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WILL BALTIC AGRICULTURE SURVIVE AFTER EU ACCESSION?

Klaus Frohberg and Monika Hartmann[1]
Institute of Agricultural Development in Central and Eastern Europe
Halle/S., Germany

1. Introduction

The economies of the Baltic countries, including the agricultural sector and its up and down stream industries, undergo fundamental changes. This is due to the transformation from a socialist system into a market economy as well as to being independent again. The economies of all three Baltic states contracted substantially with the beginning of the transition through 1993. Lithuania has shown an expansion since 1993, Estonia since 1995 and Latvia since 1996. In all three countries a steadily increasing speed of growth could be observed during the last years. Forces behind these upturns are manifold; mainly a tight monetary policy, the implementation of institutions necessary for an efficient market economy, the effective privatisation and restructuring of a substantial number of companies and the accompanying increase in competition.

In addition to the internal transformation process, the recently ratified Europe Agreements with the EU require further adjustment. Pressure for changes is to be expected as well from external developments such as modifications in the Common Agricultural Policy (CAP) of the EU, implementing EU regulations as provided in the white book, from the Baltic Free Trade Agreement (BFTA) and the GATT/WTO[2] agreement. Finally, all Baltic countries must prepare themselves for EU membership to make the process of accession as smooth as possible. This holds, although the EU Council of Ministers decided in December 1997 to select from the Baltic countries only Estonia as belonging to the first group of accession countries. Nevertheless, negotiations are expected to be initiated in the near future with the other two countries as well.

Given this state of change it seems difficult to obtain a clear understanding of the competitive potential of the Baltic agricultural sector following an EU accession. This, however, is necessary in order to adjust effectively to the opportunities and forces impacting on agriculture in the Baltic states. The relatively large importance of the agricultural sector in these countries underlines the relevance of such a study.

Thus, the objective of the paper is to analyse the present competitive position of the agricultural and food sectors in the Baltics and the expected development of this position following an accession to the EU. In order to realise this the paper starts out discussing the main determinants of competitiveness and their shape in the Baltic states (section 2). An ex-post analysis of the competitive performance of the three

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[2] General Agreement on Tariffs and Trade/World Trade Organisation

Baltic countries is carried out in section 3 utilising various indicators. Finally, some conclusions with respect to the methodology and the further development of the agricultural and food sector in these countries are drawn (section 4).

2. Competitive Potential

Competitiveness is the ability to supply goods and services in the location and form and at the time they are sought by buyers, at prices that are as good as or better than those of other potential suppliers, while earning at least the opportunity cost of returns on resources employed (Freebairn, 1986, p. 2).[3] The concept of competitiveness can be applied at different levels of product aggregation and spatial extension (see Frohberg and Hartmann, 1997). In addition, past performance (ex-post) or the potential of competitiveness (ex-ante) can be the focus of the analysis. [4] This section is concerned with analysing competitive potential while in section 3 the performance of the agrofood sector in the Baltic countries will be examined.

The competitive potential of agriculture, like any sector, is influenced by a whole set of determinants such as institutions and policies (section 2.1), factor endowment and climatic conditions (section 2.2), farm structure and management (section 2.3), input supply, processing and distribution (section 2.4) and scale and quality of consumer market (section 2.5). These factors determine the competitiveness of a sector.

2.1 Institutions and Policies

Institutions and policies set the framework for private economic agents and have, in general, a profound impact on the international competitiveness of a sector. Since an effective transformation to a market economy requires the establishment of a whole new institutional framework - ranging from the constitution to guarantee e.g. private ownership, freedom of carrying out economic deals etc., to providing hygienic standards - changes in the institutional and policy framework occur at present in many ways in these states and might foster or hamper the competitiveness of the agricultural sector.

With regard to the restructuring process in the agricultural and food industry the following institutional arrangements are of major relevance: bankruptcy law and procedure, antitrust regulations, market and price information systems as well as quality standards and controls. In addition the adjustment of agricultural and macroeconomic policies plays an important role.

2.1.1 Bankruptcy law and antitrust regulations

The implementation of a bankruptcy law introduces full liability as an important constitutional principle of a market economy. Each entrepreneur is fully responsible for

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[3] There is in fact no single definition of competitiveness in the economic literature. The difficulties in defining competitiveness are due to the various dimensions of this concept. The above definition, however, seems to be widely accepted in the economic literature. Its main advantage lies in that it not only considers the output markets, but also considers the factors of production.

[4] For an overview on measures of competitive potential and competitive process, see PORTER (1990) or FANFANI et al. (1995).

her/his activities. The state no longer recovers or capitalises debts, as it did in the centrally planned economy. Loss-making enterprises have to go out of business and the resources are allocated to those who can make better use of them. Each of the Baltic countries passed *'Laws on Bankruptcy'*. For fear of high social costs governments have in the first years of transition been reluctant to let enterprises go bankrupt. However, in the meantime these laws are increasingly applied.

Given the inherited monopsonistic and monopolistic structures in the processing and agro-service enterprises, antitrust regulation plays an important role in enhancing competition. All three Baltic countries dispose of appropriate anti-trust legislation, to which all companies, including those of the agro-food sector, are subject. Anti-monopoly Committees were established in Estonia and Latvia to monitor the situation in the commodity and service markets in these countries and to enforce the anti-trust law. In recent years competition has become stronger, thanks to the legal framework and due to the emergence of many small scale private processors. They compete with the large-scale enterprises for the farmers' raw material and the consumers' limited purchasing power.

2.1.2 Market and price information systems

During the course of the transformation to a market economy thousands of small scale agricultural producers as well as a large number of new private companies in the up- and down-stream sectors have started their business. This has created the necessity to provide market research for farmers in order to find the most favourable partners to sell products and to buy the cheapest and the best quality inputs. In the Baltic countries there is still a lack of such adequate market information systems. As a result, necessary information for private agents and politicians are often missing or insufficient. This deficit has hindered market transparency, increased transaction costs and thus has been a major impediment for a more market oriented production of agricultural and food products (OECD/CCET, 1996d, p. 116; OECD/CCET, 1996b, p. 109). It also can lead to regional market power.

However, it should be noted that during the last years there have been some efforts to improve the situation. In 1996 the Agricultural Board of Trade was set up in Estonia. This institution collects market and price information and promotes the marketing of agricultural products. Also, in Lithuania the Agricultural Foreign Trade Agency was recently restructured, and from now on is supposed to be solely devoted to market research, market analysis and export promotion activities. This agency, together with the Lithuanian Agricultural Advisory Service, will collect and disseminate domestic market price information on a regular basis, as well as collaborate with a similar Latvian agency in exchanging market information and preparing joint publications with the purpose of establishing the Baltic market information system in the future.

2.1.3 Quality standards and controls

In the centrally planned economy consumer satisfaction was kept at relatively low levels. One major problem in this regard was the poor quality of the products produced. In order to promote competitiveness of the food products in the Baltic states quality standards and sanitary controls are being introduced. In addition subsidies in

agriculture are linked to improving the quality of agricultural products, and fostering the use of high quality inputs.

All three Baltic countries are in the process of harmonising their standards with EU regulations. Yet, it will still take some time until the controls work effectively in practice.

2.1.4 Agricultural Policies

After independence all three Baltic countries have abolished most of the direct production and consumption subsidies introduced by the Soviet regime. Estonia has pursued the most liberal agricultural policy, relying almost entirely on improving and controlling product quality as well as on input support measures in the form of fuel excise tax compensation, credit interest and investment support programs. In 1998 direct payments were introduced for cows, cereals, oilseeds and flax and those new measures account, in 1998, for the lion´s share of the agricultural budget (41%).To qualify for this support a minimum level and quality of production is requested. In general, there seems to be a growing pressure in Estonia to introduce more protectionism, including anti-dumping measures, to protect farmers' incomes and bring Estonian agricultural policy more into line with the CAP model.

Agricultural policies in Latvia and Lithuania are, as well, relatively liberal, although to a lesser extent than in Estonia. Especially in Lithuania some reversal of the liberal policies at the beginning of the transition process occurred in 1994 with the introduction of minimum farm gate prices and intervention purchases for specified quantities of the main agricultural products. However, in 1997 the Lithuanian Government has implemented major reforms in market regulation and price support programmes by revoking previously announced farm price increases and reducing the list of commodities subject to minimum prices and subsidies. Besides that, the price support system has been reorganised to become more targeted towards higher quality agricultural output. In 1997, remaining agricultural policies are relatively less distorting and rely mainly on indirect support measures such as reimbursement of excise tax for fuel as well as other input subsidies. This also holds for Latvia.

Credit policies play an important role not only in Estonia as mentioned above but also in Latvia and Lithuania. Due to a lack of clearly defined property rights, farmers are missing collaterals. In addition, a rural financial system that would enable saving and financing has still not been organised. This is regarded as a major impediment for getting working and investment capital into agriculture and thus for the progress of the agricultural sector. To overcome these obstacles all Baltic countries have implemented some form of credit subsidy schemes. Support is given to agricultural producers in the form of interest rate subsidies, covering part of the investment costs and/or providing collateral.

Tax concessions provide another significant indirect support to agriculture, especially to family farming in all three Baltic states. These contain exemption from land tax and tax concessions on personal income and corporate profit tax. In Lithuania farmers and agricultural companies involved in primary farming also enjoy reduced road tax rates as well as reduced tariffs for electricity and natural gas.

There is no separate social security system for farmers in Estonia, Lithuania and Latvia. However, in Lithuania farmers enjoy a reduced rate of financial contribution to social insurance and health insurance funds.

2.2 Factor Endowment and Climatic Conditions

Already the standard theory of trade stresses the importance of factor endowment of a country for its competitiveness. New approaches, however, do not just consider a nation´s stock of basic production factors such as labour, land, capital, natural resources and infrastructure as crucial for its competitive position but more important qualitative aspects. Human capital is sometimes considered to be the most important production factor for gaining and maintaining international competitiveness (Porter, 1990, p. 80, Gahlen et al., 1986, p. 141; Horn, 1985, p. 327).

