

Commission on Growth and Development

**Estonia's Economic Development: Trends, Practices, and
Sources**

A Case Study

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Acknowledgments

This is a paper prepared for the Commission on Growth and Development. We thank Homi Kharas, Johannes F. Linn and Roberto Zaghera for detailed comments and Ardo Hansson for insights, which substantially influenced approach developed in this paper.

Abstract

This paper is a case study of an open small economy whose development and growth based largely on foreign trade and foreign direct investments. One purpose of the paper is to find out causes, which have created such development pattern. Estonia is a former socialist economy, part of the Soviet Union, which introduced comprehensive structural and institutional reforms in 1990s. Estonia's transition to market economy has been enhanced by the integration to the European Union, the last process being very important in evolution of institutions. One particular research question is related to the role of external anchors upon economic development; i.e. imposed conditions used to mandate certain requirements that reflect the values, objectives and aims of a socio-economic alliance and what frames also economic policy of that country. One conclusion of the paper is that the integration process played an important role in creating and supporting private sector based and liberal market economy. Implementation of the rules, standards and norms helped to increase the competitiveness of Estonian companies by improving market access to the European Union and other markets. The external anchor concept is worth to the role of international agents.

Critical factor for the future development and structural changes lies in transforming from a transition economy to an innovation economy. The role of information technology and communication sector and Skype in this development has been examined. Skype is a part of a telecommunication technology but also presents a much wider impact of the new telecommunication technology on society. Estonia's development in this field is empirical evidence that location, production, technology, and timing along with external anchors represent a catalyst for change.

JEL Classification: F53, O10, O24, O32, P30

Keywords: Development, Growth, International Political Economy, IT Technology, Technological Change, Trade, Transition.

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Estonia's Economic Development: Trends, Practices, and Sources

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I. Introduction

After regaining independence in 1991, Estonia's economic development has been influenced partly by initial conditions (age structure, skills and education of population, geographic location, infrastructure) as well as economic and political reforms. Introduction of Estonia's kroon and monetary reform supported by prudent macroeconomic policy brought price stability and created a solid basis for economic development. Comprehensive structural and institutional reforms created a well-functioning market economy. According to the definition given by the World Bank, Estonia has been successfully undergone the transition process already at the beginning of 2000s.²

Estonia is an example of an open economy whose development and growth based largely on foreign trade and foreign direct investments (FDI). One purpose of the current study is to describe Estonia's most important development trends and also find out some causes, which have created such development patterns.

Estonia's transition to market economy has been enhanced by the integration to the EU, the last process being very important in evolution of institutions during the last ten years before Estonia joined the EU, but also after achieving membership in 2004. Membership then meant being part of a general deepening and widening process of the EU, which means the development of more integrated markets with respective institutions and improved adjustments capacities of the economic agents to the market competition.

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² Transition: The First Ten Years, *Analysis and Lessons for Eastern Europe and the Former Soviet Union*, The World Bank, Washington, D.C., 2002.

One particular research question is related to the possible role of external anchors upon economic development; i.e. imposed conditions used to mandate certain requirements that reflect the values, objectives and aims of a socio-economic alliance and what frames also economic policy of that country. Thus, the EU membership is considered as one important anchor and the fulfillment of a wide set of indicators for this membership definitely framed the Estonia's economy and political system.

Estonia is still a middle-income country and for the future development and decrease of income gap with high-income countries the further structural changes are necessary. That brings out the following question: what could the new activities be for the creation of a perspective economic growth? The role of IT sector and new services worked out here would be one example of those activities. This invites a wider question – are values related to high tech industries and the results of to information based innovation external anchors? Does creating a positive image and providing support for applications in this field yield measurable developments and provide proactive frames that benefit wider roles in society? A case study describing the development of Skype and its application from an Estonian perspective is presented in the current paper.

II. General Economic Framework

i. Initial conditions

Estonia, like the other Baltic States, Latvia and Lithuania, gained its independence for the first time after the World War I during the collapse of the Czarist Russia and in war with the Soviet Russia. The statehood lasted from 1918 up to 1940 and ended with the annexation by the Soviet Union in June 1940. That was followed by the German occupation during 1941-1944 and of the Soviet power returned in 1944. The Baltic States belonged to the Soviet Union in the form of the Soviet Socialist Republics from August 1940 until the collapse of the Soviet Union in 1991. The experience of the statehood and market economy between the two World Wars is a distinctive feature of the Baltic States in comparison with the other 13 former Soviet Republics, which belonged to the Soviet Union.

Estonia had historically strong German cultural impact until the Second World War. There was a small but economically influential Baltic German minority until 1939 and Germany was the most important single partner of the Estonia's foreign trade amounting to 30% of export and import. After regaining independence in 1991, Estonia started to build up state institutions and took orientation after the German law system. The historical experience had a role to play but there were probably more important circumstances as after the unification Germany became the largest and the most powerful EU economy, the deutschmark was the most stable European currency.

For Estonia, neighborhood with Finland has always been of importance. The similarity of the Estonian and Finnish language has been crucial. The general issues of market economy as well as the main rules of a democratic society were spreading through TV and other communication channels during the Soviet period. That partly help to compensate a more closed iron curtain, compared to several Central European countries like Hungary or Poland during the communist period, and made the

exchange of information possible. The close economic connection played an important role in the transformation of foreign trade from east to west and later supported the integration with the Western world and particularly with the EU.

There was a strong political consensus on the need for fast and substantial economic reforms. Fast and comprehensive cut from the Soviet type economic system was a central point of this consensus. There was a widely shared understanding by the general public that the reason for a modest level of economic development was the Soviet type economy with its state ownership, rigid, value-losing currency, the Soviet rouble, closed economy with the orientation towards the Soviet market, and that Estonia deserves more. The historical experience of the statehood and market economy was glorified, which also created a very strong support for the economic reforms.

There was also an understanding that Estonia does not need to invent all necessary economic tools to introduce reforms. Different models from other countries were borrowed to accelerate economic reforms. As a result of a political consensus it was decided that the German Law system is to be followed as the basic framework.

ii. Liberalization of economy

Liberalization stands for freeing the prices, which means abolishing a system of fixed administrative prices and most subsidies for socially or politically relevant goods and services. An important precondition for price liberalization has been very different from that of market economies initial structure of relative prices in planned economies, particularly in Soviet Union. Liberalization was accompanied by the adjustment of the whole price system to the new conditions through very deep changes in relative prices.

One specific feature in Estonia and in the other Baltic States has been huge jump in prices of oil and other resources, which had been relatively cheap in planned economies and started to be more expensive even in comparison with other goods and services. This adjustment process brought along high inflation.³ Increase in some prices caused additional costs in the entire economy, which resulted in cost-push inflation (due to fast increase in prices of energy and raw materials).

Another set of prices was connected to purchasing power of citizens and influenced the consumption of socially essential goods and services (rental payments, prices of communal services and transportation). Combined solution has been applied very often in the set of economic reform methods: dominating part of prices has been liberalized but administrative regulation of some prices has been retained. In Estonia the administratively regulated prices are those of electricity and central heating, postal services, telecommunications and communal transportation. Those prices have been

³ In 1991 and 1992 Estonia experienced very high inflation due to collapse of the former Soviet Union and lacking monetary discipline. The Consumer Price Index (CPI) was 1076% in 1992. The monetary reform in June 1992 meant a very deep policy change. The average annual CPI was 89.8% in 1993, 47.7% in 1994, 29.0% in 1995, 23.1% in 1996, 11.2% in 1997, 8.2% in 1998 and 3.3% in 1999 (Statistical Yearbook of Estonia 1999, 1999, p.220).

increased but the price policy is controlled by respective central government agency or in some case, by local governments (prices of communal transportation).

Foreign trade liberalization stands for the introduction of sole foreign currency exchange rate, substantial decrease in necessary licenses and quotas and other administrative restrictions for foreign trade activities. Full convertibility of a currency is a very important element of liberalization. For Estonian kroon, the transactions described on the current account, as well as on the capital account of balance of payments, have been liberalized practically from the very beginning of introduction of the currency.

Liberalization of foreign trade has several purposes related to widening of markets for domestic producers and the realization possibilities to achieve through specialization and realization of absolute and relative advantages, increase of supply of consumer goods through imports accompanied by spillovers of knowledge of the more advanced products.⁴ It could be seen also in the context of price liberalization. As most of the industries have been dominated by monopolies or have had features of oligopolistic competition, the import of foreign goods has been the only means to create an additional supply on the domestic market and to balance the demand and supply at the beginning of reforms and before structural changes. International prices have been transformed into the economy through foreign trade. That is the basis for a completely new set of market signals, which started to allocate the resources within the economy.

Liberalization of the banking and financial sector of the economy had also a profound effect on the money and capital markets. By liberalizing activities, interest rates and lending procedures, entrepreneurship has been unleashed opening up the possibilities to introduce companies, create different ownership forms and invest beyond one's means. Liberalization tools have been more related to changes on micro level of economy. Estonia pursued a liberal framework from the very beginning of the economic reforms – for example a foreign trade regime without any customs tariffs for imported goods until end of 1999. Starting from January 2000, a limited number of tariffs were introduced against non-EU countries. Although EU membership from May 1, 2004 was generally seen as a positive event, it also introduced the EU foreign trade barriers against the non-EU members.

iii. The Monetary reform and stabilization of economy

First liberalization attempts were made when Estonia still belonged to the ruble zone. The Estonian kroon was introduced in the framework of the monetary reform in June 1992.⁵ The currency board regime was used to achieve the macroeconomic stability in

⁴ See about the role of foreign trade in Áslund (2002), Estrin (2002), Rodrik (2006).

⁵ During the currency reform, all people residing in Estonia, who had registered their names for the conversion, were allowed to exchange 1500 roubles at a rate of 1 kroon per 10 rouble during three days in the period from 20 to 22 June 1992. That was equal to approximately 18 deutschmarks. Larger amounts of roubles were converted into kroon at a ratio of 1 kroon to 50 roubles during the period from June 26 to 30. Bank deposits made by residents were converted into kroons at the rate of 1:10. Roubles held by enterprises were also converted into kroons at the rate of 1:10. There are several articles written

Estonia. The convertibility of the Estonian kroon was introduced. The exchange rate of the kroon was fixed to the deutschmark (1 DEM = 8 EEK) and to euro since January 1, 1999. The exchange rates to other currencies are calculated according to the rate with the euro. The introduction of kroon was an important condition for stabilizing the economy and the basis for future economic development.

The exchange rate between the kroon and the deutschmark was set at the level of the rouble at the time of the currency reform. The rouble's market rate was determined in interbank auctions, which began at end of 1980s. Due to the scarcity of currencies offered and abundance of the rubles, the rouble rate was undervalued. Taking that exchange rate between the rouble and the deutschmark as the basis for the exchange rate between the kroon and the deutschmark undervalued the kroon. That undervaluation means that the kroon's exchange rate was below the level that would prevail in the medium term once productivity of Estonia begun to rebound.⁶

In June 1992, when Estonia introduced its currency and started the stabilization, the average wage was 41 USD, two times lower than in Poland and three times lower than in Czechoslovakia. The similar level in Russia had mandated the low initial wage level, which was at the time the key trading partner of Estonia. Setting the exchange rate to bring the dollar wages close to Poland's level was not a serious option, as it would have destroyed the competitiveness of the unreformed industrial and agricultural sectors.

In this matter, Estonia's choice regarding the level of exchange rate and its impact on price level in international comparison was exactly the opposite to what happened in Eastern Germany after the German unification. Of course, in Germany there were very strong political reasons, which determined the exchange rate between the eastmark and the deutschmark, but the result was that Eastern Germany had too high wage level and social costs in comparison with the level of productivity.⁷ Another reason was probably high migration from the Eastern part to the Western part of Germany, and the young and better-educated part of the population dominated this trend. There were very big investments from the federal state budget into the infrastructure in the Eastern part of Germany, but that was probably only a necessary but insufficient condition for economic growth. That complicated the convergence of the Eastern part with the Western part of Germany.⁸

on the details of the Estonian monetary reform, Hansson (1995), Kallas and Sörg (1995), Lainela and Sutela (1994).

