 data for the manufacture of food products.

For individual food processing sectors, the developments in PCM have differed; however, an immediate fall after EU accession has been characteristic to all sectors. Figure 2.33 depicts the PCM2 for the meat, fish and dairy industries. The developments in price-cost margins largely match the developments in the ratio of value added to sales. Price-cost margins have been growing in the meat and dairy industries through 2000–2003; however, fell in 2004 (by 16 and 77%,

[104] However, 2008 data is not directly comparable with the previous years, as 2008 data was only available for the manufacture of food products, while data for the period 1998–2007 is based on the manufacture of food products and beverages. Furthermore, 2008 data likely reflects the impact of the global economic crisis.

respectively). This indicates that the profitability of the meat and dairy industries was increasing until 2003, followed by a fall in profitability in 2004.

Profitability in the fish industry, which is more dependent on export markets, on the other hand, had been constantly decreasing through 2000–2004, reaching nearly zero in 2004. In light of changing consumer trends related to health and convenience towards a higher consumption of fish products in the EU (Failler 2007: 15–16), this is a rather disappointing result.

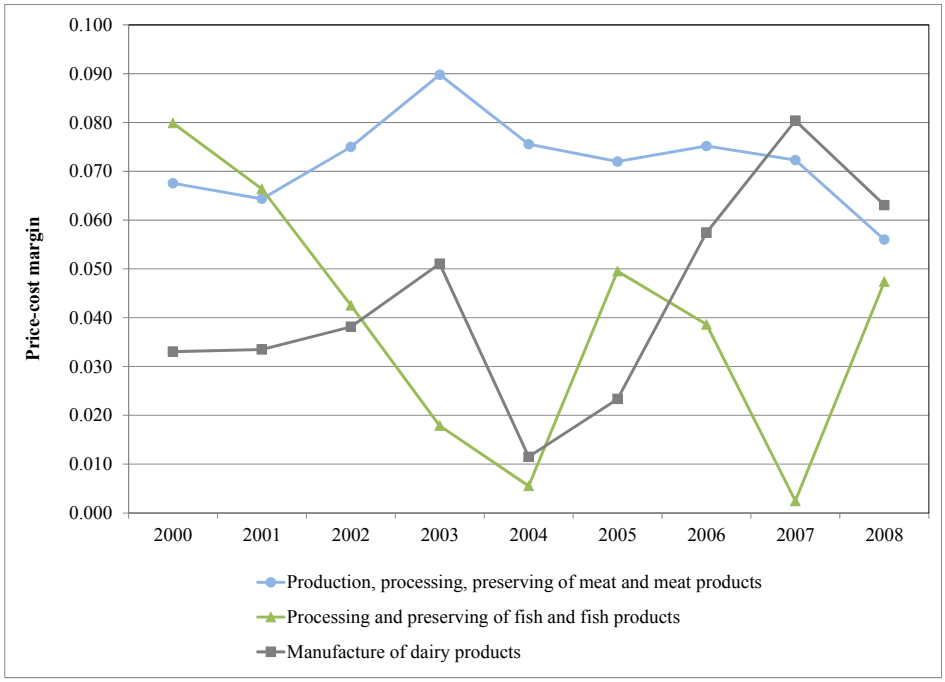

Figure 2.33. Price-cost margins (PCM2) for selected food industry sub-sectors in Estonia, 2000–2008 (Source: Statistics Estonia 2006, 2010; author's calculations)

During the post-accession period, however, the three industries under consideration have followed a rather different path. While price-cost margins picked up in the milk processing industry during 2005–2007, exceeding the 2003 level by 2006, price-cost margins in the meat industry continued to deteriorate with only a slight improvement seen in 2006. In the fish industry during the same period price-cost margins have been more volatile; nevertheless, they have never again reached the levels seen during 2000–2001.

Developments in price-cost margins depend on the one hand, on prices, and on the other hand, on costs. The prices of foodstuffs not only depend on domestic demand and competition, but also on world market prices and opportunities to penetrate foreign markets. The cost of inputs (raw materials and

intermediates) in the food industry is even more strongly influenced by world market prices and EU agricultural policy. For example, the sharp fall in PCM2 in the dairy industry in 2004 was mainly the result of the increase in the purchasing price of raw milk (by 33%), promoted by improved export possibilities after the opening up of the EU market and stiffer competition among processors in procuring raw materials (Estonian Ministry of Agriculture 2004). The threat of foreign companies in the EU (especially Finland) buying up raw milk from Estonian farmers motivated food processors to raise the price paid to farmers.[105] Indeed, after the initial negative price effect, the competitiveness of the Estonian milk processing industry started to improve, and this is illustrated by an increasing PCM2 through 2005–2007.

Similar developments occurred in the meat sector, where the procurement price for beef grew in 2004 to a level around 30% higher than before EU-accession, while retail prices only changed modestly, resulting in decreased price margins for meat processors.

For the dairy and meat processing industries, total costs grew by 34.1% and 8.1%, respectively, for 2003–2004, while at the same time, net sales increased relatively less – by 30.2% and 6.8%, respectively. As opposed to the dairy and meat processing industries, net sales in the fish industry had been decreasing since 2001, and sales had been falling faster than costs, resulting in falling profitability.

In the dairy and meat processing industries, costs on materials, supplies and intermediate goods have mainly contributed to increases in total unit costs for 2003–2004 (an increase of 48% and 13%, respectively), whereas in the fish processing industry, increases in the cost on merchandise dominated (increase by nearly 2.2 times in 2004 compared to 2003) (in Appendix A.23, developments in separate cost items for the meat, fish and milk industries are shown). Personnel costs fell by 5% in the fish industry, while these increased in the dairy industry and meat industry by 9% and 8%, respectively.

The respective unit costs (based on net sales) are given in Figure 2.34. As a comparison, data for the total food processing industry is added. During 2004–2008, unit costs in the meat processing industry have followed an upward trend (with the only exception being 2006), while unit costs in the milk processing industry have been declining after an initial increase during 2004–2005. In the fish industry, on the other hand, unit costs dropped in 2005 before starting to increase again in 2006. In 2008, unit costs in the fish industry fell, in contrast to the milk and meat industries.

[105] On the other hand, in 2004, the EU's intervention purchasing system for butter and skimmed milk powder was adopted in Estonia, ensuring a "price floor" for producers. This did not necessarily increase the incomes of producers, but assured that in the case of falling world prices, the producers would still retain a certain level of income.

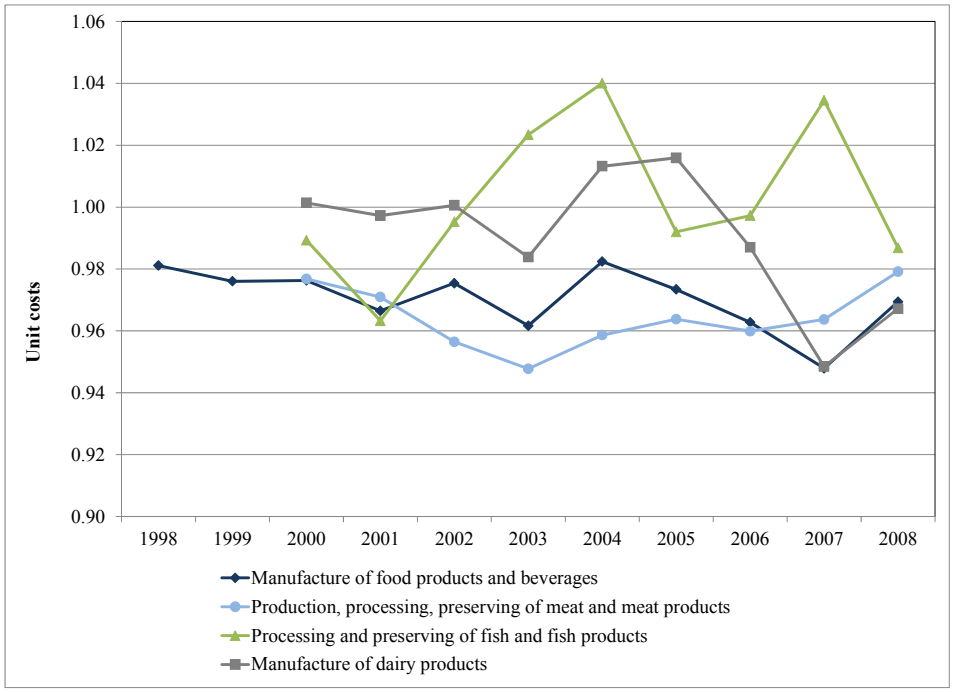

Figure 2.34. The development of unit costs (based on net sales) in the Estonian food processing industry, 1998–2008 (Source: Statistics Estonia 2006, 2010; author's calculations)
Note: 1998–2007 data for the manufacture of food products and beverages, 2008 data for the manufacture of food products.

However, looking at apparent labour productivity in the food processing industry suggests that in terms of productivity, the Estonian milk, meat and fish processing industries have all gained in competitiveness potential (see Figure 2.35). In spite of a drop in the productivity in 2004, the milk processing industry has not only shown the fastest improvements in productivity, but the level of labour productivity (in terms of value added) has also reached the highest level in this sector. This development is in accordance with our findings with respect to export competitiveness and profitability indicators, and suggests that the competitiveness of the Estonian milk processing industry has indeed improved since accession to the EU.

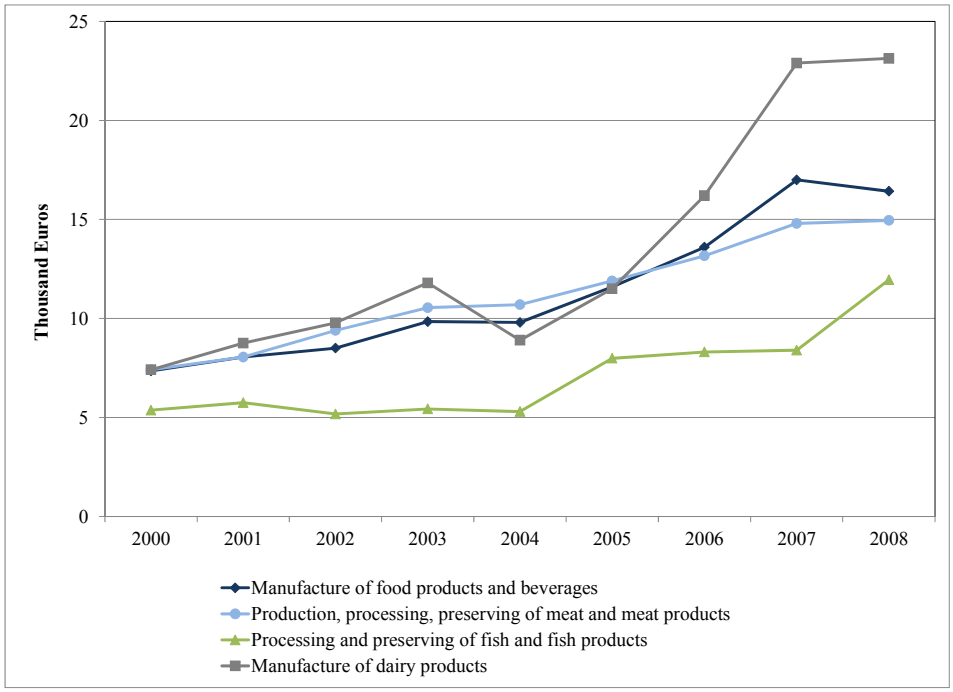

Figure 2.35. Apparent labour productivity (gross value added per person employed) in selected sub-sectors of the Estonian food processing industry, 2000–2008 (Sources: Eurostat; Statistics Estonia 2006, 2010; author's calculations)

Hence, in terms of value added and price-cost margins, the immediate impact of EU accession for the food processing industry in Estonia was a deterioration in competitiveness. This was mainly the result of increased costs of intermediate inputs, which was not compensated for by increasing export opportunities even for the dairy industry. However, for the milk processing industry, this immediate loss in income/profitability was reversed by an increased competitiveness over the medium term, while the competitiveness of the meat industry has not seen any (notable) improvements since accession despite a strong boost in exports to the EU-15.

In the case of the Estonian fish industry, which is to a great extent dependent on export markets, the level of value added has followed a downward trend since 2004 and even though price-cost margins in that sector have been more volatile, they have not reached the levels seen during the early 2000s. This suggests that EU accession has not enhanced the competitiveness of the Estonian fish processing industry.

2.4.2 Future developments in EU policies concerning the food processing industry and their impact on the competitiveness of the food processing industry in Estonia

As mentioned earlier, the policies of the EU affecting the Estonian food processing industry are not fixed, but changing over time, partly due to the EU's internal reforms, but also strongly affected by developments in international trade relations within the framework of the WTO. As current negotiations under the auspices of the WTO – the Doha Round, which started in 2001 – are still ongoing and no concrete agreement has been reached, the main elements of the Doha Round concerning the agricultural sector are pretty certain even though technicalities still need to be agreed upon. In general, member countries of the WTO have agreed to cut tariffs, reduce market-distorting domestic support and eliminate export subsidies by the end of 2013 (WTO 2011).

In regards to the food processing industry in Estonia, these developments would create a rather unique situation where a country which initially conducted a very liberal foreign trade policy and joined an economic union as a result of which, it had to take over a much more protectionist trade policy, would once again have to undergo a liberalisation in its external trade regime. Basically, this would mean a move back towards the political environment that prevailed prior to Estonia's accession to the EU.

This raises two questions:

1) Would the liberalisation of EU tariff policies and the elimination of export subsidies applying to the food processing industry worsen the competitive situation of the Estonian food processing industry vis-à-vis its trade partners?
2) What should be done to avoid any loss of competitiveness?

In response to the first question, as a consequence of lower market barriers, the Estonian food processing industry would indeed face a higher competitive pressure from third countries on the EU markets. In regards to the competitiveness on the markets of non-EU countries, the answer is ambiguous. On the one hand, elimination of export subsidies would make it more difficult for the Estonian food processing industry to compete based on prices. The competitiveness of the Estonian food processing industry could deteriorate, especially in the milk industry, which has benefitted most from EU export subsidies and where accession to the EU has indeed boosted the sector's competitiveness on the markets of non-EU countries. On the other hand, elimination of export subsidies would increase the importance of differences in cost efficiency and make many inefficient EU producers unable to compete based on prices on the markets of non-EU countries, giving a competitive advantage to efficient Estonian producers. As a consequence, Estonia's exports would increase. Just as the negative scenario of elimination of export subsidies is most likely in the case of the milk processing industry, also the positive scenario is most probable in the case of milk industry.

Moreover, the liberalisation of trade measures will not be carried out by the EU alone – within the framework of the WTO, its trade partners also have to lower their trade barriers vis-à-vis EU producers. Nevertheless, the Russian Federation – the main non-EU market for the Estonian food processing industry's exports – is not a member of the WTO yet, meaning the obligations put on WTO members might not apply to Russia. Nevertheless, Russia is in negotiations to become a member of the WTO and its accession to the WTO would imply that it would become more difficult for Russia to support its domestic producers and protect its domestic market from imports.

In terms of the competitiveness of the Estonian food processing industry on the domestic market, a decline in market barriers applied to third countries would mean higher competitive pressure from the third countries. Nevertheless, the countries of the EU account for the bulk of Estonia's food imports, suggesting that the impact of lowering import tariffs and other market barriers would be relatively limited, although some increase in the share of imports from non-EU countries is possible.

In addition to trade liberalisation within the framework of the WTO, the EU has decided to phase out the milk quota system by 1 April 2015, until then however, quotas are increased 1% annually (European Commission 2010). Nevertheless, this should not have any direct impact on the competitiveness of the Estonian milk processing sector as milk quotas in fact have been under utilised for some years now. On the other hand, as the Russian market grows, milk quotas could become an obstacle to export opportunities of the Estonian milk processing industry on the Russian market already before 2015, hence the elimination of quotas would be beneficial for the Estonian milk processing industry.

The answer to the second question is to increase the level of value added products. Given the fact that Estonian producers cannot sustainably compete on the world market with bulk commodities in the long term, the answer to sustainable exports as well as domestic sales lays in the development of high value added products, which are less price sensitive and ensure higher profit margins for the industry.

In order to succeed in the EU market, the Estonian food industry has to improve the quality of its products. Hence, investments in product development (R&D) are increasingly important. These, however, have been relatively low, partly due to the large investments in hygiene and structural requirements, which left inadequate resources for product development. In addition to technological innovations (product and process innovations) which are based on R&D, non-technological innovations – organisational and marketing innovations – are important. These involve the use of new business methods, new organisational concepts, changes in product design and packaging, product promotion or pricing. Costs for implementing organisational and marketing innovations may be significantly lower than costs related to technological innovations, and rarely involve fixed investment or long periods between expenditure and return (Schmidt, Rammer 2007: 4).

The small volume of production of the Estonian food processing industry as well as rapidly increasing production costs suggest that the Estonian food processing industry cannot compete in the market for bulk products, athough specialising in core products would help fulfil shipment orders and exploit economies of scale. In order to succeed in EU markets, the food processing firms have to find new ways to gain customers; for example, by specialising in niche products that differ from their competitors' products in terms of some special value to the consumers (e.g. special taste or quality characteristics, or other original quality, organic products).

2.5. The impact of EU accession on the competitiveness of the Estonian food processing industry – the results of interviews among milk processing companies

2.5.1. The motivation for interviews and the choice of companies

In order to understand the reasons behind the changes in the competitiveness of the Estonian food processing industry concurrent to Estonia's accession to the EU, interview-studies were undertaken among the managing directors of the four largest milk processing enterprises and the marketing manager of one ice-cream producer in Estonia.[106]

The milk processing industry was chosen as a case study for several reasons. First of all, it represents a large proportion of Estonian manufacturing output and is characterised by relatively high export orientation. Second, the milk industry has been one of the few food processing sub-sectors that has experienced a positive trade balance during the period under consideration. Third, the milk processing industry is the manufacturing sector where CAP measures introduced after accession are most extensive. All these aspects mean that accession to the EU has had a significant impact on the milk processing industry.