The much higher ratio of land to inhabitant can be seen as an advantage for the Baltic states agricultural sector compared to this sector in the EU. With respect to the indicator hectare of agricultural land per caput, these countries have almost a 200 % higher resource capacity than the EU-15. While this ratio is equal to 0.96 in the Baltic countries it equals 0.37 in the EU. With respect to the indicator hectares of arable land per caput this relationship is even more favourable (0.65 in the Baltic states compared to 0.21 in the EU).

Besides size, the quality of land also affects the location advantage of a country. In all three Baltic countries soil quality is rather poor (see Table 1). In Estonia about 80% of agricultural land, all but the central part of the country, is shallow and stony, and about 60 % of it is drained. Main soils in Lithuania are also not of a high productivity. About 45% of Lithuanian soils have pH values of less than 5.5 and require periodic liming. Outdated, wasteful cultivation practices, and drainage disrepair[5] have led to a further deterioration of soil fertility, increasing weed incidence and plant disease, and increased susceptibility to wind erosion (Boruks, 1996). In Latvia the fertility of the soils is relatively poor as well.

Table 1: Key Climatic and Soil Factors in the Baltics

Country	Latvia	Estonia	Lithuania
Aggregate active temperatures, above 10 C, in average	1850	1780	2150
Vegetation period, (days/year)	180	176	190
Uneven surface, (% of total area)	33	6	30
% of eroded soils	15	4	13
Reclamation fund, under drainage (%)	86	47	78
Average estimate of agricultural land in points	38	40	44

Source: Boruks, A., (1996): Common Agricultural Market in the Baltic states. In 'Lauku avîze, September 17, 1996.

[5] Large parts of agricultural land in the Baltic states was drained to avoid the excess moisture. Partly due to current fragmentation of land ownership, delays with the land title registration process and the slow development of land market, maintenance and reconstruction of drainage systems as well as other land reclamation activities become difficult to carry out.

The climatic conditions in the three Baltic countries differ, which also results in differences in the structure of agricultural production. Table 1 reveals that besides the soil, the climate conditions for intensive agriculture are also not very favourable in the Baltic countries. The short growing season, in particular, presents a considerable problem in reaching high yields of grain and forage maize, fruits and vegetables. This problem is especially pronounced in Estonia, while it is of less relevance in Lithuania.

Additional disadvantages are the relatively much higher costs for capital, the low quality of the fodder, the lack of management skills and market orientation, the use of outdated technology, and the fact that, in general, labour, breed and seed productivity is inferior to that in the EU. However, the abundant endowment with land is not the only advantage the Baltic countries have in the factor conditions compared to Western Europe. Additional advantages are the much lower wages and energy prices as well as lower feed costs.

2.3 Farm Structure and Management

Restitution was the main instrument for the settlement of private property rights in agriculture in the Baltic countries. If restitution of original property was not possible or desired by the former owners, compensation was to be offered instead and could take the form either of a transfer of equivalent physical property or of payment in vouchers.

While the process of restitution is still going on in Latvia and Lithuania, it has reached its final stage in Estonia. However, this does not imply that all land is private again in Estonia. Due to the low interest in agricultural land, only about 25% was claimed to be restituted in kind. As of January 1, 1998 80% of this claimed land is registered in the cadastre and received a title. Thus a significant part of Estonia's agricultural land is still property of the state (Loko and Sepp, 1998, pp. 28). This land is awaiting final disposition, and it is rented to farms on short-term contracts.

In all Baltic countries family farm and household plots account for the majority of agricultural land use amounting as of January 1st 1996 to 52.1% in Estonia, 84% in Latvia and 64.7% in Lithuania.

The emerging farm structure in the three Baltic countries is rather mixed. Farms are especially fragmented in Lithuania, where the average size of family farms amounted to only 7.8 ha in 1996. The average size of family farms is somewhat higher in Latvia and Estonia, reaching 20 ha and 21 ha, respectively. So far, Estonia, particularly, has avoided an excessive land fragmentation. About 60 % of agricultural land is operated by farms of more than 100 hectares. This is a positive factor which may create favourable conditions for productivity growth and increased international competitiveness. A much better utilisation of economies of scale will therefore be possible in Estonia compared to the other two Baltic countries and compared to most farms in Western Europe.

One of the major structural deficiency having quite some negative impact on competitiveness of agriculture in the three Baltic countries is the lack of a well-functioning land market. This is especially due to the fact that the process of land

registration is lengthy. However, without title to their land, it is hard to expect farms to attract investments. This situation prevents smaller production units from becoming larger and thus be able to utilise economies of scale. The restructuring process of the large scale farms is hampered as well due to this situation, since they are not able to obtain necessary investments to become more efficient and competitive in international markets.

2.4 Input Supply, Processing and Distribution

An important determinant of the competitiveness of a certain sector is the existence of international competitive up- and downstream sectors (Porter, 1990, S. 100ff.). In the former Soviet Union, especially, the downstream sector was the weakest link in the whole food chain, receiving the least amount of investment resources. This in turn led to a poor quality of processed foodstuffs. Moreover, both up- and downstream industries were characterised by monopolistic structures.

Unlike in agricultural primary production, the suppliers of inputs, the food processing enterprises and the food distribution sector were mostly privatised by tender, by public or restricted auction, or by a public offer for sale of shares through the stock exchange. Co-operatives formed by those who use inputs produced by the upstream sector or who produce agricultural products for processing were given preferential treatment in the acquisition of upstream and downstream enterprises.

In the agricultural upstream sector there has also been a growing trend towards specialisation and diversification of services. Along with greater competition due to the increasing number of firms this trend could increase the competitiveness of agriculture through cheaper and more diverse inputs. However, this also depends on improved qualities of inputs. In this regard more efforts are still needed.

In Latvia and in Estonia, the privatisation of the food processing industry is almost completed and has led to an increasing number of firms and thus contributed to the development of a competitive environment in the sector. The applied privatisation method in the Baltics, giving, in most food sectors, preference to producer co-operatives, could have a negative impact on efficiency improvement of the processing enterprises because agricultural producers generally lack financial resources, and technical, marketing and business skills. Moreover this policy may also have contributed to the lesser amount of foreign investment in this sector. Other factors which indicate a relatively low level of competitiveness of these sectors are the increase in labour costs, the use of outdated technology and the considerable over-capacities due to the sharp decline in demand for food. This results in negative consequences also for agriculture of the Baltic countries.

In the former Soviet Union marketing infrastructure was poorly developed. Agricultural products were in general supplied directly by farms to the food industry. The distribution of processed products was managed by state owned companies (see e.g. OECD/CCET, 1996b, p.64). After 1990 the food trading system was completely overhauled in the Baltics both as regards its ownership structure and the range of products traded. In Estonia especially, a great variety of stores and enterprises have emerged such as discount shops, purchasing associations of independent retailers, franchises and cash and carry units. In addition distribution methods have improved considerably. Liberalisation, especially of the food retail

sector, opened up opportunities for many new private entrants leading to less concentration. However, although the total number of traders is in many cases very large, the sector is often dominated by a few leading companies (see e.g. OECD/CCET, 1996b, p.86). High processing and distribution margins, especially in Latvia and Lithuania indicate, that the distribution network is still not sufficiently developed (e.g. too few wholesale markets). Also, institutions to help entering export markets are still missing or insufficient.

2.5 Scale and Quality of Consumer Market

Considering the demand conditions in the Baltic states, a negative influence on the competitiveness of the agricultural and food sector has to be stated. This is due to two reasons. First, the purchasing power of the Baltic consumer markets is low. Therefore the quantity of products that can be sold on the domestic markets is relatively small and the product structure consists mainly of basic food items.

However, the quantity constraint will be reduced and thus the Baltics will very likely be able to better utilise economies of scale in the future. This is due to three reasons: First, all three countries show increasing real GDP growth rates during the last years. This trend is assumed to continue. Second, the Baltic Free Trade Agreement signed by Estonia, Latvia and Lithuania has enlarged the markets for the respective firms and, third, with an EU accession the market will increase even further.

In addition to the static efficiencies determined by the quantity of home demand, the dynamic efficiencies due to the quality of home demand imposes a disadvantage as well. A critical and anticipatory home market often leads to a high level of innovation thereby, in general, upgrading competitive advantage. Since consumer preferences were of little relevance in the socialist system this also has its impact on consumer behaviour in these countries today. For this reason and also due to lower income levels, consumers in the Baltic countries are less sophisticated compared to those in West European countries.

The discussion so far reveals that agriculture in the Baltic countries is faced with advantages and opportunities but also with many problems and deficiencies. An aggregation of those advantages and disadvantages is not possible. This holds even more so given the fact that in the concept of international competitiveness only relative changes are of relevance. Thus, to get an idea with respect to the international competitiveness of the agricultural and food sector in the Baltic countries, it is necessary to estimate it with the help of indicators.

3. Ex Post Analysis of Competitive Performance

Several approaches are used for analysing the past performance of competitiveness. The most important ones are accounting methods like production costs or gross margins (profitability), market share indicators, foreign direct investments and the real exchange rate. They differ widely in their methodology and data used. This sections summarises some results with respect to those four indicators.

3.1 A comparison of profitability indicators

Profitability of producing a commodity is one way to measure competitiveness. In calculating this indicator the quantities of all inputs and outputs as well as their prices are accounted for. This provides detailed farm level information which offers useful insights with respect to future developments of competitiveness.

On the other hand, this approach has also shortcomings (Frohberg and Hartmann, 1997). Among others, this includes assessing the value of those fixed factors for which market prices are difficult to be obtained and selecting appropriate farms and technologies. If the comparison of farm level indicators of competitiveness is to be a useful exercise, these measures must be representative of all farms for which the comparison shall be valid. Results calculated for special farms are often not very indicative for a broad group.