⁶ Hansson (1995).

⁷ From July 2, 1990, the two Germanies were pre-united by sharing the deutschmark as a common currency. Stocks of eastmarks were changed into deutschmarks at an average rate of 1.8:1 and all monetary contracts have been converted to a deutschmark base. Children below 15 years could exchange 2000 eastmarks, adults below 60 years 4000 eastmarks, and pensioners 6000 eastmarks on a one-to-one basis. Most other amounts of money and financial claims, including company debt of about 260 billion eastmarks, were exchanged or converted at a rate of 2:1. Price contracts, wage contracts, and pension claims were converted at a rate of 1:1 (where pensions were recalculated using the West German schedules amended with the eastern pension claims as lower bounds), Sinn (1996, p. 146).

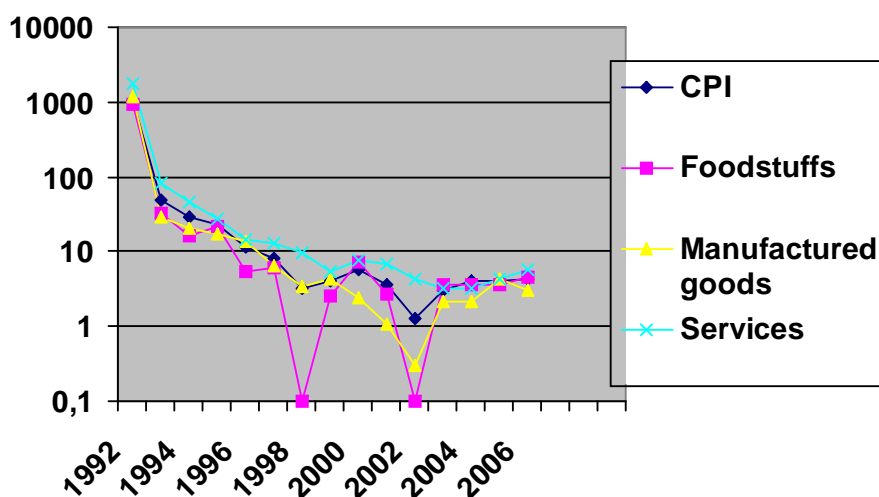
⁸ Sinn and Westermann (2001).

The applied exchange rate with ruble made Estonia's import expensive and favored the exports of goods and services. The exchange rate promoted foreign investments, but resources of those domestic producers, who sold the dominating part of their output on the domestic market, were very limited for importing equipment for technological changes. These conditions created a stimulus for export and were favorable for foreign capital to achieve a larger share in the economy.

Estonia had a relatively high inflation, especially during first years after the monetary reform. Estonian economic development under a fixed exchange rate arrangement has resulted in constant appreciation of domestic inputs. On the other hand, the economy has witnessed a rapid growth of output and exports, which is manifested in the fact that Estonian enterprises have been competitive despite the growing production costs.

The ability of Estonia to sustain the peg was related to sharp growth of productivity of tradables producers. Estonia maintained huge growth rates of exports in the face of real appreciation. Also the quality of consumer goods and services increased markedly once firms were exposed to competition from producers from other countries. That increased the competitiveness of local goods and services, allowing producers to sell them for higher dollar or deutschmark prices. At the same time, the inflation was quite high because the continuing relative price shifts took place first of all through the price increases. The country did not plan very low inflation in 1990s.

Figure 1. Consumer price index and its components, change over the previous year, 1992-2006, %, the logarithmic scale



Sources: Eurostat, National Statistics.

Inflation decreased to a single digit figure in 1998, six years after the monetary reform was introduced. The prices of services (closed sector) tended to increase more rapidly practically during the whole period, though, the difference between the price increase of services and the total CPI figure was 1-2% after 2000. The CPI was lowest in 2003, 1.3%, but afterwards the price increase returned and the CPI was 4.1% in 2005 and 4.4% in 2006. The increase of prices of services was respectively 4.1% in 2005 and 5.7% in 2006. During the first half of 2007, the price increases speeded up even more and the CPI was on the level of 6.4% on annual basis in July 2007. That postponed the EMU membership for several years. The price increases were caused by shortage of resources due to the fast economic growth (shortage of labor first of all, which was accompanied by a fast growth of wages and domestic demand) and a very rapid growth of credits and the real estate market. That put strains on the currency board system adjustment capacities. The authorities hoped that the increase of interest rates due to restrictive policy of the European Central Bank (the majority of interest rates of the real estate financing credits is fixed to the six months EURIBOR) would limit demand of credits and after the required increase of excise taxes of gasoline and alcoholic beverages to achieve the EU required minimum levels, the price increases will cool down.

iv. Structural reforms

The structure and dynamics of the Estonian economy has been substantially influenced by local natural resources, of which oil shale as the biggest importance. Oil shale mining for production purposes for burning in different equipments and for chemical industry started already in 1920s. After the Second World War, oil shale based power engineering industry had been created. That industry produced dominating part of electricity in Estonia also in 2000s.

In 1970s and 1980s Estonia had typical features of an industrial country. The share of manufacturing and agriculture was larger than in developed countries whereas the state of infrastructure, service and trade sectors in the economy was modest. The transition to market economy has been accompanied by introduction of modern banking and finance, real estate markets and business services. The retail and wholesale trade grew also very rapidly.

Substantial investments were made in the 1980s into transportation. The most important construction was Muuga Port near Tallinn. This port has been increasingly important for Estonian economy serving domestic needs and transit trade after regaining independence

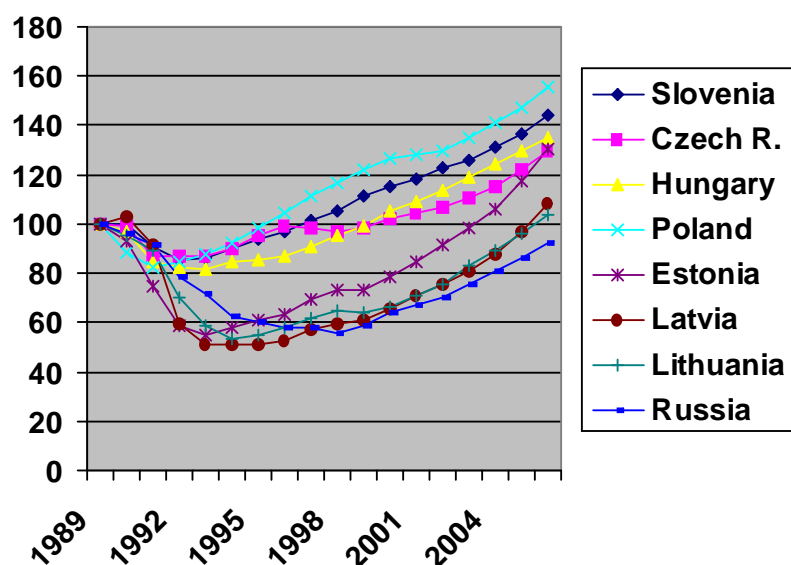
Structural changes have been very important because the structure of planned economies was one of the main sources of problems. That concerns industrial structure of the economy (a very large share of manufacturing and agriculture, a small service sector), size structure of industries (limited number of large companies in every branch, a modest proportion of small and medium size companies), ownership structure by type (dominating state ownership, a missing private sector, basically domestic companies and very few foreign companies), market structure (proportion of domestically produced and exported production).

The changes in the economic structure have been connected with privatization and liberal capital transfers, which created a variety of new activities. The new private sector which was formed as a result of the privatization of state-owned companies and the emergence of new private companies, was a major engine of stabilization of the economy and of further economic growth.

On the basis of the dynamics of the GDP, it is possible to observe that in the market economy creating reforms, all economies in Central and Eastern Europe went through a period of economic decline. The decrease amounted to 15-20% in Slovenia, Czech Republic, Hungary and Poland and to 40-45% in the Baltic States and Russia⁹. On the basis of these figures it is possible to see that economic changes and adjustment to new conditions were much more dramatic in the area of the former Soviet Union. The decline in the Baltic States was as deep as in Russia, the main difference being that due to very radical and comprehensive reforms, the Baltic States started to grow in 1994-1995 and achieved the level of 1989 GDP in 2004-2006. In Russia, the economic decline continued much longer and the first year of GDP's growth was in 1997 which was followed by a decline in the next year due to financial crises and deep devaluation of the ruble. The level of 1989 was not achieved in 2006, nevertheless there was a fast growth starting from 1999, very much due to revenues from the sales of oil.

⁹ There have been several critical comments on reliability of statistics and possible comparisons of time series in Central and Eastern European countries. In the former Soviet Union, a very high inflation made the evaluation of real growth figures also very complicated. Furthermore, the transformation from material balances system to the value added concept of the GDP had an impact on this measurement problem. Our estimates are based on the growth figures presented by countries included and we agree that the comparisons of different countries on the basis of this available statistics could be quite conditional.

Figure 2. Real GDP dynamics in the Central and Eastern Europe, % (1989=100)



Sources: Eurostat, National Statistics.

As Estonia had typical features of industrial economy with larger than in developed countries share of manufacturing and agriculture and modest state of infrastructure, service and trade sectors before economic reforms, these reforms changed the general structure of the economy substantially.

Table 1 The Structure of the GDP in the Baltic Countries and the EMU (%)

	Estonia			Latvia			Lithuania			EMU
	1990	1995	2003	1990	1995	2003	1990	1995	2003	2002
Agriculture	16	9	5	22	10	5	27	12	7	2
Industry	50	29	30	46	33	24	31	35	34	28
Services	34	62	65	32	57	71	42	53	59	70

Source: World Bank EU-8 Quarterly Economic Report, January 2005, Part III.

The structural changes described in Table 1 are an evidence of the fact that during 13 years the Baltic States transformed from the Soviet type economies to modern market economies with a structure quite similar to the EMU member states.

That economic growth is first and foremost related to institutional and structural changes. Institutional changes ensured the access to new markets (free trade agreements with other countries, relations with new foreign trade partners, implementing quality control systems which made the production acceptable in foreign markets); structural changes were manifested in the formation of new companies producing high-quality goods and in the adaptation of existing companies so that goods and services could be marketed despite increased domestic production costs.

v. Role of FDI

Estonia liberalized its capital movements further than it was required by its Europe Agreement. Since the monetary reform in 1992, there have no longer been restrictions on the FDI. Foreign investors may open accounts in both foreign and domestic currencies. Profits and enterprise liquidation income can be freely repatriated, and the currency is fully convertible.

At the beginning of the transition period FDI flows into Estonia were mainly caused by the privatization process. As privatization in the Eastern Germany has been perceived as the fastest model for changing state ownership into private ownership, that model has been taken into consideration. The Estonian Privatization Enterprise was founded in 1992, followed by the Estonian Privatization Agency, which was founded in 1994 and operated until 2000.

The founded Estonian Privatization Enterprise followed the Treuhand example, the Treuhand's experts advised Estonia's government and the Estonian Privatization Enterprise. At the same time, Estonia's privatization had also important differences from the German scheme. The companies were not introduced into the balance of the Estonian Privatization Enterprise as it was done in Germany, there was an open tender only for core ownership of enterprises in Estonia, but also the minority shares were reserved for the voucher scheme and combined with the privatization of living rooms. The political competition between the political parties preferring interests of former owners in the restitution process, interest of former managers and workers and foreign companies framed the whole process.¹⁰

The privatization process in manufacturing and services was nearly completed by the end of 1996 and continued first of all with privatization of infrastructure. Economic aspect dominated in the privatization of enterprises, the main features being the selling the enterprises for cash, no privileges for employees of privatized enterprises, limited role of privatization securities (vouchers) and finding a core investor for privatized enterprise before some part of the share was sold for privatization securities.

Due to this approach, foreign investors had an important role in the privatization process. The new owners with foreign participation paid 16% of the total purchasing price and offered 30% of all investment guarantees in 1993-96. Only one important advantage was given to the domestic owners during that period: they had

¹⁰ On privatisation and politics related motives in Estonia, see Frydman, Rapaczynski, Earl et.al. (1995), Kilvits, Purju, Pädam (2005), Purju and Teder (1999), Terk (2000).

the right to pay by installments and the period of paying was up to ten years.¹¹ This also caused the creation of joint ventures registered in Estonia or using Estonian companies to participate in privatization by foreign economic agents. The characteristic feature of Estonian model of privatization was to sell without reorganizing and restructuring which was very suitable also for foreign participation in this process.