The companies interviewed represent a large spectrum of different milk processing companies in Estonia. First of all, the companies chosen can be divided between those producing high value added consumer products and those producing mainly commodities. Second, the companies interviewed represented both companies solely based on Estonian capital as well as those based

[106] The interviews were undertaken during the period from September 2006 to January 2007. Since then, important changes have occurred in the management as well as ownership of several of the companies interviewed, as a result of which several of the persons interviewed are not related to the respective companies anymore. In October 2007, the managers of AS Põlva Piim bought the company from the Dutch investors, and in less than a year sold it further to AS Tere. In November 2007, AS Rakvere Piim was sold by its British owners to AS Maag, an Estonian capital based dairy company. Since 2007, the new name of AS Tallinna Külmhoone is Premia Tallinna Külmhoone AS.

on foreign capital/ownership. The latter can be divided between those where the parent company has an important role in operational planning, and those where the parent company does not intervene in production and merchandising decisions (see Table 2.23.).

Table 2.23. The characteristics of the companies interviewed

	Based on Estonian capital	Based on foreign capital	
		Parent company/ owner has a significant influence	Parent company/ owner has an insignificant influence
High value added products	AS Tere (Former CEO Kadi Lambot)	Valio Eesti AS (Former CEO Timo Malmi)	AS Rakvere Piim (Former CEO Jaanus Vihandi), AS Tallinna Külmhoone (Katre Kõvask, Member of Management Board)
Commodities	–	–	AS Põlva Piim Tootmine (Former CEO Aivar Häelm)

Source: author's table

The managing directors of the companies were asked for their opinion about the impact of EU accession on the selection of their main export markets, on their perception of the changes on domestic and export markets, their production costs, their company's strengths and weaknesses on different markets, the structure of their exports and innovative activities in their company. In addition, they were asked about their attitude towards the adoption of EU sanitary requirements, the need and potential for government assistance in winning export markets as well as their vision of their future export opportunities. The companies owned by foreign investors were also asked about the role of their parent companies in the choice of and opportunities on export markets. One interview was carried out in English, while the rest were carried out in Estonian. Only one interview was not recorded. The interviews were undertaken during the period from September 2006 to January 2007. The interview form is given in Appendix A.24.

2.5.2. The results of the interviews

The managers' responses differed somewhat depending on whether their company was producing primarily commodities or value added products directed at end-consumers. Only one company specialised in producing and selling commodities, and although to a limited extent, this company also produced

products directed at end-consumers. All the other companies specialised in producing high value added consumer products.

Concerning the impact of Estonia's accession to the EU on the choice of export markets, companies specialised in high value added consumer products in general experienced a positive change. All companies recognised an opening up of the EU market for their exports right after accession to the EU. Not only did it become possible or easier to export to the old members of the EU, but managers also emphasised the opening up of markets in the new member states for their exports. Only one manager (Company D) doubted, whether this change in export possibilities was due to accession to the EU, or rather as a natural development related to firm growth. In contrast, the company specialising in commodities (Company C) did not experience any changes in its export markets as a result of Estonia's accession to the EU.

The changes with respect to the markets of the old member states perceived by the interviewees can be categorised into two:

1) elimination of formal market barriers,
2) decrease in bureaucracy.

Despite the fact that some interviewees pointed out that the EU quotas applied to Estonian exports to the EU prior to 2004 were sufficiently high, the removal of the quotas and the accompanying licence system appreciably lowered bureaucracy and enhanced the competitiveness of Estonian companies. This quota system was especially bureaucratic in the case of high value added consumer products, and less limiting in the case of commodities. However, one interviewee (Company A) also acknowledged that the opening up of the EU-15 markets was only a precondition for exporting to these countries; export requires a long-term commitment and tight partnership.

Access to the markets of the other new member states of the EU, which joined the EU with Estonia in 2004, was also in general perceived to have become easier after accession. Nevertheless, export possibilities in the case of milk products directed to end-consumers are limited by geographical distance. This means that even though the barriers were formally dismantled, it did not necessarily open up new markets. The main trade partners – Latvia and Lithuania – were already open for Estonian milk products before accession within the framework of the Baltic Free Trade Agreement, although this agreement was not always obeyed and some problems existed (Company E). Latvian and Lithuanian markets were considered to have become more open after accession mainly due to global developments and the appearance of pan-Baltic retail chains (Company B, Company D). However, one interviewee (Company C) pointed out that due to their small production volumes in comparison with Lithuanian producers, Estonian companies are not competitive in the long term in supplying orders for the large retail chains.

In terms of factors that hinder exports to EU markets, one interviewee (Company C) mentioned a lack of relevant know-how and small production volumes. He elaborated that small production volumes and the lack of interest

from the owners has led to insufficient R&D, which hinders product development. The problem of small production volumes seems to be more acute in the case of commodities and not so much in the case of high value added products. Nevertheless, another interviewee, representing a company specialised in the production of high value added consumer products (Company D), mentioned that large European companies have an important advantage in comparison with Estonian milk producers in so far as their large production volumes allow them to be more efficient, lower manufacturing costs and enhancing product quality. One interviewee (Company B) mentioned that one of the main factors hindering exports to the EU is the lack of competence – more specifically, the lack of familiarity with the markets. Two other interviewees (Company D and Company E) also emphasised the role of local competitors on export markets and foreign customers' perceptions and preferences as an important obstacle to exports.

Concerning access to non-EU countries, the removal of double tariffs on exports to Russia was seen as an extremely important and positive result of EU accession. Only one interviewee (Company D) did not mention it since the company had never exported to Russia and did not plan to do so in the near future. However, the interviewees also admitted that many problems still exist when exporting to Russia; these are related to invisible trade barriers and political matters. This is especially problematic in the case of perishable consumer products, and it seems that Estonian milk processing companies specialising in high value added consumer products do not see that many opportunities for exporting to the Russia market. One interviewee (Company B) also mentioned that even though the Russian market has considerable potential, this potential has been long noticed by large international food companies that Estonian companies are not able to compete with. Nevertheless, companies C and E were mainly oriented towards the Russian market. EU export subsidies had been used by some companies, but most of them acknowledge that the subsidies were rather bureaucratic and accessing them was very time-consuming. Two companies had transferred this function to their parent company or their partners.

Managers' perceptions of the impact of EU accession on the domestic market differed somewhat. One interviewee (Company A) said that EU membership did not change anything for their business on the domestic market. Another interviewee (Company C) pointed out that the only change was the disappearance of subsidised imports of butter; overall imports did not increase because of the lack of interest due to the small size of the Estonian consumer market. Nevertheless, two interviewees (Company D and Company E) pointed out a considerable increase in the competitive pressure from imports, especially in the case of yoghurt. The interviewee from Company E also mentioned higher competition in the case of cheeses; however, in contrast, the interviewee from Company D found that Estonian cheese producers face less competition from imports (from Lithuania) as other, larger and wealthier markets have opened up for cheese producers from other NMSs. Another interviewee (Company B) was

of the opinion that during the first two years after accession, no significant changes occurred in the Estonian market, but since then, import competition had become stronger. This tendency was considered as a result of global developments and improvements in the general standard of living in Estonia, rather than the effect of EU membership. The main competitors in the case of imports were in most cases seen as the large pan-European companies.

In response to the question about the impact of EU accession on production costs, all interviewees said that production costs have increased due to global developments. Only one interviewee (Company B) mentioned that the opening up of new export markets had enabled their company to take advantage of economies of scale and become more efficient. Investment support from the EU to food processing companies as a positive effect was mentioned by one interviewee (Company E). In addition, the role of EU investment support to dairy farming in Estonia to ensure the quality of milk was emphasised by two interviewees (Company D and Company E).

The interviewees from companies owned (at least partly) by foreign capital (which originates in all cases from the "old" EU countries) were also asked about the role of the parent company or the owner in choosing export markets. In only one case, the parent company had a decisive role through a matrix organisation (Company E). In the other three cases, the foreign owner did not intervene in operative decisions; however, in one company (Company C) the owner took the financial risk of applying and waiting for export subsidies. Hence, it can be concluded that having a foreign investor from an EU country does not necessarily help in gaining export markets in the EU.

High value added products can be sold on export markets either under the producers' own brand name (private brand), under a retail chains' brand name (private label) or as contract work for another company (as an ingredient in industrial production). The interviewees were asked about the share of products sold under their own brand names. Company E only exported products under its own brand, while other companies had also participated in competitions for retail chain private labels. It seems that it is relatively difficult to sell products under your own brand name to the old member states of the EU, while the share of products sold under a private brand is in general relatively higher in exports to the NMSs. One interviewee (Company B) even noted that even though a private label offers a lower price to the producer than a private brand, nevertheless it outbids the private brand financially due to the costs related to selling own brands on a foreign market.

In terms of the impact of EU accession on the companys' innovative activities, only one interviewee (Company B) noted that the motivation and resources for their innovative activities have increased. The other companies did not experience any change in innovative activities after accession or did not answer this question.

The interviewees were also asked about their future vision of the Estonian milk processing industry's export opportunities. Even though producers specialising in high value added milk products directed at end-consumers saw

their main opportunities in the domestic market, exports remain an important issue. One interviewee (Company C) pointed out the importance of Russia for the Estonian milk processing industry, due to its large and growing demand, lack of self-sufficiency, low quality of local milk and increasing incomes. However, the interviewee also admitted that it is quite difficult to enter the Russian market with high value added consumer products. Also, another interviewee (Company E) pointed out their continuous plans to export commodities to Russia; but also emphasised the potential of the NMSs for high value added exports. According to the interviewee, it is easier to export to the NMSs than to the old member countries of the EU. Other companies pointed out the EU countries (Company A), Baltic and Scandinavian countries (Company D), and more precisely, Latvia, Lithuania and Finland (Company B) as their main export markets in the future. Company B did not exclude Russia either, if the political situation should change.

The choice of export markets is, as expected, largely determined by physical distance (especially in the case of high value added products), and new, more distant markets are rather an exception. As one interviewee (Company B) pointed out, milk products are too cheap to transport too far. The transportation costs are too high and the shelf-life of the products too short.

In response to the question of how the Estonian government could promote Estonian milk exports on EU markets, the interviewees were divided with two companies suggesting that the government should intervene minimally, while two other companies expected more promotional work and lobbying from the state.

A summary of the results of the interviews is given in Appendix A.25.

3. CONCLUSIONS

The theoretical framework for assessing the impact of regional economic integration on the competitiveness of an industry

Although the term "competitiveness" is frequently used in the economic literature, there is no single definition of this term, not least due to the fact that the subjects of competitiveness can differ considerably. This dissertation limits itself to the competitiveness of an industry, and only deals with these aspects of economic competitiveness relevant for an industry. Compared to the competitiveness of firms and countries, the concept of the competitiveness of an industry is considerably less developed. Nevertheless, the concept of competitiveness at industry level is tightly linked with the concepts of competitiveness for countries or individual firms.

In general terms, an industry competes with other, either similar or different, industries abroad and in the home country for production resources and customers. This dissertation utilises the two-level concept of the competitiveness of an industry, which defines the competitiveness of an industry as the industry's ability to earn, which itself is based on the ability to penetrate product markets relative to the same industries from other countries, and to attract production factors relative to the other industries within the same country or industries (including the same industry) from other countries. These two abilities themselves depend on certain factors. If the factors of competitiveness change during time, then the ability to sell products and the ability to attract production factors in the next period depend on the industry's ability to react and to adjust to changes in the environment, which determines the industry's competitiveness in a dynamic sense.

The current dissertation focuses on the competitiveness of an industry on product markets, where these product markets are either domestic or export markets. This means that the competitiveness of an industry can be considered a two-level phenomenon, incorporating the industry's ability to sell and, through that, earn profits. This means that indicators used in measuring competitiveness must take these two aspects into account, but it also suggests that there is no single indicator of competitiveness, but rather a system of indicators needs to be developed.

The most common measures of competitiveness, or more precisely, the ability to sell, widely used at an industry level analysis are market share indicators and developments in trade and sales volumes. Despite various shortcomings related to the use of market shares, they remain the most popular measures used in the literature. Measures related to the ability to earn, on the other hand, look at indicators such as profits, value added and price-cost margins. The dissertation suggests a decomposition of export structure into low and high value added parts as complementary indicators of competitiveness on product markets, which directly also affect the industry's ability to earn through

the assumption that higher value added products also ensure higher earnings to the industry.

The number of factors potentially influencing the competitiveness of an industry is almost indefinite, nevertheless, a few authors have tried to systematize these factors. In general, factors affecting an industry's competitiveness can be divided into internal and external determinants of competitiveness. The former constitute factors which are under the control of an industry, either through the individual firms belonging to the industry, or resulting from the inter-action of different firms belonging to the industry. The competitiveness literature is relatively rich in terms of factors determining the success of individual firms, such as the strategies, products, technology, training, own R&D, know-how, costs and links of firms. At the same time, competitiveness determinants internal to an industry which go beyond the firm-specific determinants – such as rivalry, co-ordination of activities between the firms belonging to the industry, the existence of lobby groups etc. – have received much less attention, with only a few authors, for example Porter, touching upon these aspects.

Government policies as well as factors only partly controllable by governments or not controllable at all constitute factors external to an industry. Factors partly controllable (quasi-controllable) include world market prices, exchange rate movements, which affect the industry's relative costs vis-à-vis trade partners, or the country of origin effect, demand conditions and the international trade environment. Especially in the case of a small country, these factors are often beyond the control of the national government. Uncontrollable factors such as the climate and endowment with natural resources are important in determining the competitiveness potential of an industry, whereas their role has often been considered in the economic literature within the framework of comparative advantage. In addition, the distance of a country to its main consumer markets can be an important factor, especially in the case of the food processing industry, which produces products often characterised by high perishability.

Governments can, to a large extent, influence the development of the competitiveness of industries via economic policy. It is not only policies conducted by a home country that affect an industry's competitiveness – policies applied by trade partners also constitute part of the environment the (domestic) industry operates within, and hence, influence its competitiveness. In the case of the food processing industry, government policies such as health and hygiene regulations, competition, trade, investment, industrial policies, R&D policies and agricultural policies, which affects the prices of inputs (raw materials) into the food industry, and the location of production and trade have all been found to be of most importance. In addition, energy policy, taxation, education and research policies are also of high importance, and in recent years, environmental policy has also gained significantly in importance.

In this dissertation, we introduce the "filter" model of the competitiveness of an industry by arguing that factors internal to an industry coupled with

uncontrollable factors and factors controlled by governments that do not distort trade determine the potential of competitiveness, meaning a competitive advantage that makes the products of a national industry vis-à-vis foreign competitors more appealing to customers – either through a price or quality advantage – and that potentially helps the industry to increase its profits – either through a cost or productivity advantage or superior technology. These measures can be called "real" determinants of competitiveness.

Trade-distorting public policy measures, on the other hand, constitute a "filter", which determines whether this competitiveness potential will materialise into actual competitiveness performance or not, or whether they can help industries not possessing competitive potential to achieve competitiveness – although this may pose other problems not least related to disputes with trade partners. In other words, government policies can assist (or impede) in transforming competitive potential (which is based on "real" drivers of competitiveness such as relative cost level, productivity, technological progress) into actual competitiveness performance.

Accession to a regional trade bloc involves the abolition of trade barriers between the countries forming a trade block – either in the form of a free trade agreement, a customs union or a common market – as well as the implementation of common rules and policies, such as common external tariffs vis-à-vis countries not belonging to the trade block. In other words, economic integration leads to changes in trade policies and other policies set by governments, thereby influencing the competitiveness of an industry via two channels: direct changes in the competitive environment, and changes in the incentives of firms belonging to the industry. In terms of the "filter" model of competitiveness, this means that regional economic integration directly affects the "filter" – government policies that influence the relative price of trade, through which competitive potential will be transformed into competitiveness (performance). On the other hand, it also indirectly influences competitiveness through its impact on the "real" determinants of competitiveness potential through changes in firms' incentives as a result of a change in the competitive environment. While the first effect occurs immediately, the latter may take some time as firms adjust to the changing environment, whereas the signs of these effects can differ.

The traditional theory of economic integration looks at the case of a country initially protecting its markets from imports. If this country joins a regional trade bloc, barriers on imports from countries within the trade bloc will be abandoned and a common external trade policy will be applied towards third countries. This means that the removal of import tariffs and non-tariff measures on countries within the trade bloc directly leads to lower costs and prices of traded goods, enhancing the firms' competitiveness. On export markets, on the other hand, improved market access also means increased earning opportunities, and this effect is even more pronounced if regional integration leads to higher exports of products with higher value added. This effect is especially pro-

nounced in the case of a small country with a relatively low income level joining a trade bloc with countries of a higher income level.

The abolition of import barriers and opening up of export markets also affects producers' incentives. A reduction in prices leads to higher domestic and export demand, meaning a larger market for domestic producers, which allows better exploitation of economies of scale, scope and learning, lowering the average cost of production even further. At the same time, the fact that import barriers are abolished also means higher competitive pressure from imports from the rest of the trade bloc, forcing producers further to restructure in order to lower average costs. These effects are likely to occur over a medium term, as it takes time for producers to adjust. Furthermore, in the long term, a third effect can occur – also through changes in producers' incentives – as the enlarged market and higher competitive pressure may lead to increased innovation activity and technological progress, enhancing the competitiveness of producers.