As profitability indicators gross margins are commonly used. In this study, gross margins of type II and type III are employed which relate to each other in the following way:

Total returns, in ECU per animal or ha
- Total operating costs, in ECU per animal or ha
= Gross margin I, in ECU per animal or ha
- Labour costs, in ECU per animal or ha
= Gross margin II, in ECU per animal or ha
and
Gross margin I, in ECU per animal or ha
÷ Labour requirement, in hours per animal or ha
= Gross margin III, in ECU per hour

In agriculture, production processes mostly yield more than a single product. Gross margins are calculated for such processes. Alternatively, one might contrast revenues and total production costs of only the main commodity of a production process. The latter concept is used also in this analysis. One of the advantages of this indicator is that it can be compared with prices received by farmers. Total production costs of a main commodity are derived as follows:

Operating costs
+ Labour costs
+ Fixed costs
= Total costs of the production process
- Value of by-products
= Total production costs of the main commodity

Profitability indicators discussed in this section only measure competitiveness at farm level. They exclude costs of processing, marketing and distribution. Since primary commodities need at least some marketing and distribution, competitiveness is likely to be affected by the downstream activities.[6] Hence, these indicators do not

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[6] Transportation costs account for a substantial share of production costs. Especially in countries which are spatially large and land locked efficient transportation systems are a very important factor for determining competitiveness.

provide a complete indication at how well a country will be able to compete at various levels of processing and marketing.

For the calculations of profitability indicators for the Baltic countries production technologies as well as yield levels are assumed that have been adapted by the most efficient quarter of this kind of farm in the mid 90s. In other words, on the average, production costs might be somewhat higher and gross margins somewhat lower in the Baltic countries than those shown in the current analysis. An appropriate choice of farms for which profitability indicators are to be calculated is very difficult in transition economies because of the rapidly changing farm structure. The data used in the calculations for Estonia and Latvia refer to 1996. Lithuanian data are from 1995.

For comparison, production costs are also provided for Poland, Hungary and Germany. Finland and Sweden are added to contrast producer prices and gross margins with two Northern countries of the EU. For Finland, the calculations describe the gross margins of family farms in Southern Finland (Association of Rural Advisory Centres, 1996) and for Sweden of family farms in the Stockholm region (Agricultural University of Sweden, 1996). Farm subsidies and value added taxes were not taken into account in the calculations. This is likely to introduce some bias since, especially in Finland, transfer payments represent a substantial share of farm income. In 1997, 42 % of total returns to agriculture consisted of such payments.

A detailed description of the numerous assumptions made in the data collection and preparation is beyond the current study. The interested reader is referred to Kämäräinen, J. et al., 1998. Only a few but important assumptions are stated in the following. In milk production, a typical feed ration was chosen. Considerable differences exist in milk prices received by farmers. For example, in Estonia the price small farms commonly receive is approximately 30 % lower than that of large farms. In this analysis, the price large farms get was used. Another problem arises regarding quality differences in milk. For Estonia, an average milk price was determined assuming 85 % of milk has premium quality, 14.5 % belongs to first and 0.5 % to the second class. An average quality was assumed for the other two Baltic countries. Fixed costs have been valued for 40 cows in a new cow shed. Depreciation of the cow shed has been calculated as to write off the book value over 15 years. Appliances considered cover milking machines as well as air conditioning and manure removing systems.

Profitability calculations of beef production are carried out for a male animal of a dairy breed. The calculations describe relatively extensive husbandry consisting mainly of pasture feeding. The period of fattening is about 15 months. In Estonia and Lithuania, beef cattle is grown to 225 kg slaughter weight and in Latvia to 240 kg.

Profitability indicators of pork production are calculated under the assumption that the operation is set up for 150 pigs to be fattened. The feed ration is a combination of fodder grain and protein concentrate. In Estonia and Latvia, pigs are fattened from 12 kg live weight to 70 kg slaughter weight. In Lithuania, they are fattened from 12 kg live weight to 80 kg slaughter weight.

In crop production, fixed costs consist of land tax, insurance and management as well as overhead costs. Tractor and harvester costs are evaluated according to

customs work. Consequently, operating costs include those for labour involved in tractor and harvester work. Thus, these activities are not part of labour costs. For profitability of potato production it is assumed that 67 % of output is used for human consumption and the remaining part for feeding. Labour is valued according to an average salary of farm workers which includes social security payments and taxes (for example, 33 % in Estonia).

Table 2 depicts production costs for the Baltic countries as well as Poland, Hungary and Germany. In Latvia, costs of milk production are 30 % higher than in Estonia and Lithuania which may be explained by differences in milk yield. Producer prices of milk exceed production costs only in Estonia but not in the other two Baltic countries. When compared with production costs in Poland and Hungary, milk production in the Baltics has a slight competitive advantage. The main reason is their low fodder price, especially of pasture (Kämäräinen et al. 1998; Laurila 1997). Production costs of milk are also not covered by the price farmers in Poland and Germany receive for milk. If all transfer payments, however, were included in determining revenues, this result might be different.

As can be seen from Table , both Poland and Hungary are more cost efficient in beef and pork production than the Baltic countries. Furthermore, Poland is the cheapest potato producer among all countries considered. This holds for Hungary with respect to barley. The ranking of all other products cannot be that clearly distinguished. Interestingly, the Baltics produce sugar beets cheaper than Poland and Hungary with the exception of Estonia whose costs exceed those of Hungary. A similar pattern emerges for rape seed. Production costs of all Baltics are below those of Poland and Lithuania's costs are even slightly below those of Hungary. Based on production costs Germany has hardly a competitive advantage among these countries.

Table 2: Production costs in 1996 (1995 for Lithuania), in ECU per ton

Product	Estonia	Latvia	Lithuania	Poland	Hungary	Germany
Milk	136	170	143	150	180	330
Beef	1390	1570	1220	750	920	1980
Pigmeat	1330	1070	960	790	740	1170
Wheat	76	86	57	130	60	100
Rye	88	100	88	150		120
Barley	73	86	63	150	50	110
Oats	68	88	61			
Rape seed	132	180	128	230	130	210
Potatoes	102	53	110	30	130	110
Sugar beet	24	16	14	30	20	30

Source: Kämäräinen et al. (1998); Miglavs, A. and R. Snuka, (1997); Wissenschaftlicher Beirat beim Bundesministerium für Ernährung, Landwirtschaft und Forsten, (1997), Tabelle 3.8.

In the Baltic countries, producer prices of beef are only half that of Finland and Sweden. In Estonia, the producer price is roughly equal to production costs whereas

in Latvia, beef production is not profitable. In Lithuania, the producer price exceeds production costs.

Table 3: Producer prices in 1996 (1995 for Lithuania), in ECU per ton

Product	Estonia	Latvia	Lithua-nia	Finland	Sweden	Poland	Hun-gary	Ger-many
Milk	186	150	117	321	373	145	187	309
Beef	1360	1240	1338	2610	2750	1471	1470	1253
Pigmeat	1260	1630	1174	1480	1440	1142	1160	1142
Wheat	116	138	86	140	140	148	128	129
Rye	116	111	67	141	129			109
Barley	103	103	67	112	129	112	119	164
Oats	97	103	76	114	126			115
Rape seed	194	168	153	208		246	191	170
Potatoes	162	73	153	106		45		146
Sugar beet	29	36	27	58		27	24	49

Source: Kämäräinen et al. (1998) for Finland and Sweden, for the remaining countries see Table 2.

The producer price of pigmeat in Latvia is higher than in any other country included in the comparison - which also holds for Finland and Sweden. The production costs exceeds the producer price in Estonia whereas in Lithuania and especially in Latvia, production of pigmeat is profitable.

Table 4 depicts gross margins for the Baltics, Finland and Sweden. Contrary to the Baltic countries, labour costs for Finland and Sweden also include tractor and harvester work which in the former states are not part of the operating costs of crops. Consequently, the gross margins of type III are not comparable and are not listed for Finland and Sweden.

Table 4: Gross margins in 1996 (1995 for Lithuania)

Product	Gross margin II, ECU per animal or ha					Gross margin III, ECU per hour				
	Esto-nia	Lat-via	Lithu-ania	Fin-land	Swe-den	Esto-nia	Lat-via	Lithu-ania	Fin-land	Swe-den
Milk	359	113	-19	280	445	5	3	1	11	21
Beef	29	-43	48	-349	102	2	0	3	-3	23
Pigmeat	8	46	32	-23	-10	2	9	5	-14	-10
Wheat	171	288	131	-26	215	58	98	41		
Rye	108	82	-58	-162	58	37	29	-18		
Barley	113	105	18	-49	139	39	37	7		
Oats	109	87	59	49	103	37	31	21		
Rape seed	123	3	50			42	3	18		
Potatoes	1122	201	1066			141	27	134		
Sugar beet	155	852	539			10	52	33		

Source: Kämäräinen et al. 1998 for Finland and Sweden, for the remaining countries see Table 2.

Among the Baltic countries, gross margins of type II are highest for almost all products in Estonia.[7] The exceptions are pork and sugar beet compared to both Latvia and Lithuania, wheat compared to Latvia and beef relative to Lithuania. A comparison with Finland is not very indicative its her margins are negative except for milk and oats.[8] For the former, Estonia enjoys higher gross margins than Finland and the other two Baltics lower ones. Lithuania has even negative gross margins II for milk. For oats, all Baltic countries have higher ones than Finland. Sweden enjoys, for almost all products, higher gross margins II than any other country considered.

Gross margins of type III reflect the difference between total revenues and total operating costs and are based on a working hour. Most of them are positive for almost all commodities and countries shown in Table 4. Rye in Lithuania as well as beef and pork in Finland and pork in Sweden are the exceptions. For six out of ten commodities Estonia enjoys higher values of this indicator than both Latvia and Lithuania, pointing toward a relative high labour productivity. A comparison is not very revealing for beef and pork with Finland and pork with Sweden because the operating costs are not even covered by total revenue. For the remaining livestock products Finland and Sweden enjoy higher gross margins III than the Baltic countries.

Among the indicators, production costs reveal a competitive edge better than gross margins. This is due to the widely different farm prices prevailing in the countries used in this comparison. Therefore, a policy change may alter the ranking based on gross margins rather drastically. In general, the comparison indicates that milk is the product for which the Baltics reach the highest level of competitiveness.

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[7] Some of the gross margins II are even negative in Latvia and Lithuania.

[8] Again, as mentioned earlier, this is largely an outcome that transfer payments are not included in the revenues.

3.2 Market Share Indicators

3.2.1 Revealed Comparative Advantage in Trade

A host of different indicators are used in the literature to measure competitiveness based on market information. These include e.g. production, export as well as import shares for the agricultural and food sectors in total and/or for selected agricultural products. The calculation of these very simple indicators seems to be less appropriate to measure competitiveness since competitiveness is a relative measure. Absolute production and market shares thus say little about the competitive position of a sector/sub-sector in an economy. For this, it needs to be calculated relative to other sectors. This is done in more comprehensive measures of international competitiveness (see e.g. Balassa, 1989; Vollrath, 1991) such as the

- Revealed Comparative Advantage Export Index (XCA);
- Revealed Import Penetration Index (MP).