The privatization of the national infrastructure enterprises - energy and telecommunication sectors (Estonian Railway, Estonian Energy, Estonian Oil Shale, Estonian Telecom, the Port of Tallinn) became topical in 1995. 49% of Estonian Telecom shares was sold to joint venture of TeliaSonera in Estonia already in 1992 but state still hold another part and in 1999, organized the IPO of 24% of the shares, while retaining a minority position. In 2002 and 2003, TeliaSonera held negotiations with the Government of Estonia about the possible purchase of shares held by the government but negotiations failed partly due to the price, not being considered to be of sufficient value.

Estonian railway's majority shares were privatized in 2001 to the Baltic Rail Service (private company) and the tender included infrastructure such as railway and related land. The main source of income for the Estonian Railway has been oil transportation from Narva, a town on the Estonian-Russian boarder, to the Port of Tallinn. The main profiteers of the oil product's export through Estonian ports have been the privately owned companies operating in the Port of Tallinn. These companies are owned by Estonian, Western and Russian investors and had a strong impact on political discussion on the privatization of railway and ports. The decision to buy shares back from The Baltic Rail Service was made by the Government of Estonia in autumn 2006 and the deal was completed at the beginning of 2007. The future approach to railway business would be keeping the infrastructure in the ownership of a state-owned company and to very clearly separate the operating services, provided by the competitive private companies.

Table 2. The GDP and the FDI, 1995-2006, EUR mln., current prices.

Indicator	1995	2000	2003	2004	2005	2006
GDP	2638	5926	8494	9375	11060	13074
Gross fixed capital formation	676	1519	2488	2951	3436	4423
Inward FDI	148	425	822	775	2254	1341
Outward FDI	2	67	137	217	507	876
Gross fixed capital formation/GDP, %	25.6	25.6	29.3	31.5	31.1	33.8
Inward FDI/GDP, %	5.6	7.2	9.7	8.3	20.4	10.3
FDI/Gross fixed capital formation	21.9	28.0	33.0	26.3	65.6	30.3
Total FDI stock, end of year	540	3572	5553	7378	9539	9616
Stock of FDI/GDP, %	20.5	60.3	68.2	78.7	86.2	73.6

¹¹ Purju (1999), Purju and Teder (1999).

Sources: Statistical Office of Estonia, Bank of Estonia, author's calculations

The figures in Table 2 describe sources of the Estonia's fast economic growth. The investments rate was more than 30% of the GDP in the beginning of the 2000s. The inward FDI created around 30% of the total investments. The very big inflow of the FDI was due to the takeover of remaining shares of the Hansapank by the Svedbank in 2005.

vi. The political effects of FDI

One strong factor driving Estonian political and economic path has been the integration with the West and drifting away from Russia. That policy paid off in the membership of the EU and the NATO. The FDI from the EU and the USA has been seen as an important factor for the integration process due to the additional financial resources for investments and for enabling modern technologies. The Baltic politicians observed potential investments not only in terms of their economic value but also in their political impact. In the light of candidacy for the EU and NATO membership it was considered that priority should be given to investments from the EU and the USA.

Until the mid 1990s, the majority part of the FDI went into privatized companies. As politicians formed the major part of members of the boards of privatization agencies, realization of those political preferences was quite easy.¹ Afterwards the situation changed, because more green-field investments occurred. The investment decisions were made then by the private economic agents and state's political preferences were not so strongly represented.

The political relationships with Russia have been complicated and an issue of concern. The economic agents in Estonia could see the economic advantages from linkages with Russia. The primary energy resources and raw materials from Russia are important for Estonia. The Baltic Sea ports have been an important transit trade channel for Russian exports to the EU and other countries. On those circumstances investments, accompanying and supporting that trade, could be a reasonable economic step. However, the FDI from Russia have been met with suspicion in the Baltic States. The two main reasons for trying to avoid Russian investments have been the fear of losing control over vital aspects of the economy and unclear source of investments.

In the Estonian economy Russian investments made up only 2.6% of the stock of FDI at end of 2006. These figures suggest a low penetration rate of Russian foreign direct investments into the Baltic countries. However, it is generally believed that the economic influence from Russia is larger. In the case of Estonia, expert estimates evaluate that Russian investments make up 5-7% of the stock of FDI. Due to the fact that Russian investors use third countries, like the Netherlands, Cyprus, or sometimes even Scandinavian branches for direct investments, the whole stock of Russian investments is not given by the official statistics on country allocations.¹²

¹² Kilvits, Purju and Pädam (2005).

vii. Structure of the FDI by components, countries and industries

In the period of 1992-1996, the main reason for foreign investments was privatization. From 1997 onwards acquisition of private Estonian capital owned firms by foreign ones started to play a major role. The biggest acquisitions occurred in the Estonian banking system in 1998 and in telecommunications in 1999. In the 1990s, the investments into equity capital dominated. Also since 1997 increased the role of reinvested earnings in the total inflow of the FDI and formed 50-70% of the total annual FDI during last five years. Another trend was increase of the loan capital in the total inflow of the FDI. The inflow of equity capital created a biggest proportion of the FDI in 2005 due to takeover of the Hansapank by the Svedbank.

Table 3. Structure of the FDI, 1995-2006, current prices

Indicator	1995		2000		2003		2004		2005		2006	
	Mln EUR	%	Mln EU R	%	Mln EUR	%	Mln EU R	%	Mln EUR	%	mln EU R	%
FDI in Estonia	148	10 0	425	10 0	822	10 0	775	10 0	2254	10 0	1341	10 0
Equity capital	75	51	251	59	341	41	296	38	1787	79	147	11
Reinvested earnings	11	7	116	27	409	50	510	66	525	23	911	68
Other direct investment capitals	62	42	58	14	72	9	-31	-4	-57	-2	283	21
-Loans	53	36	65	15	50	6	-20	-3	-56	-2	283	21

Sources: Statistical Office of Estonia, Bank of Estonia.

Table 4. The flows of FDI by industries during 1995-2006 and position of the FDI in Estonia, end of 2006, mln. EUR.

Indicator	1995	2000	2003	2004	2005	2006	The FDI stock, end of 2006	
							mln EUR	%
Total	148	425	822	775	2254	1341	9616	100
Financial intermediation	10	112	121	159	1978	785	2700	28.1
Real estate, renting and business activities	0	79	186	251	-24	67	2865	29.8
Manufacturing	67	70	102	177	190	249	1678	17.5
Wholesale and retail trade	35	27	293	145	55	12	997	10.4
Transport, storage and communication	16	64	59	21	0	110	677	7.0
Other	20	73	61	22	55	118	699	7.8

Sources: Statistical Office of Estonia, Bank of Estonia.

Table 5. The flows of FDI by countries during 1995-2006 and position of the FDI in Estonia, end of 2006, mln. EUR.

Country	1995	2000	2003	2004	2005	2006	The FDI stock, end of 2006	
							Mln EUR	%
Total	148	425	822	775	2254	1341	9616	100
Sweden	64	169	285	183	1832	725	3797	39.5
Finland	13	166	365	205	357	344	2543	26.4
Great Britain	12	7	51	74	26	73	362	3.8
The Netherlands	1	17	-87	-25	-28	-30	328	3.4
Norway	4	3	6	72	3	48	315	3.3
Russia	1	-5	2	47	57	51	251	2.6
Latvia	1	0	13	39	-25	53	228	2.4
USA	13	9	18	0	-53	-101	202	2.1
Germany	1	12	27	34	70	-13	188	2.0
Denmark	4	7	18	13	-13	9	180	1.9
Other	34	40	124	133	28	182	1222	12.6

Sources: Statistical Office of Estonia, Bank of Estonia.

The most attractive field of activity for foreign direct investors in Estonia have been real estate, renting and business activities (29.8%) and financial intermediation (28.1%). The other important fields of activity were manufacturing (17.5%); wholesale, retail trade (10.4%) and transport, storage and communication (7.0%).

The total stock of the FDI invested into Estonia was 9.6 billion EUR at end of 2006. A significant part of the FDI came from Sweden (39.5% of the total FDI stock) and Finland (26.4%). The Estonian economy is closely connected to the economies of Finland and Sweden via trade linkages; furthermore, the major part of FDI into Estonia came from these countries as well. Finland and Sweden have specialized in the high-tech industries. These countries have been looking increasingly towards the Central and Eastern European (CEE) economies for new high-growth markets as well as sources of labor and raw materials.

According to the results of different researcher studies (*Purju, 2003, Roolah, 2006, Vissak, 2006, Varblane, 2001*)), the main determinants of the FDI made in Estonia are following. Among investors coming to Estonia for the first time, the main determinants were potential market growth, financial stability (convertibility of Estonian currency and free movement of capital) and political stability. Among those investors who are reinvesting into Estonia the main determinants were availability of labour, financial stability and production costs. The perspective EU membership also played an important role targeting the Baltic market as the same region. It was possible already in 1997, after those countries had signed the Association Agreements with the EU, to forecast that they would become the EU members in the near future. That meant harmonization of institutional framework and lower transaction costs for foreign investors.

Other important advantages have been related to country's open economy, its flexible legal framework with no foreign exchange controls or restrictions on foreign investments, the ability of foreign businesses to own land, the unrestricted repatriation of profits, the fact that all profits retained in the company are exempt from corporate income tax, the high level of spoken English and the modern business infrastructure, particularly in telecommunications.

At the same time, there has been also a vision of Estonia as a gateway to Russia for foreign companies. A comparison of success estimates by the affiliates' host countries or regions (*Varblane, 2001*) shows that investments into the other Baltic States have lived up to the expectations more than those made into the CIS or the EU region. Big multinational companies preferred to go to Russian market directly, without a gateway. Though, there are some rare examples, when the Estonian or the Baltic market has been a place for certain exercises. The Scandinavian banking sector and also a purchase of breweries in the Baltic States, Russia and Ukraine by the Baltic Beverage Holding, initially a joint venture of the Hartwall from Finland and Pripps from Sweden, are some examples. This project started with purchase of Saku Brewery in Estonia in 1991, which as a pioneering exercise of participation in privatization process for the Scandinavian companies.

Very important aspect for foreign investors has been the possible expansion to the markets of other Baltic states. The FDI into Estonian financial sector still create a large proportion of the total stock of the FDI and the further investment opportunities

here also played an important role. Similar developments occurred also in insurance and real estate activities.

Recent FDI projects in Estonia has been realized also in forestry and pulp and paper industry. The Finnish-Swedish Stora-Enso, an integrated forest products company, acquired the largest forestry group in Estonia AS Sylvester. Target of this purchase was the Estonian forestry resource, manufacturing capacities and also the possibility to manufacture timber imported from Russia. A cellulose plant, constructed by the Norwegian company Larvik Cell in Kunda, Northern coast of Estonia, was another comprehensive project. That project also targeted Estonian forestry resources.

A significant factor generating new FDI is the extent of networking between the existing firms in Estonia. It includes expansion of the existing foreign-owned enterprises through initiating new subcontracting orders to the domestic firms and also more active co-operation between foreign-owned firms themselves. A possible example is provided by the establishment of the Finnish-owned JOT Eesti OÜ, which produces equipment and assembly lines for electronics plants and provides its services to Estonia's largest export firm, Finnish-owned electronics plant Elcoteq, with its services. It is connected to more than 30 subcontractors in Estonia.

There is also a relatively large number of companies in service sector from Finland and Sweden, which have moved to Estonia together with their clients in Scandinavia. One example is the Finnish company TietoEnator, providing banks with IT software for accounting and other banking operations.

Networking is important also in FDI-based companies bringing together foreign capital and local R&D. Particular areas of strength for Estonia are information technology, biomedicine and material technologies. The network of companies, some of then products of Spinno type projects, increase innovation in companies, promote cooperation between industry and science community. The Tartu Science Park, working closely with University and the Tallinn University of Technology Innovation Center are two examples of that kind of networks.