To sum up, regional economic integration influences the competitiveness of an industry in a small country in the following ways:

1. Increased opportunities to gain export markets due to reduced trade costs as a result of the removal of trade barriers and opening up of foreign markets, thus increasing the competitiveness of a country's industries on export markets. This effect is especially pronounced in the case of a small country with a domestic market of limited size. Earning extra profits from sales abroad is especially probable in the case of export markets in countries with higher income levels, and hence, price levels.
2. A reduction in the industry's domestic market share due to the opening up of the domestic market to foreign competitors, which may result in a fall in the competitiveness of the domestic industry on the domestic market. Price competition may be intensified especially from imports from large countries of a similar developmental level, because their industries are presumably larger and can gain market shares in the small country relatively easily. Import competition from countries of a higher developmental level may be intensified mainly because their products possess higher quality or other non-price characteristics.
3. In the short and medium term, better access to export markets allows the industry to grow in production runs and thus, better exploit economies of scale, resulting in a fall in unit costs. This implies that at a given price level, the profits of the industry would increase.
4. Intensified competition (both effective and potential) puts downward pressure on price-cost margins in the domestic market, and hence, potentially lowers the industry's profits. Hence, competitiveness falls. This effect can be relevant especially in the case when a small country forms an economic union with large countries of the same developmental level. Loss of profits in the domestic market can, however, be compensated for by higher profits on export sales.

5. Intensified competition, on the other hand, forces firms within the industry to improve their level of efficiency in order to withstand competition and maintain profits, hence, enhancing competitiveness.
6. Over the long term, an industry's productivity and the quality of the industry's products improve through restructuring and investments in innovation. This implies a potential increase in the competitiveness of the industry.

The sign and the scale of these effects on the competitiveness of an industry depend, on the one hand, on the initial level of trade barriers vis-à-vis the members of the trade bloc as well as initial conditions vis-à-vis third countries relative to the policies conducted within the trade bloc, and on the other hand, on the relative size and income level of the other countries within the trade bloc.

The level of analysis

This dissertation analyses the impact of accession to the EU on the competitiveness of the Estonian food processing industry. The industry level is seen here as a proper level of analysis for several reasons. First, the industry level allows us to generalise about the impact of EU accession on a large set of companies. Second, it allows us to neglect the detailed interactions between domestic companies, and fully concentrate on the impact of accession. Third, much of the available data is given at the level of industry. Since the aim of the analysis is to assess the impact of a policy change, and not the underlying factors of competitiveness for the Estonian food processing industry, the focus is rather on competitiveness in the context of market distortions, and "real" comparative advantage as a concept is neglected.

Given the share in total manufacturing output as well as the importance of exports, three food processing industry sub-sectors were chosen for analysis: the manufacture of dairy products, meat processing and fish processing. These are also among the sectors most influenced by the changes in trade and agricultural policies concurrent to accession to the EU.

The data used is based on trade statistics from the Estonian Statistical Office (Statistics Estonia) and Eurostat. In addition, financial statistics of enterprises based on the online database of Statistics Estonia as well as the price information and retail sales data of the Estonian Institute of Economic Research are utilised.

The analysis covers the period from 1999 to 2009; of which, five years illustrate the period before Estonia joined the EU and six years characterise the situation as a member of the EU. In some cases, other periods are considered, mainly based on the availability of statistical data. The analysis focuses on the short-term and medium-term aspects of the integration, as the period of analysis is too short to draw any plausible conclusions about the long-term impact of EU accession.

Validity of research propositions and overview of findings

Since the beginning of the 1990s, the Estonian food industry has been operating in rather exceptional and controversial economic conditions. The export opportunities of the Estonian food processing industry were often limited because their trading partners protected their markets with import tariffs and quotas. On the domestic market, as a result of Estonia's highly liberal trade policy, Estonian food producers have had to face fierce competition from importers. Neither the economic policy prevailing in Estonia nor the trade policies implemented by its main trade partners fostered the competitiveness of the Estonian food processing industry in either export markets or the home market. A solution to this problem was expected to be accession to the EU and the accompanying change in the competition environment created by the economic policy.

With Estonia's accession to the EU on 1 May 2004, the last remaining formal trade barriers on Estonia's exports to EU countries were abolished. Moreover, the removal of non-tariff barriers in the form of border checks also improved access to the markets of other new member states of the EU. In addition, significant changes occurred in the trade regime with third countries. The most important of these for the Estonian food processing industry were definitely the removal of double tariffs on exports to Russia and the cancellation of the free trade agreement with Ukraine.

Based on the accession-induced changes in policies comprising the competitive environment for the Estonian food processing industry in export and domestic markets, five research propositions were formed.

Proposition 1. The abolition of the last remaining barriers to exports to EU markets, led to a considerable increase in Estonian food processing industry exports to the EU (trade creation effect).

Indeed, during the period 2003–2007, the value of Estonian milk exports to the EU-15 increased on average 15.0% per year (8.8% in terms of quantity), while meat exports grew 66.5% (93.6% in terms of volume) per year. An increase in fish product exports was less significant at a 4.4% (1.4% in terms of quantity) average annual increase. As a result, Estonia's share in total EU-15 imports of milk and meat products (in terms of quantity) increased respectively from 0.18% and 0.00% in 2003 to 0.22% and 0.02% in 2007. As regards fish products, Estonia's market share in total EU-15 imports dropped slightly from 0.11% in 2003 to 0.10% in 2007.

However, when considering EU-15 imports from the NMSs alone, Estonia's market share in the case of milk exports declined from 13.32% in 2003 to a mere 2.29% in 2007, before dropping further to 1.46% in 2009. This suggests that milk exports from other NMSs have increased more during the post-accession period. In the case of meat products, Estonia's share in EU-15 imports from NMSs increased from 0.07% in 2003 to 0.56% in 2009, indicating relatively better performance of the Estonian meat exports compared to other

new member countries. When considering EU-15's fish imports from the NMSs, Estonia's share dropped from 7.59% in 2003 to 3.51% in 2007 and only 2.30% in 2009. This suggests that Estonia has done better than other NMSs only in the case of meat exports – but Estonia's market share in the case of meat products is still very low.

The results of the descriptive analysis of Estonia's exports to the EU-15 were supported by the results of the regression analysis based on difference-in-difference approach which indicated that EU accession had a general positive effect on exports of milk and meat products from the 8 NMSs to the EU-15. Hence, the increase in milk and meat exports was characteristic to the accession. Moreover, EU accession seems to have had a relatively stronger effect on exports of meat products. However, no effect of accession could be detected in the case of the fish industry, which partly can be a result of the low statistical significance of the model.

Including anticipatory effects to the model showed that part of the accession effects occurred already before the accession, in particular what concerns the volume of meat and fish exports.

The relatively poor performance of the Estonian milk and fish industry compared to other NMSs in penetrating the EU-15 markets can be partly explained by the relatively fast appreciation of the real exchange rate as well as relatively high export prices. In addition, regression analysis revealed a trade diversion effect away from the EU-15 in the case of milk products for countries neighbouring Russia, hence Estonia's milk exports to the EU-15 have grown less because of the attractiveness of the Russian market as an export destination.

Accession to the EU also expanded export opportunities of the Estonian food processing industry to the other NMSs, nevertheless, only the milk industry has been able to benefit from that.

Hence, Proposition 1 can be partly accepted, for the milk and meat processing industries.

Proposition 2. The significant investments in EU hygiene and product standards undertaken by Estonian food processing companies and the abolition of the last remaining barriers on exports to the EU have resulted in changes to the export structure – exports of foodstuffs indicate an increase in the share of processed consumption-ready foodstuffs.

Trade data analysis allows us to conclude that EU membership has not fully facilitated access to the EU-15 markets for high value added products and enabled the Estonian industry to reap the benefits of the wealthy consumer market, or the growth in exports of high value added products has been slower than the growth in exports of products of a lower value added level. However, the milk processing industry has been rather successful in finding markets for their high value added consumer products in the old member states of the EU, where the share of processed milk products for household consumption grew from 29.1% in 2003 to 49.8% in 2009. Better access to the EU-15 markets for

high value added products was also recognised by the representatives of the milk industry. This increase was at the expense of processed milk products for industrial use, which fell from 67.5% to 44.7% during the same period. In addition, primary milk products slightly gained in importance, from 3.4% to 5.5%. Estonia was also the only NMS that experienced an increase in the share of processed products for household consumption in exports to the EU-15. This allows us to conclude that even though the milk processing industries in other NMSs have been more successful in gaining EU-15 markets in terms of the volume of exports, Estonia stands out as the NMS which has been able to change the structure of dairy exports towards a higher share of high value added products.

At the same time, a shift towards unprocessed products in Estonia's meat exports occurred. In 2003, the share of unprocessed meat products in total meat exports was 64.9%, which had increased to 83.5% in 2009. Although Estonia has seen the third-highest growth in the post-accession volume of meat exports, this has not been accompanied by a shift in export structure towards products with higher added value, which signals that other NMSs have been able to take better advantage of the opening up of the EU market.

A slight shift towards products of higher processing level occurred in the case of fish products, nevertheless, this was accompanied by only a relatively low increase in the absolute volume of exports. Furthermore, it is questionable whether a higher share of processed products in fish exports actually is a positive sign, as paradoxically, the profit margin of the bulk of products exported under the category "processed products" is relatively low compared to the products categorised under "unprocessed fish products". The NMSs which have seen the highest growth rates in fish exports in terms of volume (Latvia, Lithuania) have also experienced a shift towards unprocessed products.

The fact that not all considered industry subsectors have experience an increase it the share of high value added products in exports allows us to conclude that even though formal trade barriers between Estonia and the EU have been dismantled, national preferences and prejudices remain. Furthermore, Estonia's high value added exports to the EU are hindered by high advertising expenses and brand loyalty. In addition, Estonia's relatively remote location renders it difficult to export perishable consumer products to the core markets of the EU. Hence, in the EU-15, the only possible export markets for many high value added products remain the nearest markets such as Finland.

The results of the regression analysis based on difference-in-difference approach did not indicate any general effect of EU accession on the structure of NMSs' exports to the EU-15. Nevertheless, including anticipatory effects to the model showed that part of the accession effects in the structure of milk exports occurred already before the accession.

Hence, Proposition 2 can be accepted only in the case of the milk processing industry.

Proposition 3. Estonia's accession to the EU and the accompanying adoption of the Common Commercial Policy of the EU led to an increase in Estonia's food processing industry exports to third countries.

The trade analysis showed that Estonia's exports of milk and meat products to the third countries gained momentum in the post-accession period, which can be largely associated with the dismantling of double tariffs on Estonia's food exports to Russia. Fish exports, on the other hand, lost in pace in terms of value being hit by the abolition of the Free Trade Agreement with Ukraine. Regarding the structure of exports in terms of their level of value added, similar patterns can be seen as in the case of exports to the EU-15. Milk exports have become more oriented towards high value added products while the opposite was experienced in the case of meat exports. The share of unprocessed fish products in exports has increased, which nevertheless, contrary to theoretical predictions, can be considered as a positive sign given the low profit margin – and in fact, despite higher processing levels and lower levels of value added – of the bulk of products belonging to that product category. In fact, similar trend, although to a lesser degree, can also be seen in the case of meat exports. Hence, Proposition 3 can be accepted only in the case of the milk processing industry while in the case of the meat processing industry, Proposition 3 can be accepted only partially. The proposition was rejected for the fish industry.

Proposition 4. Due to the introduction of the EU import regime on agricultural products and foodstuffs, and the abolition of export subsidies on products from EU countries exported to Estonia, Estonian products became relatively more price competitive in the domestic market.

In general, changes in import prices after Estonia's accession to the EU were smaller than expected. Nevertheless, even small price effects can induce changes in the relative competitive position in the domestic market. An analysis of the relationship between import prices and prices of domestic goods in Estonian supermarkets revealed that in general domestic milk products have been relatively competitive before as well as after accession, while only in the case of butter have Estonian producers clearly gained in price competitiveness after 2004. This is directly related to the removal of EU subsidies on butter exports to Estonia after May 2004. This has been accompanied by a fall in the import penetration ratio in the case of butter and natural cheese (even though their share in the sales value of supermarkets has increased as a result in increased prices), while the market share of imports has increased in the case of drinking milk and processed cheeses.

In the case of meat products, the import penetration ratio overall dropped immediately after accession, but picked up again in later years, whereas the increase in ratio of imports to total domestic use of a product has been most remarkable in the case of beef.

Unfortunately, no comparable data was available for fish products. However, a 110% increase in imports of fish and fish products (in terms of value) through 2003–2007 compared with a 14.1% decline in the value of sales for the Estonian fish processing industry and a 5.2% drop in exports during the same period indicates that the fish processing industry has lost competitiveness vis-à-vis imports in the domestic market. The results of the analysis hence allowed to accept Proposition 4 only partially in the case of some milk products.

Proposition 5. The changes in economic policies concurrent to Estonia's accession to the EU enhanced the ability to earn of the Estonian food processing industry.

The analysis based on both value added and price-cost margins revealed that the immediate effect of Estonia's accession to the EU on price-cost margins was negative in all industry sub-sectors considered, indicating an immediate deterioration in the competitiveness of the industry. This was a result of the increases in costs related to both the investments in EU hygiene and product safety standards as well as the increase in intermediate inputs, while price increases were limited by consumer purchasing power on the domestic market.

Later developments have been different for the individual food processing sectors; largely confirming the results found in the analyses of the competitiveness of export and domestic markets. The milk processing industry looks to be the one clearly benefitting from accession to the EU, both in terms of value added as well as price-cost margins. The meat processing industry, on the other hand, has not been able to reach the levels of profitability seen in 2003, although both the indicators for value added and price-cost margins have been higher for 2004–2007 than seen in the period 2000–2001. In terms of value added, the fish processing industry has clearly lost competitiveness in the post-accession period, nevertheless the developments in the price-cost margin have been more volatile. In light of changing consumer trends related to health and convenience towards the higher consumption of fish products in the EU, this is however a rather disappointing result. Hence, Proposition 5 can be accepted only in the case of the milk processing industry.

Nevertheless, apparent labour productivity in Estonian milk, meat and fish processing industries has increased, suggesting increased competitiveness potential. Thereby milk processing has not only experienced the fastest improvements in productivity, but has also reached the highest absolute level of labour productivity. This is in accordance with our findings with respect to export competitiveness and profitability indicators, and suggests that the competitiveness of the Estonian milk processing industry has indeed increased since accession to the EU.

The ongoing liberalisation of the EU trade policies within the framework of the WTO trade negotiations creates a rather unique situation for Estonia where a country which initially conducted a very liberal foreign trade policy and joined an economic union as a result of which, it had to take over a much more

protectionist trade policy, would once again have to undergo a liberalisation in its external trade regime. This poses many new challenges but also opportunities for the Estonian food processing industry both on export markets as well as on the domestic market.

In order to ensure success on export markets as well as the domestic market, the Estonian food processing industry has to focus on high value added products, which are less price sensitive and ensure higher profit margins for the industry. Hence, investments in product development are increasingly important. In addition to technological innovations, organisational and marketing innovations are important, whereas these may be significantly less costly than tehnological innovations and rarely involve fixed investment or long periods between expenditure and return. In order to succeed in EU markets, the food processing firms have to find new ways to gain customers; for example, by specialising in niche products that differ from their competitors' products in terms of some special value to the consumers (e.g. special taste or quality characteristics, organic products).

Recommendations for future research

This dissertation focused on the international competitiveness of the Estonian food processing industry on product markets within the framework of Estonia's accession to the EU. Nevertheless, it is likely that the accession also has affected the industry's ability to attract production resources, for example via changes in human capital quality and mobility, or sectoral investment decisions. Even though the inclusion of the factor market aspect would not change the final result of the analysis of the ability of the food processing industry in Estonia to earn, it would give valuable insights into the causes behind the developments in the indicators of the industry's ability to earn.

The empirical part of this dissertation was only concerned with the direct short-term effects of the EU accession on the competitiveness of the Estonian food processing industry. Nevertheless, the indirect medium-term and long-term effects arising from changes in domestic producers' incentives as a result of a change in the economic environment, can have an even stronger effect on the competitiveness potential of an industry – and consequently, performance – and deserve therefore thorough analysis.

While this analysis could be conducted at industry level, it nevertheless also suggests that output, trade and financial data at firm level could be very useful in order to assess the impact of EU accession via the incentives and behaviour of individual producers. Furthermore, analysis at firm level would allow one to distinguish between different groups of producers (e.g. small versus large producers, producers oriented towards export markets or the domestic market) and test whether differences in producer characteristics have resulted in different reactions to the change in the competitive environment.

The long-run effect of regional integration results from the positive impact of enhanced competition and market size on innovation and technological

progress. As one of the main possibilities for the Estonian food processing industry to maintain and enhance its competitiveness lays in innovations, the impact of EU accession on innovations in the Estonian food processing industry needs a comprehensive analysis.

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APPENDICES

Appendix A.1. Selected measures of the competitiveness of an industry

- Relative Trade Advantage (RTA), Relative Export Advantage (RXA), Relative Import Advantage (RMA), Revealed Competitiveness (RC) (Vollrath 1991):

$$RTA_{ij} = RXA_{ij} - RMA_{ij}$$

$$RXA_{ij} = \frac{\left(x_{ij} \Big/ \sum_{t,t\neq j} x_{it} \right)}{\left(\sum_{k,k\neq i} x_{kj} \Big/ \sum_{k,k\neq i} \sum_{t,t\neq j} x_{kt} \right)}.$$

$$RMA_{ij} = \frac{\left(M_{ij} \Big/ \sum_{t,t\neq j} M_{it} \right)}{\left(\sum_{k,k\neq i} M_{kj} \Big/ \sum_{k,k\neq i} \sum_{t,t\neq j} M_{kt} \right)}$$

$$RC_{ij} = \ln RXA_{ij} - \ln RMA_{ij}$$

where:
x – exports,
M – imports,
i – country,
j – industry (product),
k – set of countries,
t – set of industries (products).