The Revealed Comparative Advantage Export Index (Import Penetration Index) is defined as a country's export share (import share) in the world market with respect to the considered product category as a percentage of a country's world export share (import share) with respect to all commodities. The level of this measure indicates the degree of competitiveness. Values for XCA (MP) above unity suggest that the country has a comparative advantage (comparative disadvantage) in the considered product category, values below unity reveal comparative disadvantages (comparative advantage).

An extension of the XCA is the Index of Revealed Relative Export Advantage (RXA). Similarly, the MP has been further developed into the Index of Revealed Relative Import Penetration (RMP). Both additional indexes were first used by Vollrath. The extension introduced by Vollrath avoids double counting. Thus, instead of relating the exports or imports to all products, it is compared to all products but the commodity considered. The same holds with respect to the country. Instead of relating the products to all countries, they are compared to all countries but the one under consideration (see equations 1 and 2). This distinction is especially meaningful if the country is fairly important on international markets and/or the commodity group considered is highly significant in total trade. In these cases a true comparative analysis is not possible using XCA and MP and RXA and RMP should be chosen as being the more appropriate indicators.[9]

$$(1) \qquad RXA_{ij} = (X_{ij} / \sum_{l,l\neq j} X_{il}) / (\sum_{k,k\neq i} X_{kj} / \sum_{k,k\neq i} \sum_{l,l\neq j} X_{kl})$$

$$(2) \qquad RMP_{ij} = (M_{ij} / \sum_{l,l\neq j} M_{il}) / (\sum_{k,k\neq i} M_{kj} / \sum_{k,k\neq i} \sum_{l,l\neq j} M_{kl})$$

More complex than the indicators mentioned above is, however, the Relative Trade Advantage Index (RTA) given in equation (3). It is defined as the difference of the RXA and the RMP. This indicator implicitly weights revealed competitive advantage by the relative importance of relative export and relative import advantage and thus

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[9] At this point it should, however, be noted, that the RXA and the RMP have the disadvantage that the basis varies between different countries.

is not dominated by extremely small export or import values of the specific commodity.

(3) $$RTA_{ij} = RXA_{ij} - RMP_{ij}$$

While the indexes XCA and RXA as well the MP and RMP are exclusively calculated on the ground of either export or import values, the RTA considers both export and import activities.[10] From the point of view of trade theory, this seems to be an advantage. Due to the growth in intra-industry and/or entrepot trade, this aspect is becoming increasingly important (Frohberg and Hartmann, 1997).

The significance of using an indicator that considers exports and imports simultaneously can be easily demonstrated with an example. The RXA value for chocolate reveals a value of 3.1 in 1996 in Estonia, thus indicating a high level of competitiveness for this product. However, the RTA value only amounts to -2.8, thereby pointing towards a lack of competitiveness for this product. What is the reason for these contradicting results? The answer is rather obvious. Intra-Industry Trade was important in the Estonian chocolate market in 1996, amounting to 57 %. Although Estonia exported quite large quantities of chocolate it was even a more important importer of this commodity, as is revealed by the high relative import penetration value of 5.9. Therefore, in considering both exports and imports the RTA is a much better and more comprehensive measure of competitiveness.

Besides the more structural problems these indexes have, they are to be interpreted with care due to numerical problems. E.g. in the case that trade in one product is carried out by only one country the index is undefined. Though such examples are extreme cases they nevertheless might occur. A further problem arises with the indexes shown due to the fact that they are not bound from both sides; the RXA not from above and the RMP not from below. The RTA even is not bound from above and below. Being unbounded makes them more difficult to be interpreted.

Finally, it has to be pointed out that market share indicators measure competitiveness only on the grounds of observed, and possibly distorted, market data. Thus, by interpreting the indicators, such intervention needs to be taken into account. Especially in the agrofood sector, trade is considerably hampered by tariff and non-tariff trade measures, with the effect of reducing the exchange between countries.

RXAs, RMPs and RTAs have been calculated for all three Baltic countries and the EU-15 for 39 agricultural raw and processed products/product groups. As a reference product group in the analysis all merchandise trade excluding the respective product has been used; the reference country group is the world excluding the respective country. The indices have been calculated for 1994 to 1996. Strong statistical irregularities were prevalent at the beginning of the transition

[10] This also holds for the net export index developed by Balassa (Balassa, 1989, p. 81). Although this indicator is often used in studies of competitiveness, it gives more a hint with respect to intra-industry trade of a sector. In fact it is very similar to the Grubel-Loyd index of intra-industry trade. As a measure of competitiveness it seems not suitable for the same reasons already mentioned with respect to absolute export shares, production shares or cost measures. All those measures do not take into consideration that competitiveness is a relative issue and can not be measured by absolute indicators.

period. These very likely also include the year 1994. For this reason Table 5 only summarises the results of the RTA for 1995 and 1996. The discussion concentrates on the RTA, since this index implicitly covers the other two already.

The RTA values show a quite heterogeneous but not unexpected picture. Table 5 reveals that for most animal products the indicator is higher than for crops or for processed crop products. This very general result might be explained by the unfavourable climatic and soil conditions in the Baltic countries. Therefore, crop production has a natural comparative disadvantage; e.g. in Estonia the poor climatic condition limit the production of winter crops and also the quality of some crops (see also section 2.2). In the past, most grains could only be used for feed in Estonia and Latvia since they are less suitable for human consumption (OECD/CCET, 1996c, p. 102). Although this has changed for Latvia due to the introduction of new varieties, it still holds for Estonia.

Especially high positive RTA values are revealed in Table 5 for milk products in Estonia and Lithuania but also in Latvia. This result can be explained with the high percentage of pasture land in total agricultural land. The negative, albeit small, value for fresh milk by high positive values especially for the processed milk products, dry milk and butter in Estonia suggests that this most northern country obviously imports fresh milk that is processed in the local dairy industry. This indicates that the Estonian dairy industry must be very competitive compared to the respective industry in the neighbouring countries. The EU possesses, as well, a revealed competitive advantage for milk and processed milk products. This latter result is mainly the outcome of the high protection for this product in the EU.

Beef and veal in the Baltic countries is mainly produced from dairy cattle. For bovine cattle as well as beef and veal positive RTA values were calculated for all three Baltic states in the years 1994[11] and 1995, but for Latvia in 1995. However, in 1996 the RTA values for beef and veal also turned negative in Estonia. Low prices for beef combined with high feed prices have forced farmers in Estonia to kill new borne male calves. In general this is done at the age of a few weeks to secure that the fur of the animals can be used. Thus, in 1996, of the three Baltic countries only Lithuania reveals positive RTA values for bovine cattle (0.6) as well as for beef and veal (2.6). Also for other animals, meat and meat products, Lithuania seems to be competitive. Small negative values are only unveiled for pigmeat. The revealed trade advantage is less pronounced for Estonia and Latvia; an exception is sausages. All Baltic countries seem to be highly competitive in the production of this product. The EU reveals as well positive RTA values for most livestock, meat and meat products. In the case of the EU the only exception is sheep and goats as well as the meat of these animals.

[11] However, numbers for 1994 are not revealed in Table 5 due to the general data problems discussed above for the years up to 1994.

Table 5: Measuring Comparative Advantage in the Baltic Countries and the EU based on the Relative Trade Advantage Index (RTA)[1] in 1995 and 1996

	Estonia		Latvia		Lithuania		EU-15	
	1995	1996	1995	1996	1995	1996	1995	1996
Live Animals								
Bovine cattle	0,1	0,0	-0,4	0,0	0,6	0,6	0,6	0,4
Sheep & goats	0,1	0,1	0,0	0,0	0,0	0,0	-0,2	-0,2
Pigs	0,7	0,3	-1,1	0,0	0,4	0,3	0,2	-0,1
Meat and Meat Products								
Beef & veal	0,3	-2,2	-0,1	-0,1	1,6	2,6	0,1	1,9
Mutton & goat	0,0	0,0	0,0	0,0	0,0	0,0	-2,0	-2,3
Pigmeat	-0,5	-4,0	-0,6	-1,9	-0,1	-0,2	1,4	0,3
Bacon & ham	0,3	-0,1	-0,2	-0,6	0,0	0,0	2,9	4,7
Sausages	2,5	2,7	2,1	6,9	3,8	1,2	2,2	1,0
Meat, prepared	8,4	-1,2	5,2	0,1	1,9	3,7	0,5	0,3
Poultry meat	-0,9	-3,1	-0,2	-0,3	0,8	0,5	0,2	0,0
Eggs in shell	-0,1	0,9	-0,1	0,0	4,0	2,7	1,1	0,9
Milk and Milk Products								
Milk, fresh	-0,4	-0,1	2,0	1,7	1,1	0,9	9,4	5,0
Milk, dry	13,0	17,8	0,2	0,5	22,3	21,5	1,7	1,5
Butter	15,7	19,3	2,3	3,9	18,2	15,6	1,5	0,0
Cheese	1,7	2,7	2,1	1,5	4,3	3,4	3,8	3,9
Crops								
Wheat	-0,1	-0,2	-0,7	-1,8	-0,5	-0,3	0,2	0,2
Barley	-2,5	-7,4	-0,4	-2,3	-2,2	-1,2	1,2	0,9
Rye	-5,2	-3,4	11,7	-21,7	1,9	1,4	9,6	11,0
Potatoes	0,6	-0,5	-0,6	-0,5	0,2	0,3	0,2	-0,1
Sugar	-1,9	-2,4	-1,6	-2,3	-1,5	-1,1	0,2	0,1
Tomatoes	-1,5	-1,5	-0,9	-0,3	-0,2	-0,1	0,0	0,6
Onions	-1,6	-1,2	-4,2	-1,7	-2,0	-0,5	-0,1	0,0
Apples	-2,0	-2,3	-2,5	-1,3	0,9	0,2	-0,4	-0,7
Grapes	-0,9	-1,4	-0,8	-1,0	-0,5	-0,5	-0,3	-0,4
Rape/mustardseed	1,8	2,8	0,3	0,2	2,6	0,8	-0,8	0,1
Soybeans	-0,1	-0,2	0,0	0,0	0,0	0,0	-1,5	-1,2
Sunflower seed	-0,2	-0,8	-0,9	-0,9	0,2	0,5	-3,6	-3,7
Processed Crops								
Wheat flour	-5,5	-7,1	0,0	-0,1	0,1	0,2	1,8	1,7
Soybean oil	-0,4	-0,6	-0,1	-0,2	0,0	0,0	0,2	0,3
Sunflowerseed oil	-1,4	-0,8	-4,8	-3,5	2,4	1,8	0,2	0,4
Rape/mustard oil	-8,7	-11,7	-3,8	-6,1	3,4	3,5	2,2	1,9
Margarine	-9,1	-13,3	-4,4	-3,7	12,8	10,2	1,9	1,7
Soybean cakes	-0,5	-0,3	-0,4	-0,1	-3,0	-1,6	-1,4	-1,3
Sunflower cakes	-4,1	-8,3	-0,6	-1,1	-3,3	-1,7	-5,3	-6,1
Rapeseed cakes	0,0	0,0	0,0	0,0	0,0	0,0	-0,8	-0,8
Wine	-1,8	-2,2	-0,9	-0,4	-1,5	-0,2	6,2	4,5
Beer	-1,4	-2,0	-0,9	-0,5	-1,7	-1,1	1,7	1,8
Chocolate	-0,9	-2,8	2,0	1,1	8,2	6,7	2,9	2,2
Other Agric. Prod.	-0,7	-1,3	-0,1	-0,4	-1,2	0,3	-0,2	-0,3
Non Agric. Prod.	0,1	0,2	0,7	0,9	-0,7	-0,7	0,2	0,1

