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The Estonian Economy Current Status of Competitiveness and Future Outlooks

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The Estonian Economy Current Status of Competitiveness and Future Outlooks

Short version of the report

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Estonian Development Fund is a public law entity founded by the Estonian Parliament on the basis of an Act of 2006 the objective of which is to initiate and support changes in the Estonian economy and society to help updating the economic structure, ensuring the export growth, and creating new jobs requiring a high qualification. For that purpose, the Development Fund performs risk capital investments into the starting and growth-oriented technology companies together with the private sector and carries out socio-economic and technology foresight.

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Foreword

Success never only brings along new opportunities and happiness, it brings more responsibility and larger obligations. There is concern about how to keep what has been achieved and how to move on. In order for the success to continue, we need to know more and more precisely about what is happening in our own economy and how does it adjust to the ever faster developing and changing world.

To get a more accurate picture about what the competitive position of Estonia is like and what the outlooks are for us in the 21st century frontier-free world, the Estonian Development Fund commissioned a study from the economic researchers at Tartu University, "The Estonian Economy. Current Status of Competitiveness and Future Outlooks". The objective of the study was not just mapping the competitive position of Estonian enterprises today, but to analyse possible future development scenarios, and make suggestions for avoiding unfavourable developments.

It is important to understand that our problem does not lie in what is happening to the Estonian economy in the near future, or to what extent economic growth will decelerate at this moment, but in the fact that the current economic structure of our state does not enable us to reach the rich countries in the farther future either. For that end, a far too large share of our people is working in fields with an insufficient productivity perspective, which are predominantly targeted at the domestic market.

If, on the one hand, we desire to catch up with the successful European countries, we need to think seriously on the other hand about how to evoke larger structural transformations in the economy, how to manage and implement them at an accelerated pace. Estonia is small enough to do that. At the same time, we all need to change our way of thinking in the following years for that sake, to look at the world with a "wider glance", and cooperate with each other. Entrepreneurs of today and tomorrow must search for business models that would enable going out to the world from Estonia. Heads of the education field must find opportunities about how to inject a more global view and ambition into the current students. Moreover, we have to look together for ways on how to bring good people from abroad to learn in Estonia and, thereby, to work here.

In this analysis report, the economic researchers at Tartu University see moving towards the so-called North Star as the most preferred development scenario for Estonia. What this means and what are the alternative solutions, you will find out in this paper.

Enjoy reading and wishing you brilliant ideas,

Ott Pärna
CEO of the Estonian Development Fund

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1. Problem: why is it necessary to handle the issues of the development of economic structure through the prism of competitiveness

The Estonian economy has undergone continuous and accelerating growth ever since the year 2000. Recently, signs have been starting to emerge indicating possible threats to the sustainability of the development and deceleration of economic growth due to the exhaustion of the former growth sources.

For a small country like Estonia, a sales success on the world market is an important source for economic growth due to the limitation of the domestic market. It depends on both the capacity of enterprises to effectively use the existing resources as well as create them, and on the ability of the economy to structurally adapt to the changes occurring on the world market. In the formation of such a skill, the government sector's ability to create an institutional framework and public infrastructure enabling the best possible use of the existing resources has an important role to play. Changes taking place in international competition of Estonia are direct feedbacks referring to the need for changes both in the branch structure of the Estonian economy and the use of production factors, as well as in the institutional structure of society and infrastructure.

This paper points out and analyses the factors on which the economic growth of Estonia has been based until now and how it would also be possible to maintain that in a longer, that is in a 5–10 years', perspective. The preparation of future scenarios was not limited solely to a general macroeconomic analysis, but also studied the dynamics of the branch structure and the ability of enterprises to adapt to the changing conditions.

Ensuing from the tasks raised, the following questions are tried to be answered.

1. Which stage has Estonia reached in its economic development, what is the international competition position of the Estonian economy?
2. In which direction is the Estonian economy, its branch structure, productivity of the use of production factors, labour costs, and innovation developing?
3. What are the behavioural patterns of Estonian enterprises in the current situation and how can they be assessed from the aspect of forecasting future developments?
4. What would be the possible development scenarios for Estonia's development in a mid-long perspective?
5. What should be done to avoid unfavourable developments and to support favourable ones?

In order to answer those questions, the working group carried out an international competition analysis of the Estonian economy by using statistical materials of international and Estonian macroeconomic and economic sector levels. Also, the actual behavioural patterns of enterprises were investigated by interviewing the heads of 14 enterprises, drawing up expert assessments on 25 enterprises, and using prior surveys on many enterprises. On the basis of the received results, the possible scenarios for Estonia's development were prepared, and general strategic development trends and policy suggestions for maintaining and strengthening the competitiveness of the Estonian economy were proposed.

2. Assessment on the international competition position of the Estonian economy

2.1. Definition and factors of competitiveness

The competitiveness pyramid model (see Figure 1) is quite widely acknowledged, and it enables analysis of the achieved, as well as forward-looking, strategic planning. Earning ability (earning current profit and winning the market share enabling earning profit in the longer perspective) ultimately synthesises all other aspects of competitiveness: the ability to compete on the sales markets and production factor markets, the ability to adapt to the business environment.

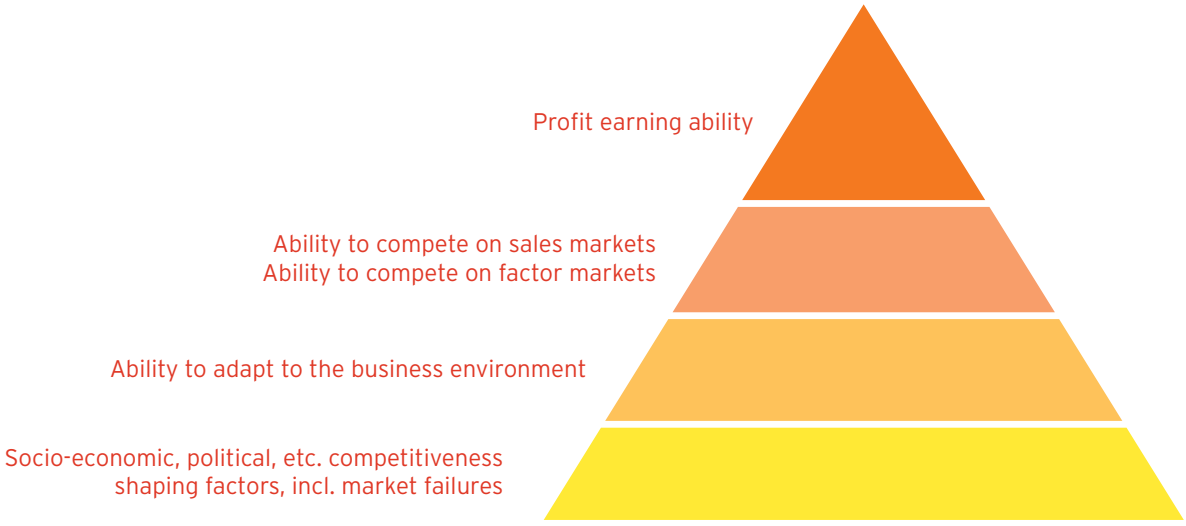


Figure 1. Hierarchical system of the formation of competitiveness

Source: compiled by the authors

From the point of view of influencing the competitiveness of the state or a sector of the economy, it is important to stress that competition takes place at two levels (see Table 1):

- At micro level, the entrepreneurs compete with one another on sales markets by offering their products and services;
- At macro level, on the other hand, the states (governments)[1] compete over mobile factors of production (labour force, capital).

In the macro level competition, the instruments are primarily immobile, i.e. local factors of production: legal and administration system, infrastructure (incl. science, education and health systems) and the services provided by public sector supporting the development of competitiveness.

1 In the Estonian language, the terms *state* and *government* are often used as synonyms. Here, the word *state* is actually used in a narrower meaning and *government* in a wider sense, i.e. a public authority as a subject of policies.

Table 1. Levels of competition and competitiveness

Level Characterisation	Micro level	Macro level
Competitors	Entrepreneurs	States (governments)
Objectives	Profit, enlarging the market share at sales markets	Attracting mobile factors of production
Instruments	Enterprises, products, services	Physical and institutional infrastructure, public sector

Source: compiled by the authors

The competitiveness of a sector of the economy is formed as a total effect of the activities of the subjects of two levels – the government and entrepreneurs. If the government fails to create such an environment in the state which would attract mobile factors of production into the sector of the economy, then the competitive disadvantage in that country as a location of the economic sector will be aggravated. At the same time, expenses made by the government for the creation of a favourable environment will not be refunded if the producers cannot use them on the world market for occupying better competition positions (the example of the Eastern Germany!).

Actually, at the moment competitiveness also depends at all levels on factors that are hard to understand, such as history, cultural background, geographic location, etc. The latter mentioned aspects constitute a part of the state's path-dependency that must be taken into consideration in forecasting development, but also in the current politics and business. Path-dependency appears as an inertia in the values, attitudes of the society and, hence, also in the policies used. Estonia's path-dependency depends, on the one hand, on the decades when the economy functioned in the conditions of a totalitarian planned economy but, on the other hand, also on the very liberal approach of the economy that has been dominating over the last 15 years.

2.2. Estonia's international competition position

Next, the position of Estonia in international social, economic, and economic-political space will be studied. The objective is to determine the strengths and weaknesses of Estonia among other countries, at the same time trying to distinguish indicators of the development level and development potential. Methodologically, the charts and rankings compiled by various international organisations are relied on, which try to make different qualitative aspects of community life measurable. The most well known are the following three objects of analysis (see Table 2).

Table 2. Indicators of Estonia's level of development and development potential (2007)

Indicator (institution)	Estonia's rank	Score
Human Development Index (UN)	44	0.86 (max. Iceland 0.968)
Economic freedom (HF)	12	78.1 (max. Hong Kong 89.3)
Economic freedom (FI)	14	7.8 (max. Hong Kong 9.0)
Ease of doing business (WB)	17	Not ranked (1st Singapore)
Competitiveness (IMD)	22	74.3 (max. USA 100)
Competitiveness (WEF)	27	4.74 (max. USA 5.67)

Source: UN, HF, FI, WB, IMD, WEF

- **Level of human development** which is measured by a Human Development Index (HDI) as compiled by the UN.
- **Economic freedom** which is empirically studied by the *Heritage Foundation* (HF) in the USA, and the *Fraser Institute* (FI) in Canada. Enterprise freedom is studied by the *World Bank* (WB) in its series *Doing Business.*
- Economic **competitiveness** which finds its expression in relevant indices of both the *World Economic Forum* (WEF) and the *International Management Development* (IMD).

A critical assessment has been given to the entire innovation system of Estonia, which in the current form definitely does not constitute in itself a development advantage.

The human development general index primarily shows the already achieved level of development in its widest sense, connecting earning ability with indicators of education and health. Economic freedom, on the other hand, is purely an institutional feature and in this way targeted at opening the development potential of the state. Competitiveness, however, is a structure where the achieved level (primarily the earning ability) and development potential meet.

In the **human development** of transition countries, a remarkable turning point was in the middle of the 1990s. Although the earning ability decreased to a considerable extent, the transfer processes did not have a remarkable impact on the quality of human capital. Therefore, it was possible to rely on it as a certain reserve (potential) after the reorganisation of the economic system, and to achieve a relatively quicker economic growth in comparison with other countries. By now, that reserve has been realised in Estonia and does not constitute a development advantage[2] any longer. Special indicators of **development potential** still refer to the continuing convergence possibilities of Estonia with the developed countries. That is especially noticeable by assessments according to the indices considering economic and enterprise freedom taking account of private sector framework conditions, where Estonia is situated among the top twenty countries in the world. Summary figures of **competitiveness**, which synthesise all development presumptions and, at the same time, also consider the achieved development level, place Estonia among the top thirty countries in the world.

Unfortunately, it must be admitted that the average indicators are somewhat deceptive here. The World Economic Forum's Global Competitiveness Index differentiates development factors into three stages: 1) basic requirements, 2) efficiency enhancers, and 3) innovation factors. On the basis of the general index, Estonia has the largest development potential among transition countries. There, Estonia's rank has consistently been 25–27th in the past few years, whereas deviations have been primarily caused by the addition of new states (see Table 3). The most favourable is the rate of efficiency enhancers, especially so concerning the technological readiness (16–19th).

2 In several transition countries, it has not succeeded to turn the relatively high quality of human capital into an earning ability due to the "reform retention". An extreme example here is Cuba.

Table 3. Estonia's rank by competitiveness factors

Stage of development	Factor	Rank 2006	Score 2006	Rank 2007	Score 2007
Basic requirements	Institutions	31	4.67	34	4.74
	Infrastructure	36	4.34	36	4.38
	Macroeconomy	15	5.87	14	5.85
	Health and primary education	36	6.25	30	6.06
Efficiency enhancers	Higher education and training	26	4.69	23	5.18
	Market efficiency	25	5.01	27	4.95
	Efficiency of labour market	23	4.74	26	4.76
	Development of financial markets	39	4.76	31	5.10
	Technological readiness	16	5.29	19	5.07
	Market size	81	3.36	91	2.89
Innovation factors	Business sophistication	37	4.38	44	4.39
	Innovation	32	3.69	31	3.75

Source: GCR 2006, 2007

Another domain where Estonia belongs in the top twenty is the macroeconomy. A small home market is an inevitable business condition for Estonia. One probably has to reconcile the poor assessment given to the market size. But what should be of concern is the fairly critical assessment given to the business development (sophistication). Above all, it refers to the low level of development of enterprise networks and clusters in Estonia. Practically, a critical assessment has been given to the entire innovation system of Estonia, which in the current form definitely does not constitute in itself a development advantage. That is especially confirmed by the successful analysis of the Lisbon process prepared by WEF for EU states (last *Lisbon Review* 2006). While comparing Estonia with the USA and East Asia, Estonia appears especially to clearly lag behind in the innovation factors' development stage.

As a whole, the favourable institutional basis of the market economy created in Estonia and its relatively good "marketing" to the international public is reflected in international rankings. Unfortunately, that may be sufficient for development in the stage of basic requirements and efficiency enhancers, but it is insufficient in the innovation factors' stage of development to catch up with the world's top countries.

Figure 2 shows the state of Estonia amongst the European Union Member States as compared to the five most successful ones on the basis of indicators describing various aspects of competitiveness creation and realisation. While Estonia's relative lag in the working hours per employee and in the share of labour force from the population is fairly small, then the differences in productivity are extensive. For example, in 2006 Estonian GDP per capita amounted to only 22 per cent of the relevant indicators of the five wealthiest European Union states (42 per cent if considering the level of prices). This means that in order to reach the EU top countries, the productivity must increase more than twofold in the production of final products.

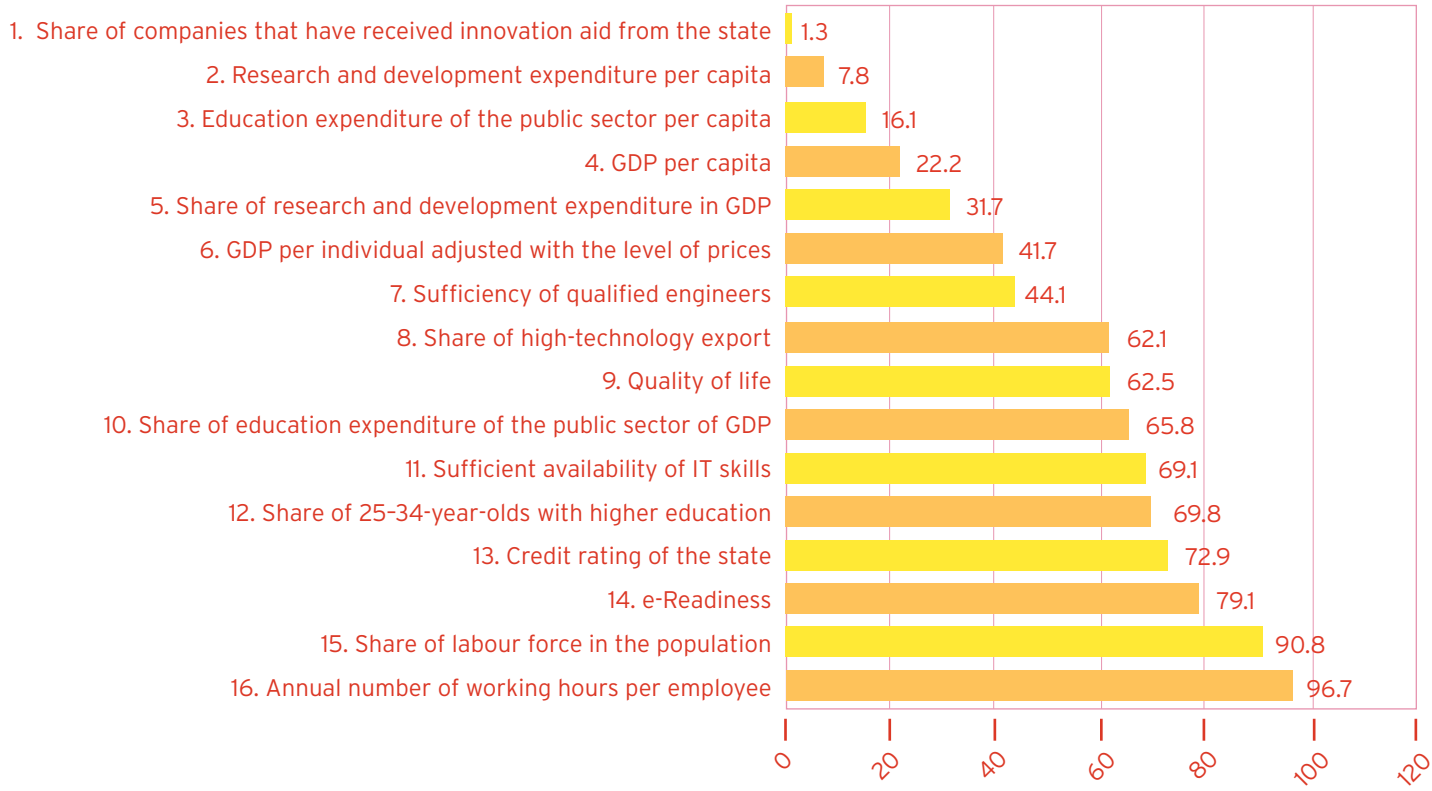


Figure 2. Comparison of Estonia with the average of the European Union five best states in the chosen categories of competitiveness (EU5 best average = 100 per cent, in 2006, partially also in 2004, 2005, 2007)

Sources and notes: Data in row 1 are from the source Pro Inno Europe (2007), European Innovation Scoreboard 2006; row 14 originates from the Economist Intelligence Unit (2007), The 2007 e-Readiness Rankings; all the rest of the data are from IMD (2007), World Competitiveness Online. The data in row 6 have been adjusted with purchasing power parity; rows 7, 9, and 11 originate from the interview results; in the case of row 15, it is meant how many per cent the labour force constitutes from the entire population (Labour force, per cent of population)

One of the significant reasons for the productivity lag in Estonia lies in little activity in research and development and its financing: when in 2006, 0.3 per cent of enterprises in Estonia received aid for innovation from the public sector, then in the EU five most active countries the relevant figure was 23.3 per cent. Also, the research and development expenditure per capita is considerably smaller here than in successful countries: in 2005, 96 and 1,231 U.S. dollars respectively.