- Porter-Adapted Export Market Share indicator (PXMS), Porter-Adapted Index of Revealed Comparative Advantage (PRCA), Dunning-Adapted Net Competitive Advantage Index (DNCA) (Traill, Gomes da Silva 1996):

$$PXMS_i = \left(\frac{X_i + IPO_i}{X_{iw} + IPO_{iw}} \right),$$

where IPO_i is the value of output produced by the country's outbound FDI in industry i, and IPO_{iw} is the value of output produced by the total world FDI in industry i.

$$PRCA_i = 100\left(\frac{X_i + IPO_i}{X_{iw} + IPO_{iw}}\right)\Bigg/\left(\frac{X + IPO}{X_w + IPO_w}\right),$$

where X is the value of country's total exports and X_w is the value of world total exports. IPO presents the value of output produced by the country's total stock of outbound FDI in all industries, and IPO_w is the value of output produced by the total world stock of FDI in all industries.

$$DNCA_i = 100\frac{\left(X_i + IPO_i\right) - \left(M_i + IPI_i\right)}{Y_i + IPO_i - IPI_i},$$

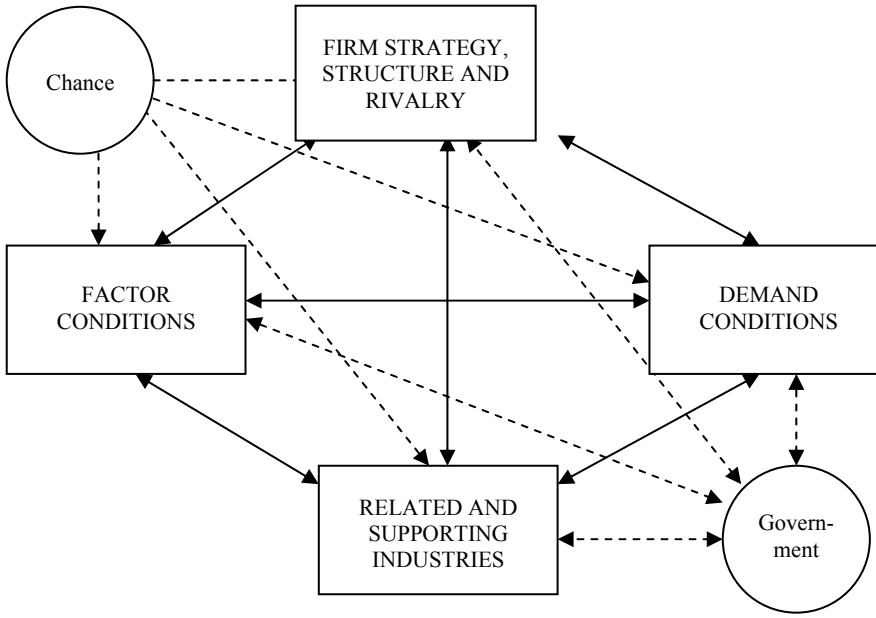
where IPI_i is the value of output produced by country's inbound FDI in industry i, and Y_i is the value of output in industry i.

Appendix A.2. The determinants of the competitiveness of the food processing industry by Abbott and Bredahl (1994)

- Factor endowments and natural resources, which are known as the key to comparative advantage from standard trade theories, and which are especially relevant in the case of agricultural products.
- Technology, which can enhance a competitive advantage either through cost reduction or through quality enhancement, and which may require investments into research and development (R&D).
- Investments in order to attain technical change.
- Human capital, as the importance of skilled labour and special characteristics and services attached to a product is constantly increasing.
- Managerial expertise, as the quality of management can be critical in determining firm's success.
- Product characteristics, which are especially of high importance in case of high value-added products mainly directed to end-consumers.
- Firm strategy, such as cost leadership or differentiation, and industry structure, which reflects the competition in an industry.
- Relationship between the producers and their input suppliers.
- Marketing and distribution channels, which also encompass transport networks and economic ties with other countries.
- Infrastructure and externalities, including public goods such as public works, education and utility regulation.
- Regulatory environment, which determines the rules and constraints firms face (e.g., environmental, health and sanitary requirements), and can, thus, influence their competitiveness.
- Trade policy, which is a special case of government regulations set on products crossing national borders.

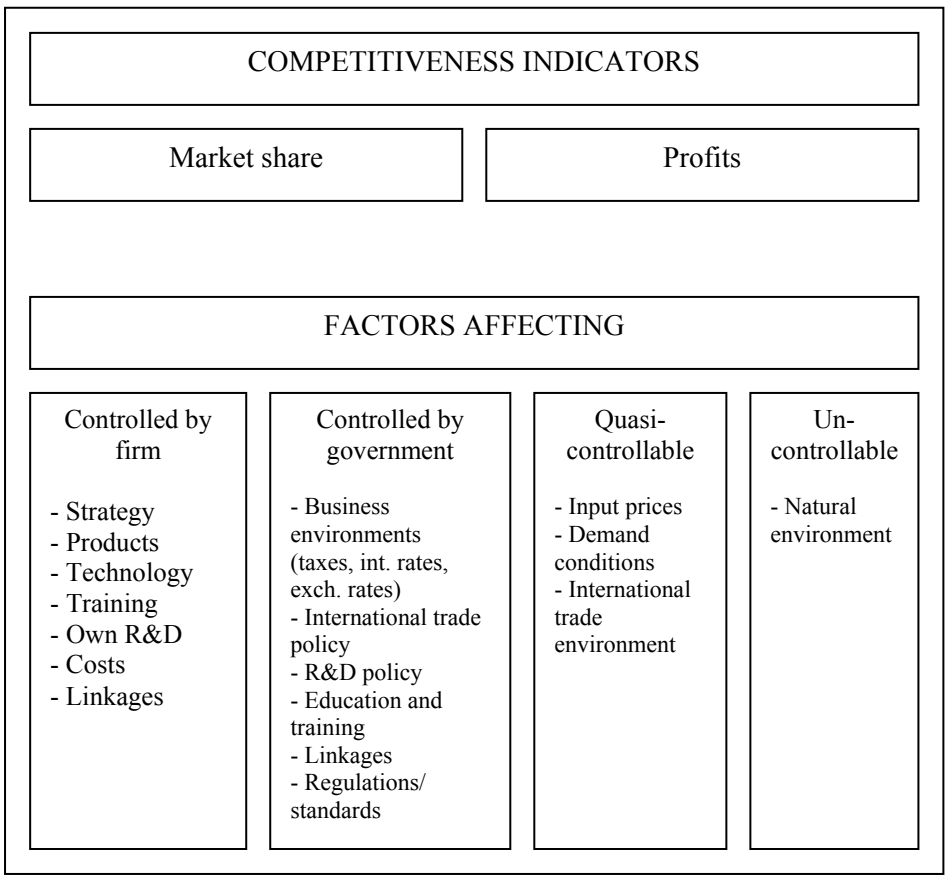
Source: Abbott, Bredahl 1994: 24–26

Appendix A.3. The national diamond model by Porter (1990): the sources of international competitiveness



Source: Porter 1990: 127

Appendix A.4. Competitiveness indicators and determinants by Martin *et al.* (1991)



Source: Martin *et al.* 1991: 1457

Appendix A.5. Importance of selected determinants of competitiveness in the framework of the "four economies of agriculture" by Abbott and Bredahl (1994)

	Production, assembly, transformation (processing) and final distribution of:			
Determinants of competitiveness	Undifferentiated primary commodities	Differentiated primary products	Semi-processed products	Consumption-ready products
Natural resource advantage, factor endowments	Generally critical, but the mobility of technology is likely reducing its importance		Little importance, but varies with mobility of primary outputs	Little importance, but varies with mobility of primary and semi-processed products
Cost-reducing technology	Mandatory, but technology is increasingly mobile	Some importance, but product differentiation requires certain characteristics be reflected in production practices, technology generally mobile		
Human capital and managerial expertise	Some importance; skills in application of production technology important, many people involved		Great importance; skills are critical, especially in organization and coordination of activities, with fewer people involved	
Quality enhancing technology	Some importance: quality, transportation, etc.	Some importance: quality/product form	Great importance; end-user characteristics most important	
Product characteristics and non-price factors	Some importance: grades and standards provide information	Moderate importance: product differentiation possible through quality differences	Great importance: degree of product differentiation and other activities determine the amount of value added	
Firm strategy	Minimum cost is only feasible strategy	Some importance: cost and differentiation are possible strategies	Great importance: cost leadership and product differentiation, or a combination may be pursued	
Industry structure, input supply, marketing and distribution	Some importance: markets provide vertical coordination	Importance varies depending on economies of scale in economic activities other than production. Markets or hierarchies link primary product production. Often accomplished by single firms. Importance of end-use characteristics at farm level varies, and influences the vertical coordination of		

	Production, assembly, transformation (processing) and final distribution of:			
Determinants of competitiveness	Undifferentiated primary commodities	Differentiated primary products	Semi-processed products	Consumption-ready products
		markets		
Infrastructure	Important to cost competitiveness		Important to cost competitiveness and product differentiation; and to innovation	
Regulatory environments and trade policies	May determine trade patterns	Importance varies; policies greatly influence competitiveness and trade patterns. But, often the policy impacts are indirect. Technical barriers matter most		

Source: Abbott, Bredahl 1994: 28–29

Appendix A.6. The share of sub-sectors in the production of the Estonian food industry, 1995–2007 (%)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Production, processing, preserving of meat and meat products	16.6	14.3	13.3	14.3	15.3	15.6	16.3	16.8	17.5	17.5	18.2	18.6	19.1
Processing and preserving of fish and fish products	13.8	17.3	18.9	18.0	14.9	15.6	17.4	15.0	12.3	10.4	9.5	10.0	7.4
Manufacture of dairy products	24.9	26.5	27.4	27.8	23.8	26.3	26.1	24.6	24.7	29.2	27.7	25.7	26.5
Manufacture of grain mill products, starches and starch products	1.0	1.1	0.7	0.8	1.0	0.5	1.1	1.2	1.3	1.3	1.4	1.4	1.5
Manufacture of prepared animal feeds	3.8	2.9	3.3	3.7	3.5	2.7	2.7	3.0	2.6	2.6	2.7	2.1	2.2
Manufacture of bread; manufacture of fresh pastry goods and cakes	10.0	11.0	8.9	9.4	11.9	10.2	10.3	10.8	11.0	10.4	10.1	10.7	10.3
Manufacture of beverages	20.4	18.4	16.7	15.9	20.3	19.4	16.3	17.4	18.2	16.9	18.2	19.3	19.1
Manufacture of other food products	9.3	8.5	10.7	10.2	9.4	9.7	9.8	11.4	12.3	11.7	12.2	12.1	14.0

Source: Statistics Estonia; author's calculations

Appendix A.7. The share of exports in total sales across the sub-sectors of the Estonian food industry, 1995–2007 (%)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Manufacture of food products and beverages	28.4	31.8	35.8	33.4	25.6	28.6	29.0	26.8	27.3	27.1	26.7	27.5	26.6
Production, processing, preserving of meat and meat products	9.8	5.1	7.9	13.5	9.5	12.8	13.3	14.1	14.5	12.3	13.0	13.2	11.4
Processing and preserving of fish and fish products	83.7	82.0	84.1	78.8	69.4	79.6	81.0	72.8	73.1	67.8	69.6	75.4	72.8
Manufacture of dairy products	41.5	40.9	41.7	38.5	29.3	29.1	24.0	25.1	29.9	36.7	32.9	32.0	33.0
Manufacture of grain mill products, starches and starch products	1.3	0.0	0.6	1.9	4.5	7.8	6.0	5.9	4.2	9.2	22.4	28.1	28.4
Manufacture of prepared animal feeds	1.4	2.5	4.4	3.5	2.8	4.0	7.4	5.2	0.8	1.0	1.7	1.5	1.4
Manufacture of bread; manufacture of fresh pastry goods and cakes	0.3	0.3	0.2	2.6	4.9	2.6	1.1	1.2	2.4	1.9	2.1	3.5	4.9
Manufacture of beverages	11.5	16.8	17.2	20.0	15.8	13.5	18.0	18.3	20.4	17.8	19.3	21.3	21.5

Source: Statistics Estonia

Appendix A.8. Comparison of applied MFN tariffs in the EU and Estonia

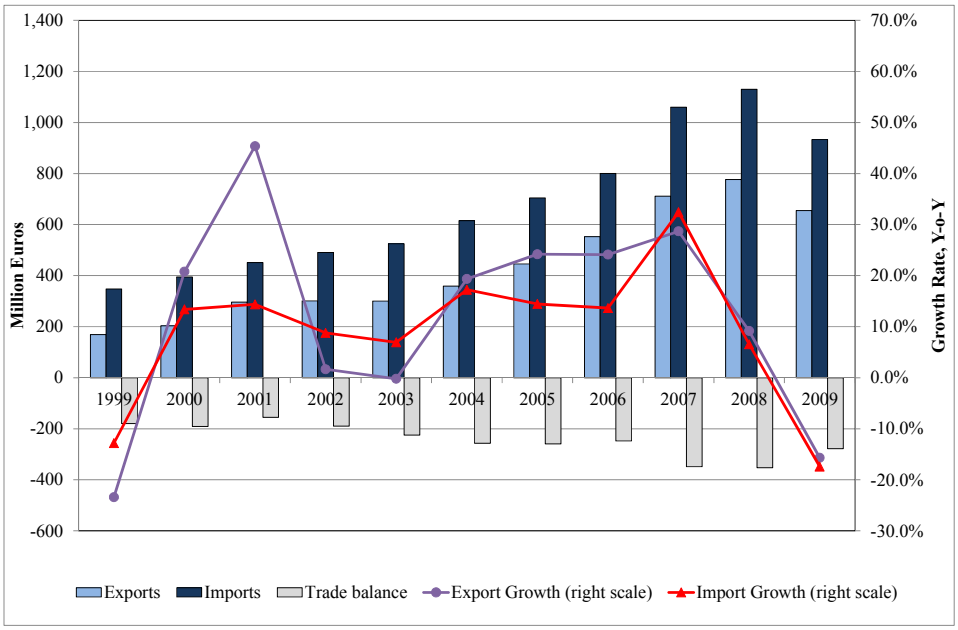
Code	Description	Estonia 2003		EU 2004		EU 2008	
		Average tariff (%)	Range (%)*	Average tariff (%)	Range (%)*	Average tariff (%)	Range (%)*
	Total/Average**	11.6	0-59	14.6	0-209.9	15.5	0-280.9
1	Live animals	15.8	0-39	20.6	0-107.8	9.8	0-59.1
2	Meat and edible meat offal	31.8	0-59	28.9	0-192.2	29.7	0-204.2
3	Fish and crustaceans, molluscs and other aquatic invertebrates	0	0	12.2	0-23	9.8	0-23
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	33.8	0-49	38.4	0-209.9	33.2	0-189.7
5	Products of animal origin, not elsewhere specified or included	1	0-20	0.2	0-5.1	0.3	0-5.1
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	0	0	6	0-10.9	6	0-10.9
7	Edible vegetables and certain roots and tubers	22.8	0-40	13.2	0-150.1	13.5	0-168.4
8	Edible fruit and nuts; peel of citrus fruit or melons	8.6	0-30	10.4	0-118.1	10	0-30.5
9	Coffee, tea, maté and spices	0	0	3.1	0-12.5	3	0-12.5
10	Cereals	6.6	0-59	39.6	0-101.1	49.4	0-138.2
11	Products of the milling industry; malt; starches; insulin; wheat gluten	45.9	20-50	22.2	1.2-84.5	21.7	3.8-68.4
12	Oil seeds and oleaginous fruits; misc grains, seeds and fruit; industrial or medicinal plants; straw and fodder	0	0	2	0-52.3	1.6	0-9.1
13	Lac; gums, resins and other vegetable saps and extracts	11.7	0-15	2.2	0-19.2	3.1	0-19.2
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	0	0	0	0-0	0	0
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	2.7	0-48	8.9	0-75.8	9.6	0-161.9
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	28.4	0-39	18.5	0-97.2	18.6	0-74.7
17	Sugars and sugar confectionery	0	0	23.6	2.1-114.4	35.7	0.1-604.3
18	Cocoa and cocoa preparations	0	0	17.9	0-68.9	11.9	0-95.6
19	Preparations of cereals, flour, starch or milk; pastry cooks' products	19.3	0-30	20.3	7.6-49.6	18	7.6-57.8
20	Preparations of vegetables, fruit, nuts or other parts of plants	20	30-May	20.9	0-146.9	23.7	0-280.9
21	Miscellaneous edible preparations	13.9	0-30	9.6	0-21.1	9.6	0-29.5
22	Beverages, spirits and vinegar	1.3	0-30	5.7	0-58.6	10.2	0-218.3
23	Residues and waste from the food industries; prepared animal fodder	14.7	0-35	7	0-76	15.4	0-145.5
24	Tobacco and manufactured tobacco substitutes	0	0	18.3	2.2-74.9	28.6	10-74.9

Sources: WTO 2004: 151, 164; WTO 2009a: 169

Notes: *The minimum and maximum tariff applied

** Simple average tariffs over all agricultural products and foodstuffs (HS 01–24)

Appendix A.9. The development of Estonia's trade with agricultural products and foodstuffs (HS 01–24), 1999–2009



Source: Statistics Estonia; author's calculations

Appendix A.10. The share of different country groups in Estonian exports of agricultural products and foodstuffs, 1999–2009 (in terms of volume, %)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Milk and milk products											
EU-15	23.5	60.3	49.1	65.7	74.4	73.3	53.6	26.6	37.3	25.7	37.1
NMSs	30.0	20.5	19.8	17.4	23.1	18.2	33.0	62.8	49.0	62.2	40.9
Non-EU	46.5	19.3	31.1	17.0	2.5	8.5	13.4	10.7	13.7	12.0	22.0
Meat and meat products											
EU-15	2.9	2.5	0.9	0.7	0.8	4.7	16.4	19.0	13.7	16.4	16.2
NMSs	89.8	94.8	91.7	92.9	93.7	92.6	78.6	72.3	77.8	74.4	73.6
Non-EU	7.2	2.7	7.4	6.3	5.5	2.7	5.0	8.7	8.6	9.3	10.2
Fish and fish products											
EU-15	6.9	9.5	4.5	6.3	6.9	7.8	9.9	6.6	7.2	5.4	4.9
NMSs	5.2	7.5	4.3	7.1	9.4	9.5	7.3	7.6	8.5	9.3	7.2
Non-EU	87.9	83.0	91.3	86.6	83.6	82.7	82.9	85.8	84.3	85.4	87.9