III. Institutional Reforms

Institutions regulate the relations of economic agents. Institutions reduce uncertainty associated with transactions and thus guarantee the stability of the economic system.¹³ It is the lack of such stability arising from legal loopholes and arbitrary actions that has hindered Estonia's economic growth. Estonia's institutional environment can be characterized by the legal system established in essential features, operating political machinery and dominant share of private entrepreneurship in the economy.

As for institutional aspects, integration with the EU should be mentioned, as it has an important impact on Estonian economic development. In addition to the safety aspect, the integration significantly directs also the development of Estonia's institutions. The

¹³ For more detailed description of the role of institutions in economy see (North, 1990, North, 2000).

application for the integration forces to implement a more detailed legislative regulation, which enables to control the activities of both foreign as well as domestic monopolies and balance the competitive interests of different economic agents.

The introduction of number of several institutions to regulate the market might seem at first an unnecessary expense, but it will actually promote stability in the economy. Estonia and the other Baltic states should rapidly adopt institutional framework from industrialized countries to gain credibility with economic agents. The introduction of such institutions would also have positive effects on domestic economic policies and external security.

The Free Trade Agreement and Association Agreement concluded with the EU have played a very important role in the development of Estonia's economy. These agreements created a framework for the participation of Estonia's enterprises in international co-operation. In order to ensure the growth of exports and economy in total, with the increasing production costs, Estonian economy needs further changes in the structure, which guarantee the competitive ability of economy also under the new circumstances. Domestic resources have not been sufficient for this kind of changes in structure and the need for further foreign investments has been one of the main pillars of the integration with the EU. In order to guarantee foreign investments in the capacity, which ensures changes in structure, motives are needed. Accession into the EU economic area has been one of those motives.

Time is an important factor of changes because different economic policy means need different time to create results. Liberalization and macroeconomic stabilization have been achieved through relatively short term programs and later policy has targeted on maintenance and monitoring of the achieved conditions.

Structural reforms need time for realization, measured in years. For example, restructuring the industry through privatization, the FDI based restructuring would take several years. The same applies for the reform of social insurance system and other this kind of more complex policies, which have been made in Estonia just before the EU membership.

For institutional reforms, the time period is even longer. Very important are new qualities and skills of enforcement system. The practice of legal treatment of different complicated business matters is very limited or missing and needs practice and discipline to improve. The EU accession process supported these reforms in Estonia substantially. I

i. Institutional explanation for the liberal trade policy

Estonia's foreign trade policy has been somewhat unique: customs tariffs practically did not exist in the 1990s and restrictions to enterprises in developing foreign economic relations were minimal.¹⁴ While the foreign trade policy of the Soviet Union, whose impact on Estonia ended with the restoration of Estonia's independence

¹⁴ There have been even no customs tariffs even for agricultural products. Only from January 1, 2000, the limited number of tariffs has been introduced on agricultural products against non-EU countries and on those which do not have free trade agreement with Estonia.

in 1991, was characterized by an extensive autarchy, the newly independent Estonia adopted different policies: there was a political determination to achieve as open an environment as possible.¹⁵

There were also other factors, which were more closely linked to the economy. The population's demand for Western consumer goods and the need for imports of various kinds of equipment and other technical goods were key considerations. Several other factors favored Estonia's tendency towards a more liberal regulation of foreign trade: Estonia is smaller than other transition economies; it has an advantageous location between rich Scandinavian countries and Russia; and it is closely connected to the Finnish economy.¹⁶ The introduction of the freely convertible kroon in the framework of a currency board in 1992 was an important tool of liberalization¹⁷ as was initial access to high quality consumer goods and services (tourism) alleviating short supplies in the economy and acting as a counterweight to a temporary decreases in real wages that accompanied economic reforms.

Trade reforms in Estonia were facilitated during the periods when the controlling coalition had a sufficient majority in the Parliament. A large number of important draft laws were prepared by the executive branch, co-coordinated with the corresponding ministries, and approved by the government before they were submitted to the respective parliamentary commissions. These draft laws were passed with relative ease. An advantage of the significant role of executive power was that a more utilitarian approach predominated.

The Department of Foreign Trade of the Ministry of Foreign Affairs played a central role in the harmonization of various legal acts related to foreign trade. The Department has also acted as a coordinator of measures to integrate Estonia into the EU and the WTO and to build relations with EFTA and other countries. The Department has been the most liberal of all the institutions that influenced the regulation of foreign trade. One reason for this is that Soviet Estonia had no Ministry

¹⁵ In 1991-1992 the Estonian political elite had already come to the decision that a liberal economic policy would be the best for the country. The Prime Minister of Estonia of the period 1992-1994, Mart Laar, stressed the following in his address to the colloquium of the German Foreign Policy Association in June 1993: "A vital factor in Estonia's economic success has been the openness of the Estonian economy" (Laar, 1993).

¹⁶ According to Sörg and Vensel, the reasons for laissez faire policy in Estonia include (Sörg and Vensel, 1999, p. 16): 1) the small size of the Estonian market; 2) the long-term experience of the over-regulated socialist command economy had been strongly unfavourable and thus gave rise to a generally negative attitude towards state regulation; 3) a lack of funding for regulation; 4) the weakness of public authorities with respect to both political and economic sense. For a long time the population had regarded the state as an instrument of a foreign power and passive resistance to government structures was widespread. If the authorities in the restored Republic of Estonia had tried to impose significantly higher tax rates and tighter regulations than before, the reaction to these measures would have been hostile; 5) events in other post-socialist countries have also shown that the more liberal the economic policy of a country is, the faster will the improvements caused by reforms work to stop the decline of economy. In order to prevent the development of pressures that might be conducive to a return to the former system, the first stage of transition (economic decline) must be passed as quickly as possible.

¹⁷ The liberalisation of the Central and East European countries from the socialist political and economic regime gave birth to financial and economic problems analogous to those caused by the liberation from colonial subjection. It was therefore natural for the idea of the currency board to be reborn in 1990s (Sörg and Vensel, 1999, p.12).

of Foreign Affairs; hence no political history. Since it was formed during a period of political changes in Estonia in the early 1990s the Department employed many young people who did not have the burden of former associations with certain economic branches of the old system.

As there were no experts competent in market economics for a number of spheres of economic policy in Estonia, the role of international organizations has frequently been of utmost importance in formulating principles of legislation and regulations. Their representatives often preferred solutions that were not influenced by Estonian lobbies.

The role of other ministries became more important during the second half of the 1990s. The Ministries of Economic Affairs, Finance, Agriculture and Transportation, the Customs Board and several other executive branch agencies have had bigger roles in solving specific problems in foreign trade because wider integration with the EU introduced additional issues to that had to be addressed by the government. These developments have introduced more complicated issues that have attracted the interest of several growing lobby groups.

One explanation for the success of different coalitions in promoting a liberal foreign trade policy was the weakness of traditional lobby groups. During the transition period the former managers of state-owned enterprises lost the basis for their economic power.¹⁸ Though many of them were successful in the privatization process, they were not effective initially in exerting pressure to obtain advantages from the government. A reason for this, as suggested by Patrick Messerlin, is that the managers of many state-owned enterprises, included into the privatization program, are not inclined to fight for trade protection, if only because the final set of goods to be produced by the successor of privatized firms is largely unknown (Messerlin, 1995).

Another reason is that the competition in the privatization process between several groups in the same field hampered consolidation of activities to achieve common protection of a certain industry. Agriculture is the usual applicant for protection in most countries but Estonia's liquidation of state and collective farm system radically changed the economic and political structures in rural areas. Though many collective farms were reformed into co-operatives and joint-stock companies in which the former leaders played the leading role, the influence of representatives of these new entities was initially modest.

In addition, the middle 1990s brought significant power to the banking sector as it began to dominate the economy. Their attitude has been more liberal than that of

¹⁸ László Csaba described this in following way: "With the collapse of Comecon and of the one-party state, a peculiar situation emerged in Central and Eastern Europe. Because of their strong integration into the outgoing power structures, priority areas and large firms often found themselves defenceless: subsidies were cut, trade regimes opened and their secure market gone. In the first months of disarray, reformist governments could indeed make great advances in legislating market-comfortable institutions and arrangements: structural adjustment had started. As employment started to follow output losses, however, after a delay of some two years, resistance to the open trade regime started to gather momentum." (Csaba, 1995).

the traditional industrial branches such as agriculture or manufacturing and this had a profound effect.

When evaluating the meaning of liberal trade policy for different groups it is important to consider both the benefits from Estonia's image as a country of liberal reforms and the costs of that image. The Estonian economic environment and Estonian entrepreneurs have certainly profited from that image. The benefits include foreign investments and support from international organizations. Foreign trade policy without customs tariffs has been a part of that image. The EU membership returned some regulations but that did not have a crucial impact on trade flows and was counterbalanced by increased credibility of institutions and business environment.

IV. Role of External Anchors

Creation of private ownership based market economy was a generally recognized aim of reforms at the beginning of the 1990s where escape from the autarky and autocratic system of the Soviet planned economy and reestablishment of the economic institutions that existed in the pre-Second World War Republic of Estonia were the first strong motive of reforms. Afterwards the basics of contemporary developed market economies, reforms in Central and Eastern Europe, advice of international organizations and a liberal agenda started dominate the discussion concerning practical steps of reforms.¹⁹

Estonia's main foreign trade partners were since the introduction of Estonian kroon the Scandinavian countries who belonged then to EFTA. Possible membership in EFTA as been discussed as well as EU membership which started to be a target in 1993-1994. The joining of Finland and Sweden the EU in 1995 played an important role in motivating Estonia to seek membership.

i. The Scandinavian impact

The role of Scandinavian countries in the process of Estonia's integration with the EU deserves a special discussion. As it was described, approximately 40% of the Estonia's foreign trade was executed with Finland and Sweden and close to 70% of the FDI came from these two countries. That reflects definitely the big role of Scandinavian countries in structural changes in Estonia and the importance of products of these countries for consumers and importance of these markets for producers of Estonia. A quite big proportion of this trade was created by vertical intra-industry trade and reflected closer industrial integration of Estonian companies with companies in Finland and Sweden. At the same time, that integration with Finland and Sweden did not cover all areas and there were activities, in which other contacts were also important.

¹⁹ We would here like to refer to Janos Kornai's book *A Road to Free Economy*, first published in Hungarian in 1989, and later in English 1990, in 1992 in Estonian and other languages. That book has been sort of guidebook during the earlier days of reforms and it is still worth to read and compare the initial design and later realisation of reforms.

If we take a look on the institutional side, market regulations and welfare state aspects, the situation in Estonia is quite different from Scandinavia. The tax burden and social expenditures as a proportion of the GDP are much closer to the Anglo-American type of economies than to Scandinavian countries. The EU integration with the obligatory takeover of a wide set of regulatory tools certainly defined this process and in some aspects moved probably closer to the Scandinavian countries.

One critical aspect is related to the received state aid and consultancy from different sources. The support from the Scandinavian countries was important during the first half of 1990s, but also different organizations of Germany were involved and that support from different country and regional or industrial level organizations was dominating and accompanied by the important role of the international organizations like the IMF, the World Bank, the UN.

Starting from the middle of 1990s, the EU accession started to play a central role. Finland and Sweden together with Austria joined the EU in 1995, but that was not a single important factor, which could explain why the Scandinavian role was in some sense substituted by the EU central role. The empathy of the Scandinavian countries towards the Baltics had some role in the EU discussions then, and probably made their way to the EU in some way more smoothly.

Here it should be also remembered that the development level of the Baltic States was in several aspects lower than that of the Central Eastern countries like Czech Republic, Hungary and even Poland, not to mention Slovenia at the beginning of 1990s. For example, the price system of the Baltic States diverted much more from the price structure of the market economies than the price structure of Poland or Hungary, one reason being that the Baltic States were during the Soviet period much more closed economies towards the Western markets even in comparison with these countries.