1) The reference product (country) group is all merchandise trade (the world), but the considered product (country).

Source: Own Calculation based on Data from FAO (ed., 1998), FAOSTAT.

For the year 1996 Table 5 shows that the RTA values are negative for all crops except rapeseed in Estonia and Latvia. The extreme difference in the RTA values for rye in Latvia between 1995 and 1996 must surprise. The explanation for these numbers is as follows. In 1993, large amounts of rye were imported from Finland on a concessionary basis. As a consequence huge stocks of rye were accumulated and prices dropped. However, rye stocks could not be used for food requirements and thus were reexported in 1994 and 1995. Due to the decline in prices, domestic production of high quality rye decreased leading to a deficit of high quality rye on the domestic market in 1996. That is why rye had to be imported that year. Given the small quantities of rye traded internationally, this development has resulted in such a large positive RTA value in 1995[12] and an even higher negative number in 1996.

With respect to crops the results are rather mixed for Lithuania. The analysis suggests that Lithuania possesses a revealed comparative advantage for rye, potatoes, sunflower seeds, rapeseed and apples while for all other crops a lack of competitiveness seems to be prevalent.

The EU reveals a comparative advantage for all considered grains, for sugar and for tomatoes while the examination indicates a lack of competitiveness especially for soybeans and sunflower seeds. While the RTA values are also negative for all oilcakes in the EU, positive values are revealed for the processed products oil and margarine. The latter might have two reasons. First, in this sector tariff escalation is a fact in the EU; thus the nominal and effective protection rates increase with the degree of processing. Second, productivity in the oil-processing industry seems to be quite high.

Also in Lithuania the RTA values for 1995 and 1996 hint at a competitive advantage in the production of vegetable oil and margarine (see Table 5). However they were negative in previous years. What is the explanation for this result? First of all the protection level for producing oilseeds is relatively high in Lithuania. While in 1996 (1995) the Producer Subsidy Equivalent amounted to 14% (6%), the respective number for oilseed was 41 (39) (OECD/CCET, 1997b). In addition, in 1994/1995 one oilseed crushing plant was modernized with the help of foreign direct investments and another one was newly built, improving the processing capacities in Lithuania and thus providing an additional incentive to farmers to grow oilseeds (OECD/CCET, 1996d, p. 99; Girgzdiene and Kuodys, 1998). The situation is somewhat different in Estonia and Latvia. Since there is a lack of oilseed pressing plants in both countries the raw products are in general exported, e.g. to Finland or Denmark for refining and the processed products are then re-exported.[13] Competitiveness is thus revealed in the analysis for the raw product rapeseed while the opposite holds for vegetable oils and margarine.

Also, with respect to all other processed crop products, a lack of competitiveness is revealed for Estonia and Latvia. An exception is chocolate in Latvia. This can be explained by the success of the well-known chocolate industry LAIMA in Latvia. In

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[12] The positive value for 1994 was even higher. The bulk of these exports took place in 1994 leading to a RTA value of above 100.

[13] Latvia has no oilseed crushing plant while Estonia has one plant that is, however, suitable only for basic processing (OECD/CCET, 1997, p. 194).

Lithuania the results are again rather mixed. For the EU competitiveness can be detected for all processed crop products but oilseed meals.

At this point it needs to be noted that the Baltic countries are in a transformation process which still implies strong shifts in competitiveness even from year to year. The results presented in this section thus have to be treated with caution, and can only be indicative for the competitive position of the Baltic agrofood sector in 1995 and 1996. This becomes obvious when looking at the coefficient of variation over the period 1994 to 1996. While the average coefficient of variation over all 39 agricultural product groups analysed amount to 0.4 for the EU, this coefficient equals 2.7 in the case of Estonia, 1.6 in the case of Latvia and is, in the extreme case of Lithuania, even 2.8.

3.2.2 Similarity in Trade and Trade Advantage

The competitiveness of the agricultural and food sector in the Baltic countries after accession to the EU very much depends on the similarity or complementary structure of agricultural trade advantages of these states with the EU. For this reason, the index of Overall Bilateral Complementarity in Trade Advantage (OBC) between the EU and each of the Baltic states is calculated. The OBC index is the negative correlation between the RTA-values of the respective Baltic Country and the corresponding numbers for the EU. The index ranges between -1 and 1. Negative values indicate a high competitiveness between the two regions, since advantages exist in the same product categories. In contrast, positive values point to a complementary relationship in the competitive structure. The results in Figure 1 reveal that agricultural trade of the EU on the one hand and Lithuania as well as Latvia on the other hand is more characterised by advantages in the same product categories thus indicating for this country a high level of competitiveness with the EU. [14]

For Estonia the OBC values are around zero in all three years. Thus, there is neither a clear indication that competitiveness nor that complementarity will determine the trade relationship between Estonia and the EU after the accession of the former to the EU.

As already discussed above, the EU Council of Ministers confirmed the proposal of the EU Commission to start negotiations for accession with the Czech Republic, Estonia, Hungary, Poland and Slovenia. Thus Estonia will be in the first round of member countries. This implies that for Estonia not only the complementarity or competitive in trade relations with the EU matters after the enlargement but also with the other new member countries (NewMCs), since free trade will hold in the enlarged Union of 21. The results in Figure 2 reveal that the OBC between Estonia and the NewMCs is negative in all cases in the years 1994 to 1996. The analysis reveals that competitiveness rather than complementarity will determine the trade relationship between Estonia on the one hand and the other NewMCs, namely the Czech Republic, Hungary, Poland and Slovenia after the accession of all five countries to the EU.

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[14] Since the extreme values for rye in Latvia are due to food aid and not comparative advantages they were excluded in this analysis.

Thus, while the EU will start membership negotiations with Estonia, Latvia and Lithuania will not be in the group of those countries that will enter the EU in the first round. The enlargement of the EU theoretically gives rise to two effects: trade creation and trade diversion. The latter could have negative repercussions for Latvia and Lithuania. This is likely to occur if the EU is of relevance as an export market for both countries. With 18% of all Lithuanian and 15% of all Latvian agricultural exports going to the EU in 1996, this region is of some importance as a destination for both countries exports. Trade diversion thus might occur if the NewMCs export the same type of commodities to the EU-15 as Lithuania and Latvia, and if trade barriers for exports of those products to the EU exist at the time of east enlargement. Where exports are not similar or European import tariffs are close to zero, there is little scope for trade diversion.

The level of protection given in the EU agricultural policy certainly varies considerably for different products. This aspect will be neglected here; the possibility that the first east accession may divert trade away from Latvia and Lithuania will be assessed exclusively on the basis of the degree of similarity in relative revealed export advantage between each of the NewMCs on the one hand and Latvia and Lithuania on the other hand to the EU. For this purpose the Similarity in Trade Advantage Index (STA) was calculated[15].

The STA is calculated in two steps. First, those products for which the respective Baltic country and a NewMCs possess a revealed comparative advantage to the EU are identified calculating the RXA (see equation 1 above). In a second step, the share of a country´s exports to the EU in which it has RXA values greater than 1 is calculated. It seems reasonable to assume that trade diversion is more likely to occur if a NewMC and a non-member country possess a competitive advantage in exports to the EU market for the same kind of products. The results in Figure 3 reveal that Latvia is especially affected by the accession of Estonia and Poland due to an overlap in competitive advantage in 60 % of her exports to the EU. Table 2 also shows a high overlap in the competitive advantage of Lithuanian trade to the EU with Poland, Slovenia and Estonia in 1996. Almost 80 % of exports from Lithuania to the EU may be exposed to increased competition from Poland.[16]

At this point it should be noted that the analysis so far can only give a first indication with respect to the possible repercussions of the first east enlargement on Latvia and Lithuania. Further studies also need to consider the post-accession level of EU protection expected on those markets where a high degree of similarity has been detected between NewMCs and the two Baltic countries, since trade divergence will take place on markets with a high level of EU protection.

3.3 Foreign Investments

Foreign investment is important not only as a source of capital but also as means of transferring foreign experience, technology and management skills. As to competitiveness, foreign direct investment can serve as an indicator for the

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[15] See also BRENTON, TOURDYEVA AND WHALLEY, 1997.