In addition to that, the problem of Estonia lies in low education expenses per capita (in 2005, 517 and 3,213 dollars respectively), a lack of qualified engineers, relatively insufficient availability of information technology skills, as well as a comparatively low share of people with higher education as compared to the five most successful countries in this category (Sweden, Belgium, Ireland, Finland, and France).

The gross domestic product per capita created in this comparison, which could be interpreted as a summary figure of competitiveness, substantially lags behind the level of the developed countries. Hence, the competitiveness potential created by a favourable institutional environment will not be realised to the hoped extent.

2.3. Sources of economic growth

The competitiveness of the economy will first be expressed at the state level as economic growth. Estonia's very rapid economic growth and large investment volumes have been supported by both the multiplication of loans issued by the banking sector and the active operation of foreign investors in reinvesting their profits earned in Estonia. At the same time, many factors that have supported the development have had a fairly short impact and there is a reason to doubt their sustainability. Hence, it must be analysed what guarantees economic growth in a long period and how those factors appear through competitiveness.

Generally speaking, economic growth (increase of GDP *per capita*) could be decomposed into the following parts:

- More intensive use of the labour force: higher share of labour force, higher employment rate, and the number of working hours;
- Capital accumulation: amount of capital increased as a result of investments per employee;
- Increase of total factor productivity (*TFP*): the part of the increase of productivity that cannot be explained by the increase of labour and capital, which comes from such factors as professional skills, production technology, innovation, organisation, competition, and scale effect.

Data presented in Figure 3 show that Estonian economic growth has been very rapid as compared to both old and new European Union Member States. Demographic factors and the change of the use of labour force have expressed a relatively limited influence to that (in the period 1995–2000, it was even negative). Therefore, the predominant contribution to economic growth has been caused by the increase of the labour force productivity. The economic growth achieved on account of the increase of productivity has, according to this data, been more than four times quicker than in the

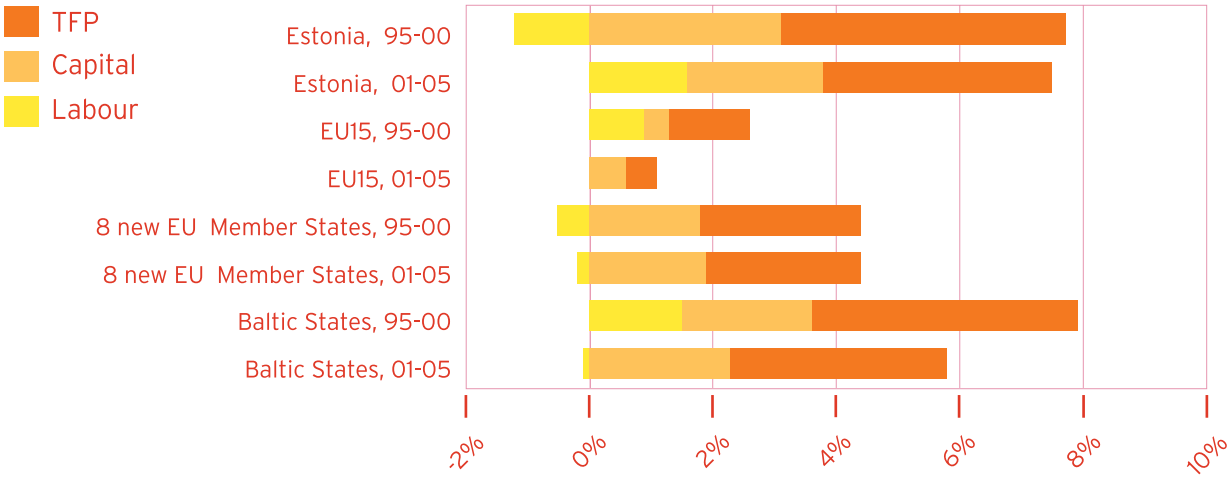


Figure 3. The period's average economic growth as decomposed by sources

Note: new Member States are Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, and Slovenia
Source: IMF (2007)

old European Union Member States, and by 75% higher than in the new EU Member States. Therefore, the labour productivity has grown thanks both to the increase of intensity of the use of capital and to the total factor productivity.

When assessing the sustainability of economic growth experienced in the recent past, it must be considered that in Estonia the capital used per employee constitutes 22%, the employment rate 100%, and the total factor productivity 42% of the euro zone average. Hence, it is clear that in order to guarantee economic growth in the future, it is important to primarily increase the labour productivity both through the intensity of the use of capital and the growth of total factor productivity.

The increase of Estonian domestic demand with the help of an extremely high speed growth of the external debt is unsustainable.

The very rapid economic growth of Estonia has so far been supported by:

- **Increase of the demand of households** financed to a large extent with the help of the growth of loan burden that was enabled thanks to the lowest interest rates ever in the years 2004–2006, which originated from both the impact of global factors and the decrease of the country risk accompanying the accession of Estonia to the EU and the fall of risk premium;
- **Increase of the demand of the government sector**, an important source of which was a extremely high speed growth of the state budget, caused by the taxation of domestic demand as a result of the loan boom;
- **Active operation of foreign investors in investing in Estonia**, which has constantly covered the current account deficit of the balance of payments, and enabled the continuous high growth of the money supply so far in the conditions of the Currency Board system;
- **Export growth**, which has mainly relied on cost advantage (especially on low labour costs);
- **Positive impact of the accession to the European Union** (decrease of trade restrictions, structural funds, competition, growth of attraction for investors and foreign tourists, etc.).

Continuation of a positive impact of several economic growth-supporting factors in a mid-long perspective is unlikely.

1. The increase of Estonian domestic demand with the help of an extremely high speed growth of the external debt is unsustainable. Total external debt in Estonia has, in relation to GDP, increased from 20 per cent in 1999 to 108 per cent by mid-2007. In the first three quarters of 2007 alone, it grew by 54 billion kroons. Figure 4 comparatively presents the levels of external debt in Estonia and other new European Union Member States, and change in the period from 2000 to 2006 (in the case of Estonia, also an assessment for the year 2007). Estonia belongs to the same group as Latvia and Hungary where the external debt has increased very quickly. The growth of external debt has been a lot more moderate in countries with a strong export increase – Slovakia, Czech Republic, and Poland.

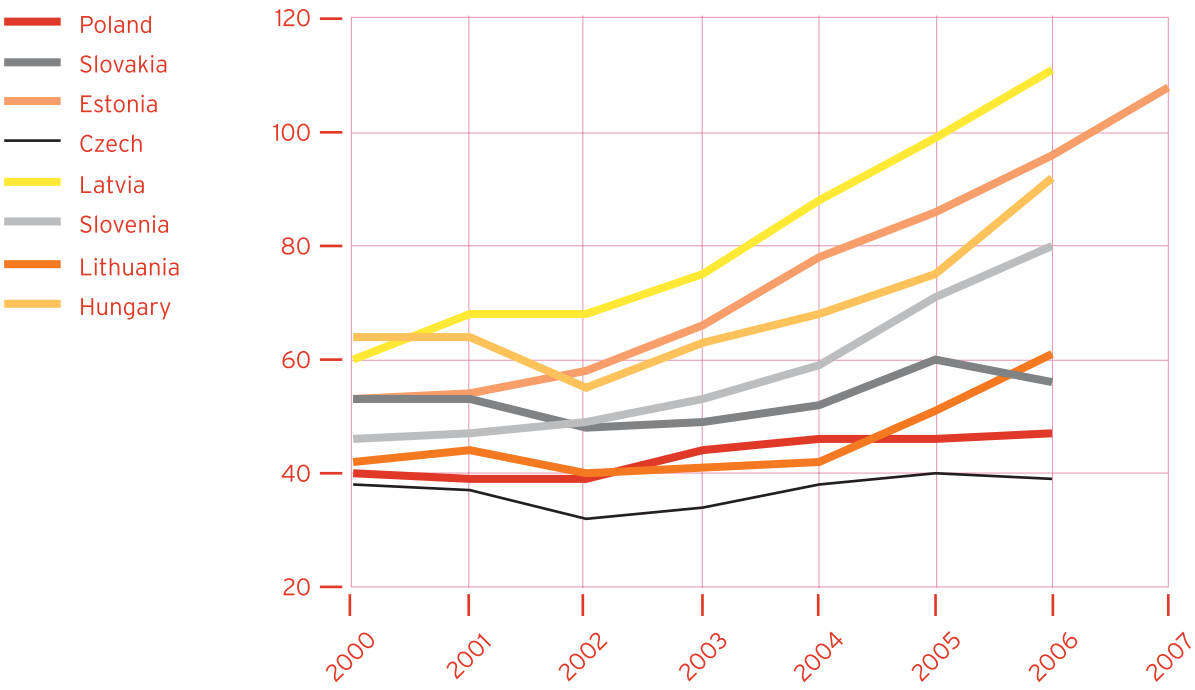


Figure 4. Comparison of the change in the rate of external debt of Estonia and GDP with other European Union new Member States in the period from 2000 to 2006

Source: Bank of Austria 2007, authors' calculations

The Estonian economy exploits an increasingly larger external debt with a successively smaller efficiency. That is illustrated in the figure in Annex 1 describing the productivity of the growth of the Estonian loan burden in the years 2000–2007, which presents the growth of GDP per one kroon increment of the Estonian external debt and the loan balance of the Estonian banks. The first of them shows the productivity of the means lent from abroad, and the second the productivity of total lent means. Use of the external debt is becoming an activity with a continually decreasing efficiency. When in 2000 2.4 kroons of gross domestic product could be created per one lent kroon of the external debt, then in the calculation for the first half of 2007 it has decreased to 50 cents. Hence, the creation of additional value in the Estonian economy demanded the inclusion of a larger amount of foreign instruments. It can also be claimed that earlier on other factors besides the external debt had a more powerful contribution to economic growth.

2. Estonia has until now consumed more than it has been able to sell to the world, and such **living in debt to the rest of the world is reflected in the current account deficit of the balance of payments**. This situation has been enabled by foreign investors who have helped to cover the current account deficit by financing a large share of the investment needs of our economy and, hence, supported the economic stability of Estonia. At the same time, the investments made outside Estonia have increased very quickly in the past few years, which in 2006 reached 13 billion kroons and in the first half of 2007, 6.1 billion kroons. Consequently, the direct investment flows made to Estonia and those directed outward are gradually becoming equal. In the third quarter of 2007, the foreign direct investments made to Estonia exceeded the investments made outside Estonia by only 300 million kroons. Therefore, **in the future foreign direct investments**

will not help balance the current account deficit of the balance of payments to the previous extent, which in its own turn might influence the money supply in the monetary system functioning on the basis of the Currency Board.

The consumption boom based on lending had a serious impact on the export orientation of Estonian enterprises by making the domestic market more attractive than the external market.

3. Previous very rapid growth of exports has been slowing down ever since the beginning of 2007 (see Annex 2). There are several reasons for the decrease of the export growth rate, the most important being the decline of the sales ability of the exporting sector on the world market caused by the loan boom. The **consumption boom based on lending** had a serious impact on the export orientation of Estonian enterprises **by making the domestic market more attractive than the external market**. High marketing margins in the real estate business also encouraged industrial undertakings to be engaged in this, and a shift appeared in the Estonian manufacturing industry towards the benefit of sectors and services satisfying the needs of the domestic market. On the other hand, **the demand caused by the loan money created a basis for the increase of wages**. Manufacturers oriented towards the external market, however, cannot ask a higher price from the market and they must be able to increase productivity at least as much as to cover the increase of the cost price caused by the growth of labour costs.

In addition, from the second half of 2007 the real estate boom has started to calm down and the increase of the domestic market demand has decelerated. All those factors together have led to a situation where, from the second half of 2007, the volume index of growth in manufacturing industry productivity has started to slow down and in September became negative after a very long time (see Figure 5).

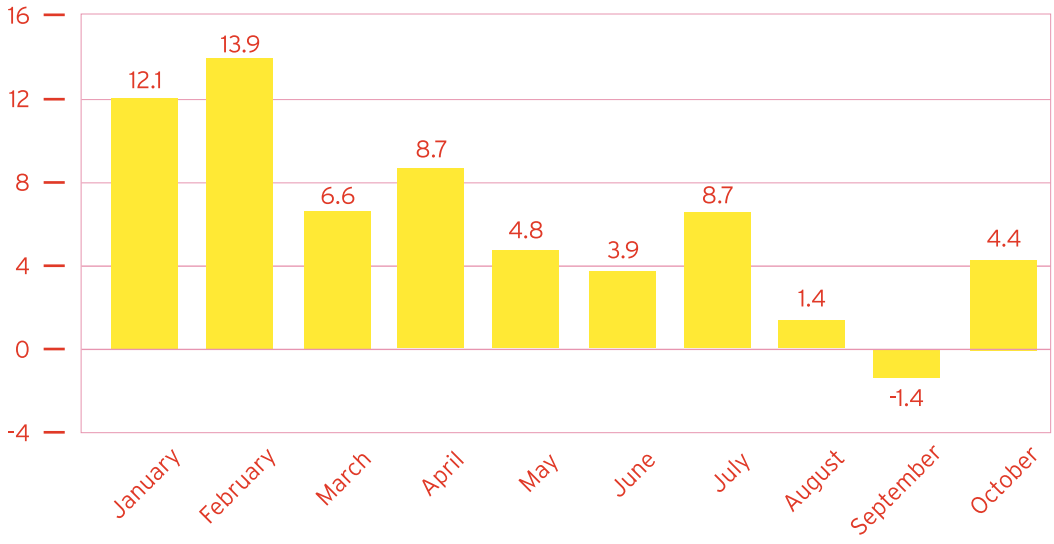


Figure 5. The change in the volume of the productivity of the Estonian manufacturing industry in 2007 in comparison with the same month of the previous year (%)

Source: Statistics Estonia, authors' calculations

In addition to the above-mentioned negative developments among the former success factors, new problems have also occurred, which discredit the continuation of the so far successful economic development of Estonia.

The increase of the domestic demand based on the loan boom has brought about **an inflation increase** (see Figure 6). Due to the Currency Board system, the money supply is directly bound to the monetary reserves of the central bank, which in turn depends on the inflow of foreign currency. As the inflow of loans and foreign investments into the Estonian economy were high, then also the reserves of the central bank have been continually growing, therefore increasing the money supply which in turn has exerted pressure on the price increase.