One way to explain why the Baltic States developed quite different type of market economy in comparison with the Scandinavian countries is to look on other factors deterring this process. There was a very strong antipathy against the Soviet type planned economy and economic freedom with limited intervention into market transactions was seen as the most important factor of market economy. In this context, the arguments about the social aspect of market economy and the role of redistribution and wider welfare states in Scandinavia way were weak arguments not supported by the public. Another aspect is that probably such one-sided attitude towards market economy was also exploited by emerging lobbies and political parties.

ii. Integration with the EU

Substantial changes in Central and Eastern European countries created conditions for co-operation and integration of Estonia, Latvia and Lithuania with the EU. The first assistance was granted to the CEEC under the PHARE program, and another step towards a deeper integration was implemented through the Free Trade Agreements. The Free Trade Agreement between Estonia and the EU came into force on January 1, 1995. Estonia together with the other Baltic States negotiated Europe Agreements (Association Agreements) in 1994–1995. Estonia signed the European Agreement on 14 June 1995, thus becoming the first country to conclude such an agreement without

a transition period. The European Agreement was partly based on the Free Trade Agreement between Estonia and the EU, which it replaced after its ratification in February 1998.

Estonia presented its application for membership of the European Union on 24 November 1995. The European Commission presented an opinion on the application and recommended commencing accession negotiations with Estonia. At the Luxembourg Summit at the end of 1997, the European Council decided to begin EU accession negotiations with six countries, including Estonia. The Intergovernmental Conference in Brussels in March 1998 marked the beginning of Estonia's formal accession process.

Special standards, quality requirements and other regulations as well as differences in legislation and complicated administrative procedures can be important trade barriers to market access. One way to remove trade barriers is to harmonize regulatory regimes (e.g. standards, administrative requirements, customs procedures, product testing, certification).²⁰ For example, adoption of quality standards that are similar to the EU's was one of the main objectives of Estonia's pre-accession phase (*Government Activity Plan for Joining the European Union*, 1996). Implementation of the rules, standards and norms of the Single Market helped to increase the competitiveness of Estonian companies by removal of cost-creating barriers and, thus, improving market access.

Harmonization started with the Government implementing the Commission's White Paper on integration into the Internal Market. The final objective of Estonia was to harmonize its legislation with the *acquis communautaire* in all relevant areas. The *Government Activity Plan for Joining the EU*, the detailed road map for Estonia's integration with the EU institutions and structures, was part of the recommendations in the White Paper. In October 1997, the government published *Estonia's Road Map to Reform*, a document that laid out a strategy for Estonian integration into the EU, taking into account the various issues. The more comprehensive strategy for Estonia's integration into the EU, the *National Work Program*, was created by the Government of Estonia at the beginning of 1998.

In March 1998, the accession negotiations between Estonia and the EU were launched. During 1998 and 1999, the so-called "screening" exercise took place, which was finished in autumn 1999. The *acquis communautaire*, the body of all the EU rules, is divided into 32 chapters, under which Estonia's legislation and administrative system was carefully analyzed. The aim was to find out how to what extent Estonian legislation had already been harmonized with the EU rules and which steps were still to be taken. The next aim was to harmonize the major part of Estonian legislation with the EU system by the end of 2002. In several areas, the need for a transition period was envisaged.²¹ When Estonia joined the EU on May 1, 2004, the major part of the legislation had been harmonized with the EU *acquis communautaire*. In the course of negotiations, several transition periods and conditions were agreed upon in the fields of environment, taxation and energy.

²⁰ Baldwin 1994, Baldwin, Francois and Portes 1997.

²¹ Koidu, Kuldkepp and Purju, 1999.

Figures in Table 6 demonstrate that during the period of accession process and also after membership from May 1, 2004, the new Central and Eastern European market economies grow faster than was the EU- 15 or afterwards, EU-25 average growth. As a result the new EU member-states converged with the wealthier countries on the basis of per capita income. For comparison, the trend of Portugal with the lowest GDP per capita figure from the EU-15 is presented.

Growth estimates demonstrated that all the countries converged with the average level of the EU-15 or EU-25 levels. The Baltic States with the lowest GDP per capita in comparison with the EU-15 average had the fastest growth rates and rapidly decreased the income gap.

Table 6. The Convergence with the Average EU Level of Less Developed Countries of the EU

Country	Convergence level of the GDP per capita at PPP from the EU average, in %				Average annual growth rate of the real GDP per capita, 1995-2006, %	Reduction of the GDP gap from EU-15 average during 1995-2006, %
	1995, from EU-15	2000, from EU 15	2006			
			From EU-15	From EU-25		
Slovenia	61,2	66,4	76,0	83,3	4,0	14,8
Czech Republic	62,2	59,6	69,4	76,0	2,9	7,2
Hungary	44,9	48,8	57,9	63,4	4,2	13,0
Poland	34,4	41,7	46,7	51,2	4,2	12,3
Estonia	31,2	37,5	59,3	60,0	7,2	28,1
Latvia	26,2	31,5	48,6	53,2	7,1	22,4
Lithuania	31,9	35,8	50,1	54,9	5,9	18,2
Portugal	61,2	64,9	64,2	70,3	2,3	3,0
EU-15	100,0	100,0	100,0	100,0	1,8*	
EU-25			91,2		1,9*	

*Average growth of the GDP per capita during 2000-2006.

Sources: For comparisons with the EU-15, Varblane and Vahter, 2006, for other comparisons, authors calculation on the basis of Eurostat figures.

iii. Accession to the World Trade Organization

Estonia became an observer to the GATT in June 1992. In March 1994, the Estonian Government requested accession to the GATT 1947, which was later transformed into membership application to the WTO. On 31 May 1994 the Working Party agreed to pursue market access negotiations with Estonia for goods and services. Estonia held bilateral negotiations on tariffs with the US, Canada, Australia, Mexico, Japan, Poland, Hungary, Kyrgyzstan and New Zealand. Negotiations on trade in services were held with the US, Canada, Poland, Japan, Switzerland and the EU. The

accession protocol was signed on 21 May 1999, and Estonia's membership came into force on 13 November 1999.

Membership in the WTO was an important missing aspect of Estonia's trade policy. Although Estonia had a very liberal trade regime at the beginning of the negotiations, there were several horizontal and sector level regulations that did not conform with the WTO rules. The Government of Estonia made available to the negotiating members 61 laws and many other documents to prove Estonia's trading regime's conformity with the WTO rules. Changes had to be made in all laws and regulations that did not comply with the WTO agreement or that were not clear enough to satisfy the negotiating partners. Some new laws, mainly related to technical barriers to trade, had to be adopted. In some specific sectors, e.g. commercial policy instruments, Estonia had no regulations and therefore agreed not to use such instruments until having laws and regulations in conformity with the Uruguay Round commitments.

Reorganizing the activities of government agencies and the process of trade negotiations influenced the administrative capacity of the Estonian government institutions by deepening the know-how of government officers. This included basic training as well as in the matters of the WTO agreements and instruments and structures of market economy. The most important benefit for the system was maybe that of the wide range of questions raised in the WTO negotiations prepared the government and the private sector for the negotiations with the European Union. During the negotiations, Estonia solved beforehand many problems that would have arisen in the process of integration into the EU.

V. The Role of Foreign Trade

i. General trends

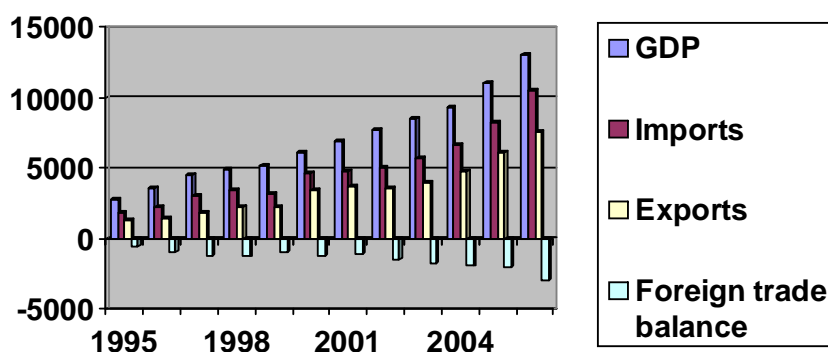
The geographical position between the Scandinavian countries and Russia has been one important determinant of economical, political, social and cultural development of Estonia. This geographical position has resulted in fluctuation between open and wide trade flows enabling an accumulation of wealth to forced political dependence retarding development.

Estonian foreign trade started to grow very rapidly after the monetary reform. The Free Trade Agreements with Finland and Sweden, replaced later by Free Trade and Association Agreements with the EU, played a very great role in that growth of foreign trade. When Estonia's main trade partners Finland and Sweden joined the EU in 1995, the EU became the Estonia's main foreign trade partner.

The Estonian economy has remained very open, with foreign trade turnover exceeding the GDP. The openness of the Estonian economy, as measured by the ratio of exports of goods to the GDP, was between 40-50 % in 1990s. It grew as high as 58.4 % in 2006. Estonia had a foreign trade deficit, which was quite stable in relative terms and accounted to 16-22 % of the GDP and to 13-18 % of the total foreign trade turnover in 2000s.

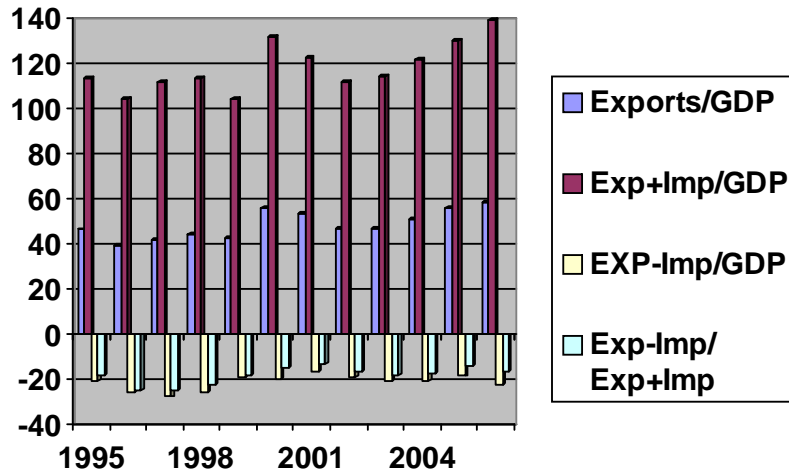
The growth of exports during the period under the fixed exchange rate arrangement when at the time the real exchange rate of the currency appreciated seems to be at first glance paradoxical; however, the initial conditions of the economy and the general framework of development should be taken into account. Estonia started reorientation toward Western markets at the time when a very large share of its production was unacceptable to the markets of developed countries; Estonian enterprises had to substantially change the character of their products. Many enterprises changed from being manufacturers of final and semi-final products to being subcontractors of Western firms. Raw materials (unprocessed wood, scrap metals) formed a very large share of Estonian exports. Afterwards the structure of Estonian exports improved, traditional industries started to exports more processed products. The intra-industry trade created a significant part of exports and imports of mechanical appliances and electrical equipment.

Figure 3. The GDP, exports and imports of goods and foreign trade balance, in current prices, mln. EUR



Source: Statistical Office of Estonia.

**Figure 4. Oppeness of Estonian economy
and the relative size of the foreign trade
deficit, %**



Source: Statistical Office of Estonia.

ii. Commodity structure

The commodity structure of Estonian exports is shown on Figures 5, 6 and 7. Traditional export articles such as textile and food products have declined in relative and absolute terms, and in 2006, machinery and equipment had the largest share of 24.6 % in Estonian exports. The export of electrical devices was 80 %, and machinery and mechanical devices accounted for 20 %. The share of radiotelephones and TV apparatus' parts in exports of electrical goods was about one third, with the most important markets being Sweden and Finland.