[16] For a more detailed discussion of the similarities in trade advantage between non-member countries and NewMCs see Bergschmidt and Hartmann, 1998.

attractiveness of a country for internationally mobile production factors (Horn, 1985, p. 326). [17]

Out of the three Baltic states Estonia is attracting most foreign direct investment (FDI) measured as stocks in 1996 in US$ per Capita. Total FDI inflows between 1991 and 1996 amounted to about US$ 799 million which was equivalent to an accumulated stock of FDI in 1996 of 507 US$ per capita (United Nations, 1997). In 1996 FDI inflows accounted for about 13% of GDP and thus were highest among transition economies. Macro economic stability, a favourable tax regime and well-managed privatisation tenders are some of the reasons for the sizeable inflow of foreign direct investment.

Interesting enough is that the smallest of the three Baltic countries has attracted the bulk of FDI. In general the small size of a market is seen as a major impediment for attracting FDI. Obviously, the favourable external conditions have overcompensated this limitation. Due to the establishment of the Baltic Free Trade Agreement, the market for foreign investors has increased which might result in an additional incentive for such investments in all three Baltic countries.

In general it should be noted that FDIs are not important for the primary sector while food processing has been able to attract a considerable part of those investments especially in Estonia and Latvia. Since agricultural and food trade policy are, especially in Estonia, very liberal, the motivation for FDI inflows is not to overcome trade barriers but seems to be the assumed competitive potential of the Estonian food industry.

3.4 Real Exchange Rate and Purchasing Power Parity

The nominal exchange rate is a measure of the price of one currency in terms of another one. For discussing competitiveness, however, developments in the real sphere of the economy are of relevance. This can be measured with the real exchange rate. In its most widely used definition the real exchange rate (E_r) is equal to the nominal one (E_n)- expressed in units of domestic currency per one unit of foreign currency - times the appropriate price deflator for the foreign currency (P_w) divided by the appropriate deflator for the domestic currency (P_d); i.e.

$$E_r = E_n * \frac{P_w}{P_d}$$

Another definition of the real exchange rate is that it represents the relative price of two sets of goods; that of tradables to non-tradables. The latter may also be seen as the domestic production costs of non-tradables. An appreciation of the real exchange rate indicates an increase in production costs and therefore a loss in competitiveness[18].

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[17] However, one needs to differentiate with respect to FDIs. If a large part of such investments is primarily aimed at opening up foreign markets that can perhaps not be accessed through exports due to trade barriers, they mirror competitiveness of the donor country and not necessarily of the country or region attracting FDIs. Unfortunately, it is generally not easy to distinguish which of the two causes dominates.

[18] At this point, a note regarding the interpretation of the real exchange rate should be given. Changes in this indicator can be either a reflection or the cause of an improved or deteriorated

In adjusting nominal exchange rates for price differentials among countries, the Purchasing Power Parity (PPP), which is the ratio of an index of all goods at domestic prices to an index of the same basket of goods at foreign prices is widely used. The nominal exchange rate is defined as the ration of the PPP to the real exchange rate. Since calculating the PPP requires a considerable amount of information, it is often approximated by using some kind of a relative price index; e.g. the ratio of the domestic consumer price index (CPI) to that of the foreign country. Instead of using the domestic and the foreign CPI, the corresponding food price indexes may also be used if one is interested in the competitiveness of agriculture. The major difference between using the PPP or the ratio of CPIs of two countries is that the former uses the same basket of goods in the numerator as well as in the denominator while the latter does not. The CPI is always based on the basket of consumption goods of that country for which it is calculated. Hence, if one takes the ratio of the domestic to the foreign CPI as deflator, one uses indexes each of which is aggregated by employing different weights.

Of substantial concern for economic development is the competitiveness of a country regarding its prices. This can be assessed with an index of real exchange rates. Such a measure shall include the bilateral rates of all or the most importing trade partners. One such index is the real effective exchange rate which is the arithmetically or geometrically weighted average of bilateral real exchange rates. Following most studies of this kind, the current analysis employs trade shares as weights. They reflect volumes of both exports and imports and are averaged over the years 1995 and 1996. It is common to hold the weights constant over time in obtaining the real effective exchange rate for different years (e.g. Poganietz, 1998). This procedure was undertaken here as well, since the necessary data determining the weights for each year was not easily available. [19]

Another concept of arriving at an index of a real exchange rate with regard to all trade partners is based on the currency basket approach. This method is used e.g. in calculating the European Currency Unit (ECU) and the Special Drawing Rights (SDR) of the International Monetary Fund (Gandolfo, 1995). The essential difference of this approach to the calculation of the effective exchange rate index is that the weights implicitly vary from period to period if the bilateral nominal exchange rates are not constant over time. In general, they increase for those countries against which the one analysed - in this case one of the Baltic countries - appreciates strongest in nominal terms.

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international competitiveness. If enterprises gain shares in domestic and foreign markets this will c.p. result in an appreciation of the domestic currency which will be reflected in the appropriate movement of the real exchange rate. The intensitity of variations in the real exchange rate is indicative of the extent of improvement or deterioration in international competitiveness. However, experience gained over the last decades reveals that changes in real exchange rates are very often more influenced by capital movements and their impact on the nominal exchange rate than by changes in basic conditions of the non-monetary part of the economy. Thus, to relate changes in the real exchange rate to modifications in international competitiveness is correct only if the causes of the variations are known (Horn, 1985, p. 326).

[19] Another reason often put forward for using constant weights is to ease the interpretation of effective exchange rate indexes. Keeping the weights constant reduces the causes of changes in such effective rates to just one; to aterations in exchange rates. Allowing weights to vary would add a factor of complication for interpreting such an index (Turner and Van't dack,, 1993, p.14). However, the authors of this paper do not agree to this reasoning since by using changing weight it would be possible to divide up the total real exchange rate effect in a structural and a performance effect, which would provide some additional and quite interesting information.

Table 6 shows the results of the two methods in arriving at an index of nominal exchange rates for the Baltic countries against those countries they trade with.[20] Numbers reported in columns headed (A) are based on the currency basket method and those in columns headed (B) on the effective exchange rate method; i.e. on the geometrically weighted average of the relevant bilateral nominal exchange rates. As major trade partners those countries were selected which have the largest shares in trade volume and together account for about 90 % of total agricultural trade in 1995 and 1996. For each of the Baltic countries 11 trade partners were selected in this way. These are for each of the Balics the other two Baltic states, some member countries of the EU, some additional ones from Central Europe associated with the EU, and three member countries of the Commonwealth of Independent States (CIS).[21]

The development of the nominal exchange rates is strongly affected by exchange rate policies the Baltic states pursue. In general, all three countries kept, and still continue to hold, their exchange rates constant against a basket of currencies or a single one; Estonia against the German Mark, Lithuania against the US$ and Latvia against the SDR. With these policies, they aim at reducing their inflation rates.

Comparing the results of 1992 with those of 1996 in Table 6, both methods indicate an appreciation of nominal exchange rates for all three countries. This is shown by the increase in both indexes. However, the level of appreciation differs substantially between the two methods. Relative to 1992 the appreciation of the Estonian Kroon in 1996 is 2.3 times stronger for the effective exchange rate (column (B)) than for the currency basket (column (A)). For Latvia this factor of appreciation differential between the two approaches is 3.6 and for Lithuania 3.2. What is the cause of this considerable divergency? First, it is to be noticed that the bilateral nominal exchange rates of the Baltics against all countries included in this analysis but the three members of the CIS remain relatively stable. However, they appreciated substantially against the currencies of Belarus, Russia and the Ukraine. This holds especially for the earlier years of transition, while the appreciation was somewhat more modest in later periods. In the nominal effective exchange rate index, these varying levels of bilateral appreciation are included with the same (trade share) weight. The index based on the currency basket method, however, implicitly increases the weight of those countries against which the corresponding Baltic country appreciates and vice versa. The index of the latter method, therefore, reflects, on the average, smaller appreciations than the index of the effective exchange rate. The differences in the two methods are especially pronounced in the current assessment because of the extreme divergence in the development of bilateral exchange rates considered.

Estonia may be used for an explanation. The index of nominal exchange rates is set equal to 100 in 1995[22]. Estonia appreciated against the two members of the GUS

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[20] The data collection and calculations of the exchange rate indexes for this table as well as Table 8 were carried out by Drs. Meinlschmidt and Poganietz of IAMO.

[21] Some of the countries selected are common for all Baltic states. These are the two other Baltic countries, Russia, Ukraine, Germany, the United Kingdom, the Netherlands and Denmark. In addition, some countries are included in the analysis of only one or two Baltic states. These are the following one: i) Finland, Italy and Sweden for Estonia; Poland, Sweden and Belgium for Latvia; and Poland, Italy and Belarus for Lithuania.

[22] This is the year for which the so-called quantities based on the trade shares were calculated.

from 1992 to 1996 leading to an implicit increase in the weights of these countries over that period. Since the weights were calculated for 1995 they implicitly decline from that year going back to 1992, the year in which the currencies of these two countries were still more valuable than in 1995. This kind of 'depreciation toward the past' of Estonia weighs not as strongly in the currency basket approach as in the calculation of the effective nominal exchange rate index.

Table 6: Indexes of nominal exchange rates of the Baltic countries with their main trade partners; using the concept of the currency basket (A) and the effective exchange rate (B), for the years 1992 to 1996, (1995 = 100)[1)]

year	Estonia		Latvia		Lithuania	
	(A)	(B)	(A)	(B)	(A)	(B)
1992	71.6	30.7	44.7	12.4	56.4	17.7
1993	79.7	58.1	53.6	34.6	60.0	38.8
1994	83.8	76.1	71.1	65.5	77.3	68.4
1995	100.0	100.0	100.0	100.0	100.0	100.0
1996	101.5	101.1	103.5	103.5	109.1	108.8

1) Values increasing over time indicate an appreciation

Source: Own calculations, based on data from: DIW Kooperationsbüro Osteuropa-Wirtschaftsforschung (1995); ZMP, (1995); IMF (1995); EU-Commission (1995); OECD (1995); Statistisches Bundesamt, (1995); OECD/CCET (1997a); Deutsche Bundesbank (1997).

In Table 7, the indexes of the real exchange rates are depicted.[23] They are arrived at by deflating the index of nominal exchange rates with the geometric mean of inflation differentials of the corresponding Baltic country to those trade partners used in determining the nominal exchange rate index.[24] As a measure of inflation the CPI in each country is used. The deflator represents the ratio of the CPI in the corresponding Baltic country to the geometric average of the CPIs of all trade partners.