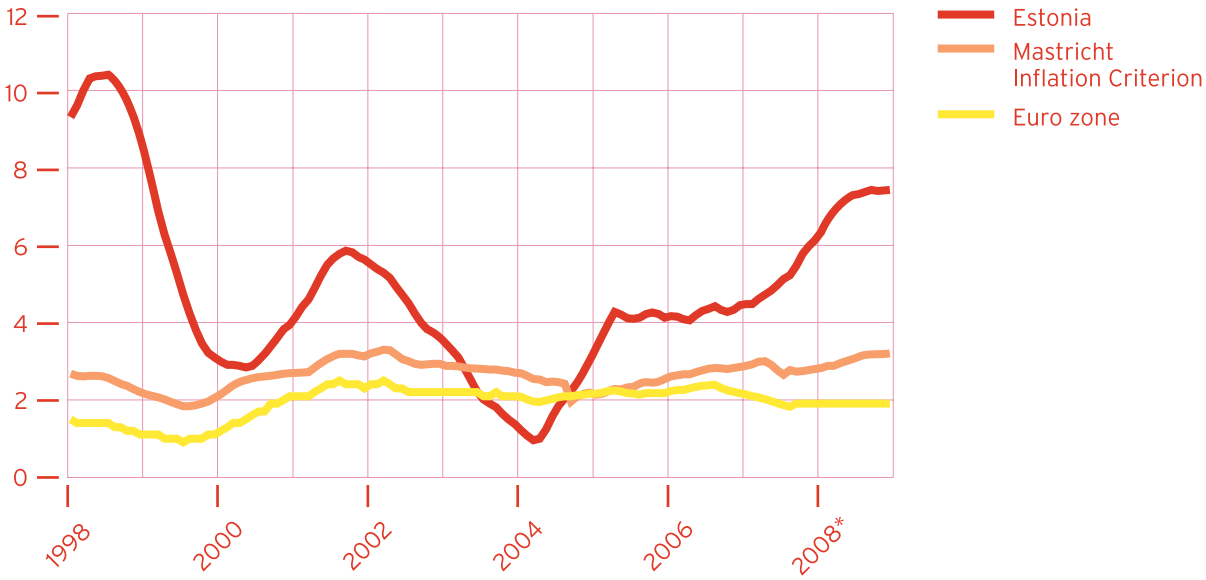


Figure 6. Inflation (annual change of the consumer price index, CPI) in Estonia and the European Union

Source: Estonian Action Plan for Growth and Jobs 2005–2007 for the Implementation of the Lisbon Strategy, State Chancellery, Tallinn, October 2007

Besides the rapid growth of the loan burden, the factors influencing the increase of inflation have also been the rise in prices on the world market (petroleum, food products), price increases in the closed sector (electricity, heating), the price level in neighbouring countries (main trading partners), and the increased public sector expenditure through the growth of EU supports. The above-mentioned factors will also keep acting as the cause of inflation in the next few years, but the diminishing total demand caused by the roughening loan conditions will start to suppress the increase of prices.

A relatively high inflation (*ca.* 7 to 9 per cent as forecast in 2007) postpones switching over to the euro to an indefinite future, which will cause several problems for the Estonian economy. An absence of the euro gives a signal to more investors that this is an unstable European Union Member State where it is not useful to invest. That uncertainty is also strengthened by risk rating agencies, which have given a negative

assessment to the development outlooks of the Estonian economy. The image of Estonia is also influenced by the behaviour and economic situation of the other Baltic countries. Lingering over switching to the euro together with uncertain development expectations preserves an opportunity to suspect a possible devaluation of the Estonian kroon, which further increases the instability.

The increase of the domestic demand based on the loan boom has brought about an inflation increase.

In the past few years, **the Estonian economy has been characterised by a very rapid growth of wages**, which is one of the natural consequences of the overheated economy. Rapid growth in demand and an expansive development of enterprises together with a partial opening of the EU labour market have brought the unemployment in Estonia to its lowest level in the last 13 years (in 2006, it was 5.3 per cent). In the course of the last year, the gap between wages and the growth of the labour productivity has deepened. The premature increase of wages cannot be sustainable from the point of view of employment, because if productivity grows any slower, the entrepreneurs will not be able to pay high salaries to the current personnel. Therefore, a need for change will occur: the decrease of employment, investments into technologies, etc. On the other hand, the rapid increase of wages amplifies the changes occurring in the economic structure. Less successful entrepreneurs are forced to review their business models, which might lead to the termination of production in Estonia and transferring it to countries with lower labour costs.

3. In which direction does the Estonian economy and its competitiveness move

The objective of this section is to summarise the main results of the study on the dynamics of various economic sectors and the fields of activities in Estonia (in the past few years, particularly during the period of 2000–2005). The competitiveness of the sectors is studied according to their ability to perform necessary investments (investments in fixed assets), activity on the labour market, ability to renew products and services, and apply marketing and organisational reforms (differences in innovation strategies of enterprises), and according to the fact how it has been reflected in the productivity of the enterprise until now (primarily in the value added per employee), as well as in the general indicator of competitiveness of the sector. Also, an assessment is given to the branch structure of the Estonian economy and to its development depending on its relation to productivity.

3.1. Level and dynamics of productivity

The income levels of the Estonian population, the export structure and its knowledge intensity have not yet caught up with the relevant indicators of highly developed countries. Therefore, the productivity of the creation of value added is particularly low.

Labour productivity lags in all economic sectors in Estonia greatly behind the level of more highly developed European Union Member States.

According to Eurostat data, Estonian GDP per capita, as assessed in the units of purchasing power parity (PPP), constituted 67.9% of the average of the Europen Union 27 countries in 2006, but the labour productivity indicators are considerably lower. In the past few years, the main engine for the growth of GDP has been the consumption of the Estonian domestic economy, the growth of which has constantly exceeded the aggregate increase of GDP (Statistics Estonia data). At the level of an individual, consumption expenditure has mainly increased in connection with the optimistic expectations towards the increase of incomes in the future. As a continual growth of actual incomes is expected in the future, people take loans to finance the impulse expenses on account of the anticipated higher income. Changing the future expectations of individuals and the increased interest rates should decrease the importance of the private consumption component in the growth of future Estonian GDP. Thus, in order to secure economic growth it is necessary to achieve a considerable increase in productivity, which would enable compensating the impact of deceleration of private consumption growth through the acceleration of export growth, and create wider investment opportunities for enterprises.

Labour productivity (created value added per employee) lags in all economic sectors in Estonia greatly behind the level of more highly developed European Union Member States, exceeding only the relevant indicators of Latvia and Lithuania (see Table 4). When compared with less developed countries like Portugal, Estonia has reached the closest in the productivity of real estate and business services, which constituted 80%. In the rest of the sectors, ca. 40–60% of the productivity of Portugal has been achieved.

Table 4. Productivity of the Estonian economic sectors (2004, per cent of the level of similar countries)

Field of activity	Ireland	Den-mark	Germany	United Kingdom	Finland	Portugal	Czech Republic	Poland	Latvia	Lithuania
Extractive industry	18.2	0.9*	19.4	3.0	15.6	28.8	59.6	51.0	146.2**	51.8
Manufacturing industry	6.6***	17.3	17.9	16.5	14.6	47.4	61.4	56.8	133.3	125.6
Energy, gas, water	29.0	15.5	21.3	16.4	14.6	21.5	62.6	83.4	152.0	152.0
Construction	9.7	21.7	28.0	15.5	21.6	63.1	69.4	83.5	148.0	156.3
Wholesale and retail trade	22.7	26.0	27.7	29.8	24.4	57.8	70.5	86.6	134.4	172.0
Hotels, catering	31.2	30.4	33.6	32.6	21.1	54.5	82.0	94.8	165.9	214.7
Transport, communication	17.0	23.0	28.9	27.3	31.3	40.3	92.4	92.9	154.8	150.0
Real estate, business services	20.6	21.7	28.4	27.3	30.2	79.5	77.7	104.1	193.5	167.9

* The extreme productivity of the extractive industry in the United Kingdom and Denmark comes from the high profitability of the gas and petroleum industry in the North Sea.
** The positions where Estonian productivity is larger are marked in a grey background.
*** Ireland's extremely high productivity in the manufacturing industry is partially caused by the strategy of international corporations located there to also show the profit of their overseas subsidiaries for the purpose of optimising taxes by using transfer pricing.

Source: Eurostat, Statistics Estonia, authors' calculations; in nominal calculation, purchasing power parity is not considered

In Estonia, the productivity of contemporary knowledge-intensive service and industry sectors is still several times lower than in highly developed countries. For example, in the field of business services, productivity is 21 per cent of the level of Ireland and Denmark, and 30 per cent of the level of Finland, which overrides the view that Estonia has caught up with the developed EU countries in the business services sector. This also points to the fact that Estonian enterprises are often engaged in those stages of the value chain where the productivity in knowledge-intensive fields is comparatively low, and also their export orientation is low.

By fields of activities, however, the largest in productivity lag lies in the manufacturing and extractive industry, energy and construction, where it constitutes only 7–18 per cent of the level of the European Union Member States with higher income levels (see also Annex 3). Low productivity in the manufacturing industry will start retarding further economic development in Estonia and also hinder the development of knowledge-intensive business services with high productivity. Former experience from elsewhere in the world (e.g., South-East Asian countries) shows that reaching a high income level has occurred through a stage where the manufacturing industry becomes a sector with high productivity and cooperates tightly with knowledge-intensive service providers. Estonia as a small country certainly needs, in addition to raising the productivity of the manufacturing industry, **to pay much more attention to**

developing knowledge-intensive and high-productivity services oriented towards external markets (creation of software, health services, creative economy, various financial services, etc.). One cannot expect a simple services economy to help Estonia catch up with the developed industrial countries. A solution cannot be the desire to direct a large amount of the population to offer services with low value added (hotels, catering, trade, etc.) without having a manufacturing industry with an extremely high productivity and sectors offering knowledge-intensive services oriented towards external markets. At the same time, when developing economic sectors providing knowledge-intensive services oriented towards the external market, the manufacturing industry must, in order to achieve high productivity, go through both a structural change and a change in the technology basis.

Estonia needs to pay much more attention to developing knowledge-intensive and high-productivity services oriented towards external markets.

The previous growth rate of the productivity of the manufacturing industry will not ensure the convergence of productivity to the average level of the old EU15 Member States in the following decades. Although the relative lag of Estonia diminished in the years 2000–2004 thanks to the rapid productivity growth, its absolute increment is, due to the low starting level of productivity (change of the value added created by one employee), considerably lower in Estonia (in some cases by a order of magnitude) than the increment achieved in EU15 countries. Thus, in spite of the quicker increase inproductivity, the absolute productivity lag might not be changed (see Figure 7).

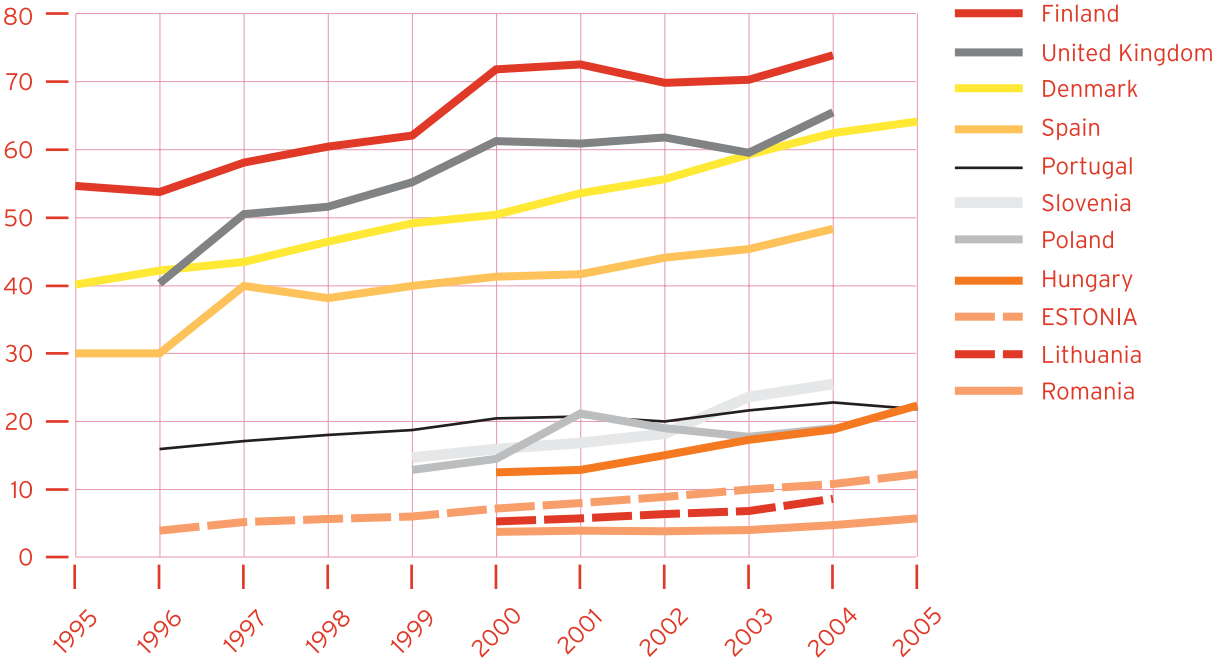


Figure 7. Comparison of productivity of an employee of the manufacturing industry in some EU Member States in 1995–2005 (value added per employee, thousand EUR per year)

Source: Eurostat, authors' calculations

When in 1996, the productivity as calculated per employee in Estonia was 38.3 thousand euros lower than the Danish level, then by 2005 the difference was already 51.9 thousand euros. As it is the created value added (a part of the product which remains after bearing the costs of labour and capital replacement) that is an important source for additional investments of enterprises, then its small volume hinders the achievement of productivity of highly developed European countries.

The previous growth rate of the productivity of the manufacturing industry will not ensure the convergence of productivity to the average level of the old EU15 Member States in the following decades.

Annex 4 compares the value added created per employee in the sections of the Estonian manufacturing industry with relevant indicators of a set of European Union Member States according to the data of 2004. From the Estonian industry sectors, the building materials industry, production of precision instruments and car accessories have reached closest to the productivity level of the old European Union Member States (*ca.* 1/3 of the level of the old EU countries). Particularly low is the productivity level in the sewing industry (*ca.* 11–13% of the level of Denmark, the Netherlands, Ireland, the United Kingdom) and in the furniture industry (14% of the level of Denmark, 18% of Germany). In low productivity sectors (clothes, textile, leather, and footwear industries), the value added per employee has not grown remarkably in the past few years; only the share of labour costs in the value added per employee has increased. The jobs of approximately 35 thousand people engaged in the above-mentioned sectors are in danger (30% of the employees in the manufacturing industry). The growth of productivity of these sectors to the level of the Western Europe would presume a remarkable decrease of employment considering the limitation of growth opportunities of the market share.

Low productivity is largely caused by an unfavourable structure of the Estonian economy.

3.2. Branch structure of the economy

Low productivity is largely caused by an unfavourable structure of the Estonian economy. Next, the economic structures of Estonia and Denmark will be compared. Denmark is chosen as a country of comparison because it is a small country where the leading role in the economy is held by small and medium sized enterprises, which have achieved a uniformly high productivity. When comparing the employment structure by fields of activities in Estonia and in Denmark (see Figure 8), it is striking that industry and energy have a relatively higher share in Estonia, while the business services sectors have a lower share. Consequently, the employment in Estonia has concentrated more on the fields where the gap with the Danish productivity is relatively higher (see Table 3).

Even larger differences are detected when looking at the structure within the manufacturing industry (see Annex 5). In comparison with Denmark, a fairly high share in the Estonian employment is possessed by those industrial sectors, in which productivity is quite small in Denmark. For example, the share of the clothes industry in Estonian employment is more than 10 times and the textile industry five times larger than in Denmark. At the same time, the share of employees in the high-productivity industrial sectors in Denmark, like engineering, production of precision instruments and chemical industry, out of the total employment is much bigger than in Estonia. Also in comparison with other EU15 countries, there is a very large share of employees in the sewing, textile, leather and footwear, and furniture industries in Estonia.

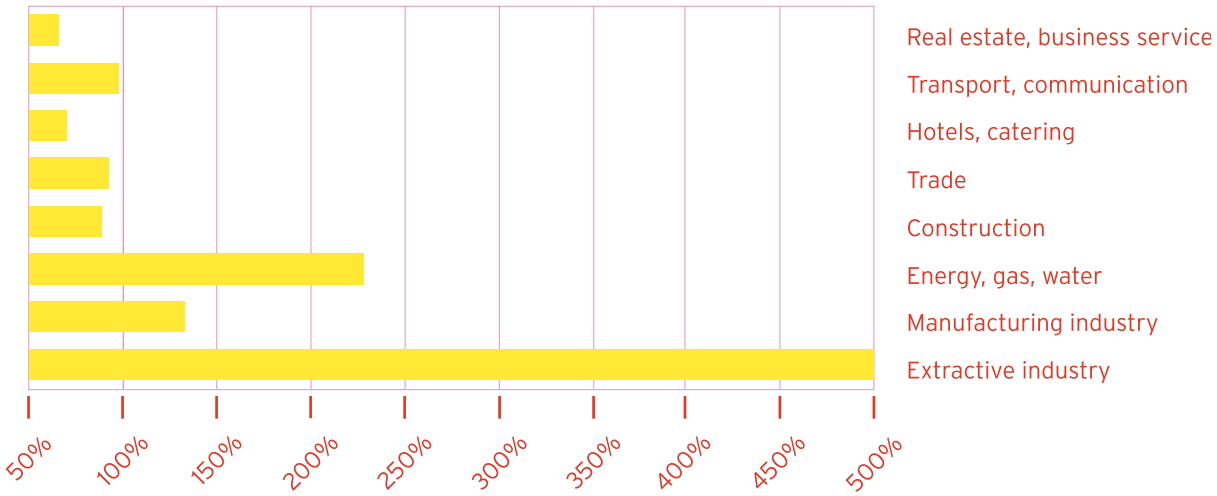


Figure 8. Comparison of the share of employees working in a relevant sector in Estonia to those in Denmark, per cent of the Danish level, 2004

Source: Eurostat, authors' calculations

When assuming that in all sectors of the Estonian manufacturing industry the productivity of the relevant production sector of the more developed EU countries would be achieved, but the division of employees among industrial sectors remained unchanged, then the productivity of Estonia would only reach to 56 per cent of the level of Ireland, 78 per cent of Germany, 80 per cent of Finland, and 90% of Denmark (see Annex 13). Surprisingly, Estonia would also clearly lose in such a comparison to the Czech Republic and Poland – in the case of both of these countries, the productivity and the employment structure of Estonia would only reach 86% and 87% of the productivity of those countries.