The second main commodity group was mineral fuels, the share of which increased significantly in Estonian foreign trade. The fast growth in the exports and imports of mineral products can be explained by the fact that the goods flows which previously crossed Estonia as transit are since 2004 included in official statistics of exports and imports.²²

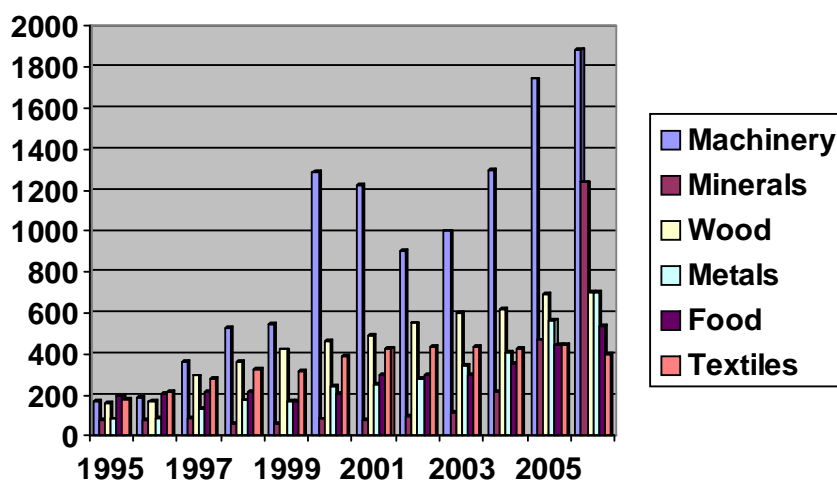
Wood and articles of wood accounted for 9.2 % of exports in 2006 where the major markets for round timber were Sweden, Finland and Norway; and the UK and Germany for sawn timber. Textiles and textile articles accounted for 13.9 % of exports in 1995 but only for 5.2 % in 2006. The shares of capital and know-how intensive industries have increased in Estonian exports, but there is still a relatively high proportion of natural resource and unskilled labor intensive industries such as the manufacture of wood and textiles

²² Foreign Trade 2006, Estonian Statistical Office, Tallinn, p. 10.

Subcontracting accounted for 70-80 per cent of the exports of clothes in 1990s, but decreased substantially in 2000s. The main markets were Finland and Sweden, which also were the major customers of subcontracting. In 2000s, also the CIS markets started to be more important.

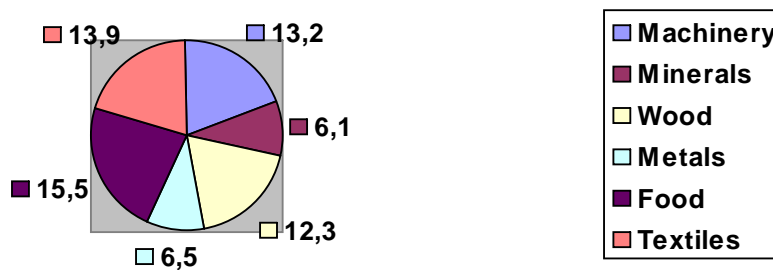
A very rapid increase in exports of food products to the CIS market occurred in middle of 1990s. However, the Russian financial crisis put an end to the boom in the Estonian food industry and forced another restructuring toward a lower share of traditional manufacturing industries. In 2000s, the main target markets of food products were Latvia, Lithuania, Russia, Finland, Germany and the Netherlands.

Figure 5. Exports of goods, current prices, mln. EUR



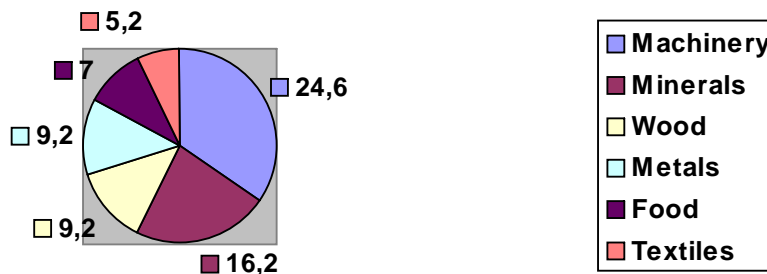
Source: Statistical Office of Estonia.

Figure 6. Structure of Estonian exports, 1995,%



Source: Statistical Office of Estonia.

Figure 7. Structure of Estonian exports, 2006,%

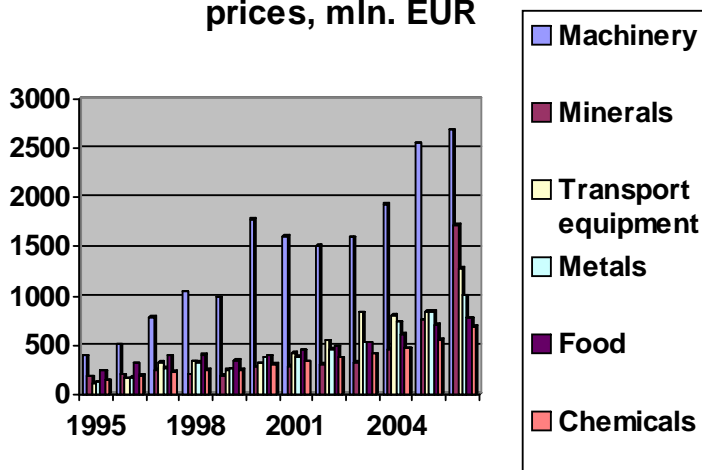


Source: Statistical Office of Estonia.

The structure of Estonian imports has been largely determined by the necessity to purchase fuel and other raw materials; i.e. metals cotton etc. Machinery and equipment was the most important single article with 25.4 % of total imports in 2006. More than one-third of those products were imported for processing.

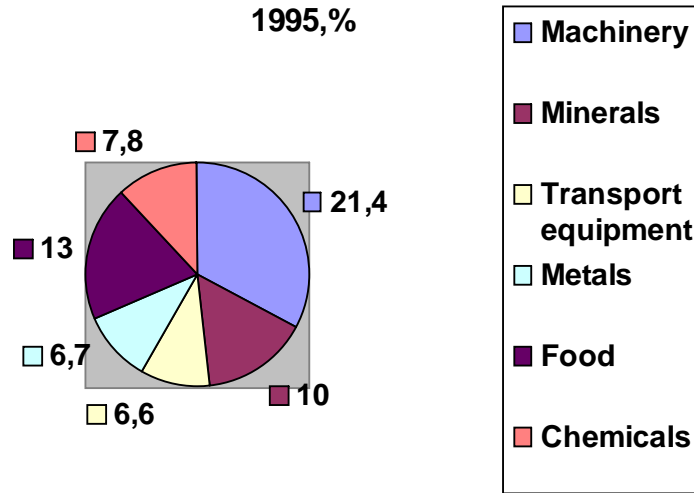
Minerals created 16.3 % of imports and the increased of importance of this item has been partially related to changed statistics. Mineral products accounted for 7.4 % cent of imports (95 % of them consisted of fuels, out of which two-thirds were light and heavy oil and one-third, gas). The main suppliers of oil were Russia, Lithuania (refined oil products from Mazeikiiai refinery) and Finland (re-export) and the main supplier of gas was Russia.

Figure 8. Imports of goods, current prices, mln. EUR



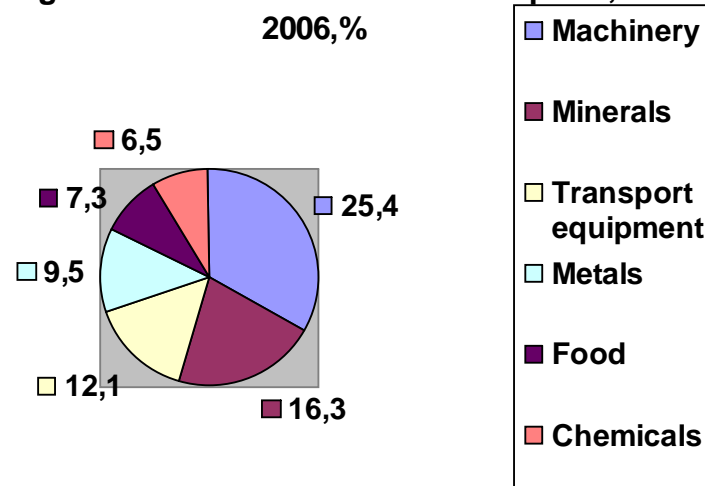
Source: Statistical Office of Estonia.

Figure 9. Structure of Estonian imports, 1995,%



Source: Statistical Office of Estonia.

Figure 10. Structure of Estonian imports, 2006,%

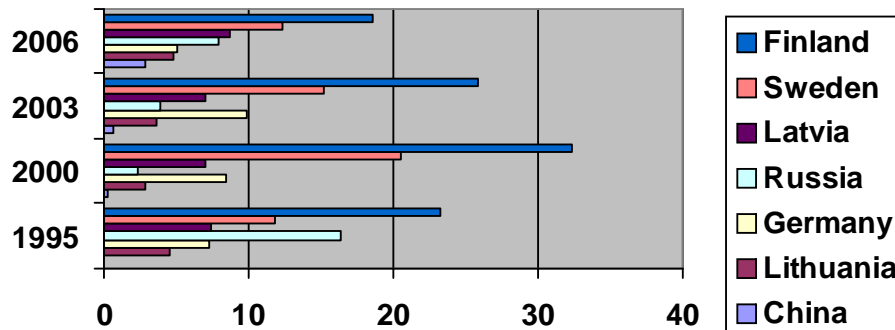


Source: Statistical Office of Estonia.

iii. Geographical pattern

The geographical pattern of Estonian foreign trade changed very substantially in 1992. Finland played a very important role, encouraged by its knowledge of these markets and its linguistic similarity to Estonian. Additionally Finland's share is high due to a large number of foreign direct investments which increased number of Finnish companies in Estonia. Those companies tend to trade with Finland formulating a large proportion of trade that re-export subcontracted items.

Figure 11. Exports structure by countries, 1995, 2000, 2003, 2006, %



Source: Statistical Office of Estonia.

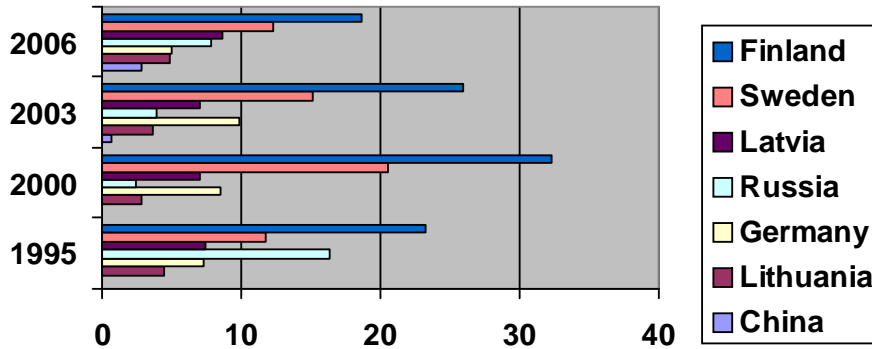
Table 11 shows the geographical pattern of Estonian exports. Among Estonian exports to Finland, machinery and mechanical appliances, and textiles and textile products were the leading items. Both are related to subcontracts of which a large number of Estonian producers manufacture semi-final products for Finnish enterprises. Often Estonian producers and traders who sought foreign contacts in Finland, later moved on to Scandinavian and to other West European countries.

The structure of Estonian exports to Sweden - Estonia's second largest foreign-trade partner, is rather similar. The leading export items are machinery and mechanical appliances, wood and articles of wood; textiles and articles thereof. The main structural shift in exports to Finland and Sweden has been a decrease in the share of textiles and an increase in machinery and mechanical appliances.

Russia's share of Estonian foreign trade declined dramatically in 1990s, but then recovered in 2000s. Russia furnished 13.1 % of Estonian imports and received 7.9 % of Estonian exports in 2006. For mineral oil, metals and wood resources, Russia is an important source of imports, Estonian producers and traders are interested in having economic linkages with Russia. Russia has been an interesting market for Estonian food and textile products.

Trade with other Baltic countries, Latvia and Lithuania, has been rather modest in 1990s, but increased rapidly in 2000s. To Latvia, Estonia exports electricity, which was the largest single article in 1990s. Later the share of electricity fell and food and chemical products became the leading items.

Figure 12. Imports structure by countries, 1995, 2000, 2003, 2006, %



Source: Statistical Office of Estonia.

Lithuania's share was 4.7 % of exports and 1.6 % of imports. Estonia received a rather important part of its petrol from the Mazeikiiai refinery in Lithuania. The food products, machinery and mechanical appliances and chemicals dominated the Estonian exports to Lithuania.

Germany has been a market for wood, furniture and textile product. From Germany Estonia imported mainly transport vehicles, machinery and mechanical appliances and chemicals. Historically, between the two World Wars, Germany was the main trading partner of the Republic of Estonia.