For Estonia and Lithuania, the appreciation of the currency in real terms is smaller than in nominal terms. The opposite result is obtained for Latvia. This implies that the CPI increased stronger (less) in Latvia (Estonia and Lithuania) than the geometrically weighted average CPI of all trade partners.[25]

The two methods lead also to different interpretations regarding the overall development of the index of the real exchange rates. The smaller appreciation in nominal terms measured with the currency basket even results in a depreciation of the Estonia Kroon in real terms from 1993 to 1995. Only in 1996 is a rather modest appreciation shown. The other method indicates a strong appreciation also from

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[23] The results in Table 7 diverge from those presented in Frohberg and Glauch (1998). For the current analysis, more recent and reliable data for CPI and exchange rates have been available for Belarus, Russia and the Ukraine.

[24] For both indexes of nominal exchange rates the same deflator was used to arrive at the respective real exchange rate index.

[25] The weights are kept constant in calculating the geometric mean of the CPI.

1993 to 1995. For the other two Baltic countries these differences do not occur. Nevertheless, a wide divergence can be seen as well.[26] Lithuania appreciates especially in the first years considered in this analysis. Latvia indicates the strongest real appreciation among the Baltics. In particular, the index based on the real effective exchange rate depicts a very strong appreciation; an increase of more than 9 times from 1992 to 1996.

Table 7: Weighted average of real bilateral exchange rates of the Baltics with their main trade partners; using the concept of the currency basket (A) and the geometrically weighted average (B), for the years 1992 to 1996, (1995 = 100)[1)]

year	Estonia		Latvia		Lithuania	
	(A)	(B)	(A)	(B)	(A)	(B)
1992	100.2	43.0	42.5	11.8	71.3	22.3
1993	84.9	61.5	67.7	43.6	99.7	64.8
1994	86.6	78.6	80.4	74.1	98.1	87.3
1995	100.0	100.0	100.0	100.0	100.0	100.0
1996	113.0	112.6	111.4	111.4	115.9	110.9

[1)] Values increasing over time indicate an appreciation
Source: Own calculations, for data source see Table 6.

4. Conclusions

In this paper the major determinants of competitiveness in the agricultural and food sector in the Baltic states are discussed. Some empirical support to the arguments is also provided.

The results reveal that, although the endowment with agricultural land is very favourable in the Baltic countries, many other main determinants of competitiveness such as quality of soil, climatic conditions, input supply and quantity as well as quality of processing and distribution facilities and the scale and quality of the consumer market are major impediments for agriculture in these countries in gaining international competitiveness. While out of the three Baltic countries Estonia is most hampered by the unfavourable natural conditions compared to the other two states, it was rather successful in providing the necessary institutional framework for a speedy transition of the whole economy which is also beneficial for agriculture.

The values of the Relative Revealed Comparative Trade Indicator show that milk production in particular seems to have a competitive advantage while crop production appears to be less competitive in the Baltic states. This very general result can be explained with the unfavourable climatic and soil conditions for growing grain, oilseeds and sugar beets in the three northern countries. This result is partly supported by the profitability indexes. It is shown that production costs in the Baltic countries are, relative to Germany, especially low for milk and beef production, while

[26] The factor of divergence between the two methods, however, is the same as for the indexes of nominal exchange rates.

for some other products such as pork they are in all three Baltic countries higher than in Germany. The picture with respect to the gross margins is less clear.[27]

An extrapolation of the results presented is to be done with some caution since the Baltic states are in the process of restructuring and thus considerable intra- and intersectoral adjustments in the allocation of resource is still taking place. The annual variation in production and trade is still much higher than in other countries such as the EU. Although these limitations have to be taken into account, the presented figures can provide a first indication with respect to the level of competitiveness of the different product markets in the Baltic states. An answer with respect to the future competitiveness in the agricultural and food sector of the three northern association countries very much depends on the development of relative prices and technological changes and on the price and technology induced adjustments of the production structure. Those changes will occur already before, but also due to, the EU accession.

Following an EU accession it can be expected that output prices will go up initially relative to input prices. Prices of inputs traded freely on world markets will not adjust. However, those which are determined more or less by internal factors may rise. To the latter belong especially labour costs. The relative wage rate in Estonia, Latvia and Lithuania compared to Germany amounts only to less than 10% in the mid 90s, being by far the lowest in Lithuania. Thus, as time passes, labour costs are expected to increase since their low level currently observed will adjust toward those prevailing in the EU.[28] The explanation for this adjustment can be found in the Heckscher-Ohlin factor price equalisation theorem. If this is going to happen, labour intensive production techniques will gradually be replaced by those requiring a relatively high share of capital input. This will lead to an adjustment of production techniques toward those used in the EU.

The relative change among prices of crops and livestock will mainly depend on the adjustments in the EU agricultural policy prior to accession. However, given the fact that protection for non-ruminant meat is much higher in Latvia and Lithuania compared to the EU, there is good reason to believe that prices for these products will not rise but will decline (see Table 8). For Estonia this only holds for poultry meat in 1996. On the other hand, in all three Baltic countries grain prices might even rise if the CAP is reformed, thus putting a second source of relative disadvantage on non-ruminant meat products because this will increase costs of feeding grains which make up about 45% of total production costs of these commodities - though at the beginning a large percentage of starchy crops might be fed. With rising labour costs this is expected to become too costly and a gradual shift toward a larger share of feed grains in the feeding ratio can be expected.

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[27] At this point it should, however, be pointed out that the comparision of the results of the profitability indexes between countries although desirable is quite difficult. This is due to the fact that the base year and the methodology used in the different studies on profitability calculation differ. It is even more difficult to make a comparison of the profitability indexes to the RTA values obtained because of differences in the level of processing and marketing of the products considered. In addition, and possibly most important, the reference country/region differ. The profitability results are compared to Germany while the reference country group with respect to the RTA is the world excluding the considered country.

[28] Nevertheless, there is some eidence that factor prices, especially wages, will not adjust to the same amount as commodity prices. In the EU-15 there still exists large differences in wages.

Table 8: Comparison of Agricultural Protection in Agriculture in the EU and the Baltic Countries (1996)[1]

- Measured in Producer Subsidy Equivalents (PSE) -

	EU-15	Estonia	Latvia	Lithuania
Wheat	29	-1	6	18
Coarse Grain	41	10	4	19
Oilseeds	56	15	0	41
Sugar	54	-95	48	52
Crops	**37**	**8**	**7**	**21**
Milk	60	22	7	-6
Beef and Veal	68	-43	-31	-3
Pigmeat	9	-8	17	35
Poultry	26	43	33	48
Eggs	-1	-6	16	2
Livestock Production	**46**	**6**	**7**	**10**
All Products	**43**	**7**	**7**	**14**

Source: OECD/CCET (ed.), (1997): Agricultural Policies in Transition Economies, Monitoring and Evaluation. Paris. OECD (ed.), (1997): Agricultural Policies in OECD Countries. Measurement of Support and Background Information. Paris.

Also, increases in prices of ruminant meats and milk can be expected in the Baltics even if the EU is going to lower the price incentives to produce beef, milk and sheep meat. This holds since beef and veal is discriminated against in all three Baltic countries while it receives a high protection in the EU (see Table 8). Also, protection of milk is, compared to the EU, relative low in Estonia and Latvia and even negative in Lithuania. An increase in the production of these products in the Baltic states is thus very likely. Given soil and climatic conditions, ruminant production is expected to have a comparative advantage providing an additional impetus for production growth in these countries.

With respect to changes in relative prices of crops, grain prices are seen to rise relatively to other crops. However, this is not expected to lead to a drastic increase in production since climatic conditions are not favourable for an intensive grain production and already a large share of agricultural land is devoted to grain.

Finally, it has to be noted that the competitiveness of agriculture in the Baltic countries crucially depends on the quality of their products and the efficiency of the processing as well as distribution sectors. Thus additional production incentives due to an EU-East Enlargement would be severely reduced if the Baltic states are not successful in improving the quality of their food products and in reducing the inefficiencies in their food industry and wholesale markets.

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Figure 1: Overall Bilateral Complementarity in Trade Advantage of the Baltic Countries in Agriculture with the EU (1994 - 1996)[1]