When analysing the branch structure of the economy of the EU27 countries while relying on the data presented in the *Eurostat* database on the creation of value added in the years 2000–2005 by six aggregate field of activity and by using factor analysis[3] for that purpose, it is possible to point out two general indicators of economic structure. The first of them (F1) characterises **the level of development of the post-industrial service economy** as being positively connected to mainly service oriented sectors that are more important in the creation of value added. The other general indicator (F2) could be interpreted as a factor characterising **the technological innovation environment**. That general indicator is positively connected

3 Factor analysis is a statistical technique for presenting generalised data with an objective to explain the variability occurring in the variables under observation with the help of factors or with the smallest number of non-reference generalised variables.

to creating value added with a larger relative importance for industry, but it is the industry that creates presumptions for broad innovation. The above-mentioned two general indicators of the economic structure explain *ca.* 64% of the variety of productivity (value added per employee) in the EU27 countries. The remaining 36% of the productivity variety can be explained by country-specific factors, including also belonging to new or old Member States.

The Estonian economic structure is becoming "Greece-like" rather than "Luxembourg-like".

On the basis of the value of the indicator of post-industrial service economy (F1), Estonia belongs to the same group with the new European Union Member States where the role of the service industry in the formation of value added is still relatively small. According to the level of the indicator characterising technological innovation environment (F2), the South-European and Baltic countries are distinguished from the rest of the Europe due to the considerably lower indicator level than the average (see Figure 9).

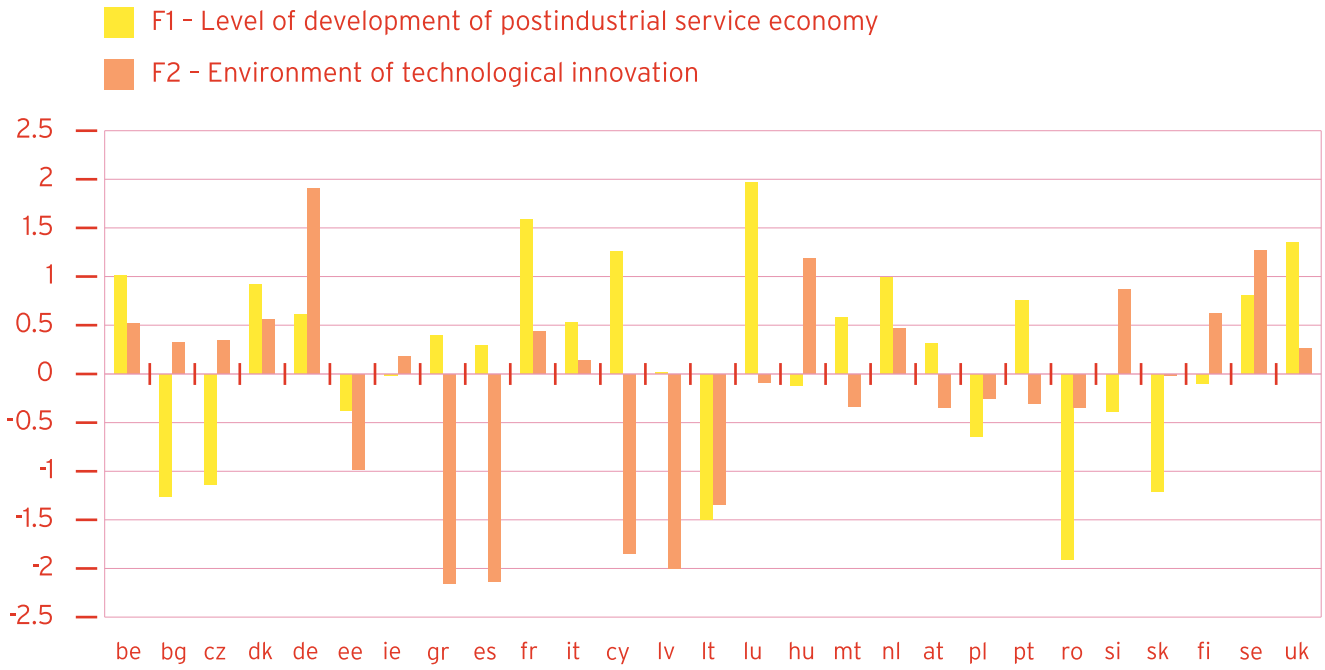


Figure 9. Values of general indicators (factors) characterising the economic structure in EU countries in 2005[4]

Source: the figure and calculations are made on the basis of value added data as presented in the Eurostat database by six aggregate economic sectors

The general tendency of development of economic structures in the countries under observation is moving towards a post-industrial service economy, the only exception being Slovakia (see Annex 6). Estonia has followed the general tendency here, but the development has not been very rapid. In creating the technological innovation environment, Estonia has lost its position and the development of its economic

4 Explanation: The level of general indicators of the economic structure described in the figure are characterised by rates – factor loadings. As factor loadings are standardised, then the factor loading's value of a state being zero gives evidence to the fact that the value of the general indicator (factor) in the case of this examination is the sample's average. In case of a positive value of the factor loading, the level of that indicator in the state is above, and in case of a negative value, below the sample's average.

structure has occurred similarly to the South-European countries (see Annex 7). The Estonian economic structure is becoming "Greece-like" rather than "Luxembourg-like": In tangible production, construction dominates over industry and low productivity trading- and hotel business over high productivity business services and financial intermediation. An example of successful development is Ireland: high readiness for a technological change has led to a significant development towards a post-industrial service economy within the period.

Hence, the following conclusions could be made from the branch structure of value added creation.

- Estonia's **economic structure** by no means resembles a contemporary knowledge-based economy; it is rather an industry **built up on cheap labour** and services.
- **It is impossible** for Estonia to catch up with the level of productivity in the developed industrial countries by merely raising the technological level of enterprises and **by increasing the so-called technical productivity**.
- It is imperative to **change the structure of industry** towards increasing the relative importance of sub-branches with higher productivity (for example, production of precision instruments, medical equipment, sophisticated electronic components and equipment). The importance of knowledge-intensive services in the economy must increase.
- As in the previous development of the economic structure, no shift towards the **innovation supporting** environment could be seen, it must be attempted to influence the process by economic policy instruments.

In Estonia, both the production structure and the technology used is more oriented towards blue collars in comparison to the European average.

When analysing the previous changes in employment sub-structure, then the relative share of the primary sector has gone through a drastic decrease and the share of the services sector in employment has increased. At the same time, the structural change did not occur as a result of relocation of the labour force (to some extent it did happen), but primarily due to a decrease in general employment. Only in the services sector has the employment slightly increased in absolute numbers in comparison with the early 1990s. Thus, also in the development of employment's sub-structure a general tendency towards a post-industrial service economy can be followed. At the same time, it should not be forgotten that in developed countries it occurs on the account of a decrease in the relative share of industry; in Estonia, however, on the account of a decrease in the primary sector. But that has a negative impact on the change of productivity, as services sectors with a relatively low productivity are pre-developed.

When analysing the structure of jobs and economic sectors in Estonia and comparing it to the situation in developed countries, it can be said that in Estonia, both the production structure and the technology used is more oriented towards blue collars[5] in comparison to the European average. At the same time, the analyses conducted on the basis of data from several fields of activity show that the demand for workers with a tertiary level education (higher education, professional higher education, and vocational education after secondary education) will increase the most in the future.

5 According to the classification of occupations ISCO6-ISCO9 (skilled workers of agriculture and fisheries, skilled workers and craftsmen, equipment and machine operators, unskilled workers).

3.3. Labour costs

A relatively low productivity starts to limit the possibilities for further wage increases and diminishes the competitiveness of several industrial sectors in Estonia. That in case the premature growth of productivity cannot be ensured by various measures before the wage increase, which is inevitable in the conditions of the European Union open labour market. This is accompanied by the following problems:

- Transnational wage disparities might cause the emigration of people;
- Increasing labour costs and a decrease of profitability pressure the exports of jobs from Estonia to other countries with lower labour costs.

Due to a large relative share of labour costs out of total costs, the problematic sectors are the leather and footwear industry and, to some extent, also the paper, textile, and sewing industries.

The differences in wage level in comparison with the destination countries of migration have decreased, therefore also the migration pressure to leave Estonia and to work abroad is decreasing.

When comparing the wage level and dynamics in Estonia and in the EU developed countries, it can be seen that in the past few years the wage increase in Estonia has been quicker than in the destination countries of migration (Finland, the United Kingdom, Ireland, Norway, Sweden, Denmark, and Germany). At the same time, the differences in the wage level are still 4–5 times lower. The rapid wage increase in Estonia has brought about a situation where the differences in wage level in comparison with the destination countries of migration have decreased in all economic sectors under observation, therefore also the migration pressure to leave Estonia and to work abroad is decreasing (see Annexes 8 and 9).

A very important factor in exporting jobs is the labour cost per employee. The rapidly developing Asian countries: China, India, Korea, Malaysia, and Philippines, were included in the analysis. During the observed period (2000–2006), the labour cost has grown faster in Estonia than in the Asian countries (see Figure 10). Only in 2000, the labour cost in the majority of sectors in Estonia was *ca.* 50% higher, now it is 2–3 times higher than in the control group of selected Asian countries. Consequently, Estonia's ability to compete with the Asian countries from the aspect of low labour cost has decreased very quickly. In comparison with other countries of destination, the Estonian labour costs have also grown quicker and has become equal with the level of Czech Republic and Hungary and overtaken Slovakia, Poland, and other Baltic countries.

The wage increase in itself does not necessarily mean having problems. Becoming a state with a high living standard presumes the increase of the level of wages. If that is accompanied by a growth of productivity and if profits did not decline, the competitiveness would be maintained and no pressure to export jobs would occur.

However, the analysis shows that there is a whole range of sectors in Estonia where residual profit (see Annex 10) per employee is low and that has increased slower than wages. Such sectors are:

- Manufacture of textiles and textile products;
- Leather processing and manufacture of leather products;
- Wood processing and manufacture of timber products;
- Production of paper pulp, paper, and paper products;
- Publishing, manufacture of rubber and plastic products;
- Manufacture of means of transport;
- Transport.

Thus, the analysis shows that **wages grow quicker than productivity primarily in the manufacturing industry. In the above-mentioned sectors, production will probably be reduced in Estonia.** On the other hand, in those sectors where productivity grew quicker than wages, the employment has also increased.

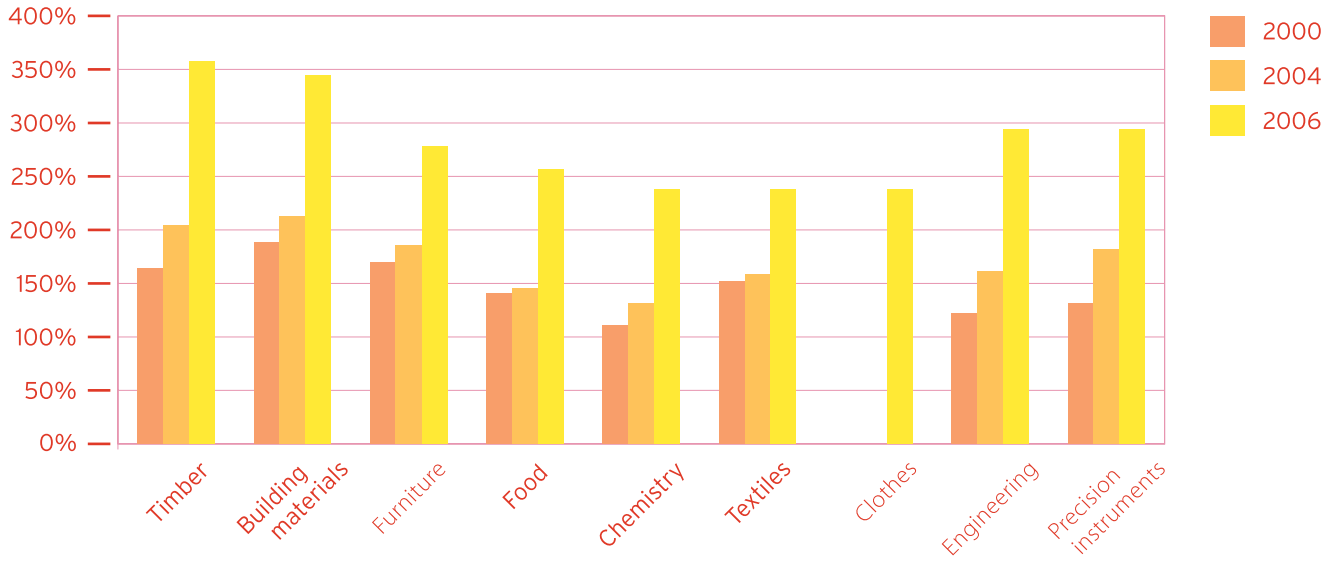


Figure 10. Labour costs in the selected sectors of the Estonian manufacturing industry (per cent of the level of the Asian countries)

Source: ILO database, authors' calculations
Note: The chosen countries are China, India, Korea, Malaysia, and Philippines. The share of labour costs in total costs is calculated as a rate of labour costs and total costs of enterprises. Statistics Estonia possesses the latest data for 2005. The wages for 2006 are forecast on the assumption that the wage increase in 2006 was 5% faster than in 2005. Labour costs of the Asian countries have been found on the basis of ILO data. Average labour costs have been taken directly from the database. As labour costs in different countries are from different periods (day, month, year), necessary recalculations have been made. Also, in case of missing data for single years, the average labour costs have been calculated on the assumption that their growth in the period 2000–2004 was equal. Labour costs according to the ILO data were translated into euros for the purpose of this analysis.

3.4. Migration and working abroad

In connection with accession to the EU, the opportunities for people working abroad have significantly widened. An important impulse for migration was given by the decision of Estonia's neighbouring country, Finland, in 2006 to abolish all restrictions to the free movement of labour originating from the new member states.

Statistics on that field are very deficient. When summing up all the workers sent (*ca.* 18,000– 20,000) and the employees who have worked abroad either for a shorter or longer period (*ca.* 32,000–35,000), one gets the result of *ca.* 50,000–55,000 people who have worked abroad at a certain period of time (from the beginning of 2004 until the beginning of 2007, Ministry of Social Affairs data). That figure also includes those who have returned and those who have been abroad repeatedly, which to some extent smoothes the non-calculation of unofficially working people in the official migration statistics. Therefore, it can be presumed that as an average, *ca.* 15,000–20,000 people work abroad per year.

The volume of investments made in fixed assets as calculated per employee still remains considerably below all the EU15 countries.

The entire active population (who work or look for a job) in Estonia is *ca.* 680,000 people at the moment; hence, the number of people working abroad constitutes *ca.* 2–3% of all the people actively operating on the labour market. If we presume that approximately as many work abroad unofficially, the total number would be 5–6%.

From Annex 8 it appears that in the period 2000–2006, the average difference in wages between Estonia and the main countries of destination of migration has decreased by 30–60%. Today, it can be claimed with certainty that working abroad is decreasing because the increase of wages in Estonia has definitely reduced the desire of people in several specialties (e.g., construction) to work abroad. Also the recent communication of the Labour Market Board on the fact that less and less people are looking for a job abroad through the employment mediation system EURES refers to that tendency. Even considering those working abroad as a reserve, in the future there might be a necessity to import labour while taking into account the aging of population.

3.5. Insufficient fixed asset investments as a reason for low productivity

One of the reasons for low productivity is insufficient investment into capital (fixed assets per employee amounted to only 22% of the average level of the euro zone in Estonia in 2004). Accumulation of capital is an extremely significant factor of economic growth, as the investments of the enterprise (for example, in fixed assets) create a potential for the continuation, or even for extension, of activities of the enterprise. Although investments in fixed assets in the Estonian manufacturing industry have quintupled by 2005 as compared to 1995, the volume of investments made in fixed assets as calculated per employee still remains considerably below all the

EU15 countries. From Figure 11, it appears that in 2004 the level of investments made in fixed assets in Estonia was even lower than the indicators of Slovenia, Slovakia, Hungary, Czech Republic, and Poland. It is however positive to mention the increase of investments made in fixed assets in the Estonian manufacturing industry – in 2006, it reached 4 thousand euros per employee a year.

Investments in fixed assets have grown most in the production of radio-television equipment and communication apparatus and waste conditioning, but the share of the mentioned industrial sectors in the employment is not large. As compared to the average of the manufacturing industry, proportionally less was invested into food and beverage production, clothes production, leather processing, chemical industry, production of building materials, and furniture production. The food industry has already made necessary investments, but in the other above-mentioned labour intensive industrial sectors it is inevitable to increase investments in fixed assets.