The majority of foreign trade with China was created by imports and exports of electronics components by Elcoteq company.

iv. Importance of transit trade

Transit trade of goods from Russia through Estonia to Western Europe, of which oil and oil products created a major part, has had quite an important role in Estonia's economy. That has also been a politically sensitive issue due to the recent tensions between Estonia and Russia and claims that Estonia's fast economic growth is first of all due to absorption of profits from the trade with Russia's natural resources. There have been estimates that those profits were equal up to 20% of Estonia's GDP.²³ The following part of the current report describes results achieved in a special report, prepared jointly by researchers from the Tallinn University of Technology and the Estonian Statistical Office.²⁴

The amount of transit flows of goods; services and tourists are measurable quite easily. On the other hand, to determine the size of value added created by transit is a complicated task. The role of transit trade is even harder to define if the indirect

²³ Bronshtein, 1999.

²⁴ Purju, Dedegkajeva and Soosaar, 2003.

impact of those activities is considered. The transport and storage services are accompanied by different financial, security and other services. In the framework of transit cluster, the re-export should also be included. However, in the framework of the current evaluation only direct transit services have been considered.

Calculations on different transit flows are described in Table 7.²⁵ Only transit trade through ports has been taken into account. According to estimation of other sources, the amount of goods and services passing the Estonian territory without going through ports is very limited. The statistics based on trade and services flows through ports gives more than 90% of respective volumes. The share of Port of Tallinn has been during 1990s 80-90% of trade flows through ports.

The GDP in basic prices is a value added from which the FISIM (indirect estimation of financial services) is deducted. To the GDP in basic prices, the net production taxes (added are production taxes and deducted are subsidies) are added and the GDP in market prices is derived.²⁶ The value added at company level is calculated according to the following formula: value added product = net turnover - purchased goods + changes in inventories – products for own use. In the case of transit trade, the similar formula has been used and the companies, whose main activities have been related to the activities described in Table 8, have been picked up.

The GDP in basic prices have been the basis for comparisons. In that way, the assumption that net production taxes have been distributed in the same proportion has the GDP in basic prices between different activities and the structures of the GDP in basic prices and market prices are the same, has been used.

Another critical issue has been the determination of the share of transit in those enterprises involved in transit trade. The proportion of transport turnover in ton kilometers has been the basis for calculation of the proportion of value added known only for enterprises total activities in the case of railway transportation.

For marine transportation and port activities, the physical proportion of goods in tons has been the basis for calculations to determine the share of transit in value added production of those enterprises. In the case of road transportation, the source for estimation has been statistics of ports on visiting transport vehicles. For the port operators and expeditors it has been estimated, that all of their activities have been related to serving transit trade.

The share of transit was 58% of value added in transport and storage sector in 2000. The value added created by transit goods and services were 4.38 billion kroons or 5,1% of the total value added.²⁷ From the different transportation services, the

²⁵ Calculations have been made by the Estonian Statistical Office according to assumptions worked out jointly with the working group from Tallinn University of Technology, Faculty of Economics and Business Administration.

²⁶ See also Table 2

²⁷ For comparison, The ETLA research report gives the following figures about the role of transit trade in Finland in 1998: value added 650 million FIM or 0.13% of the GDP (Widgren, M. etc *Transitoliikenne ja välityskauppa Venäjälle*, Helsinki, 2000. The same report puts the figure of indirect services related to transit trade at the level of 30% of direct transit trade.

railway transportation with the share of 86.8% and marine transportation with the share of 77.2% for transit trade have been very much dependent on services related to the flow of goods and services through Estonia.

Table 7. Value added in transit trade, current prices, mln. EEK.

	Pro- duction	Intermedi- ate consump- tion	Value added	Share of main activity %	Share of main activity in value added	Share of transit %	Transit in value added	Share of transit in the GDP, %	Share of transit in transportat- ion and storage, %	Employ- ment	Employe- nt related to transit
	1	2	3=1-2	4	5=4*3/100	6	7=5*6/100	8	9	10	11
Transport of transit goods, total	9024.4	6493.1	2531.2	86.8	2196.3	39.9	1010.2	1.3	13.4	15113.5	5070.4
Railway	1562.6	891.3	671.3	98.9	663.8	89.6	594.8	0.8	7.9	4532.0	3258.5
Marine	2644.0	2232.6	411.4	77.3	318.0	77.2	245.4	0.3	3.3	1190.0	710.1
Road	4817.8	3369.3	1448.6	83.8	1214.5	14.0	170.0	0.2	2.3	9391.5	1101.8
Transit goods through ports	1302.3	411.9	890.4	71.9	640.4	75.3	482.0	0.6	6.4	1218.0	659.4
Operators in ports	5982.6	3722.9	2259.7	88.3	1995.3	100.0	1995.3	2.6	26.4	2654.0	2348.7
Agents in ports	2895.3	2004.3	891.1	99.7	888.4	100.0	888.4	1.2	11.8	700.0	697.9
TOTAL	19204.6	12632.2	6572.3	87.0	5720.4	76.5	4375.9	5.1	58.0	19685.5	8776.4
Transportation and storage	24611.0	17062.3	7548.7								
VALUE ADDED TOTAL			85244.6								

Source: Estonian Statistical Office

VI. IT Sector and The New Products

4.1. A background

The general aim of the Estonia's economic policy has been the creation of an open, competitive and stable economic framework supporting business activities. That economic framework has been considered as a necessary precondition for the FDI, and this foreign capital has been considered not only as an important source of financial tools but also technical knowledge, business culture, and marketing skills necessary for structural changes in the economy. A very important reason for such approach has been related to a very limited domestic capital accumulation due to high inflation destroying practically all savings from the Soviet period at the beginning of 1990s.

An important part of this policy has been the relatively low tax level and the level of public expenditures. There has been a strong bias toward indirect taxes, a proportional relatively low tax rate for personal and corporate income tax, which has been accompanied by a wide tax base with very few tax exemptions.²⁸ One outcome of such fiscal policy was that there have been very limited resources for substantial industrial policy and the public policy role has been related to guaranteeing stable framework with a reliable legal system and consistent enforcement of limited necessary regulations.²⁹

For that reason, no especial industrial policy was applied to support the IT sector development. The public sector has been a big client and the IT sector was considered as a symbolically important field, but very limited public resources for this sector have been available up to the second half of the 1990s. The situation changed slightly at the end of the 1990s when the government started a "Tigers Leap" project to computerize high schools and the e-government project to widen a set of public services provided by Internet.

The EU membership changed somehow this minimal government approach because harmonization of regulatory framework with the *acquis communautaire* in all relevant areas was a necessary condition. At the same time, the EU practice in industrial policy has been that the emphases are on supportive framework and the tools of horizontal industrial policy and relatively less attention is paid on the sectoral policy, except on technology policy in some areas.³⁰

²⁸ The tax reform of 1994 introduced a common 26% tax level of personal and corporate income tax. Starting from 2000, a new income tax law introduced several new regulations regarding personal and corporate income taxes, one of them being the exemption of undistributed profits from the corporate income tax. The income and corporate tax rate has been decreased further and a 21% tax rate was introduced in 2008. The state and consolidated government budget has been in surplus during 2000s and the public sector total debt burden was very low, on the level of 4% of the GDP (Action Plan of Estonia...2007, Purju, 2004).

²⁹ In the co-publication of the World Bank and the International Finance Corporation Doing Business 2008, Estonia had a 17th position in the rankings on ease of doing business (Doing Business... , 2008).

³⁰ European Commission (2004).

The availability of resources from the EU structural funds created at the same time quite large additional resources to finance R&D activities. Quasi government organization Enterprise Estonia, compiling pre-accession financial resources before 2004 and afterwards organizing the use of EU Structural Funds finances accompanied by self-financing part of Estonian State, played an important role in assistance.³¹ The state programmes in information technology and telecommunications (including application in healthcare), together with biotechnology, materials sciences and power engineering are planned to start from 2008.³²

ii. Structure of the IT sector

In this framework, the IT sector inherited from the Soviet period did not have public support and orders, but reoriented rapidly according to the changed conditions. Programming was taught in some secondary schools already at the end of 1970s and 1980s. It was in the curricula of universities even earlier. During the last decades a number of people had been educated with a diploma in electronics, cybernetics, physics and mathematics. Quite a large number of them work in the software sector.

The Institute of Cybernetics (part of the Academy of Science system) should be mentioned as the most notable institution. Despite to the general rigidity of the Soviet system, the Institute of Cybernetics had quite a strong international scientific recognition in some areas and researchers published also in Western journals. Big role in the development of programmers was also played by the Institute of Physics, Tallinn University of Technology and computing centres of different state-owned firms and municipalities. The collapse of Soviet science system and state funding resulted very big changes in these organisations. The majority of the IT organisations were liquidated, merged with other organisations or started off several times smaller, which forced younger scientists to start up their own ventures.

Nowadays, the Estonian IT sector consists of a variety of institutions with specialized firms such as software development, IT departments of small and large institutions, freelance IT specialists, and outsourced expertise. Most of the software firms are small and medium sized firms with mixed Estonian and foreign ownership.

In 1990s, biggest employers of programmers and IT professionals were financial institutions such as banks and insurance companies and telecommunication firms. Information Technology projects in both sectors were characterized by the handling of a big number of customers and high security and reliability level. Modern

³¹ The first organization supporting R&D and innovation, The Innovation Foundation was established in 1991, the initial target for innovation policy was to support spillover from applied research to product development. The understanding of innovation policy was widened during 1990s from project-based activity to a more systematic understanding of innovation. Technology Agency (ESTAG) started from 2000, as a result of reorganisation of The Innovation Foundation (Finnish National Technology Agency TEKES as a model). Enterprise Estonia (EAS) was set up as a merged institution in 2001 and started to be a State main organizational tool matching together pre-accession financial resources before 2004 and afterward is organizing use of the EU Structural Funds finances accompanied by self-financing part of Estonian central government. The Estonian Development Fund, Smart Money, started in 2006. Its major tasks are to invest in 3-5 projects each year in existing firms to support expansion phase of these enterprises, to monitor development in critical area for innovative economy.

³² Action Plan of Estonia...(2007, p. 14).

post-Soviet banking “jumped over” several older technological solutions used in Western economies. Since 2000 banking and telecommunication sectors have concentrated more on their core activities. Most of the IT service and development activities started to be outsourced to specialized firms. In addition to the banking sector, Estonian software firms have provided considerable software solutions also for transport and manufacturing industries.

Local offices and product support units of global software firms form an important part of Estonian IT: Microsoft Estonia, IBM Estonia, Oracle Estonia and others. Though the offices have been working more on sales and support, also some product development took place here. In addition to hiring local specialists and providing technology transfer they have also provided career paths for technical talents. Several technologically gifted persons have made international professional career. Units of smaller software firms of mostly Finnish and Swedish origin create another part of the international software business.

Third group of IT firms are genuine local software firms concentrating both on product development and services. They have created new solutions for customers with various successes. These companies were mostly small, very often initiated for a particular project, one business idea being to sell services, solutions or the whole company to a big international purchasers in the area.

Fourth part is the IT people working in the public sector. There have been several activities by the state and the municipal governments to enhance the use and development of IT services. Activities include subsidizing computer ownership by less welloff groups, supporting the infrastructure creation and digitalizing municipal and state services such as registering and obtaining different permissions. The public sector has been the biggest single client.³³

In addition to formal IT sector located in Estonia there are also Estonian nationals who have moved to Finland and Sweden and work in Nokia and LM Ericsson. Estonian IT sector has benefited also from relative ability to communicate in the English language. Estonia has benefited as whole from government activities creating a positive public opinion and successful IT projects which improved image and increased attraction for new investors to finance the software industry.

iii. Interesting projects

The success of several software projects has been based on various international and micro (country, firm) level factors. As a macroeconomic factor there is general information technology and Internet revolution. New hardware products and technologies have provided a platform and opportunities for the entrance of new creative ideas and solutions. New technologies have substantially changed telecommunication industry and legal environment of copyright issues. In software industry, a small number of talented and visionary people have a bigger impact than a

³³ In 1990s, 49% of the computers totally sold in Estonia, were sold through the public procurement procedures. There are not available similar figures about the software services and the situation is much more complex for the reason that some part of the software was worked out by the public sector organisations themselves, nevertheless, the public sector is a big client also here (Kilvits, Purju, 2008).

big number of mediocre people. Like every pioneering activity it depends on human talents more than mature industries.