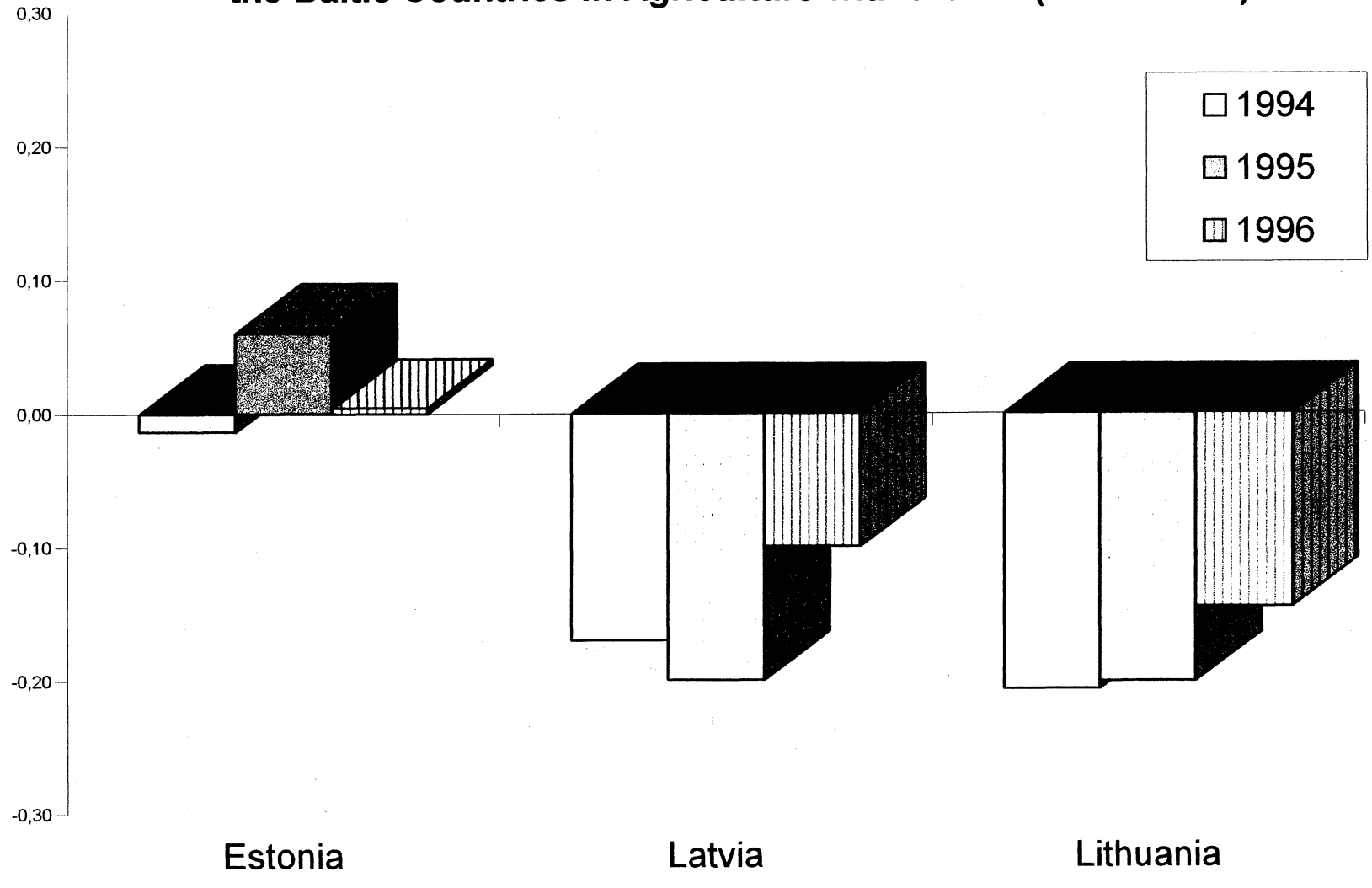
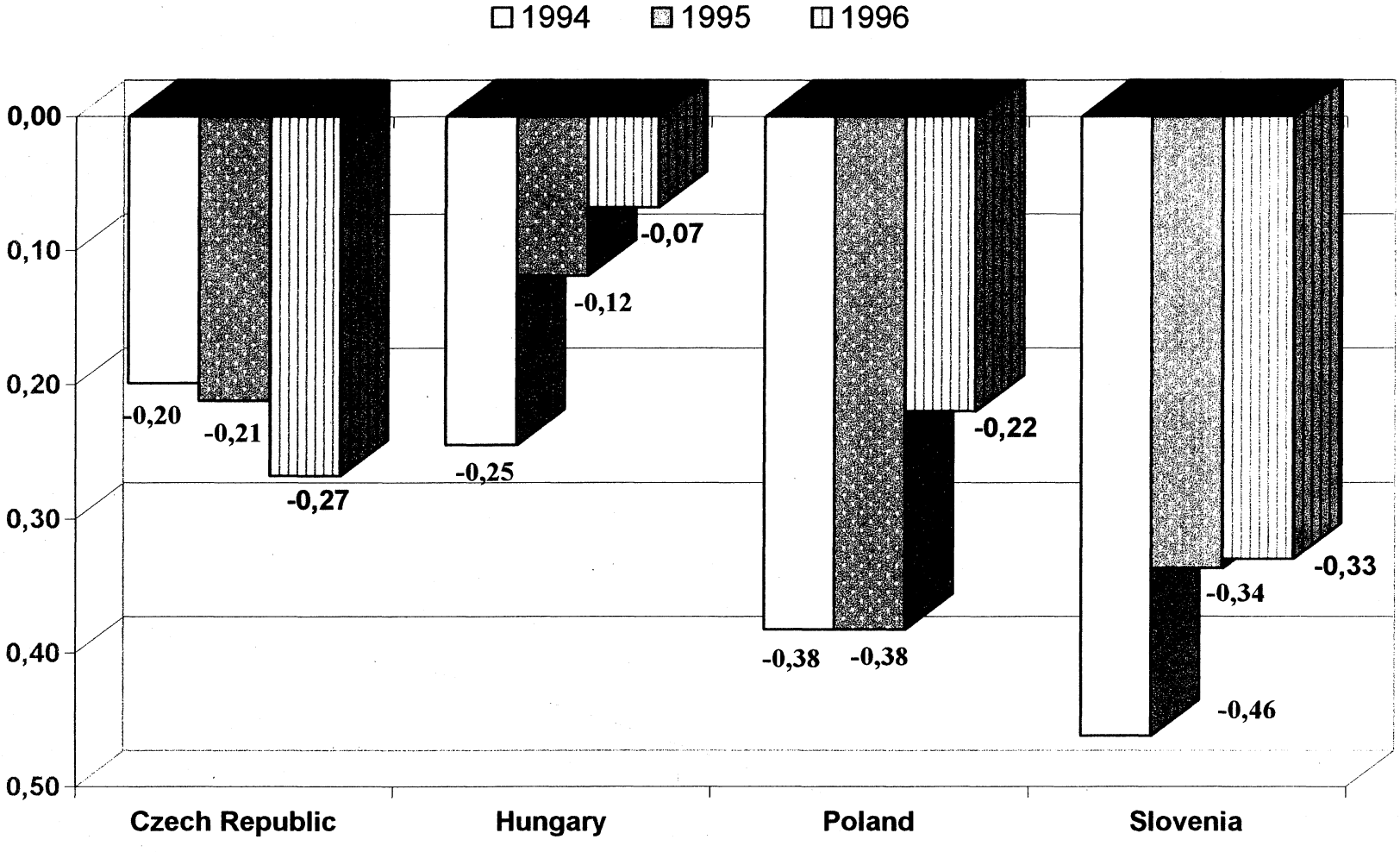


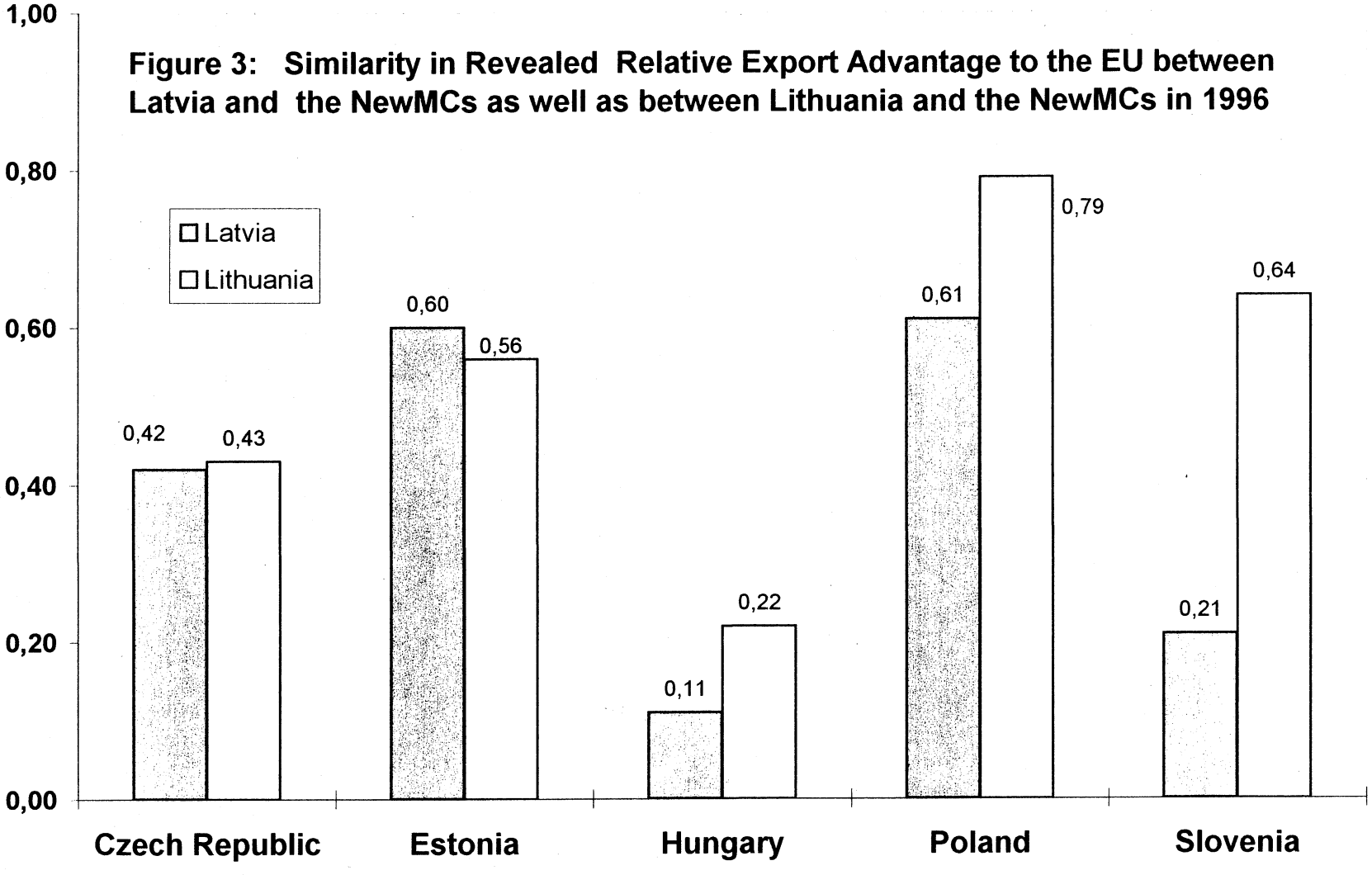
Figure 2: Overall Bilateral Complementarity in Trade Advantage between Estonia and the other New MCs[1]



1) The Overall bilateral complementarity is calculated as the negative correlation of the Relative Trade Adventage Index between Estonia and the respective other New MC across those 39 agricultural commodities considered in Table 5

Source: Own Calculations based on FAO (ed., 1998), FAOSTAT.

Figure 3: Similarity in Revealed Relative Export Advantage to the EU between Latvia and the NewMCs as well as between Lithuania and the NewMCs in 1996



Source: Own Calculations based on European Commission (ed., 1997), EUROSTAT.