Increasing investments must go hand in hand with an increase of sales volume in order to secure the necessary profitability of investments. The analysis showed that although the return on investments (rate of business profit to the sum of equity capital and long-term loans) has not changed considerably as a whole in the period 2002-2005[6] (17.6% in 2002, and 17.8% in 2005), significant changes have occurred in single sectors. The return on investments has decreased in **textile production** (14% in 2002, and 4% in 2005), paper pulp and paper production (25% and 7.2% respectively), production of office machines and computers (29% and 16%), manufacture of motor vehicles, trailers, and semi trailers (23% and 16%), leather processing (25% and 13%), wood processing and manufacture of timber products (21% and 14%). The decreased return on investment complicates the renewal of technology in these sectors.

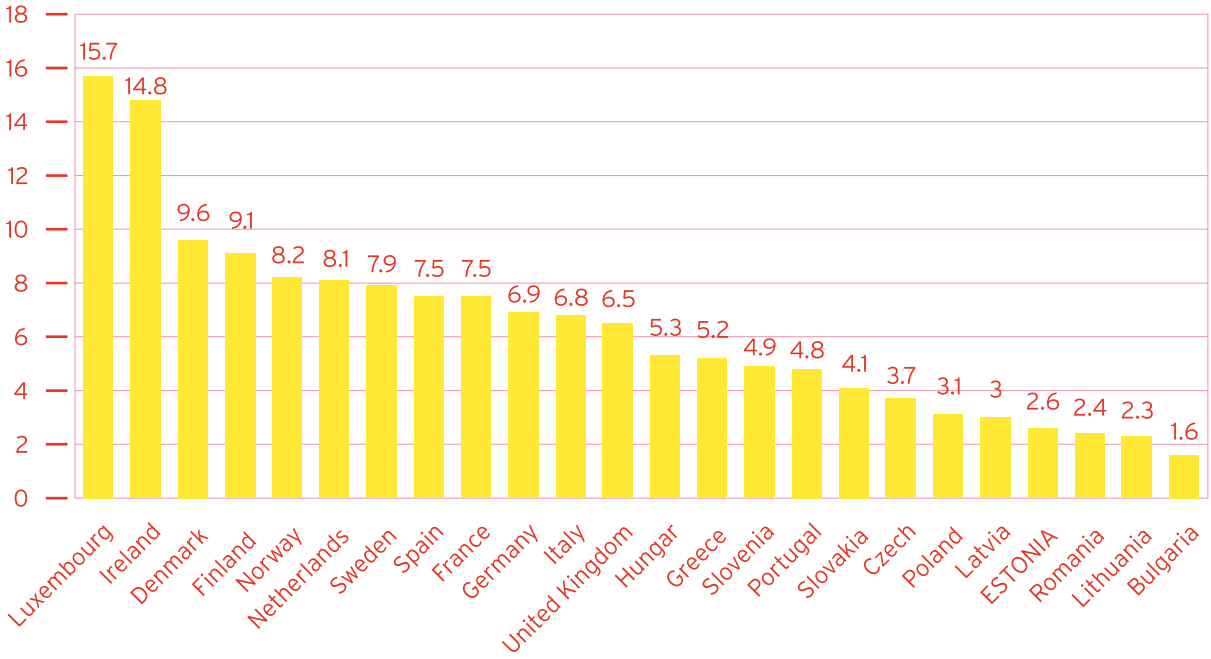


Figure 11. Investments made in fixed assets in the manufacturing industry of EU countries in 2004 (per employee a year, thousand EUR)

Source: Eurostat, authors' calculations

6 Such a period of time is chosen because the abolition of the enterprise income tax in 2000 from retained profits in several cases caused the declaration of profit for 1999 in 2000, as a result of which the profit of the relevant year could be considered abnormally high. That is also clearly expressed in the data.

At the same time, the return on investments has **increased** in a whole range of sectors, incl. manufacture of building materials (19% and 27% respectively), manufacture of metal products (10% and 19%), chemical industry (20% and 29%), production of medical equipment, optics instruments (10% and 44%), etc.

Increasing the productivity in the Estonian manufacturing industry requires the increase of investments in machines and equipment. Replacing the labour force with capital in its various forms would enable maintaining the international competitiveness in the conditions of increasing labour costs. But the higher the level of productivity, the larger investments must be made in fixed assets in order to achieve growth in productivity (see Annex 11). Therefore, **the investments required to achieve the same productivity in various sectors are very different**: when in the period 2000–2005, the double increase in productivity per employee in the building materials industry required an increase of fixed assets by less than a third, then, for example, in food production and manufacture of trailers a much smaller increase in productivity required very large investments in fixed assets (see Figure 12). Currently vigorous investments in fixed assets could be made by:

a) Industrial sectors which took advantage of the real estate boom and generally the rapid growth of demand caused by a rapid inflow of the loan money at the Estonian domestic market (building materials industry, share of paints, lacquers, etc., film preservatives in the chemical industry);
b) Industrial sectors that were supported by a growth of demand on the domestic market (food industry);
c) Industrial sectors oriented to the niches of external markets (trailers, various types of wooden houses).

Figure 12. The supply of fixed assets in some sectors of the Estonian manufacturing industry and development of productivity from 2000 to 2005 (value added and fixed assets per employee, thousand kroons)

Source: Statistics Estonia, authors' calculations

At the same time, a balance must be guaranteed in enterprises between the applied capital (production capacity) and the sales ability. In order to ensure the efficiency of use of investments, a maximum use of investments (fixed assets) must be made for earning revenue from sales. This connection was analysed with the help of net sales per fixed assets (return on sales per kroon of fixed assets) indicators, the low value of which often refers to an excessive investment in fixed assets in comparison with the return on sales received. The analysis showed that in the manufacture of food and beverages, textile and timber industry, as well as in the building materials industry, this indicator was remarkably lower than the average for the manufacturing industry. That means that in those sectors, achieving a higher cost benefit is harder because low net sales per fixed assets can be compensated only by a significant saving in costs. At the same time, the production of building materials is characterised by an increase in the indicator of net sales per fixed assets in the years 2002–2005. As we could see above, the textile industry and wood processing were characterised by a decrease in cost benefit indicators and a level lower than the average.

Also, the following differences could be noticed in the investment abilities of enterprises:

- A large amount of enterprises oriented towards external markets are under strong pressure from overheating of the economy, which is expressed in rapidly growing labour costs. These industrial sectors need rapid investments in machinery and equipment, but even more so in information technology solutions in order to decrease the labour intensity of their products. At the same time, their ability to invest from their own funds is limited, because sectors oriented to the domestic market are more profitable. In the exporting sectors, the profitability is lower, which refers to problems in securing their competitiveness.
- Large enterprises are better equipped with fixed assets, but in the last five years the difference in the volumes of fixed assets per employee has decreased among the sizes of enterprises. Also in the group of medium-sized enterprises, there has been an ability to co-finance the planned investment supports.

3.6. Innovation strategies of Estonian enterprises in sectors with a different productivity

Another important factor in increasing productivity is the innovativeness of enterprises – an ability to carry out both product and service innovations, renewal of technology processes and non-technology restructurings (marketing and organisational innovations). While grouping the Estonian economic sectors according to the primary level of productivity (value added per employee) in the year 2000, and to its growth rate in the period 2000–2005, and while calculating the indicators of input, processes and outputs of innovation processes from the innovation study data (CIS4, 2002–2004), significant differences and problems did occur in the innovation strategies of enterprises.

- Enterprises based on domestic and foreign capital have very different innovation behaviours. Expenses on innovation by enterprises based on domestic capital (incl. expenses on research and development) are small primarily due to high resource barriers.
- Sectors where productivity (created value added per employee) was fairly low in 2000 (construction, trade, agriculture, most of the manufacturing industry sectors) have generally not dealt with innovation related activities later irrelevant

of the fact whether the value added created therein grew quickly or slowly. The main reasons for that are, according to these enterprises, high resource barriers.

- The increase of labour productivity has been quicker in sectors oriented to the domestic market irrelevant of their innovativeness. Hence, innovativeness has not often been the main factor for the competitiveness of the sector in the recent past.
- In sectors with initially high productivity (chemical, building materials, medical equipment, and optics industry, postal services and telecommunication), the high growth was supported by primarily soft (non-technological, incl. marketing and organisational) innovations. In those sectors, the impact of investments made in technology on the growth of productivity has been smaller.
- Exporting sectors have a relatively lower productivity of value added and slow growth, which on the one hand reflects both the static nature of the markets and the direction of exports towards subcontracting or cheaper products. At the same time, innovation expenses in these sectors are larger in comparison with the sectors oriented to the domestic market.

Low-productivity sectors have reached a dead end due to the growing expenses and retreating profits, which does not allow them to deal with innovation.

As a conclusion, it could be said that **low-productivity** sectors (on the basis of value added) have reached a dead end due to the growing expenses and retreating profits, which does not allow them to deal with innovation and, therefore, increase the value added of their products.

Out of the **high-productivity** (on the basis of value added) sectors, rapid growth is primarily enjoyed by those sectors oriented to the high-demand domestic market (electrical energy, gas and water supply, real estate activities), but their value added does not originate from innovative products. Therefore, it could be assumed that this rapid growth is not sustainable.

Sectors with high productivity and slow growth (the paper industry and publishing, production of computers and electrical equipment) have invested into new technologies, and the share of innovative products in the turnover is relatively high. The reason for that could be the fact that in case of a high initial productivity, the achievement of further growth of value added requires significantly more investments in innovative activities.

When summing up the developments in productivity, economic structure, labour market, investments in fixed assets and innovative activities, the following problems could be pointed out from the point of view of further economic development in Estonia:

- **The increase of productivity in the manufacturing industry** is of critical importance, because achieving high productivity there also enables later moving on to providing knowledge-intensive services.
- Achieving high productivity in the manufacturing industry presumes structural changes; according to various indicators, a whole range of **problematic sectors** exist, primarily in the textile industry, leather industry, and clothes industry the volumes of which will shrink considerably in the future.

4. Behavioural patterns of Estonian enterprises – how do they manage and interpret the future

In the previous section, it was pointed out that certain developments in the Estonian economic structure are of serious concern. In this chapter, the viewpoint will be narrowed to the level of enterprises and will analyse what their behavioural patterns in making strategic choices are. It will try to explain whether a readiness for change could be seen, which could raise the competitiveness of enterprises in the renewing economic environment, and if there are, then which ones. The approach is based on an empirical study in the course of which 14 original interviews were conducted on the basis of a common plan (primary sources) and 25 expert opinions were gathered, which were compiled on the basis of earlier studies, media publications, presentations, and materials from the interviews. The compilers of the expert opinions had prior contacts with the enterprises under focus.

4.1. Types of behavioural patterns of enterprises

Two foci were taken as a basis for systemising the behavioural patterns of enterprises: first, insofar as **activity takes place within the limits of its field of operation** and secondly, to what extent they want to **extend their value chain**. As an explanation, it could be said that in intensifying its activities within the limits of its field of activity, it is measured to what extent they wish/can reduce costs, increase incomes and move towards the objectives set by the management techniques and means. All enterprises pay attention to these aspects to a certain extent, but concentrating on one characterises a strategic choice in a more specific sense. In expanding the value chain, the end consumer is approached and new value is added for the consumer, which enables a better exploration of the consumer and to consider more his or her needs.

On the basis of the two above-mentioned focus questions, the enterprises were provisionally divided into three groups/types, which are handled here as behavioural patterns of enterprises.

- Type I: enterprises **do not wish (cannot)** change the technology and their position in the value chain to a remarkable extent, and in case of problems they apply simple or passive manners (employ people from abroad in order to maintain the advantage of cheap labour, relocate production into regions with cheaper labour, etc.).
- Type II: enterprises **wish and can** change within the framework of the given field of activity. For that purpose, the strategy will be changed in a way that would enable creating additional resources and abilities, which would secure the achievement of a competitive advantage for the enterprise. Attention is paid to an active management of benefits and costs and to the improvement of the enterprise's management system.

- Type III: **the focus** of the main activities of the enterprise **changes**. Choosing such a strategy assumes the enterprise having an ability to overcome the barriers in exiting the previous branch of activity and the barriers in entering the new branch. Therefore, the competencies of enterprises should be transferable into another field of activity.

4.2. Behavioural patterns of enterprises of economic sectors with a different productivity

Below, the connection of behavioural patterns with the creation of value added in the economic branch will be observed. From the productivity analysis, it appeared that there exists a very large variability in the value added created per employee by economic sectors (see Annex 12).

Enterprises of high productivity economic sectors do not place a low price level at the forefront, but a higher quality.

High productivity enterprises in creating value added wishing to change their position in the value chain belong mostly to type II. The above-mentioned enterprises try to change within the framework of their field of activity by creating value added mainly by methods targeted at increasing incomes. Some of the enterprises extend their value chain, incl. for example *Balti Laevaremonditehas* (Baltic Ship Repair), which has considerably improved its position in the value chain, and *Baltika*, which has vigorously moved from the economic branch that is creating less value added (sewing industry) into retail trade. As a positive example, one could also mention *Regio*, where traditional basic competencies and technologies are integrated with new technologies by creating a unique competitive advantage. That has enabled the small enterprise to integrate successfully into the value chain of a global group (*Ericsson*) therefore also becoming itself a global knowledge-based enterprise. But also in traditional industrial sectors, it is possible to change constantly – for example, *Kunda Nordic Tsement* is steadily extending and puts into use new technologies – this year, more than 200 million kroons were invested. Enterprises of high productivity economic sectors do not place a low price level at the forefront, but a higher quality or combining the product with a service, which in its own turn might bring it much closer to the consumer, or to a remarkable movement in the value chain (an extract from an interview: "*Price is not number one, a stable quality is number one, the second is the stability of suppliers, price comes third*").

In these enterprises, they understand that it is impossible to increase value added without a decent compensation and necessary development of the personnel. For example, they do not save on labour in the *Haapsalu Uksetehas*es (Haapsalu Door Factory), as in case of original products labour plays a very large role and skilled labour is very important for the enterprise. In *Viking Window*s, there is no shortage of labour and the salary in the enterprise exceeds the Estonian average salary in similar jobs. The enterprise invests in technical solutions and training employees, and checks the characteristics of its products in test centres abroad and on its own test bench. The activities of *Tartu*

Maja are targeted at creating more conscious employees (an extract from an interview: "*We would like to move partially towards time wages, which presumes attestation, evaluation of the level, and paying according to it. A more competent and qualified labour force gets paid also in case there is not so much work.*").

At the same time, it is concerning that several **managers in their field of activity handle the organisation as static** (an extract from an interview: "*There are no changes in the structure. Only as much we buy new technology. Also no changes could be seen in the management, no changes could be predicted for the future.*"). Furthermore, it appeared that they **cannot always assess, or they have not even thought in which stage of development** (growth, stability, or decline) the enterprise or its various fields of activities are. Often, they underestimate the necessity for manager development (an extract from an interview: "*Trainings and everything actually increase labour costs, at least initially we have not trained managers or middle managers in how to save labour costs. We do train, but we organise special trainings on the required characteristics of some engineers, or required knowledge for an accountant, or something like that.*"). Not a very critical attitude towards developing management might come from a feeling of success that a majority of enterprises of that group have experienced. It can be said that in enterprises with a high value added, on the one hand, **efforts are made for finding new possibilities** (an extract from an interview: "*We have not set as an objective to limit the costs, but to increase the incomes.*"), but on the other hand, they are **not aware of the necessity and opportunities to develop management**. It appeared that they could not clearly point out what the expectations are towards the state or the partner.

In creating value added in medium productivity enterprises of economic sectors, they think about saving costs rather than increasing incomes.

In creating value added in medium productivity enterprises of economic sectors, **they think about saving costs rather than increasing incomes**. Exceptions were *Estiko Plastar* and *RPM* where there appeared a mentality oriented at increasing incomes and where they try to take product development to a qualitatively new level. For example, in the dairy sector both producers and processors are actively looking for opportunities to improve their position in the value chain and have maintained a critical point of view in relation to the current situation. For example, in *Tartu Agro* they are aware that in Estonia the rate of return is *ca.* 2–3 times lower than the European level. The acknowledgement of that is a step in the way of development, as it makes one analyse the substantive reasons of the problems. Surely the saving of costs has an important role, but in several cases it appears to be **a barrier to increasing value added.** Many enterprises are not able to open trade representations alone and it should be done together with partners and competitors. Selling its production to dealers by a third or even up to a half cheaper is a too high price of seclusion and enterprises could also cooperate more with their competitors.

Enterprises of that group point out several **problems in the supply of resources** (raw material, labour) and **restrictions** (EU quotas). Many enterprises complain about the lack of raw materials. For example, Estonian timber has become a hard to get and expensive, occasionally being even more expensive than in England, Finland, and

Sweden. The price of timber is formed at auction where, however, large sawn timber producers dominate, and who are temporarily able to also buy expensive raw wood. For example, *Näpi* and *Imavere Sawmills* use several times more Estonian wood than some ten Estonian log cabin producers altogether. Supporting small-size enterprises with a strong export potential in procuring raw material would ensure their survival and development in the future. Small producer timber enterprises help securing people with work in rural areas and preserving life there. For example, in Sweden producers in remote areas are subsidised via income tax incentives. That helps ensuring employment and the living environment in rural areas.