Source: Dataset DS-016893; author's calculations

Note: * NMSs refers to the countries that joined the EU in 2004 (Cyprus, the Czech Republic, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic and Slovenia)

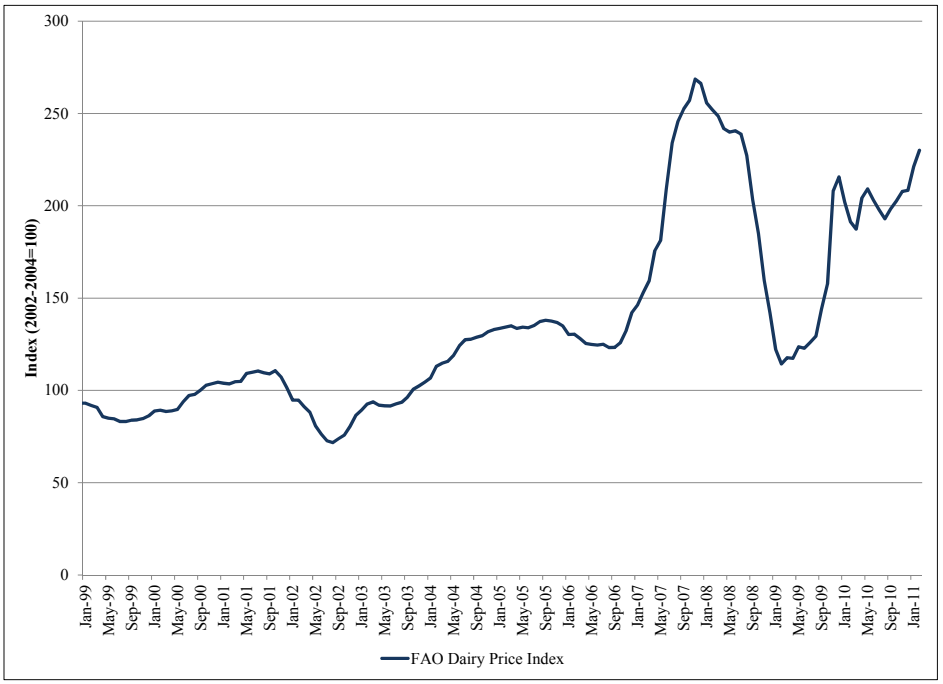
Appendix A.11. The share of different country groups in Estonian imports of agricultural products and foodstuffs, 1999–2009 (in terms of volume, %)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Milk and milk products											
EU-15	46.9	36.5	36.5	20.8	6.1	12.9	30.0	39.3	36.2	40.8	40.0
NMSs	27.6	41.6	47.8	59.2	74.0	83.9	67.8	58.4	60.2	57.0	57.7
Non-EU	25.5	21.9	15.8	20.0	19.9	3.3	2.2	2.3	3.6	2.2	2.3
Meat and meat products											
EU-15	48.3	59.1	63.2	73.5	65.6	76.7	73.7	74.5	67.7	74.5	72.1
NMSs	8.2	19.8	18.7	14.6	14.1	14.8	20.3	24.6	31.6	25.1	27.5
Non-EU	43.5	21.1	18.1	11.9	20.3	8.5	6.0	1.0	0.7	0.4	0.3
Fish and fish products											
EU-15	51.2	58.3	64.2	52.2	41.0	37.3	54.5	48.0	34.2	34.7	44.1
NMSs	3.5	1.3	2.6	5.8	8.6	12.1	21.3	22.3	37.8	44.7	32.8
Non-EU	45.2	40.5	33.3	42.0	50.4	50.7	24.2	29.7	28.0	20.6	23.1

Source: Dataset DS-016893; author's calculations

Note: * NMSs refers to the countries that joined the EU in 2004 (Cyprus, the Czech Republic, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic and Slovenia)

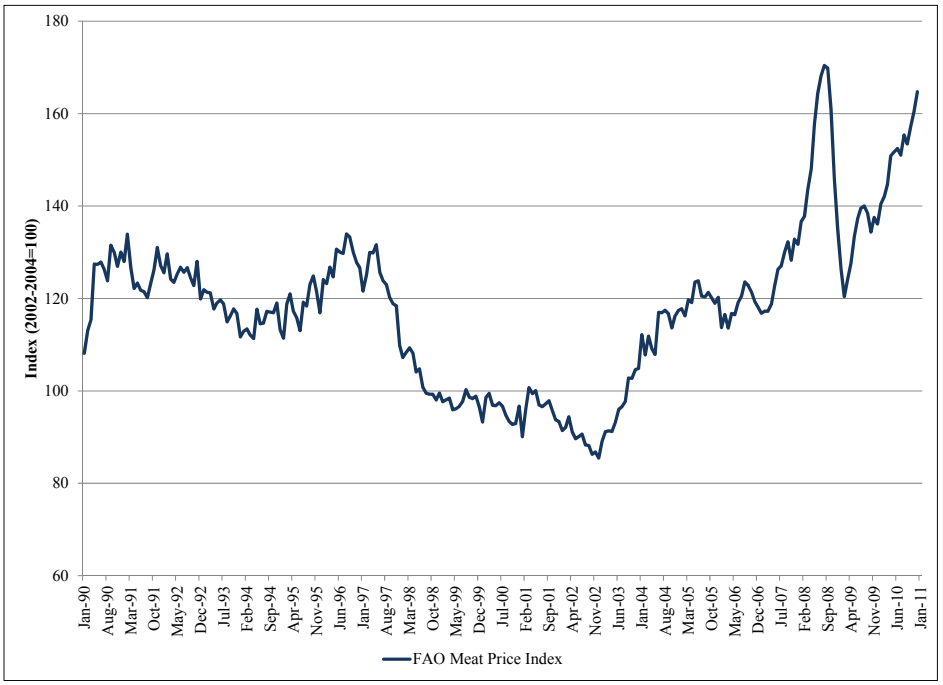
Appendix A.12. Developments in the FAO Dairy Price Index



Source: FAO 2011; author's figure

Note: The FAO Dairy Price Index consists of butter, SMP, WMP, cheese, casein price quotations; the average is weighted by world average export trade shares for 2002–2004.

Appendix A.13. Developments in the FAO Meat Price Index



Source: FAO 2011; author's figure

Note: The FAO Meat Price Index is computed from average prices of four types of meat (poultry, pig, bovine and ovine meat), weighted by world average export trade shares for 2002–2004.

Appendix A.14. Estonia's share in total imports of the EU-15 (% in terms of the volume of imports)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average 1999–2003	Average 2004–2009
Milk and milk products	0.08	0.13	0.11	0.19	0.18	0.21	0.22	0.18	0.22	0.18	0.15	0.14	0.19
Meat and meat products	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.03	0.02	0.04	0.03	0.00	0.03
Fish and fish products	0.11	0.13	0.09	0.12	0.11	0.10	0.15	0.10	0.10	0.08	0.07	0.11	0.10

Source: Dataset DS-016894; author's calculations

Appendix A.15. Estonian exports of milk, meat and fish products to the EU-15, 1999–2009

		Exports to the EU-15, volume in 100 kg											Change (%)		
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2004 /2003	2005 /2003	2009 /2003
Milk and milk products															
Volume (100 kg)	Primary products	83	4,044	4,377	7,648	8,686	19,435	50,663	52,367	50,955	15,321	14,010	123.8%	483.3%	61.3%
	Processed intermediate products	98,991	151,695	107,821	189,057	173,396	223,619	174,445	121,274	206,401	147,744	113,923	29.0%	0.6%	-34.3%
	Processed products for household consumption	108	19,352	38,488	50,462	74,788	62,014	100,167	113,799	102,010	135,866	126,841	-17.1%	33.9%	69.6%
	Total	99,182	175,091	150,686	247,167	256,870	305,068	325,275	287,440	359,366	298,931	254,774	18.8%	26.6%	-0.8%
Shares	Primary products	0.1%	2.3%	2.9%	3.1%	3.4%	6.4%	15.6%	18.2%	14.2%	5.1%	5.5%			
	Processed intermediate products	99.8%	86.6%	71.6%	76.5%	67.5%	73.3%	53.6%	42.2%	57.4%	49.4%	44.7%			
	Processed products for household consumption	0.1%	11.1%	25.5%	20.4%	29.1%	20.3%	30.8%	39.6%	28.4%	45.5%	49.8%			
Meat and meat products															
Volume (100 kg)	Unprocessed meat	2,188	2,171	722	421	1,195	8,803	30,599	34,875	22,002	39,757	33,299	636.7%	2460.6%	2686.5%
	Processed meat products	272	252	499	927	647	289	634	1,823	3,859	2,618	6,565	-55.3%	-2.0%	914.6%
	Total	2,460	2,423	1,221	1,348	1,842	9,092	31,233	36,698	25,861	42,375	39,864	393.6%	1595.5%	2064.1%
Shares	Unprocessed meat	88.9%	89.6%	59.1%	31.2%	64.9%	96.8%	98.0%	95.0%	85.1%	93.8%	83.5%			
	Processed meat products	11.1%	10.4%	40.9%	68.8%	35.1%	3.2%	2.0%	5.0%	14.9%	6.2%	16.5%			
Fish and fish products															
Volume (100 kg)	Unprocessed fish	58,859	70,499	51,138	54,394	55,997	52,544	103,166	53,521	58,167	45,435	38,860	-6.2%	84.2%	-30.6%
	Processed fish products	10,564	11,731	15,201	25,426	22,023	23,026	22,527	25,160	24,304	20,826	20,253	4.6%	2.3%	-8.0%
	Total	69,423	82,230	66,339	79,820	78,020	75,570	125,693	78,681	82,471	66,261	59,113	-3.1%	61.1%	-24.2%
Shares	Unprocessed fish	84.8%	85.7%	77.1%	68.1%	71.8%	69.5%	82.1%	68.0%	70.5%	68.6%	65.7%			
	Processed fish products	15.2%	14.3%	22.9%	31.9%	28.2%	30.5%	17.9%	32.0%	29.5%	31.4%	34.3%			

Source: Dataset DS-016893; author's calculations

Appendix A.16. Estonia's share in EU-15 imports from NMSs (% in terms of the volume of imports)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average 1999–2003	Average 2004–2009
Milk and milk products	7.09	11.53	8.72	13.77	13.32	5.69	2.75	1.87	2.29	1.70	1.46	10.89	2.63
Meat and meat products	0.12	0.12	0.06	0.06	0.07	0.24	0.68	0.62	0.38	0.62	0.56	0.08	0.52
Fish and fish products	7.70	9.31	7.39	8.88	7.59	5.26	7.15	4.00	3.51	2.74	2.30	8.17	4.16

Source: Dataset DS-016894; author's calculations

Note: * NMSs refers to the countries that joined the EU in 2004;
Estonia's share is calculated based on the total volume of exports from NMSs to the EU-15.

Appendix A.17. Definition of the variables and descriptive statistics

Variable		No. of Obs.	Average	Std. Dev.	Min	Max
Real exports (milk)	The value of milk exports from a NMS to EU-15, deflated by EU-25 HICP for milk, cheese and eggs, thous. of euro	80	64,300	106,000	954	572,000
Real exports (meat)	The value of meat exports from a NMS to EU-15, deflated by EU-25 HICP for meat, thous. of euro	80	106,000	199,000	3	1,050,000
Real exports (fish)	The value of fish exports from a NMS to EU-15, deflated by EU-25 HICP for fish and seafood, thous. of euro	80	42,000	91,400	458	476,000
Export volume (milk)	The volume of milk exports from a NMS to EU-15, 100 kg	80	697,210	1,216,932	3,311	5,367,727
Export volume (meat)	The volume of meat exports from a NMS to EU-15, 100 kg	80	400,203	827,853	9	4,670,886
Export volume (fish)	The volume of fish exports from a NMS to EU-15, 100 kg	80	140,024	281,307	3	1,507,040
Share of high VA products (milk)	The share of high valye-added products for household use in milk exports to the EU-15 (in terms of quantity)	80	19.24	17.98	0.06	74.93
Share of processed products (meat)	The share of processed products in meat exports to the EU-15 (in terms of quantity)	80	17.97	20.34	0.00	97.22
Share of processed products (fish)	The share of processed products in fish exports to the EU-15 (in terms of quantity)	80	27.00	26.56	0.00	100.00
GDP volume	Gross domestic product at market prices, Millions of euro, chain-linked volumes, reference year 2000 (at 2000 exchange rates)	80	49,086	57,445	6,160	245,212
REER	Real Effective Exchange Rate (deflator: consumer price indices - 16 trading partners - Euro Area), Index (2000=100)	80	108.22	12.44	88.05	154.50
Labour productivity (milk)	Apparent labour productivity (gross value added per person employed) in the milk processing sector (1,000 EUR)	73	11.34	5.55	2.70	25.50
Labour productivity (meat)	Apparent labour productivity (gross value added per person employed) in the meat processing sector (1,000 EUR)	72	7.75	4.51	-1.10	22.70
Labour productivity (fish)	Apparent labour productivity (gross value added per person employed) in the fish processing sector (1,000 EUR)	55	6.52	3.93	1.70	21.00
ULC (milk)	Unit labour cost measured as personnel cost divided by production value in the milk processing industry	79	9.75	2.34	6.70	19.30
ULC (meat)	Unit labour cost measured as personnel cost divided by production value in the meat processing industry	79	10.32	3.16	4.50	18.60
ULC (fish)	Unit labour cost measured as personnel cost divided by production value in the fish processing industry	60	14.29	3.89	6.50	26.70
Relative export price (milk)	The ratio of trade-weighted average export price to the average of export prices of all NMSs (average NMS=100) - milk products	80	95.89	46.52	17.60	206.20
Relative export price (meat)	The ratio of trade-weighted average export price to the average of export prices of all NMSs (average NMS=100) - meat products	80	101.04	32.18	22.40	216.60
Relative export price (fish)	The ratio of trade-weighted average export price to the average of export prices of all NMSs (average NMS=100) - fish products	80	147.58	171.22	0.70	792.60
Investments (milk)	The ratio of gross investment in tangible goods to production value in the milk processing industry	76	8.26	5.54	2.29	25.73
Investments (meat)	The ratio of gross investment in tangible goods to production value in the meat processing industry	78	7.89	4.58	2.36	22.26
Investments (fish)	The ratio of gross investment in tangible goods to production value in the fish processing industry	58	10.45	9.21	0.00	41.30

Appendix A.18. Estonian exports of milk, meat and fish products to NMSs, 1999–2009

		Exports to the NMSs, volume in 100 kg											Change (%)		
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2004 /2003	2005 /2003	2009 /2003
Milk and milk products															
Volume (100 kg)	Primary products	52,530	17,782	15,402	14,923	15,395	25,934	131,506	576,977	342,460	593,583	121,176	68.5%	754.2%	687.1%
	Processed intermediate products	37,765	10,264	10,508	9,330	11,981	10,835	14,871	16,974	23,503	16,842	28,824	-9.6%	24.1%	140.6%
	Processed products for household consumption	36,370	31,523	34,704	41,085	52,353	39,117	54,335	84,291	105,622	113,243	131,159	-25.3%	3.8%	150.5%
	Total	126,665	59,569	60,614	65,338	79,729	75,886	200,712	678,242	471,585	723,668	281,159	-4.8%	151.7%	252.6%
Shares	Primary products	41.5%	29.9%	25.4%	22.8%	19.3%	34.2%	65.5%	85.1%	72.6%	82.0%	43.1%			
	Processed intermediate products	29.8%	17.2%	17.3%	14.3%	15.0%	14.3%	7.4%	2.5%	5.0%	2.3%	10.3%			
	Processed products for household consumption	28.7%	52.9%	57.3%	62.9%	65.7%	51.5%	27.1%	12.4%	22.4%	15.6%	46.6%			
Meat and meat products															
Volume (100 kg)	Unprocessed meat	70,429	85,787	95,962	104,526	149,519	121,507	95,124	82,142	73,548	105,289	82,800	-18.7%	-36.4%	-44.6%
	Processed meat products	5,171	5,846	28,639	68,480	61,469	56,520	54,877	57,726	73,406	87,097	98,605	-8.1%	-10.7%	60.4%
	Total	75,600	91,633	124,601	173,006	210,988	178,027	150,001	139,868	146,954	192,386	181,405	-15.6%	-28.9%	-14.0%
Shares	Unprocessed meat	93.2%	93.6%	77.0%	60.4%	70.9%	68.3%	63.4%	58.7%	50.0%	54.7%	45.6%			
	Processed meat products	6.8%	6.4%	23.0%	39.6%	29.1%	31.7%	36.6%	41.3%	50.0%	45.3%	54.4%			
Fish and fish products															
Volume (100 kg)	Unprocessed fish	6,041	10,677	7,924	18,913	43,122	17,454	18,401	23,750	24,479	42,806	26,475	-59.5%	-57.3%	-38.6%
	Processed fish products	46,871	54,078	55,014	70,004	62,826	75,037	74,203	67,790	73,297	71,675	60,043	19.4%	18.1%	-4.4%
	Total	52,912	64,755	62,938	88,917	105,948	92,491	92,604	91,540	97,776	114,481	86,518	-12.7%	-12.6%	-18.3%
Shares	Unprocessed fish	11.4%	16.5%	12.6%	21.3%	40.7%	18.9%	19.9%	25.9%	25.0%	37.4%	30.6%			
	Processed fish products	88.6%	83.5%	87.4%	78.7%	59.3%	81.1%	80.1%	74.1%	75.0%	62.6%	69.4%			

Source: Dataset DS-016893; author's calculations

Note: * NMSs refers to the countries that joined the EU in 2004.