On the country level, there have been human resources available for software industry. The collapse of Soviet science systems forced younger scientists to start up their own ventures and also freed material resources for the development of new sectors of economy. That was a new challenging industry, and for several reasons, very much presented these values and expectations, which were common in the emerging market economy.

Skype, Playtech Ltd., Rate.ee, Regio Ltd. and Helmes Ltd should be mentioned as the most notable success stories. Above mentioned successful cases have greatly benefited from Estonian developers, programmers and other employees. It must be mentioned that in projects like Skype and Playtech Estonian partners have played a considerable technological role and a smaller financial role.

The common denominators in the software success stories have been that there were people with strong management and technologic skills. In most cases there has also been involvement of foreign partners who have been responsible for financing, marketing and external communications. One of the more publicized stories is Skype, which has acted as a motivating factor for many programmers and entrepreneurs.

Table 8. Some successful Estonian IT companies

	Field of activity	Most important transaction	Main partner(s)
Skype	Communication software, VoIP	Sold to E-Bay	E-Bay
Playtech	Gambling software	IPO in London Stock Exchange	
Rate.ee (Serenda Invest)	Internet portal	Sold to biggest local telecom firm	Estonian Telecom
Regio	Geoinfo systems (digital maps)	Sold to Done Corporation (Finland). 2002 MBO by local management	Ericsson
Helmes	Integration software	Societe Generale's Baltic Republic Fund acquired 34% of shares in 2000 In 2005 was MBO.	Various local firms

Source: Authors interviews, NASDAQ and OMX announcements.

It should be said that none of these projects have been started as spin-off type projects, where a scientific idea is the first, which is in turn used to develop further as a product or service technology for application. Most of the IT activities have been service-oriented and customer-specific. The customer very often provided finances or created a link with venture capital.

At the same time, the development in this sector is based very much on former higher education in the field combined with entrepreneurial spirit heated up by the

international boom and new opportunities. That enforced the idea of IT sector with much wider meaning than just particular products in the area. Most successful and important in this sense has been Skype, which has acted as a motivating factor for many programmers and entrepreneurs.

Sometimes these projects were in the areas with specific risks. Legal issues have had an impact on Estonian developments in the area. There have been lawsuits against Kazaa programme owners, the program to download music from the Internet developed in Estonia. The same team worked further with Skype. Software development in Internet gambling, in which an Estonian firm Playtech participates, is also regulated differently in different countries and legal environment is both chaotic and opportunistic.

VII. Skype

i. Skype as a VoIP

Voice over Internet Protocol (VoIP) is a term that has been popularized recently despite the fact that the terms and concepts have been in use since the early 1990's (Keating 2007, History of VoIP 2004). VoIP technology relies upon two technical aspects to effectively work; digitalization and P2P networking:

- **Digitalization:** When converting analog speech to digital signals involves hardware and software that samples the sound at small but discrete time intervals and converts the signal to a numerical format. This signal can be compressed since the human ear has a limited range and the human brain is adept at filling in missing data.
- **Peer-to-Peer (P2P) Communications:** The crux of VoIP's underlying architecture relies upon internal modularization and the power of geometric progression that occurs in stochastic well connected parallel network. Rather than routing all traffic through a series of servers, thus creating a logistical bottleneck, P2P services register users at a server but then direct the individual clients to contact themselves. Thus rather than use a hub/spoke architecture, a sparse but potentially well connected architecture is utilized via a system of dynamic networking.

Thus, the human voice is an analog signal that is discretized into a digital signal for data transmission whereby:

- **A PCM / TDM channel** establishes a connection between two phones and maintains a dedicated line of communication whereby the discretized voice signal is fed continuously. Bandwidth is reserved for two way traffic but not always utilized and the channel is most often proprietary communication line maintained by a traditional phone company PSTN (public telephone networks);
- **A VoIP channel** establishes connection between two computer/phone nodes and distributes packetized data across multipurpose Internet channels. The Internet channel is maintained by an Internet service provider (ISP) who uses the line for general data transmissions hence optimizing bandwidth usage;

- Although the sound ‘quality of service’ (QoS) on a PCM / TDM channel is superior to a VoIP channel, there are a series of additional logistical and price (dis)advantages that will be discussed. Once discretized, data is data and the packets are sent on open Internet channels such that systems can be optimized and bandwidth maximized under normal use.

The most popular provider for VoIP services in Europe is Skype due to their emphasis on customer service, marketing prowess, and ease of use. Although the mystique touted by numerous sources is that Skype was a small start-up firm, this is only a partial truth; Skype was a small but well-funded firm with necessary liquidity from previous Kazaa experience and incoming European based venture capital. The paradox of this situation is that Skype is not the most innovative or even the best VoIP technology provider on the market but they have a critical mass and perceived innovation mystique that they use to their advantage.

ii. Skype: specification and services

Skype is an independent software platform focusing on upon peer-to-peer data/voice over IP (P2P VoIP) transmissions. In the construction of the platform, the overall topology of the system has been strictly designed to minimize bandwidth and utilize the power of well connected stochastic networks. Thus, user availability as well as functionality can be easily implemented, changed, and modified with the assurance that the platform is robust and error resistant. Not only does this architecture decrease the system’s entropy but it also allows for value added enhancements to be implemented.

Utilizing advanced P2P technology allows Skype to enact carrier-class services that integrate voice, data, and video in a seamless manner. The platform is a multifaceted and integrated tool which enhances the communication experience by transmitting quality voice over IP as well as allowing users to communicate via shared text, pictures, documents, and other electronic means.

The following features are provided either for free or at a lower cost than tradition PSTN providers. In particular Skype empowers their users by providing effective client based enhancements that control parameters, which allows individuals to customize their service and personalize their system. By enacting user friendly technologies and superior end-user experience can focus their skills/attention on their specialisation and enjoyment such as:

- Multiple language control;
- Encryption for secure communications;
- Gain control, acoustic echo cancellation, and voice activation delay;
- Video calls;
- One-to-one and conference calls (up to nine people);
- Forwarding calls to other Skype names, phone number, mobiles;
- Calling computers, land-line phones, mobile phones, for little or no cost;
- Ring tones, pictures, and hardware such as headsets, phones, gear, web cameras etc.;
- Phone numbers in countries of user choice tied to Skype accounts;
- One year of unlimited calls to any phone;

- Gift certificates;
- Instant messages, sms via the computer, and file transfer capabilities;
- Contact storage as well as search capabilities;
- Voice mail and call forwarding;
- Encryption and security capabilities;
- Skype running on a mobile device (phone);
- Email and webmail;
- Job pages and networking tools;
- Blog solutions;
- Business solutions;
- Simple phone calls.

In order to decrease maintenance costs and software entropy, the overall topology of the software has been strictly designed using an Object Oriented (OO) modular approach. Thus, functionality can be easily implemented, changed, and modified with the assurance that the Skype system is robust and error resistant. Not only does this decrease the entropy of the overall system from the construction and maintenance points of view, but it also allows for the process of value added enhancements to be easily implemented. Due to this approach, Skype is cross platform tool kit which can be customized and run as an independent service under an end-users personalized control (Skype, 2007).

P2P architectures allow Skype harnesses the power of geometric progression experienced in stochastic parallel networks to ensure peer availability. The Skype network relies upon the peer to peer schemes when determining the visibility of unknown peers. The design provides superior visibility/ coverage in chaotic parallel networks, allows for increased scalability, optimal path determination, and takes advantage of the “small- world effect” described in the Kazaa P2P flooding algorithm system. By taking into account the small world effects and super-node connectivity, a distributed hash table network utilizes super nodes known to call setup and signal a priori peers to identify peers that are not known a priori. Thus, when making a phone call or connecting to a node, routing algorithms find the optimal path to the “needle in the haystack”.

iii. Changing the communication experience

Although a variety of different technologies and industrial paradigms can be chosen to illustrate economic paradigm shifts (music, television, movies, peer-to-peer file transfer), VoIP services represent a classic example of how social and technological forces have challenged and changed established lines of thinking. There has been an under-appreciated shift in how people communicate, whereby peer-to-peer (P2P VoIP) multi-layered communication services are viable solutions and superior substitute goods for traditional telecommunications since VoIP services extend beyond simple voice transmissions. Services such as Skype build tangible systems (on the back of other services) that deliver practical implementations, which directly benefit communities and often allow people to communicate for free.

Initiatives initially developed to facilitate communication over multiple mediums have opened new opportunities for the implementation of distributed systems, which connect parallel nodes; i.e. people. These new technologies, social

changes, and economic anchors are capable of delivering significant benefits to organizations/ individuals that share information via a distributed and collaborative environment.

Due to their digital background, lack of industrial history, and customer focus; VoIP providers generally understand that voice communications are more than just voice - they are personal communications experience via multi-layered information data streams. Just as an onion consists of many layers, there are also communication layers that mash the functionality of VoIP into new services involving text, blogs, pictures, videos, documents, expressions, music, links, and voice via multiple channels. By focusing technical and artistic expertise, VoIP and other social networking tools allow users to personalize their experience by combining real time end-user simplicity with leading edge product development. The emphasis is on allowing customers to select from a range of service providers, for each aspect of their telephony requirements, rather than choosing a telephony provider on the basis of the services they offer.

VIII. Concluding Remarks

Estonia is an example of an open economy whose development and growth based largely on foreign trade and foreign direct investments (FDI). Analysis of economic growth, role of the FDI in capital accumulation and the foreign trade in expanding the markets and internationalizing economic activities demonstrates the close and important linkages between them. In addition, a feeling of stability is required for FDI to be a continuous flow instead of shock increases and decreases, and that is where external anchors assist the market, by providing stability.

It is possible to conclude that the EU integration process, membership of the WTO and co-operation with the other international organizations as the World Bank, the IMF and others, played an important role in creating and supporting private sector based and liberal market economy. Implementation of the rules, standards and norms of the Single Market helped to increase the competitiveness of Estonian companies by removal of cost-creating barriers and, thus, improving market access. The external anchor concept is worth to connect to the role of these international agents.

Those trends were related to institutional and structural changes as well as true restructuring of the infrastructure of the economy. Rapid but positive and proactive change with a determined government breeds opportunity and institutional changes ensured the access to new markets. With free trade agreements, active relations with new foreign trade partners, the implementation of quality control systems and enhanced production methods acceptable in foreign markets, structural changes were manifested in the adoption and formation of companies producing high-quality goods and services that could be marketed despite increased domestic production costs.

Critical factor for the future development and structural changes lies in transforming from a transition economy to an innovation economy. Skype is a part of a telecommunication technology but also presents a much wider impact of to the new telecommunication technology on society. It is probably too early to make

comprehensive sum ups on that impact but definitely there is possible to find influence on preferences of younger generation regarding societal behavior and working habits and tools. That could change the economy just as when the train& car allowed for fast, low cost and on-demand personal transportation that had immense social, demographic. And economic knock-on effects; the liberalization of data to a cheap, mobile and immediate medium will have unknown economic and social consequences.

As with most economic evolutions, establishing a linear cause-effect relationship is moot given the inter-connectivity between human behavior and economic development. That said, there is clear empirical evidence that location, production, technology, and timing along with external anchors represent a catalyst for change. Yet, just as a chemist creates a complicated solution by mixing and stirring chemicals; if the necessary ingredients are not present, in their proper proportions, and given time, then results strongly vary. For example, Skype would not have been possible just a few years ago even similar circumstances in Estonia – without powerful computers of certain clock speed and the required world wide infrastructure to transfer large amounts of data there would as well as the lessons learned from Kazaa, another VoIP from another country would have been the success story of choice.

Like a pendulum, economic forces oscillate, but regardless of the situation, economic fundamentals are as important as “being in the right place at the right time”. External anchors are an important catalyst to this process, but as a catalyst, a reaction requires the necessary ingredients in place.

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