The problem of agricultural producers and food industry enterprises (primarily producers of dairy products) are **EU quotas**. The observed enterprises suffer from an earlier policy of the EU, which is intended to be changed in Europe. The food industry is a sector of the economy with large changes, which employs many people and for the production of which there is both international and domestic demand. The structure of Estonian dairy producers is fairly good and that development is seriously hindered by quotas. In Estonia, the production of crude milk could, according to estimations, be increased by *ca.* twice in case the EU eliminated the quota on milk production. The efforts of Estonian politicians in this respect would be very much appreciated.

The lack of **qualification of employees** and specialists (for example, designers, experts of printing and film industry) and workers is a serious problem. That is well illustrated by an example given at *Stora Enso Timber* – (an extract from an interview: "*Workers are excessively concentrated on the salary. You go there where you get paid more, which brings about a large labour turnover. When in similar enterprises of Central Europe the labour turnover is a few per cent, then here it is 20–30% a year. People are constantly looking for something better and also their training is therefore ineffective*.") In the surveyed construction enterprises, steps have been taken to apply foreign labour, whereas in one they pointed out the complexity of the process and, in the other, that step turned out to be a failure due to the poor quality of the work. The construction sector is one where most new jobs were created in the recent past, which has affected the labour market the most. Also, the representatives of the industrial enterprises of this sample (for example, *Estiko Plastar*, *Silmet*) acknowledge that the rapid development of the construction sector has tightened the situation on the labour market. At the same time, there are clear signs in both the conducted interviews and in the statistical reports that in this rapidly growing sector there are signs of deceleration, which decreases the demand for builders.

From marketing issues, **the trademark of the enterprise** has become a significant problem. Raising the prestige and trustworthiness of Estonian enterprises both as producers and partners is a key issue in the sales of the majority of products. For example, *Baltika* has successfully managed to design its brand and with the help of that has managed to get closer to its clients.

Among the enterprises of the economic sectors **with low productivity in value added creation**, the variety of behavioural patterns of enterprises is the largest – among them are enterprises that are actively looking for solutions (from the surveyed companies *Ilves-Ekstra*, *Toom Tekstiil Nonwovens*, *Fein-Elast Estonia OÜ*), and several enterprises where more attention is being paid to **ancillary activities** (like realising the existing real estate). In this group, there are mostly such enterprises that **try to manage with relatively simple methods**.

For example, a furniture producer is exporting furniture to Germany, England, Finland, etc. mainly through dealers and resellers. The sales strategy is passive and the enterprise is sent the orders and drawings of the dealer (client). Although the creative process takes place in Estonia, such production could also be considered sub-contracting. There are huge problems in this industrial sector, which are primarily caused by the decrease in demand on the world market. In the industrial sector, it is probably necessary to radically decrease the number of employees and simultaneously raise the sales ability, which presumes large changes in the value chain of the furniture industry, moving closer to the client, and increasing the share of end products in production, which requires large investments. Some of the enterprises are trying to renew their technology, but therefore the problem is importing outdated technology from the Scandinavian countries, which does not guarantee effective production.

In this group, there are mostly such enterprises that try to manage with relatively simple methods.

Low productivity enterprises in value added creation include **large textile companies**, which have not been able to adjust their former strategies to the new economic situation where the EU has opened its textile market to Asian producers and Estonian labour has become much more expensive. Production capacity would enable producing more, but the volume of orders is decreasing and, in the case of one example, it can be said that the USA market has been lost, which 10 years ago gave approximately half of the turnover. In an analysed **footwear industry company**, it appeared that so far they have not actively dealt with marketing and that is still being built up. The level of value added in the Estonian **leather, footwear, textile and sewing industry companies** does not grow, but what increases quickly is the share of labour costs. For the state it means a large number of companies and employees. In order to evaluate more precisely the development perspectives and sustainability of these industrial sectors, additional studies should be conducted and prepared for a significant decrease in production and retraining of employees in these sectors and for engaging them elsewhere. In the activities of the above-mentioned sectors, the regional factor is also of critical importance, which might cause large disproportions in the next few years (e.g., in Narva, but also in Abja-Paluoja and elsewhere) in the demand for and supply of labour.

Surely it is necessary to develop marketing in these enterprises, but with that they should have started much earlier. That is confirmed by the example of *Baltika* (in 2001, a new brand was created and an international retail network established), where the investment in marketing gave a strong impulse for the development of the entire enterprise. As a result of these changes, it can be said that by autumn 2007 *Baltika* has grown three times larger than in 2001. The total number of salespeople has exceeded the total number of sewers and the employees have acquired new skills. In the footwear industry companies, they wish to maintain the advantages of cheap labour and plan to employ workers from other countries. Problems connected to labour cost and the quality of labour were considered serious ones in this group (an extract from an interview: "*Very few employees are eager or able to learn 2–3 new tricks for work.*"). It is hard for these companies to compete with the products manufactured in China. **They even see an economic recession as a way out**, which would enable finding labour more easily. They hope that economic recession might also create better opportunities in finding domestic investors, because capital also then starts transferring into industrial sectors instead of real estate investments, for example.

4.3. Assessment of the behavioural pattens of Estonian enterprises

In all economic sectors, there are enterprises that try to improve their position in the value chain. Unfortunately, the number of such enterprises is too small. Irrespective of the sector of the economy, a majority of enterprises are also characterised by an underestimation of the **working culture**. They do not see in it an opportunity for saving costs and increasing incomes. Estonia is considered as country with a protestant work ethic and, therefore, it is presumed that dedication to work and dignified working

Irrespective of the sector of the economy, a majority of enterprises are also characterised by an underestimation of the working culture.

culture are important. Irrespective of the fact that a lot of people have the opposite practical experience, little attention is being paid to careless and incompetent work behaviour. When it was asked to point out what is hindering bringing the rate of return of the labour force to the level of the developed countries, then in only one interview was the working culture mentioned. The severity of the problem is also shown in a study conducted in the retail trade on positive and negative servicing situations (Sõstra, Vadi 2006). The results indicate that among negative episodes the cases connected with the behaviour of shop assistants constituted as much as in the next two groups of cases (with the servicing system and the products) altogether. While comparing the above-mentioned results with a similar study conducted in the USA, it appeared that there were many more negative behaviour cases among the personnel of the Estonian retail trade than in the USA. Weakness of the personnel and work ethic is also shown in the results of *The Global Competitiveness Report*, which suggest that workers with an unsuitable training, weakness of public administration and a poor work ethic are the most burning problems in Estonia.

Workers with an unsuitable training, weakness of public administration and a poor work ethic are the most burning problems in Estonia.

It is evident that by directing the behavioural patterns of employees and work ethic, it is possible to raise productivity in many economic sectors. For that purpose, the managers must be trained and increase their management competence. High-level management, incl. for example a skilful implementation of performance pay systems, helps raise labour productivity. Enterprises still have sufficient reserves for intensifying production and decreasing the number of employees by leaving the salary fund at the same level to enable increasing the average salary of employees. A good and skilled employee must be worthily rewarded otherwise he or she will leave. At the same time, the first signs could be detected that in the equalisation of the level in wages (e.g., construction sector), people that have gone to work abroad will be returning.

An important problem is insufficient **cooperation**, on the one hand, between the enterprises themselves and, on the other hand, the cooperation with the state. Entrepreneurs express their expectations towards the state differently. Some of the enterprises have used the support provided by the Enterprise Estonia and by means of that promoted the activities of some fields of activity but, however, the general opinion could not be considered a very positive one, because the interviewees have critical attitudes both towards the **opportunities provided by Enterprise Estonia** and their application. Representatives of various economic sectors noted **critically the nontransparency connected to the issues related to the public procurement** and lack of clarity in its criteria.

An important problem is insufficient cooperation, on the one hand, between the enterprises themselves and, on the other hand, the cooperation with the state.

Behavioural patterns of enterprises could be classified according to the **activity of the function** and **the position in the value chain** (see Figure 13) and, on the basis of that, assess the position of the enterprises of economic sectors with various added values.

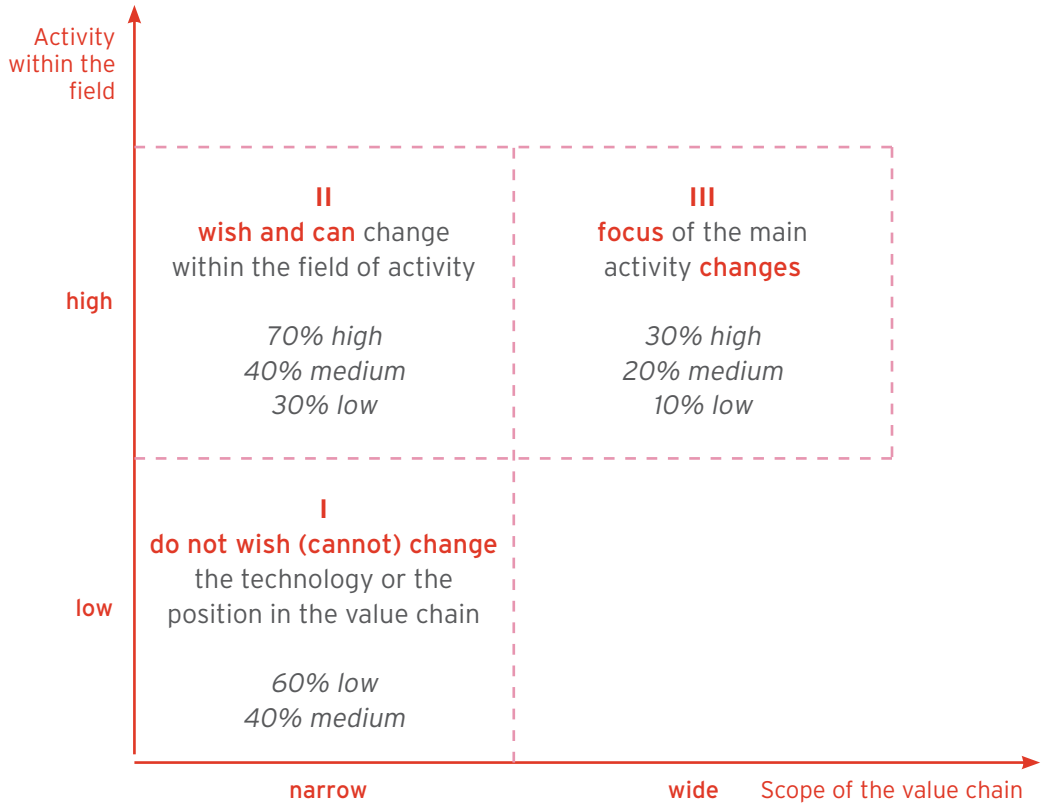


Figure 13. Assessment of value added in relation to the behavioural patterns of enterprises of economic sectors with high, medium, and low productivity (types I, II, III)

Note: Percentage shows how the enterprises of economic sectors with high, medium, and low productivity are divided between the behavioural patterns

The results of the management analysis of Estonian enterprises are close to the European Union innovation study, according to which a third of enterprises are capable to change, a tenth could change their position in the value chain, but 40% cannot/are not able to see the necessity for change. To characterise the behavioural patterns, the following generalisations could be made.

- There are too few enterprises that are actively looking for opportunities to increase value added and achieve a better position in the value chain. That result leads to an opinion that there are **no ideas** on how to achieve a better position in the global division of labour. Very few entrepreneurs have **a global ambition**. That could be a behavioural aspect influenced by path-dependency, which is of critical importance in increasing the competitiveness of Estonia.

Very few entrepreneurs have a global ambition.

- People have different knowledge on potential developments of the organisational environment. In some enterprises, they value global and local trends, but **overwhelmingly it does not appear what the assessment of the rate of environmental change is and** how many factors are considered to influence the development of an enterprise in the future.
- In enterprises of economic sectors with **higher productivity,** they think primarily about **how to increase incomes;** whereas the representatives of economic sectors with **medium and lower productivity** look at the functioning of the organisation **through decreasing the costs**.
- **There is a lack of employees** with both complex and simple working skills. In the first case, the requirements of enterprises concerning the labour force are justified; in case of the second one, however, it is either an inefficient field of activity or unsuitable managing strategies that are being applied.
- **Problems of management and organisation are not sufficiently perceived**. Only some of the interviewees used the opportunity to substantially analyse how to make the management of the enterprise more effective. Management and the organisation are seen to be static and people do not think about the organisation's capability to change as a competitiveness-supporting factor.
- The creation of **cooperation** and collective knowledge, as well as **the joint use of resources** is **insufficient.** Also, the readiness of enterprises for a **partnership with the state,** which they perceive as a fairly abstract and distant phenomenon, is modest.

Until now, besides the global economy, more attention should also be paid to the sector-based economy. That helps to pick out strong and competitive economic sectors and fields of activities in which the state should concentrate its attention and support. We should deal primarily with the development of these fields where it is possible to achieve success in the longer perspective. When summarising the analysis results, it can be said that in order to secure and increase Estonian competitiveness, we will need both a flexible adaptation to the changing circumstances and a readiness to actively influence the competition environment in the future. The future development of Estonia's economy depends on how well we cope with these tasks.

5. Possible development scenarios for the Estonian economy

From the analysis mentioned in the previous chapters, it could be concluded that the main threat to the sustainability of Estonia's economy (as well as an opportunity) lies in the economy itself and until now is related to a too slowly modernised structure. The problem does not lie as much in the drastic growth of probability of threats from the external environment, but in the incompatibility of the structure of the Estonian economy with general development trends of the external environment. As a result of that, one of the dimensions chosen in compiling the scenarios presented below was **the capability of enterprises and individuals to change and their ability to cooperate** (see Figure 14, vertical axis), which is characterised by such indicators as the readiness of enterprises to change their position in the value chain, renew the used technologies, innovate products, services, and processes, readiness for cooperation, ability to learn, etc.

One of the dimensions is the capability of enterprises and individuals to change and their ability to cooperate.

The government sector has an important role in supporting such changes. Therefore, the second main dimension chosen in compiling the development scenario was **the capability of the government sector**[7] **in supporting the required changes**. The government sector could be, according to our approach, either passive (i.e. observing the occurring processes only as a bystander) or active, possessing the effect of a catalyst in launching processes and supporting them. The government sector could express that impact either directly through economic policies, incl. enterprise supporting policies, as well as through other policies connected to the economy, like education, science, migration policy, etc. taking account of, on the one hand, the level of openness of our economy and, on the other hand, the level of development that we have reached (exhausting the possibilities of more simple economic activities), **the two central keywords will be internationalisation** (promoting the export of goods and services) **and innovation**. Naturally, achieving the ability to influence the economic situation in a positive manner by the government sector also assumes its own ability to change, focus and activate its activities, and to perform them quicker and more effectively than before. Various methods are possible for changing the behaviour of the government sector: finding a consensus of political forces in strategic questions to ensure a sufficient and stable financing of the priority activities; forcing the competence of public opinion to disclose populistic decisions.

The third dimension in our approach are the processes that will be happening in the Estonian economy in the next few years – whether the decisions on the changes required in a longer perspective must be made solely in the conditions of a slight slowdown of economic growth, or already in the conditions of a stronger economic recession. This dimension is still just a background in relation to the two previously

7 It means the public authority as a subject of policies.

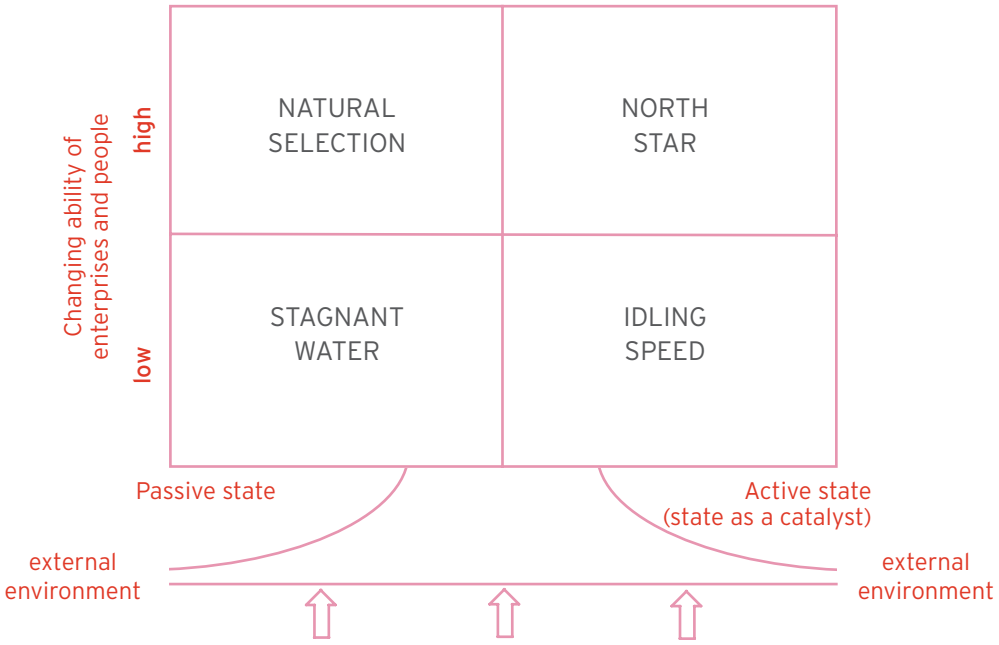


Figure 14. Possible development scenarios for Estonia's economy

Source: compiled by the authors

discussed dimensions which might ease or complicate the launch of one scenario or the other and, to some extent, influence their course but not change their essence.