Appendix A.19. Estonia's share in total imports of NMSs (% in terms of the volume of imports)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average 1999–2003	Average 2004–2009
Milk and milk products	5.28	2.12	2.36	2.25	2.65	1.88	2.84	6.83	3.71	5.52	2.21	2.93	3.83
Meat and meat products	2.89	2.77	3.61	4.20	4.84	2.33	1.46	1.32	1.22	1.26	1.10	3.66	1.45
Fish and fish products	1.23	1.37	1.30	2.06	2.28	1.80	1.61	1.52	1.45	1.56	1.24	1.65	1.53

Source: Dataset DS-016894; author's calculations

Note: * NMSs refers to the countries that joined the EU in 2004 (excl. Estonia)

Appendix A.20. Estonia's share in intra-NMS trade (% in terms of the volume of imports)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average 1999–2003	Average 2004–2009
Milk and milk products	11.67	4.71	4.11	3.96	4.72	3.03	4.61	9.36	5.88	7.65	2.98	5.83	5.59
Meat and meat products	9.17	12.19	16.87	18.05	19.33	12.98	6.30	4.62	4.16	5.19	4.50	15.12	6.29
Fish and fish products	21.52	19.61	15.40	20.81	22.13	17.37	13.91	12.82	13.13	14.84	11.00	19.89	13.84

Source: Dataset DS-016894; author's calculations

Note: * NMSs refers to the countries that joined the EU in 2004;
Estonia's share is calculated based on the total volume of exports from NMSs to the NMSs (excl. Estonia).

Appendix A.21. Estonian exports of milk, meat and fish products to non-EU countries, 1999–2009

		Exports to the third countries, volume in 100 kg											Change (%)		
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2004 /2003	2005 /2003	2009 /2003
Milk and milk products															
Volume (100 kg)	Primary products	2,160	6,166	207	14,187	368	242	0	3,793	22,547	16,976	17,388	-34.2%	-100.0%	4625.0%
	Processed intermediate products	146,667	33,406	81,342	44,861	7,490	28,017	63,782	72,950	77,368	92,634	82,601	274.1%	751.6%	1002.8%
	Processed products for household consumption	47,580	16,372	13,779	4,743	830	7,193	17,636	38,374	32,069	30,377	50,799	766.6%	2024.8%	6020.4%
	Total	196,407	55,944	95,328	63,791	8,688	35,452	81,418	115,117	131,984	139,987	150,788	308.1%	837.1%	1635.6%
Shares	Primary products	1.1%	11.0%	0.2%	22.2%	4.2%	0.7%	0.0%	3.3%	17.1%	12.1%	11.5%			
	Processed intermediate products	74.7%	59.7%	85.3%	70.3%	86.2%	79.0%	78.3%	63.4%	58.6%	66.2%	54.8%			
	Processed products for household consumption	24.2%	29.3%	14.5%	7.4%	9.6%	20.3%	21.7%	33.3%	24.3%	21.7%	33.7%			
Meat and meat products															
Volume (100 kg)	Unprocessed meat	2,271	788	1,069	1,108	880	906	1,472	4,303	8,505	14,066	14,821	3.0%	67.3%	1584.2%
	Processed meat products	3,810	1,823	8,987	10,697	11,513	4,299	8,079	12,479	7,685	9,907	10,228	-62.7%	-29.8%	-11.2%
	Total	6,081	2,611	10,056	11,805	12,393	5,205	9,551	16,782	16,190	23,973	25,049	-58.0%	-22.9%	102.1%
Shares	Unprocessed meat	37.3%	30.2%	10.6%	9.4%	7.1%	17.4%	15.4%	25.6%	52.5%	58.7%	59.2%			
	Processed meat products	62.7%	69.8%	89.4%	90.6%	92.9%	82.6%	84.6%	74.4%	47.5%	41.3%	40.8%			
Fish and fish products															
Volume (100 kg)	Unprocessed fish	542,159	645,800	957,396	564,048	442,929	467,297	649,944	649,250	651,239	738,905	819,692	5.5%	46.7%	85.1%
	Processed fish products	348,746	73,680	394,077	526,405	498,236	335,241	407,714	380,174	315,151	316,542	240,448	-32.7%	-18.2%	-51.7%
	Total	890,905	719,480	1,351,473	1,090,453	941,165	802,538	1,057,658	1,029,424	966,390	1,055,447	1,060,140	-14.7%	12.4%	12.6%
Shares	Unprocessed fish	60.9%	89.8%	70.8%	51.7%	47.1%	58.2%	61.5%	63.1%	67.4%	70.0%	77.3%			
	Processed fish products	39.1%	10.2%	29.2%	48.3%	52.9%	41.8%	38.5%	36.9%	32.6%	30.0%	22.7%			

Source: Dataset DS-016893; author's calculations

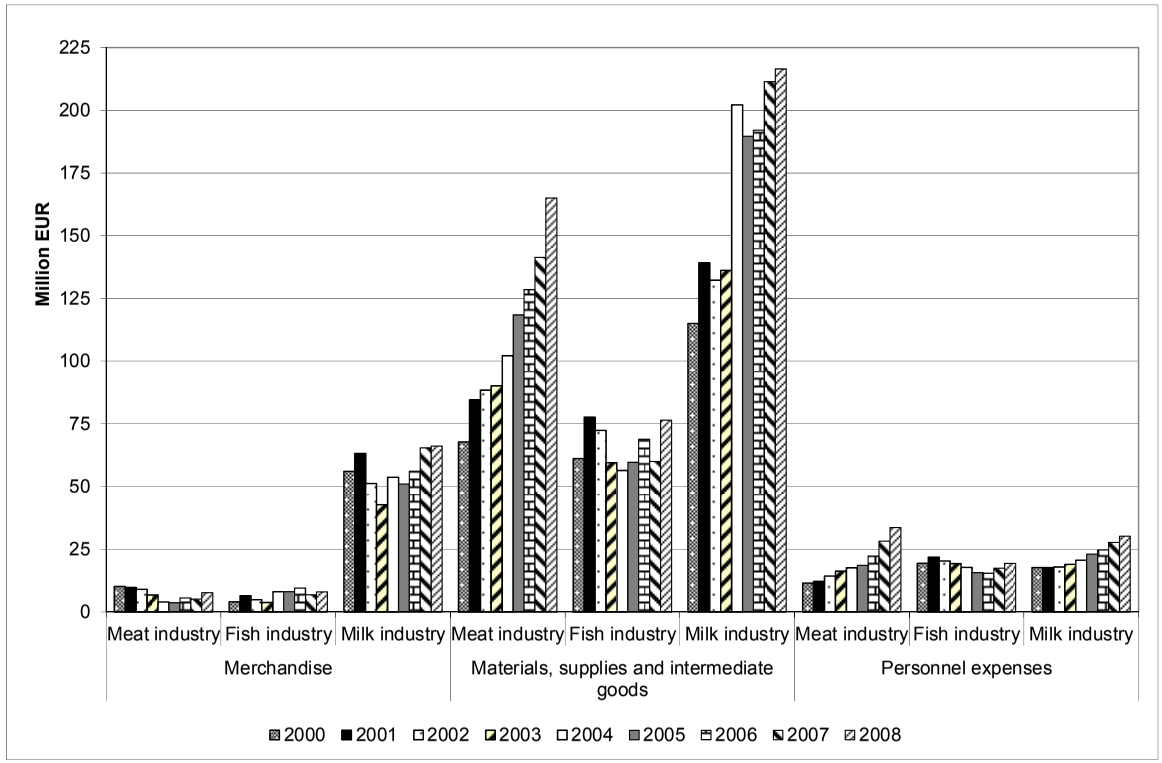
Appendix A.22. Overview of the models dealing with the agricultural price effects of EU accession in Estonia

Model	Fock (2000)	Selliov (2002)	Tamm (2002)	Toming (2002)
Method	PEM * (Comparative-static model for Estonia's agricultural and food sector EFASIM, based on CEASIM developed by IAMO)	PEM *	PEM *	PEM *
Base year	1997	2001	1998–2001	2000
Data sources	Statistical Office of Estonia; European Commission; Estonian Ministry of Agriculture, FAO	Statistical Office of Estonia; European Commission; Estonian Ministry of Agriculture, Estonian Institute of Economic Research	Statistical Office of Estonia; European Commission; Estonian Ministry of Agriculture, Estonian Institute of Economic Research	Statistical Office of Estonia; European Commission; Estonian Ministry of Agriculture
Demand functions	Demand system based on expenditure minimisation	Derived from initial consumption quantities and prices and price elasticities of demand	Derived from initial consumption quantities and prices and price elasticities of demand	Derived from initial consumption quantities and prices and price elasticities of demand (based on Roussland and Suomela (1993))
Demand-side disaggregation	1 consumer income group	1 consumer income group	1 consumer income group	1 consumer income group
Production functions	Supply functions derived from profit maximisation; perfect markets for basic agricultural producers; Cournot oligopoly in food processing industry	Production-side explicitly not modelled (production is assumed to be inelastic in short run)	Production-side explicitly not modelled (production is assumed to be inelastic in short run)	Production-side explicitly not modelled (production is assumed to be inelastic in short run)
Production-side disaggregation	9 agricultural production sectors, 10 consumer commodity groups; 5 production inputs	4 agricultural commodity groups	10 basic agricultural commodities	8 agricultural commodity groups
Extraneous use of elasticities	Own and cross price elasticities of demand; income elasticities of demand; price elasticities of supply; elasticities of substitution in production; elasticities of substitution between domestic and imported commodities	(Own) price elasticities of demand (constant and linear); infinite import supply elasticity	(Own) price elasticities of demand; infinite import supply elasticity	(Own) price elasticities of demand; elasticities of substitution between domestic and imported commodities; infinite import supply elasticity

Model	Fock (2000)	Selliov (2002)	Tamm (2002)	Toming (2002)
Policy changes incorporated	Base scenario (no accession) compared to 3 EU accession scenarios (include increases in growth rates): 1. Current CAP (1997) 2. Agenda 2000 – adoption of reformed CAP following the proposals of the EU Commission of March 1998 (reduced administrative prices, direct payments fully applied/not applied) 3. Liberalisation – drastic liberalisation of CAP (reduction in tariffs by half, intervention prices banned, decoupled direct payments)	Removal of EU export subsidies, adoption of CET and EU administrative prices (different scenarios)	Removal of EU export subsidies and the adoption of CET	Removal of EU export subsidies, adoption of CET and EU administrative prices
Policy conclusions	Adoption of CAP (compared to no-accession scenario) leads in general to increases in consumer and producer prices, whereas the magnitude of changes varies with the scenarios. The welfare effects are positive for producers and negative for consumers, the total welfare effect is, however, positive (except in Agenda 2000 scenario without any direct payments).	Net welfare decreases as a result of price increases	Net welfare decreases as a result of price increases	Consumer welfare decreases as a result of price increases concurrent with the policy changes; net welfare falls (deadweight loss)

Source: author's table based on Fock 2000, Selliov 2002, Tamm 2002, Toming 2002
Note: * Partial equilibrium model.

Appendix A.23. The main cost items of the Estonian meat, fish and dairy processing industries, 2000–2008



Source: Statistics Estonia

Appendix A.24. Interview plan for enterprise/industry (pre-prepared questions)

1. What are your company's main export markets? Has their share changed after Estonia acceded to the European Union (EU)?
2. What changes occurred for you with Estonia's accession to the EU?
    a. Did the access to the markets of EU-15 become easier?
    b. Did the access to the markets of other NMS become easier?
    c. Did the access to the markets of non-EU countries become easier?
    d. How did competition on the domestic market change?
    e. Was there an effect on production and production costs?
3. What are the main factors that hinder and favour your company's access to foreign markets (before and after Estonia's accession to the EU):
    a. To EU-15
    b. To other NMS
    c. To third countries
4. How large is the share of high value added products directed to end consumers and how big is the share of low value added (bulk) commodities? How has it changed after Estonia's accession to the EU?
5. How large is the share of private label and private brand in exports? How has it changed after Estonia's accession to the EU?
6. To what extent is the access to a foreign market determined by the decisions of parent company and to what extent by the motivation and initiative of the Estonian subsidiary?
7. Does the network of the parent company help to export to the EU countries?
8. Does the network of the parent company help to export to the non-EU countries?
9. Has Estonia's accession to the EU influenced innovation activity in your company? How? (Motivation, resources, support)
10. How do you assess your export opportunities in the future?
    a. Which are the main export markets (EU-15, NMS or non-EU countries)?
    b. Which product do you see as the main export article to the EU market (high value-added product or *commodity*)?
    c. What could assure access to and success on the EU market for high value added products, directed to end-consumers?
    d. How important is innovation in order to prolong shelf-life/ imperishability of products, while keeping the level of quality (for gaining new markets)?
    e. Could the possible shortage of raw milk (because of the implementation of milk quotas) hinder exports in the future?
11. How can the government support exports (of high value added products) to the EU markets?

Appendix A.25. The results of the interviews among selected milk processing companies in Estonia

		Company A	Company B	Company C	Company D	Company E
Main export markets	prior accession	Latvia, Lithuania	Russia	Russia, the Nether-lands, Finland, Germany	no exports	Russia, Italy
	after accession	Latvia, Lithuania, Fin-land, Czech Republic	Latvia, Lithuania, Finland, Russia	Russia, the Netherlands, Finland, Germany	Finland, Latvia	Russia, Italy, Finland, Sweden, Latvia, Lithuania
Main export article	EU-15	100% added value	100% added value	99% commodity	100% added value	90% added value
	NMS	100% added value	100% added value	–	100% added value	100% added value
	non-EU	–	100% added value	100% commodity	–	more bulk
Percentage of PB and PL	EU-15	PB 10%	PL 100%	–	PB 50%	PB 100%
	NMS	PB 80%	PL 80%	–		PB 100%
	non-EU	–	PB 100%	–	–	PB 100%
Changes	exports to the EU-15	new potential export markets	decreased bureaucracy, increased financial competitiveness	decreased bureaucracy	physical opening up of borders	no market barriers anymore
	exports to the NMSs	no change	opening-up of global markets, pan-Baltic retail chains	do not export there	physical opening up of borders	barriers between Baltic countries dissapeared
	exports to non-EU	abolition of double-tariffs gave a theoretical possibility	abolition of double-tariffs	abolition of double-tariffs	do not export to Russia	abolition of double-tariffs, increased transparency
	domestic market	no change	no big immediate changes	no big changes (excl. ceased imports of subsidised butter)	competition increased in some segments and decreased in some others	–
	produc-tion	increase in labour cost in direct correlation with EU living standards and free movement of workers	opening up of markets allows ecomies of scale, risk of increased competition increases efficiency	production costs increase for other reasons	production costs increase for other reasons	–

		Company A	Company B	Company C	Company D	Company E
Factors hindering	exports to the EU-15	invisible barriers	lack of competence	lack of knowledge and small production volumes	geographical distances, lack of economies of scale, prejudices	competition on export markets, consumer preferences, member states' promotion of domestic products
	exports to the NMSs	invisible barriers	lack of competence	–	national states and consumer preferences	–
	exports to the non-EU	invisible barriers	instable market, politics, big global players	–	–	exports subsidies are quite low and receiving them is slow
Factors promoting	exports to the EU-15	corporate relations	decrease in bureaucracy	–	Estonia is a recognised European country now	Eesti Toit
	exports to the NMSs	known markets	global thinking, pan-Baltic retail chains	–	new opportunities	–
	exports to the non-EU	corporate relations	export subsidies	–	–	export subsidies
The role of parent company /owner in finding export markets		no	–	no/yes	no	yes
The impact of EU accession on the company's innovative activity			motivation and resources have increased	–	support	no/Estonian subsidiary integrated to the whole business
Export opportunites in the future	the main markets	EU (old and new)	Latvia, Lithuania, Finland, Russia	Russia	Baltics and Scandinavia	Russia
	the main products	added value products	curd cream, pudding, ready desserts	–	yoghurt, value-added cheese, etc.	–
The role of the government in promoting exports		less bureaucracy, more topical assistance	minimal interference	–	more lobby	promotion, assuring of milk farming level

Source: author's table

Notes: PB – private brand, PL – private label

SUMMARY IN ESTONIAN – KOKKUVÕTE

Euroopa Liiduga ühinemise mõju Eesti toiduainetööstuse rahvusvahelisele konkurentsivõimele

Töö aktuaalsus

Eesti toiduainetööstus on 1990ndate aastate algusest saadik tegutsenud vastuolulistes tingimustes. Ühelt poolt kaitsesid Eesti peamised kaubanduspartnerid oma turgu impordi eest, piirates Eesti toiduainetööstuse ekspordivõimalusi. Samal ajal tähendas Eesti üliliberaalne väliskaubanduspoliitika, et kodumaised tootjad pidid koduturul konkureerima importtoodanguga, mis oli tihti subsideeritud, andes seega importtoodangule (kunstliku) konkurentsieelise.

Kui teiste majandussektorite puhul kehtis Eesti ja Euroopa Liidu (EL) vahel vabakaubandusleping juba enne Eesti ühinemist ELiga, siis Eesti toiduainetööstusele avanes suure ostujõuga ELi turg lõplikult alles Eesti ühinemisel ELiga 1. mail 2004. aastal. Kuid ELi turu avanemine nõudis Eesti toiduainetööstuselt mahukaid investeeringuid ELi hügieeni- ja sanitaarnõuete täitmiseks, mistõttu on küsitav, kas formaalne turu avanemine tagas ka reaalselt Eesti toiduainetööstusele ligipääsu ELi turule.

ELiga ühinemine andis samuti lisaimpulsse Eesti toiduainetööstuse toodete eksportimiseks kolmandatesse riikidesse. Ühelt poolt nõrgenesid barjäärid Eesti ekspordile, sest Eestile laienesid ELile osutatud kaubandussoodustused (nt Venemaa tollimaksude määr Eesti toodetele vähenes 50%). Teisalt hakkasid Eesti ettevõtted saama ekspordisubsiidiume oma toodangu eksportimiseks kolmandatesse riikidesse. Negatiivse külje pealt kaotas kehtivuse Eesti ja Ukraina vabakaubandusleping, mis hõlmas ka põllumajandussaadusi ja toidukaupu.

ELiga liitudes muutus ka kaubandusrežiim ELi mittekuuluvatest riikidest pärit impordi suhtes. Eesti loobus oma üliliberaalsest väliskaubanduspoliitikast ja võttis üle ELi ühise väliskaubanduspoliitika, mis tähendas märkimisväärset tollimaksude tõusu kolmandatest riikidest pärit impordi suhtes. Ühelt poolt vähenes analoogsete importkaupade konkurentsivõime Eesti turul, kuid teisalt kallines varem kolmandatest riikidest imporditud tooraine. Samuti kadusid varem vanade ELi liikmesriikide (EU-15) ettevõtetele makstavad ekspordisubsiidiumid Eestisse müüdavale toodangule, millega vähenes nende konkurentsivõime Eesti siseturul.

Kokkuvõttes on ELiga ühinemise otsesed ja kaudsed mõjud Eesti toiduainetööstusele väga mitmepalgelised ja vastuolulised, väärides süsteemset teaduslikku käsitlust.

Töö uudsus seisneb peamiselt kolmes aspektis. Esimene aspekt puudutab metodoloogilisi uuendusi. Autorile teadaolevalt ei ole varem konkurentsivõime teoreetilisi aspekte seotud majandusintegratsiooni teooriaga, mis traditsiooniliselt käsitleb majandusliku heaolu muutusi regionaalse integratsiooni tulemu-

sena. Teiseks on käesolev töö uudne selle poolest, et varem ei ole ELiga ühinemise järgseid mõjusid Eesti toiduainetööstuse konkurentsivõimele nii süsteemselt uuritud. Arvestades, et Eesti liikmesriigiks olemise kogemused on alles suhteliselt lühiajalised, on senised tööd, mis käsitlevad Eesti toiduainetööstuse konkurentsivõimet Euroopa integratsiooni raames, olnud n-ö. *ex ante* tüüpi, ennustades võimalikke liitumise tulemusi. Liitumise tegelikke tulemusi aga seni uuritud ei ole. Kolmandaks, nii teoreetilisest kui ka empiirilisest seisukohast vaadates on töö uudne selle poolest, et uurib juhtumit, mis on vastupidine traditsioonilistele teoreetilistele ja empiirilistele uuringutele, ja võib seega anda uusi ja huvitavaid tulemusi. Klassikaline majandusintegratsiooni teooria tegeleb peamiselt juhtumitega, kus eelnevalt üksteise suhtes protektsionistlikud riigid ühinevad majandusblokiga; Eesti juhtum on aga vastupidine – esialgne üliliberaalne väliskaubanduspoliitika asendus ühinemisel ELiga protektsionistlikuma majanduspoliitikaga.

Töö eesmärk ja uurimisülesanded

Käesoleva töö eesmärgiks on hinnata, kuidas on ELiga ühinemine mõjutanud Eesti toiduainetööstuse konkurentsivõimet. Eesmärgi saavutamiseks on püstitatud järgmised uurimisülesanded:

1) et luua tööstusharu konkurentsivõime uurimiseks vajalik raamistik, käsitletakse konkurentsivõime olemust ja esitatakse selle võimalikud definitsioonid;
2) analüüsitakse tööstusharu konkurentsivõime mõõtmise võimalusi ja esitatakse konkurentsivõime peamised indikaatorid;
3) luuakse tööstusharu konkurentsivõime tegurite süsteem, mis võtab arvesse regionaalse majandusintegratiooni rolli konkurentsivõime tegurina;
4) ELiga ühinemise mõjude uurimiseks tuuakse esile peamised muutused majanduspoliitikas, mis mõjutasid Eesti toiduainetööstust;
5) analüüsitakse Eesti toiduainetööstuse konkurentsivõime arengut peamistel eksporditurgudel;
6) testimaks, millist mõju on ELiga ühinemine avaldanud uute liikmesriikide ekspordile vanadesse liikmesriikidesse ja millistest teguritest sõltub ekspordivõime, tehakse ökonomeetriline analüüs, mis võimaldab ka võrrelda Eesti toiduainetööstuse ekspordivõimet teiste liikmesriikide omadega;
7) analüüsitakse liitumisega kaasnenud muutusi Eesti toiduainetööstuse konkurentsivõimes koduturul;
8) uuritakse ELiga ühinemisega kaasnevat mõju Eesti toiduainetööstuse teenimisvõimele, mis võtab kokku konkurentsivõime kodu- ja eksporditurgudel;
9) ELiga ühinemise mõjude paremaks mõistmiseks tehakse intervjuud Eesti piimatööstuste esindajatega.

Töö ülesehitus

Doktoritöö koosneb kahest osast. Töö esimeses, teoreetilises osas defineeritakse tööstusharu konkurentsivõime ja luuakse raamistik majandusintegratsiooni mõju uurimiseks tööstusharu konkurentsivõimele väikese, avatud majandusega riigi näitel. Esimese osa esimene alapeatükk käsitleb konkurentsivõime erinevaid definitsioone ja analüüsib konkurentsivõime mõõtmise võimalusi. Teine alapeatükk klassifitseerib tööstusharu konkurentsivõime tegurid ning analüüsib regionaalse integratsiooni rolli tööstusharu konkurentsivõime tegurite süsteemis. Selles peatükis luuakse ka tööstusharu konkurentsivõime filtermudel, mis eristab potentsiaalset ja tegelikku konkurentsivõimet ning mis on järgneva empiirilise analüüsi aluseks.

Töö teises, empiirilises osas uuritakse eelnevalt loodud teoreetilisele kontseptsioonile toetudes ELiga ühinemisest tulenevaid Eesti toiduainetööstuse konkurentsivõime muutusi. Teise osa esimene alapeatükk annab ülevaate Eesti toiduainetööstuse arengust, keskendudes kolmele allharule: piima-, liha- ja kalatööstus. Tuuakse esile ELiga ühinemisest tulenevad muutused toiduainetööstust mõjutavas majanduspoliitilises keskkonnas ja püstitatakse sellest tulenevalt – toetudes loodud teoreetilisele raamistikule – viis uurimishüpoteesi.

Empiirilise osa teises alapeatükis analüüsitakse ELiga ühinemise mõju Eesti toiduainetööstuse konkurentsivõimele peamistel eksporditurgudel, eristades kolme liiki turge: ELi vanad liikmesriigid, ELi uued liikmesriigid ja kolmandad ehk ELi mittekuuluvad riigid. Seejuures on põhitähelepanu pööratud konkurentsivõime muutustele ELi vanade liikmesriikide turgudel, sest enne liitumist olid kõige suuremad muudatused ja võimalused oodatud just sellel suunal. Et hinnata paremini Eesti toiduainetööstuse konkurentsivõime muutusi ELi vanade liikmesriikide turul, on Eesti toiduainetööstust võrreldud teisete 2004. aastal liitunud uute liikmesriikide toiduainetööstustega ning on tehtud ökonomeetriline analüüs hindamaks, millist mõju on ELiga ühinemine avaldanud piima-, liha- ja kalatööstuse ekspordivõimele ning millistest teguritest sõltub toiduainetööstuse ekspordivõime ELi turule.

Empiirilise osa kolmas alapeatükk analüüsib ELiga ühinemisest tulenevaid muutusi Eesti toiduainetööstuse konkurentsivõimes koduturul. Kodumaiste tootjahindade ja importkaupade hindade muutused määravad, kas kodumaised toidukaubad võidavad või kaotavad konkurentsivõimes koduturul, võrreldes importkaupadega. Neljas alapeatükk võtab kokku Eesti toiduainetööstuse konkurentsivõime arengud kodu- ja eksporditurgudel, analüüsides toiduainetööstuse teenimisvõime ja kasumlikkuse muutusi. Empiirilise osa viies ja viimane alapeatükk toob välja valitud Eesti piimatööstusettevõtete esindajatega tehtud intervjuude peamised tulemused, mis aitab paremini mõista, miks ELiga liitumisega kaasnenud muutused Eesti piimatööstuse konkurentsivõimes olid just niisugused, nagu nad olid.

Teoreetiline taust

Käesolevas doktoritöös lähtutakse tööstusharu konkurentsivõime kahetasandilisest kontseptsioonist, mille kohaselt on tööstusharu konkurentsivõime defineeritud kui teenimisvõime, mis baseerub tööstusharu müügivõimel ja atraktiivsusel tootmisteguritele. Müügivõime ja atraktiivsus tootmisteguritele sõltuvad omakorda teguritest, mille muutudes müügivõime ja atraktiivsus tootmisteguritele järgneval perioodil on määratud tööstusharu võimega kohaneda ja muutuda vastavalt konkurentsikeskkonna muutustele.

Käesolev doktoritöö keskendub tööstusharu konkurentsivõimele tooteturgudel, jättes vaatluse alt välja tootmistegurite turud. Seega saab tööstusharu konkurentsivõimet käsitleda kui teenimisvõimet, mis sõltub tööstusharu müügivõimest. Selline kahetasandiline käsitlus tähendab omakorda, et tööstusharu konkurentsivõime mõõtmisel tuleb arvesse võtta mõlemat aspekti. Järelikult ei ole tööstusharu konkurentsivõime analüüsimiseks ühte kindlat mõõdikut, vaid selleks tuleb luua mõõdikute süsteem. Empiirilises kirjanduses peamist kasutust leidvateks tööstusharu müügivõime indikaatoriteks on turuosad ja kaubavahetuse mahud. Tööstusharu teenimisvõimet mõõdetakse selliste indikaatorite kaudu nagu kasum, lisandväärtus ja hinna-kulu marginaal. Käesolevas doktoritöös soovitatakse tööstusharu konkurentsivõime määramiseks tooteturgudel täiendada eelnevalt mainitud mõõdikuid veel ekspordi struktuuri analüüsiga, mis seisneb kõrge ja madala lisandväärtusega toodete osakaalude leidmises ekspordis. See näitaja on seotud otseselt ka tööstusharu teenimisvõimega, sest kõrgema lisandväärtusega toodete eksport tagab tööstusharule ka suurema kasumi.

Töös lähtutakse käsitlusest, mille kohaselt saab tööstusharu konkurentsivõimet mõjutavad tegurid jagada tööstusharusisesteks ja -välisteks teguriteks. Neist esimese kategooria moodustavad tegurid, mis on tööstusharusse kuuluvate üksikettevõtete kontrolli all (nt ettevõtte strateegia, tooted, tehnoloogiline tase, kulud, uurimis- ja teaduskulutused jms), ja tööstusharusisesed tegurid, mis ei kuulu ettevõtete kontrolli alla (nt konkurents tööstusharus, haruliitude olemasolu ja tugevus, harusse kuuluvate ettevõtete koostöö). Tööstusharuvälisteks teguriteks on riigi valitsuste kontrolli all olevad tegurid ning niisugused tegurid, mis ei ole kontrollitavad (nt riigi asukoht, kliima, tootmisteguritega varustatus) või on seda ainult osaliselt (nt maailmaturu hinnad, vahetuskursi areng, nõudlustingimused, rahvusvaheline ärikeskkond).

Käesolev uurimistöö keskendub just riikide valitsuste kontrolli all olevate tegurite analüüsile. Tööstusharu konkurentsivõimet ei mõjuta mitte ainult koduriigi valitsuse otsused ja poliitikavalikud, vaid tööstusharu konkurentsivõime kujunemisel on oluliseks teguriks ka teiste riikide majanduspoliitika. Üheks riigi majanduspoliitilise valiku näiteks on ühinemine regionaalse kaubandusblokiga, millega üldjuhul kaasneb muutus tööstusharu konkurentsivõimet kujundavas keskkonnas.

Niisugusest käsitlusest tulenevalt luuakse käesolevas töös tööstusharu konkurentsivõime nn. filtermudel, mille kohaselt määravad tööstusharu konkurentsivõime potentsiaali tööstusharusisesed tegurid, mittekontrollitavad

tegurid ning valitsuste kontrolli all olevad kaubavahetust mittemoonutavad poliitikad. Valitsuste poliitikad, mis on kaubavahetust moonutava loomuga, moodustavad aga n-ö. filtri, mis – otseselt või kaudselt – määrab, kas tööstusharu konkurentsivõime potentsiaal saab realiseeruda või võimaldab hoopiski muuta madala konkurentsipotentsiaaliga tööstusharu konkurentsivõimelisemaks. Sellise filtri alla kuuluvad näiteks tollimaksud, koguselised impordipiirangud ja ekspordisubsiidiumid.

Regionaalne majandusintegratsioon toob kaasa muutused sellistes majanduspoliitikates, mõjutades nii otseselt – muutuste kaudu kaubavahetust moonutavates poliitikates – kui ka kaudselt tööstusharu konkurentsivõimet. Viimane aspekt toimub muutuste teel ettevõtete ajendites ja motivatsioonis integratsiooniga kaasnenud muutuste tõttu turu suuruses ja konkurentsisurve tugevuses. Kui integratsiooni otsene mõju tööstusharu konkurentsivõimele ilmneb kohe, siis kaudne mõju võib avalduda alles pikema aja jooksul, sest ettevõtete kohanemine uue konkurentsikeskkonnaga võtab aega.

Uurimismetoodika ja kasutatavad andmed

Käesolevas doktoritöös on vaatluse all Eesti toiduainetööstuse kolm allharu: piimatööstus, lihatööstus ja kalatööstus. Need harud on valitud vastavalt osatähtsusele toiduainetööstuse toodangus ja ekspordi osatähtusele realiseerimise kogukäibes. Peale selle on nendes harudes ELi regulatsioonid eriti mahukad ja seega saab eeldada, et ühinemine ELiga puudutas oluliselt nende harude konkurentsivõimet.

Valitud allharude konkurentsivõime muutusi ELiga ühinemise kontekstis on uuritud, lähtudes teoreetilises osas loodud tööstusharu konkurentsivõime filtri mudelist. Analüüs keskendub ELiga liitumisest tulenevate filtri muutuste otseste mõjude uurimisele, seega on vaatluse all ELiga ühinemise lühiajalisemad mõjud Eesti toiduainetööstusele, sest liikmeks oleku aeg on olnud veel liiga lühike, et teha põhjalikke järeldusi liitumisega kaasnenud kaudsete, pikaajaliste efektide kohta.

Töös on kasutatud peamiselt väliskaubandusstatistika andmeid, mis pärinevad nii Eesti Statistikaameti kui Eurostati andmebaasidest. Peale nende on kasutatud Eesti Statistikaameti andmeid ettevõtete majandusnäitajate kohta ning Eesti Konjunktuuriinstituudi kogutud hinna- ja jaekaubandusinfot.

Analüüs hõlmab peamiselt perioodi 1999–2009, millest viis esimest aastat olid liitumiseelsed ja kuus viimast aastat ELi liikmeks oleku aeg. Mõningatel juhtudel on andmete kättesaadavusest tulenevalt valitud muu analüüsiperiood.

Töös püstitatud uurimisväited ja analüüsi tulemused

Lähtuvalt ELiga liitumisega kaasnenud muudatustest Eesti toiduainetööstust puudutavas poliitikas püstitati viis uurimishüpoteesi analüüsimaks ELiga liitumise mõju Eesti toiduainetööstuse konkurentsivõimele.

Tees 1. Ühinemine ELiga ja sellega kaasnev kaubanduspiirangute kaotamine tõi kaasa märkimisväärse tõusu Eesti toidukaupade ekspordi mahus ELi liikmesriikidesse (ilmnes kaubanduse loomise efekt).

Kaubavahetusmahtude analüüs näitas, et Eesti piimatööstuse ja lihatööstuse eksport ELi riikidesse kasvas ajavahemikul 2003–2007 tõepoolest oluliselt, samas kui kalatööstuse puhul jäi ekspordi kasv tagasihoidlikumaks. Selle tulemusena Eesti turuosa ELi vanade liikmesriikide piima- ja lihatoodete impordis kasvas, kuid kalatoodete puhul kahanes. Samas, kui vaadata Eesti osakaalu uutest liikmesriikidest pärit impordis, siis Eesti piimatoodete turuosa langes, mis näitab, et teiste uute liikmesriikide piimatoodete eksport vanadesse liikmesriikidesse suurenes rohkem kui Eestil. Sama areng toimus kalatoodete puhul, mille tulemusena võib öelda, et võrreldes teiste 2004. aastal ELiga ühinenud riikidega on Eesti olnud edukam ainult lihatoodete ekspordis. Samas on Eesti turuosa lihatoodete puhul endiselt väga väike (2009. a 0,56%).

Neid tulemusi kinnitas ka *difference-in-difference*-meetodil põhinev regressioonianalüüs, mis tehti hindamaks ELiga ühinemise üldist mõju uute liimesriikide piima-, liha- ja kalatoodete ekspordile. Analüüsi tulemusena selgus, et ELiga ühinemise positiivne mõju piima- ja lihatoodete ekspordile oli iseloomulik kogu uute liikmesriikide grupile. Seejuures oli liitumise mõju eriti tugev lihatoodete puhul. Samas näitas analüüs, et ELiga ühinemine ei mõjutanud uute liikmesriikide kalatoodete eksporti, mis võib osaliselt tuleneda mudeli madalast statistilisest olulisusest.

Lisades regressioonianalüüsile n-ö ootuste efekti, selgus, et liitumise mõju uute liikmesriikide ekspordile ilmnes osaliselt juba enne tegelikku ELiga ühinemist aastal 2004, eriti puudutab see liha- ja kalatoodete ekspordi mahte.

Regressioonianalüüsi põhjal saab ka väita, et Eesti vähem edukas sisenemine EL-15 turgudele, võrreldes teiste uute liikmesriikidega, tuleb osaliselt suhteliselt kiirest reaalse vahetuskursi tõusust ja suhteliselt väiksemast kulueelisest. Peale selle ilmnes analüüsist, et Eesti geograafilise ja majandusliku läheduse tõttu Venemaaga toimub osaline kaubavahetuse ümbersuunamine ELi turult Venemaale, mis tähendab sisuliselt, et Eesti piimatoodete ELi eksportimise mahud on väiksemad Venemaa turu atraktiivsuse kasvu tõttu.