On the basis of possible combinations of the two main dimensions illustrated in Figure 14, four different scenarios will be formed for the economic development that we mark with the names "Stagnant Water"; "Natural Selection"; "Idling Speed" and "North Star". These scenarios represent various development paths and take to various states, whereas it is possible to switch over from some (not from all) development paths to the other one in the course of the process.

"Stagnant Water" is, briefly described, a scenario where enterprises continue the previous very slow (too slow) restructuring, people's capability to change is low and the state (in a wider sense: society) does not consider it necessary or is not able to change its relevant policies to a considerable extent and increase their efficiency.

"Idling Speed" is a scenario where the state is active and tries to do something significant, but that does not match the wishes, initiative and "will to play along" of the enterprises, or appears to be ineffective for other reasons (which is dealt with later in this paper).

"Natural Selection" is a scenario where enterprises become active (are forced to be active), but their activities are mainly individualistic, and cooperation opportunities with the state, other enterprises and other partners are not used.

"North Star" is a scenario the case for which a leap in development could be made by connecting the enterprises' readiness and ability to change (incl. cooperation and networking/cluster-based) with the supporting activities of the state.

As referred to above, all the described issues could occur in various macroeconomic systems.

1. In case of **a "soft" landing** in the Estonian economy, the previously rapid (8–10%) economic growth will regress in the next few years into a moderate economic growth (3–5%) and there will not immediately be larger recessions in the economy. Very likely it will mean continuation of the previous economic behaviour, i.e. preservation of the "Stagnant Water" scenario for the time being. In case it does happen that the state becomes active for some reason there will be a danger that enterprises will not go along with the state's activities, because they have not experienced an active impulse (shock), and in this case the "Idling Speed" scenario could start. It is not totally excluded that the sense of danger is also woken in such a situation on both sides and they still try start moving towards the "North Star" scenario, but in order to increase the probability of this version, it is necessary to strongly build awareness in society.

In case participants in the economy continue behaving the same way as so far, it will lead step-by-step to stagnation or to the "Stagnant Water"scenario.

2. **In case of a "hard" landing (which is painful for the society), or in case of a quick solution of the mounting problems**, the correction takes place through an economic recession during which a mentality will be established according to which changes are inevitable. Deceleration of economic growth turns into economic stagnation or recession, as a result of such a development the "Idling Speed", "Natural Selection", as well as "North Star" scenarios could start. Continuation of the "Stagnant Water" scenario in this case would be highly unlikely.

As a result of the preceding analysis on the competitiveness of the Estonian economy, it can be deduced that in case participants in the economy continue behaving the same way or towards the same direction as so far, it will lead step-by-step to stagnation or to the **"Stagnant Water"** scenario. The risk of this situation comes from the fact that an illusion could be created at first as if the unwanted results were avoided, but actually the structural problems in the economy keep piling up. In case of that scenario, enterprises and individuals do not express a larger ability to change and the government sector does not sense the necessity to enter into an active role, as a result of which the current problems will deepen.

In case of **a "soft" landing**, an ever-increasing contradiction occurs between the evolutional development of enterprises, enterprise organisations and the state (targeted at slow changes of economic structure) that do not sense the arriving threat and the changed requirements of the external environment. Labour intensive sectors will gradually shrink, the discharged workers will no longer find new jobs so quickly (or only find them in the field of low value added services) and unemployment starts growing at a moderate speed, but steadily. An essential section of high-qualified labour will not find sufficiently attractive job offers in Estonia and will leave Estonia to work abroad. The constant increase in prices causes pressure for the increase of wages, which decreases the international competitiveness of enterprises. Production starts leaving Estonia more and more, because as a result of the joint impact of inflation and the system of the Currency Board, they are not able to sell on the world market at

new higher prices. Although at first nothing visibly dramatic takes place, which would necessarily lead to changing the country risk ratings given to Estonia, the mounting problems in the neighbouring countries (e.g., in Latvia) might also cause incredulity towards Estonia. When the developments here also have a negative undertone it might also threaten the risk ratings of the country. The interest of foreign investors towards starting companies in Estonia will decrease; the capital inflow will be reduced and the outflow from Estonia will increase. The government must adapt to a smaller increase in the receipt of the state budget. The transition to the euro will be postponed to an indefinite future. If, in case of a "soft landing", the continuation of the "Stagnant Water" scenario could be forecast at first, then such a situation cannot last for long. Due to the low level modernity of the Estonian economic structure, the "Stagnant Water" scenario is not sustainable in the long run in the conditions of a fairly mild external environment. The relatively sad situation described above might be solved in different ways, whether with a crisis or turning towards a slow improvement after a long "vegetation", but in any case it means that changing the economic structure into a developed economic structure oriented towards the creation of high value added, which suits today's Europe, will be postponed for a long time.

To conclude: when at first the "Stagnant Water" scenario will be launched and the development continues for some time on this path, it is most probable that the development will transfer to the "Natural Selection" path via a stronger or weaker interim crisis. Principally, a shift towards the more active type scenarios is also possible ("Idling Speed" or "North Star"). The probability of such a shift is increased by the rapid growth of financial means targeted at Estonia from various European Union support programmes during the analysed period. Skilful use of the EU funds for supporting fields of activities with significantly more vigorous innovation, export development policy, and science-intensive export-oriented services might lead to more active development paths.

When enterprises are unable to prevent the crisis and prepare plans for changes and the government prefers to stay in the role of a bystander, then probably the "Natural Selection" scenario will be launched.

In case of a "hard" landing, a sharp reduction takes place in production of many labour intensive sectors and companies providing services for the domestic market, which is accompanied by a rapid growth of unemployment. Estonia's country ratings fall and many fear the risk foreign investors will leave. In the condition of an economic recession, the state budget revenue will decrease, but social liabilities will grow. A positive feature of a "hard" landing is that the urgency for changes will be acknowledged quickly, which would induce both enterprises and the government sector to actively search for new activity lines; at the same time, procurement of the means necessary for change in such a situation is complicated so long-term cooperation plans might seem senseless.

When enterprises are unable to prevent the crisis and prepare plans for changes and the government prefers to stay largely in the role of a bystander both in assisting the process of changes and decreasing the possibilities for crisis, then probably **the**

"Natural Selection" scenario will be launched. That scenario will practically continue the processes initiated by the "hard" landing, whereas in order to exit the situation of crisis, hope is laid on individual efforts rather than cooperation. The main source for change is the enterprise sector and the individuals. Motives which force enterprises and individuals to change come from the desire to survive. In the condition of crisis, only those companies survive that are efficient enough and have a strong ability to readjust. A quick relocation of the Estonian economy from the "Stagnant Water" scenario to the "Natural Selection" scenario brings about shrinkage of the economy, a very large number of companies will be liquidated in a short period of time and much labour might be lost. Unemployment and inactivity will grow, and it is probable that migration will start to increase again. Although Estonian enterprises fight for survival, they cannot raise their technological level, at least for the time being, as they experience large difficulties in raising money required for technological modernisation. Also, the role of the state in promoting innovation and readjusting the economy is weak (especially as compared to competitive countries). They do not deal with a systematic formation of a positive image of Estonia at the international level and that is falling apart quickly.

Movement of the development through a steep crisis into the "Natural Selection" scenario is costly in the economic, social, and moral sense.

Movement of the development through a steep crisis into the "Natural Selection" scenario is costly in the economic, social, and moral sense. It is especially costly for Estonia as a small country with a very limited amount of high quality labour, successful enterprises, and other necessary resources. The government will have large obligations in alleviating social problems, but they neither wish, nor can do that. The market price of the enterprises will fall, the interest of aggressive investors towards acquiring Estonian enterprises will increase (similar to the year 1998). Yet another wave of acquisitions of enterprises will take place, but this time already largely between the foreign investors themselves. All in all, a relatively quick change of the economic structure takes place through the alteration of the fields of activities and business models, which re-establish competitiveness in some spheres, but it is very expensive for Estonia both in the economic and social sense.

In the case of "Stagnant Water" and "Natural Selection" development scenarios, the government sector is not an active initiator of changes (a so-called passive state). Of course, in those scenarios various state policies do also function, which are targeted at changes, but as a whole their efficiency is modest. But what happens when the state tries to raise its level of activity? Both in case of the "Idling Speed" and "North Star" development scenarios, they assume the strengthening of the active role of the government sector. The main difference between those scenarios lies in the fact to what extent the active role of the government sector is meaningful, is focused on solving the truly central issues of the period, and matches the growing initiative of the enterprise sector, incl. the initiatives taken in cooperation with the enterprises themselves.

In the first case ("Idling Speed"), the efforts of the government sector remain too unelaborated and inefficient, these are not developed together with enterpises and do not consider the actual ability to go along with enterprises. In the second case

("North Star"), society as a whole is able to cooperate for the sake of development. At least in the beginning, the government sector has sufficient financial means (putting into use the reserves, loans, European Union Structural Funds) for the catalysing role. But there will be a danger that also for noble causes they might take steps, which from the outside are targeted at stimulation of the economy, but in reality do not result in the growth of enterprises' and individuals' capability to change. In this case, **the "Idling Speed" scenario** will start, in case of which two different opportunities in the choice and use of measures applied by the state are possible.

They might take steps, which from the outside are targeted at stimulation of the economy, but in reality do not result in the growth of enterprises' and individuals' capability to change. In this case, the "Idling Speed" scenario will start.

1. Measures implemented by the state act towards an unwanted direction, activities are performed in the wrong order, they have not chosen the right partners, actual needs are unmapped or some other motives are preferred over them and, therefore, the expenditures will not give the expected results. The reason for that might be political agreements, which do not necessarily coincide with the needs of the economy, or the administrative incapacity of the officials and/or cooperation weakness of various policies. There will also be an inability to differentiate enterprise policy measures with a social character (e.g. simple start-up assistance of enterprises) from the policies targeted at developing more complicated competitiveness (elaborating purposeful knowledge- and technology-intensive economic sectors as attached to policies of education, science, and foreign investments and international marketing of the state). That could be caused by a very strong lobby of various interest groups or the joint impact of all the above-mentioned factors. A problem could be a violation of corporate interests, in case the measure complexes are launched in a situation where the impact of the existing corporate groups is large and no competition occurs. For example, an improper migration policy (together with relevant financial support systems) that in the long perspective might import unnecessary labour to Estonia, under a sign of skilled labour they might import low-skilled workers to maintain low labour costs, which actually slows down the urgency for restructuring the economy, etc.

2. In an abstract sense, the measures might be even right and necessary, but they cannot be managed, their administration is too costly and sufficiency will not be achieved. Another possible reason for failure might lie in the fact that the measures of the state do not motivate enterprises cooperate among themselves, with branch associations, research and education institutions, etc. entrepreneurs do not understand the usefulness of the projects. An obstacle that is difficult to overcome is the alienation from the government sector, which is fairly widespread in Estonia; they find that the latter is attending to its "own business", and the people and enterprise "their business". They do not necessarily also believe in the sustainability of policies, they fear that they will change the established priorities again after the elections, etc. they are unable to activate economic agents, they have not been able to turn foreign investors into partners who would assist changing the structure of the economy.

In case of insufficient state action, the increase of the government sector expenditure brings about a short-time revival of only a certain part of enterprises, or postpones a crisis for them, while the results in developing long-term capabilities are poor. No significant structural changes in the economy occur, or a strongly supported oasis will be artificially created, which after the end of support is unable to develop further. A so-called learned helplessness syndrome will emerge where after the support falls off, the activity will also be terminated. Everything that happens is project-based; it is a so-called project economy.

A rapid growth of the public sector expenditure takes place, but its efficiency is small. Increasing the influence of corruption and politisation of the decision process might essentially start to hinder making the required corrections in planning the expenses. After staying in the state of "Idling Speed" for long enough, a serious danger appears to be falling back to the "Stagnant Water" scenario, or in case of a meanwhile deteriorated macroeconomic situation, also into the "Natural Selection" scenario. As the enterprise sector and individuals have had a negative experience with the activity of the state and with attempts to act at the level of Estonia as a whole (or at least of the relevant rhetoric), then the transfer from that scenario to the "North Star" scenario is highly unlikely.

The **"North Star"** is, in comparison with other development scenarios, clearly the most preferable one in the opinion of the authors of this paper. But heading to that path of development and "playing it out" is a sufficiently difficult task. Among other things, it assumes exceeding the formed inertia of mind both by the state and the enterprises, and creating remarkably more efficient cooperation models between politicians, national officials, representatives of the enterprises, education and research institutions, and of the public (incl. the media representing it). This suggested development scenario is characterised by the following features.

- The (administrative) capacity of the government sector in identifying the need for strategic changes, to manage and implement them quickly has significantly increased.
- Government sector policies are bundled into packages, which have a strong launching and supporting impact. Packages targeted at the internationalisation of enterprises, cooperation between enterprises, the government sector, and branch associations, and putting into use of contemporary production technologies are functioning well.
- Enterprises and individuals are capable of change, because there is a sufficient amount of enterprises which have built up international units in many countries and they know the world market, have a sufficiently global view, they are ambitious and adapting.
- Positive shifts have occurred in the education system: the share of students in technology fields has increased; enterprise education spreads into the study programmes of nature and science fields. The strong characteristic of international enterprise has been incorporated into the business economics, business, and economic science study programmes. Estonia has successfully switched to the international education system: a sufficient amount of foreign students study in Estonia and stay here to work. The share of foreign lecturers has increased and, therefore, also the international dimension of study programmes in higher education institutions.

- A successful labour policy takes place, in the framework of which they are able to ensure flexible retraining of employees and training the managers of enterprises. An elaborated migration policy is functioning, qualified labour has been imported.
- Estonia has a positive image in the world and that is being continually elaborated. Estonia is a trustworthy partner and has a say at state level in the formation of key clusters in the economic space of the Baltic Sea.
- Enterprises have considerably improved their position in the value chain, which has increased the ability to create value added of services and industrial sectors; there are also sub-branches and narrow fields where they are strong (oil shale power industry and chemistry, medical equipment, log houses, etc.). They offer internationally successful sophisticated services (for example, health and maintenance; specific tourism, creative tourism/experience tourism, financial intermediation, telecommunication, etc.). The creative industry (incl. design, digital media and cinematography, fashion) and its "soft" but effective outputs into various economic sectors have an important role.
- A predominant positive attitude towards the future and a substantive discussion takes place between the partners. Enterprises and people have a respect towards their state, and the government sector also relates to its partners with respect.

Surely all the above-mentioned features cannot be achieved at once in case of the "North Star" scenario. But if quite many of them already exist, a constant learning and changing process starts functioning, which helps adapt according to the changes of the external and internal environment. As a result of application of the scenario, it is possible to achieve a stable and sustainable economic growth, which maintains the convergence speed of the Estonian economy and raises Estonia from the bottom to actually among the more competitive European states (not just economically free, but also innovative, knowledge-intensive, high-technology, etc.).

To conclude, also a question on whether any changes in the external environment could cause entirely different problems and choices for Estonia. That cannot be fully excluded, but at the same time such a variant should not be very likely. In this paper, Estonian development is handled in a mid-long perspective, or within the frame of 5–10 years. As the year 2013 is the end of the current EU budget period, it also gives stability to Estonia as an EU Member state. Also, it is not probable that there would be a principle change concerning technological paradigms in the world under the observed period of time, which would create favourable conditions for Estonia in using the late-comer advantage. That means an opportunity for taking advantage of technological solutions created outside Estonia, adapt them to the needs of our economy and therefore achieve a growth of productivity, but also of the provision of innovative products and services. But the above-mentioned might not necessarily apply in case of a time horizon longer than ten years. Additional analysis is required on the question of possible impacts of extreme geo-political conflicts (for example, in the Middle East) on the well being of the Estonian economy. A sharp growth of conflict very likely brings about a significant leap in the prices of energy bearers. Belonging to the EU does not spare us from that, but a stabilising factor here could be a possibly quick creation of reliable connections with other energy systems in Scandinavia and Central-Europe.

6. Strategic development trends and policy suggestions for maintaining and strengthening Estonian economic competitiveness

In order to enhance the competitiveness of the Estonian economy, **systematic changes in the patterns of behaviour** are required at the level of people, enterprises, industries, as well as of the state. In the transition period, the achievement of success was based on the ability of economic agents to fully deploy the existing resources. Deceleration of the achieved rapid economic growth and the aggravation the imbalanced economic development shows that the possibilities of development based on the extensive use of resources are starting to be exhausted. It is necessary to find new ways for increasing the competitiveness of the economy on the basis of **an effective increase of the use of resources and the synergy emerging from cooperation**. In this stage of development, success is ensured primarily by the ability of people and enterprises to carry out necessary reforms, but in comparison with the extensive stage of development, the role of the state (public authority) will increase considerably. It becomes especially important in connection with the rapid increase of financial aid received from the European Union in the next few years and the need for its expedient use.

In order to enhance the competitiveness of the Estonian economy, systematic changes in the patterns of behaviour are required at the level of people, enterprises, industries, as well as of the state.

The state should act as **an initiator, interpreter, and catalyst of changes** targeted at cooperation and efficient use of the resources. In this case, the processes of change become quicker and more systematic and acquire an additional internal energy. That objective is served by general and more specific policy suggestions based on the results of this study to support the efforts targeted at increasing the throughput of resources and, therefore, the competitiveness of the economy.