ELiga ühinemine avardas ka Eesti toiduainetööstuse ekspordivõimalusi teistesse uutesse liikmesriikidesse, mida on suutnud kasutada eelkõige piimatööstus. Kuid liha- ja kalatoodete puhul on Eesti osatähtsus uute liikmesriikide põllumajandussaaduste ja toidukaupade impordis vähenenud, mis viitab ühelt poolt sellele, et Eesti eksport on suunatud rohkem ELi vanade liikmesriikide turule, kuid teiselt poolt võib see olla ka märgiks, et Eesti on olnud teiste 2004. aastal ELiga ühinenud riikidega võrreldes vähem edukas uute liikmesriikide

turgudele sisenemisel. Seega võib öelda, et Teesi 1 saab vastu võtta vaid osaliselt, piima- ja lihatööstuse kohta.

Tees 2. ELi hügieeni- ja sanitaarnõuete täitmine ja muude ELi poolsete eksporditõkete kõrvaldamine tõi kaasa Eesti ekspordi struktuurinihke – kõrgema lisandväärtusega toidukaupade osatähtsus ekspordis kasvas.

Analüüsi tulemusena võib öelda, et piimatoodete ekspordi struktuuris toimus muutus kõrgema lisandväärtusega tarbijatoodete osakaalu kasuks, mis näitab, et ELiga ühinemine ja sellega kaasnev kaubanduspiirangute kadumine tõi tõepoolest kaasa Eesti piimatoodete konkurentsivõime kasvu ELi turul. Liha-toodete puhul aga suurenes just töötlemata ja seega madalama lisandväärtusega kaupade osakaal, mis tõestab, et ELi turg jäi – formaalsete kaubaduspiirangute kadumisest hoolimata – Eesti kõrge lisandväärtusega lihatoodetele suhteliselt suletuks. Kalatoodete ekspordi struktuuris toimus mõningane töödeldud kaupade osakaalu suurenemine, kuid et töödeldud kalatoodete gruppi kuuluvate toodete kasumimarginaal on ettevõtete jaoks tihti madalam kui töötlemata (peamiselt külmutatud, jahutatud ja fileeritud) kala puhul, siis ei saa väita, et see areng oleks tegelikult positiivne. Regressioonianalüüsi käigus tuli ilmsiks, et ELiga ühinemine ei mõjutanud uute liikmesriikide ekspordi struktuuri. Seetõttu on kõrge lisandväärtusega tarbijatoodete osatähtsuse kasv Eesti piimatoodete ekspordis eriti positiivne saavutus. Regressioonianalüüs näitas siiski, et ELiga ühinemise mõju piimatoodete ekspordi struktuurile toimus osaliselt juba enne liitumist.

Seega saab Teesi 2 vastu võtta vaid piimatööstuse puhul, liha- ja kala-tööstuse analüüsi tulemused ei kinnita Teesi 2 paikapidavust.

Tees 3. Eesti ühinemine ELiga ja sellega kaasnev väliskaubandusrežiimi muutus tõi kaasa toidukaupade ekspordi kasvu kolmandatesse riikidesse.

Kaubavahetusmahtude analüüs näitas, et ELiga liitumise tulemusena Eesti toidukaupade ja põllumajandussaaduste eksport kolmandatesse riikidesse üldiselt kasvas. Seejuures on eelkõige piimatööstus võitnud ühinemisega seotud väliskaubandusrežiimi muutustest. Kalatööstus, mis sõltub tugevasti ekspordi-turgudest ja millele oli enne ELiga ühinemist iseloomulik Ukraina suur osatähtsus ekspordis, kaotas aga kõige rohkem ühinemisega kaasnenud Eesti ja Ukraina vabakaubanduskokkuleppe tühistamisest. Kaubavahetuse struktuuris toimus samasugune areng nagu ekspordi puhul ELi vanadesse liikmesriikidesse: kõrge lisandväärtusega tarbijatoodete osakaal kasvas piimatööstuse ja kahanes lihatööstuse ekspordis. Kalatoodete ekspordis aga suurenes töötlemata toodete osakaal, kuid et töödeldud kalatoodete madala kasumimarginaali probleem on kolmandatesse riikidesse suunatud ekspordis veelgi suurem kui ELi korral, võib niisuguse arengu võrdsustada konkurentsivõime kasvuga. Samasugune areng, kuigi väiksemal määral, on täheldatav ka lihatoodete ekspordi puhul.

Seega kehtib Teesi 3 taas kindlalt vaid piimatööstuse kohta. Kuigi lihatööstuse eksport kolmandatesse riikidesse suurenes, kaasnes sellega töödeldud toodangu osakaalu langus ekspordi struktuuris, seega võib Teesi 3 lihatööstuse puhul vastu võtta vaid teatud mööndustega. Kalatööstuse puhul Tees 3 kinnitust ei leidnud, sest ekspordi maht langes, kuigi muutused ekspordi struktuuris viitavad konkurentsivõime tõusule.

Tees 4. ELiga ühinemisega kaasnev ekspordisubsiidiumide kaotamine ELi ekspordile Eestisse ning kolmandatele riikidele suunatud ELi väliskaubanduspoliitika ülevõtmine tõi kaasa kodumaiste toidukaupade konkurentsivõime kasvu Eesti siseturul.

Mis puudutab Eesti toiduainetööstuse konkurentsivõimet koduturul, võib öelda, et vahetult ühinemisjärgsed muutused kodumaistes tootja- ja impordihindades jäid oodatud hinnamuutustele alla, mõningad üksikud kaubagrupid välja arvatud. Vastupidi teoreetilistele ootustele kasvas ELi vanade liikmesriikide osakaal Eesti piima- ja lihatoodete impordis, kuigi näiteks sellise kauba puhul nagu või – millelt kadusid ekpordisubsiidiumid – vähenesid impordikogused EList tunduvalt, võrreldes liitumiseelse ajaga. Vastavalt ootustele suurenes teiste uute liikmesriikide osakaal Eesti impordis (v.a. piimatoodete korral) ja vähenes kolmandate riikide osakaal.

Analüüs näitas ka, et impordi turuosa või ja juustu puhul vähenes, kuid joogipiima ja töödeldud juustu puhul suurenes. Lihatoodete osas vähenes impordi osakaal kohe pärast Eesti astumist ELi, kuid on hilisematel aastatel suurenenud. Kalatoodete puhul ei olnud võrreldavat turuosade analüüsi andmete puudumise tõttu võimalik teha, kuid impordi 110%line kasv aastatel 2003–2007, võrreldes kalatööstuse müügiväärtuse 14,1%lise ja ekspordi väärtuse 5,2%lise langusega, annab tunnistust, et kodumaise kalatööstuse konkurentsivõime, võrreldes impordiga, vähenes.

Seega leidis Tees 4 kinnitust vaid osaliselt, teatud piimatoodete puhul.

Tees 5. ELiga ühinemisega kaasnevad muutused väliskaubanduspoliitikas suurendasid Eesti toiduainetööstuse teenimisvõimet ja kasumlikkust.

Lisandväärtusel ja hinna-kulu marginaalil põhinevast analüüsist järeldus, et ELiga ühinemise esmane mõju oli negatiivne kõigi vaadeldavate Eesti toiduainetööstuse allharude jaoks. See tähendab, et Eesti toiduainetööstuse konkurentsivõime teenimisvõimena mõõdetuna langes pärast ELiga liitumist. See tulenes peamiselt kulude tõusust ühinemisega kaasneva investeeringuvajaduse tõttu ja sisendihindade tõusust. Samal ajal oli tarbijahindade tõus koduturul piiratud tarbijate ostujõuga.

Hilisem areng on siiski olnud allharuti erinev, kinnitades suuresti juba eelnevates teesides väidetut. Saab öelda, et Eesti piimatööstuse konkurentsivõime on pärast Eesti astumist ELi tõesti paranenud, mis seostub peamiselt konkurentsivõime suurenemisega eksporditurgudel. Lihatööstus, mille ekspordi

kasv on olnud eriti märkimisväärne, kuid mille ekspordi osakaal on suhteliselt väike, võrreldes kodumaise müügiga, ei ole aga liitumisjärgsel perioodil saavutanud kasumlikkuse taset, mis oleks sama kõrge kui vahetult enne liitumist – kuigi nii lisandväärtuse kui ka hinna-kulu marginaali indikaatorid on perioodil 2004–2009 olnud keskmiselt kõrgemad kui perioodil 2000–2001. Kui vaadata lisandväärtuse näitajat, on kalatööstuse puhul ilmne ELiga ühinemisega kaasnev konkurentsivõime langus. Tees 5 leidis seega kinnitust vaid piimatööstuse puhul.

Seega saab järeldada, et vaadeldavatest toiduainetööstuse allharudest on ELiga ühinemise järel konkurentsivõime paranenud piimatööstuse puhul, samas kui kalatööstus, mis vaadeldavatest allharudest sõltub kõige rohkem eksporditurgudest, ei ole suutnud hoida ega suurendada oma konkurentsivõimet ei kodu- ega eksporditurgudel.

Seoses ELi väliskaubanduspoliitika reformimisega Maailma Kaubandusorganisatsiooni raames tekib tulevikus Eesti toiduainetööstuse jaoks olukord, kus pärast ELi protektsionistliku väliskaubanduspoliitika ülevõtmist 2004. aastal tuleb taas üle minna liberaalsemale kaubanduspoliitikale. See tekitab nii uusi väljakutseid kui ka võimalusi nii kodu- kui ka eksporditurgudel. Konkurentsivõime tagamiseks ja suurendamiseks peab Eesti toiduainetööstus senisest suuremat tähelepanu pöörama tootearendusele, kuid olulised on ka turundusalased ja organisatsioonilised innovatsioonid, mis nõuavad tihti vähem rahalisi ressursse kui uurimis- ja arendustegevusel toetuvad innovatsioonid. Et olla edukas ELi turgudel, peab Eesti toiduainetööstus leidma uusi turge oma kõrge lisandväärtusega toodetele, nt spetsialiseerumise kaudu teatud niši-toodetele, mis erinevad konkurentide poolt pakutavast, või valmistades mahetooteid ekspordiks lähiriikidesse.

Soovitused edasisteks uuringuteks

Käesolev doktoritöö keskendus Eesti toiduainetööstuse konkurentsivõime analüüsile tooteturgudel. Samas saab väita, et Eesti ühinemine ELiga mõjutas ka Eesti toiduainetööstuse konkurentsivõimet tootmisteguriturgudel, näiteks muutuste kaudu inimkapitali kvaliteedis ja mobiilsuses, palgatasemes ja investeerimisotsustes. Et saada tööstusharu konkurentsivõime arengust täielikku ülevaadet, tuleks analüüsi lisada ka tootmistegurite aspekt. Kuigi see ei mõjutaks Eesti toiduainetööstuse teenimisvõime analüüsi tulemusi, aitaks see seletada toimunud arengu tagamaid ja põhjusi.

Käesoleva töö empiirilises osas analüüsiti vaid ELiga ühinemise lühiajalisi mõjusid Eesti toiduainetööstuse konkurentsivõimele. Tulemused olenesid peamiselt analüüsiperioodi pikkusest ja andmete kättesaadavusest. Kuid regionaalse integratsiooni kesk- ja pikaajalised mõjud, mis ilmnevad muutuste kaudu tootjate ajendites ja otsustes turu suuruse ja konkurentsisituatsiooni muutumise tõttu, võivad avaldada tööstusharu konkurentsivõimele veelgi suuremat mõju – seejuures mõjutades nii konkurentsivõime potentsiaali kui ka tegelikku konkurentsivõimet – ning väärivad seega põhjalikku analüüsi.

Seejuures on eeliseks ettevõtte tasandi andmete kasutamine, mis võimaldab uurida liitumise mõju ettevõtete ajenditele ja käitumisele. Lisaks võimaldab ettevõtte tasandi andmete kasutamine testida, kas liitumise mõju erinevus on sõltunud ettevõtete gruppidest (nt suur- ja väikeettevõtted, ekspordile ja koduturule orienteeritud ettevõtted jne).

Regionaalse integratsiooni pikaajaline efekt seisneb ettevõtete innovatsioonikäitumise muutumises suurenenud konkurentsi ja turu suuruse tõttu. Et üheks peamiseks võimaluseks hoida ja suurendada Eesti toiduainetööstuse konkurentsivõimet ELi turul on just innovatsioonitegevuse edendamine, on äärmiselt oluline uurida põhjalikult ka ELiga ühinemise mõju Eesti toiduainetööstuse innovatsioonitegevusele.

CURRICULUM VITAE

Kristina Toming

Nationality:	Estonian
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Education

2000–2007	PhD studies, University of Tartu, Faculty of Economics and Business Administration
2001–2002	Advanced Studies Program in International Economic Policy Research, Kiel Institute of World Economics, Germany
1999	Postgraduate Program in European Studies, University of Southern Denmark /Odense University, Denmark
2000	MA, Economics, University of Tartu
1998	BA, International Economics and Corporate Finance (*cum laude*), University of Tartu
1994	Rakvere Secondary School No. 1

Special courses and research abroad

- "CGE short course", Sussex University, Brighton, UK, May 16–20, 2005
- "How to Evaluate Development", University of Copenhagen, Faculty of Economics, Copenhagen, Denmark, June 1–12, 2004
- Visiting PhD student at the Royal Veterinary and Agricultural University, Unit of Economics, Copenhagen, Denmark, 2003–2005
- "Design of Online Learning", WebCT course, University of Helsinki, October-December 2003
- "Practical General Equilibrium Modeling with GAMS", Winter School 2003 in Economic Modeling, EcoMod Net and Brandeis University. Washington D.C., US, January 6–11, 2003
- "Computerized General Equilibrium Models in Candidate Countries", EuroFaculty Vilnius Centre and The Danish Research Institute of Food Economics. Vilnius, Lithuania, November 20–26, 2002
- Research at the library of the Vienna Institute for International Economic Studies (WIIW), Vienna, September 2002.
- Research at the British Library of Economics and Political Science (BLEPS), London, February 2000.

Professional employment

2010–present	Manager at Maersk Broker K/S, Research unit
2007–2010	Economist at Maersk Broker K/S, Research unit
2000–2006	Research Fellow at the University of Tartu, Faculty of Economics and Business Administration, Chair of International Economy
1997	Summer Internship at the Union Bank of Switzerland, Frankfurt am Main, Germany
1996	Summer internship at the Alte Marner Sparkasse and Meldorfer Verbandsparkasse, Marne/Meldorf, Germany

Lecturing

- The foundations of the European Integration
- The economic policies of the EU
- International Trade Theory
- International Economic Policy

Honours and awards

2nd prize in competition of student research works, Estonian Academy of Sciences, 2000.

Languages

Estonian (native), English, Danish, German, Russian

Main research interests

- Competitiveness of economic sectors
- EU integration
- International Trade
- The Common Agricultural Policy

ELULOOKIRJELDUS

Kristina Toming

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Hariduskäik

2000–2007	Tartu Ülikool, majandusteaduse doktoriõpe
2001–2002	Advanced Studies Program in International Economic Policy Research, Kieli Maailmamajanduse Instituut
1999	Magistriprogramm Euroopa Uuringutes, Lõuna-Taani Ülikool, Odense
2000	Tartu Ülikool, majandusteaduskond, majandusteaduse eriala, MA
1998	Tartu Ülikool, majanduteaduskond, välismajanduse ja ärirahanduse ja investeeringute erialad, BA (*cum laude*)
1994	Rakvere I Keskkool

Erialane enesetäiendus ja teadustöö välismaal

- "CGE short course", Sussexi ülikool, Brighton, 16.–20. mai 2005
- "How to Evaluate Development", Kopenhaageni Ülikool, majandusteaduskond, Kopenhaagen, 1.–12. juuni 2004
- Külalisdoktorant, Taani Kuninglik Põllumajandusülikool, majandusteaduskond, Kopenhaagen, 2003–2005
- "Design of Online Learning", WebCT kursus, Helsinki Ülikool, oktoober – detsember 2003
- "Practical General Equilibrium Modeling with GAMS", EcoMod Net ja Brandeis Ülikool, Washington D.C., 6.–11. jaanuar 2003
- "Computerized General Equilibrium Models in Candidate Countries", EuroFaculty Vilniuse keskus ja The Danish Research Institute of Food Economics, Vilnius, 20.–26. november 2002
- Uurimistöö Vienna Institute for International Economic Studies (WIIW) raamatukogus, Viin, September 2002.
- Uurimistöö British Library of Economics and Political Science raamatukogus, London, veebruar 2000.

Erialane teenistuskäik

Alates 2010	Manager, Maersk Broker K/S, teadus- ja analüüsiosakond
2007–2010	Analüütik, Maersk Broker K/S, teadus- ja analüüsiosakond
2000–2006	Teadur, Tartu Ülikool, majandusteaduskond, välismajanduse õppetool
1997	Praktikant, the Union Bank of Switzerland, Frankfurt am Main
1996	Praktikant, Alte Marner Sparkasse and Meldorfer Verbandsparkasse, Marne/Meldorf

Õppetöö

- Euroopa Integratsiooni alused
- Euroopa Liidu majanduspoliitikad
- Välismajandusteooria
- Välismajanduspoliitika

Tunnustused

Eesti Teaduste Akadeemia tudengite teadustööde konkursi II preemia, 2000.

Keelteoskus

Eesti (emakeel), inglise, taani, saksa, vene

Peamised uurimisvaldkonnad

- Majandusharude konkurentsivõime
- Integreerumine Euroopa Liiduga
- Rahvusvaheline kaubandus
- Euroopa Liidu Ühtne Põllumajanduspoliitika

DISSERTATIONES RERUM OECONOMICARUM UNIVERSITATIS TARTUENSIS

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