The state should act as an initiator, interpreter, and catalyst of changes targeted at cooperation and efficient use of the resources.

Based on economic policy theory, the existing development plans of the EU and Estonia and the assessments of various international organisations, the Estonian **socio-economic development factor system** could be presented in a form as shown in Figure 15.

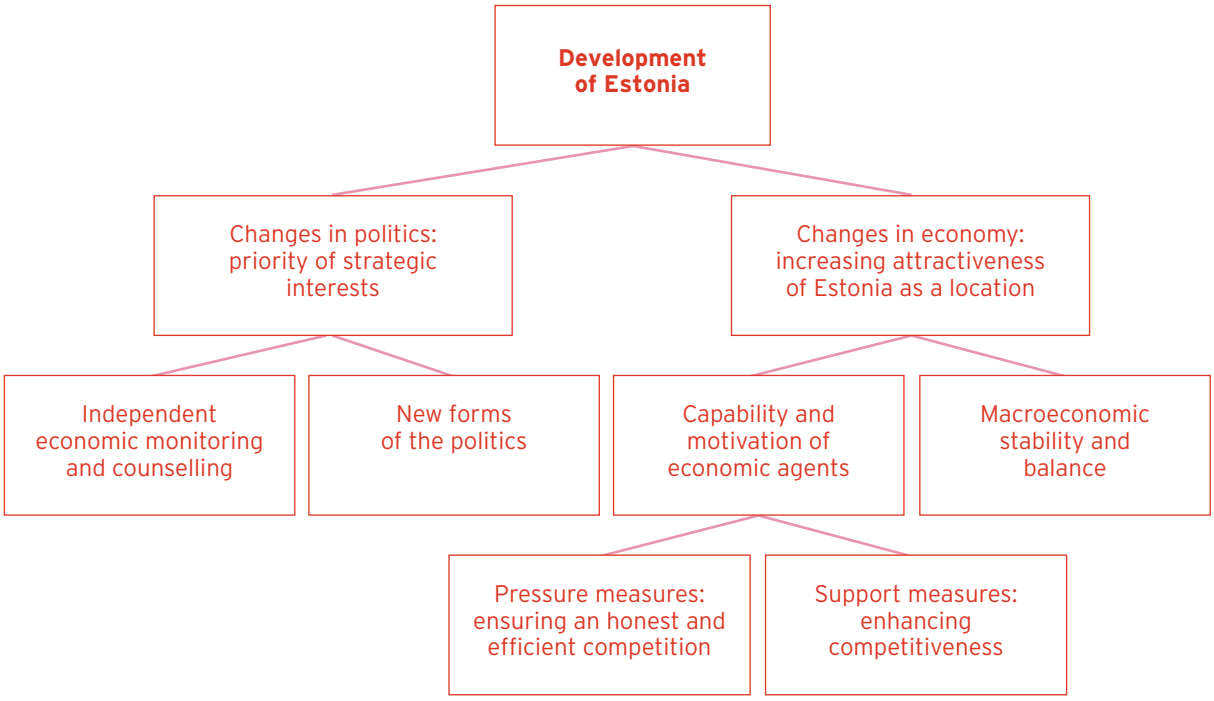


Figure 15. Factor system of the Estonian socio-economic development

Source: compiled by the authors

The construction of the factors' system is based on a perception that economy and politics are inseparably connected in the society. Only with an effective policy, which is able to act strategically, it is likely to reach a new, knowledge- and innovation-based stage of development of the economy. Instead of political declarations, a system of measures guaranteed by actual resources is needed. The further development of economy depends to a significant extent on the efficiency of policies targeted at initiating and supporting the activities increasing productivity. In the new stage of development, the economic policy must become **more diverse**. The principles of macroeconomic balance and openness to competition must be continually considered important, but it must be supplemented with new measures promoting competitiveness by developing, among other things, **Estonia's own innovation system suitable to this context.**

Ensuing from the competitiveness analysis and the prepared development scenarios, both general and specific policy suggestions can be pointed out. As the direct objective of the paper was not the elaboration of policies, general suggestions tend to remain guiding ones rather than proposing specific measures.

- The most important development policy role of the **state** is creating conditions for its citizens for a successful, mutually beneficial cooperation both in the spheres of economy and politics. To escape from the "Stagnant Water" scenario, the citizens should not only be allowed but also encouraged to operate actively in both spheres. Ensuring development in the economy and politics is of critical importance for achieving success. The basis for that is the ability to change, which is based on new attitudes, knowledge and skills of all parties, whereas the individual and collective knowledge is of equal importance. In the formation

of an ability to change, an important role is played by institutions connected to the creation and dissemination of knowledge, such as education (also featuring lifelong learning) and cooperation networks.

- **In politics,** it is necessary to find such a mechanism for passing economic policy resolutions, which would ensure the priority of strategic interests of the society over the interests of daily politics. It is important to achieve the implementation of the development plans adopted in Parliament by the executive power. It is necessary to stabilise the policy by changing it to such that could be reached by consensus and that is rule-based in all significant strategic fields (incl. science, education, innovation).

The economic policy must become more diverse.

- **Economic policy** must be purposeful and able to change according to the situation of the economy. Dealing with development plans should be a constant process where strategic targets are discussed with experts. Presumption of a strategic policy is the existence of a constant and independent economic monitoring, and continuous development and enactment of scientific counselling of the economic policy. The state must, upon necessity, start creating and training partners itself – for example, activities targeted at developing the capability of branch associations. Also, possibilities should be created for foreign investors to feel themselves as needed partners and direct their activities so that they would assist more in strengthening the competitiveness of the Estonian economy.
- **In the economy,** the main task of the state could be considered the ensurance of attractiveness both for domestic and foreign production factors (labour and capital), and the creation of both possibilities and incentives for their effective use. The creation of attractiveness starts from the ensurance and maintenance of the macroeconomic balance, stability and trust, and ends with already fostering an enterprising spirit in school and at home.
- In the immediate influence of economic agents, the state must use both pressure and support measures in as coordinated manner as possible. The central **pressure measure** is the assurance of a fair and effective competition as a result of which only those enterprises can succeed, which offer their consumers products of the largest value (better quality, cheaper price). All other unfair ways for achieving success (for example, restraints on competition, unfair competition, incl. misleading advertising, corruption, tax evasions, pollution of the environment, etc.) must be excluded by the state.
- **Support measures** must contribute to the moving of the Estonian enterprises and, even more widely, the entire economy into the next knowledge- and innovation-based stage of development. The relevant policy must use both regulative, financial, and organisational measures, which all in all would ensure the operation of an effective innovation system in Estonia, including:
  - an effective innovation system must rationally interconnect both the private and public sector, and the production and science and education spheres;
  - specific economic policy measures should support fields where the boost effect is larger and that would have positive side-effects for the entire economy;
  - policies creating and supporting conditions for development must be aggregated into packages with a strong initiating effect;
  - increasing global orientation at all levels of society;

- attention should be paid to the work culture and ethics and to the cooperation ability of the economic agents, which enables to increase the productivityconsiderably.

During the drafting of the competitiveness analysis of the Estonian economic sectors, interviewing the enterprises and drafting the scenarios for this work, the four fields of activity concentrated on were: **labour and capital productivity, labour resource management, innovation/investments and the behaviour of entrepreneurs, values, and cooperation**. In Table 5, a few more relevant policy suggestions have been brought out that should be implemented in the above-mentioned fields to solve the problems. Undoubtedly, the presented information is not exhaustive and several policies are already being implemented. The problem is that the policies and objectives are often seen separately from one another, there is a lack of cooperation between various authorities and the policies are not implemented in a systematic package. Surely, serious action should be taken to move from the previous relatively narrow and scientific-technocratic innovation and innovation policy approach towards the "third generation" innovation policy where innovation, constant need for cooperation and renewal lie in the centre of all relevant national policies (incl. also environment policy, public administration, national defence). Moreover, the efficiency analysis of the implemented policy measures so far is poor.

Below, policy suggestions are dealt with in more detail in connection with the topic of **low productivity**. With the same thoroughness, also the issue of the need for labour resource development and its reflection in the education system, learning capability and cooperation of the innovation system, and organisations and individuals should be reserached in the future. Each field of activity would require a thorough analysis in which, in addition to researchers, the representatives of the enterprise and government sector would also be included.

For a comprehensive treatment of the problem of low productivity, policy suggestions are required at four different levels.

1. At the state level, it appeared that in Estonia's economic structure the sectors with low productivity are of large importance. The possibilities for the government sector to direct the changes of the economic structure in favour of the sectors with larger productivity should be found out by:

- **Changing the education system** – by implementing lifelong learning, shaping the structure of those entering the labour market by government order of study placements to universities, and by developing the desired structural transformations through a directed migration policy;
- **Developing infrastructure and investment aids** – favouring the development of economic activities with high productivity and export capacity;
- Using a selective approach in attracting **foreign investors** to Estonia;
- Using the opportunities of the **tax policy** in supporting strategically important fields.

The time period from the implementation of measures to actual changes is generally long (at least 10 years). Several measures (like the adjustment of migration policy to favouring structural transformations, providing infrastructure and investment aid) might also evoke changes in a much shorter period (3–7 years).

Table 5. Problems related to competitiveness and a few possible solutions

Low productivity

- **Supporting the increase of sales capacity**: favouring internationalisation, incl. diversity of markets of destination, inclusion of foreign investors in accessing the markets, encouraging cooperation between enterprises in entering foreign markets, specific research programmes for entering foreign markets with services
- **Supporting cost management**: process and quality management programmes, favouring cooperation between enterprises in using resources
- **Raising the level of development of leaders and workers**: individual development and mentor programmes of leaders, measures for exchanging experience, reorganisation aid schemes, inclusion of consultants in introducing the developments of the world market and contemporary technologies, rendering importance to the role of branch associations in initiating and managing strategic foresight and technological development plans.

Lack of suitable labour force

- **Increasing the effectiveness of training the skills necessary for operating on the international market** at all levels
- Increasing the use of **information technology** in the learning process
- **Common scholarships** of the state and business sector for studying abroad and returning home
- Strengthening **post-graduate training** in the fields relevant for Estonia (energy, oil shale chemistry, wood-processing technology, etc.)
- A significantly larger use of **foreign lecturers** in higher education and post-graduate training
- A significant raise of the quality of **technical education**
- Formation of migration policy for **importing qualified labour force** (incl. especially attracting foreign students to Estonian universities with the help of international study programmes and simplifying the visa system for scholars coming from outside the EU)
- Re-establishing the system of **vocational counsellors** in schools
- Ensuring the **retraining of the unemployed** within one year

Low innovation and insufficiency of investments

- Assistiance in **surpassing innovation barriers** (incl. supporting the use of high technologies) in traditional sectors and services
- Developing **process and organisation innovation**
- Supporting the **innovation of services** and systematic development of export potential and the servicing sector with high value added (incl. education and health, communication services, financial intermediation, creative industries, etc.)
- Establishing **sectoral development centres**
- Developing the **research and development infrastructure** in cooperation with universities and industries: (e.g., commonly managed laboratories, competence centres, production trial equipment)
- Valuing **applied projects**
- Valuing and using **foreign investors** as a source of knowledge
- Applying **investment aids**
- Developing **industrial design** and applying it in business

Values unsuitable for development and low cooperation

- Strengthening the role of **branch associations** and developing cooperation between enterprises (joint purchases, joint sales, joint use and exchange of equipment, training of the labour force, joint logistical solutions, etc.)
- Supporting cooperation between **branch and professional associations and the vocational education**
- Systematic development of cooperation between **science-economy-state** (university-enterprises-region)
- Forming **work culture and values** and creating a positive image towards them (e.g. supporting team work, raising the work quality in the public sector)

Source: compiled by the authors

2. At the level of the economic sector, it is very important to support the following in order to increase productivity.

- **Cooperation between enterprises:** a) through branch associations (joint purchases, common entry into foreign markets, joint use and exchange of equipment, training of the labour force, joint logistical solutions, carrying out sector-oriented studies and dissemination of their results); b) regionally – between the enterprises of the area (solving environmental problems, retraining the labour force, etc.); c) with the state (entering the international market); d) research and education institutions (research and development).
- **Branch associations:** with the help of training and strategic consultation processes (technology foresight and development plans), it is possible to improve the knowledge of branch association about the world market, contemporary technologies, and logistic solutions. It strengthens the image of branch associations among enterprises and provides a substantive contribution to the increase of productivity in this field.

In case of actual cooperation, it would be possible to achieve results fairly quickly, in a few years' time.

3. At the level of a company, it is possible to significantly improve the export capacity, cost management, the entire logistical side of the manufacturing process (see Figure 16). It presumes a learning ability and willingness to change. Hence, the measures targeted at developing the capability of leaders are of high importance (the measures of the level of a company will be dealt with in depth in the future). The impact of measures supporting the internationalisation of enterprises will be revealed fairly quickly, in a few years. The measures targeted at developing the capability of leaders give results within 3–5 years.

4. At the level of an individual, it is possible to increase the creativity of people through arranging the education system, fostering an enterprising spirit and improving the business knowledge by inserting relevant modules into the study programmes on various levels. Primarily one should deal with improving the working culture, creating a positive image of enterprises through the media, vocational counselling, etc. In changing the values of people, the time period from the application of measures to actual changes is generally longer (more than 10 years).

In addition, productivity is also influenced by **factors of the external environment** (development trends of the world economy, prices of raw materials, etc.) and **path-dependency** (values reflect our past and may impede changes, an outdated economic structure is partially a heritage from our earlier position in the international division of labour).

Dealing with all the above-mentioned problems presumes the application of several policies at the same time. More serious structural transformations and the creation of a conscious competitive advantage require patience, long-term consistent efforts, and political agreements (e.g. Ireland, Finland).

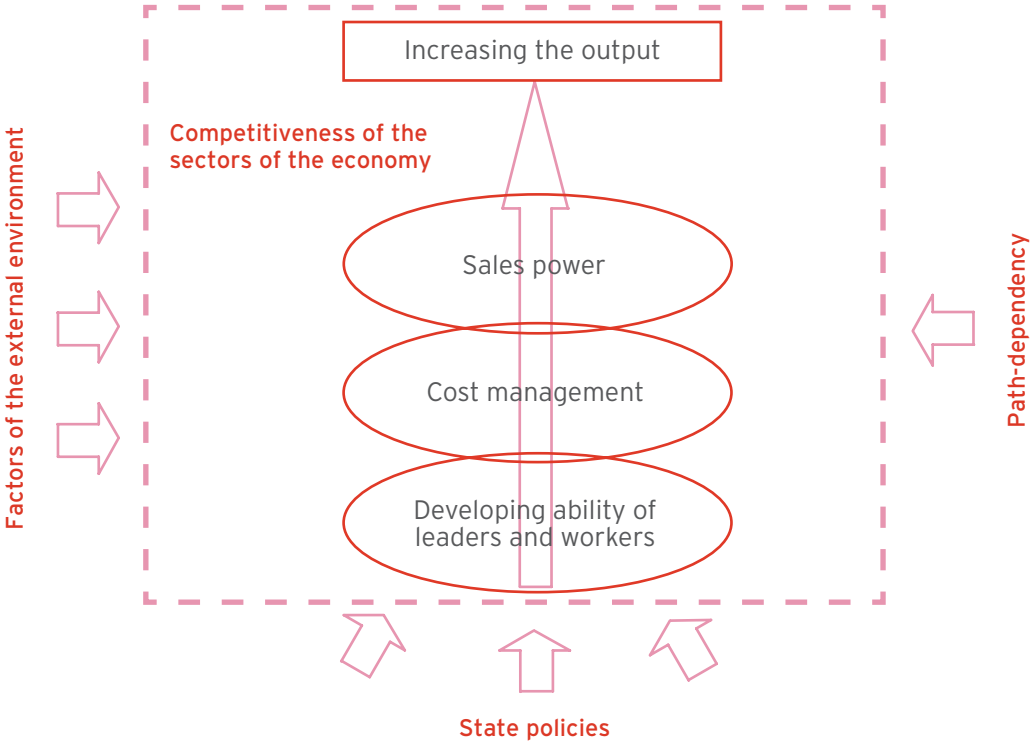


Figure 16. System of productivity development factors

Source: compiled by the authors

From the previous analysis, it appeared that there are three main opportunities for **increasing the productivity of enterprises** (see Figure 16): **increasing the sales ability, cost management, and developing leaders and workers.** Enterprises can influence these factors themselves, but for the creation of a multiplier effect it is necessary to have cooperation between the state as a catalyst and other interest groups.

The most important source for increasing the sales ability of Estonian enterprises as a small country is internationalisation. The state could assist the **increase of internationalisation** of enterprises by**:**

- disseminating market related information;
- promoting cooperation between enterprises in entering foreign markets;
- supporting the enlargement of diversity of the markets of destination, including promoting entering fast growing markets (e.g., new EU Member States, the Ukraine, Kazakhstan, China, India)
- assisting in finding foreign investors who would support Estonian enterprises in entering international networks;
- supporting the export of services to new markets;
- promoting and supporting the launch and development of enterprises that are globally oriented from inception (born global) and business models;
- facilitating the formation of internationally competitive brands;
- supporting information technology solutions for bringing various services and products to the world market.

Another equal source for the increase of sales ability is the **development of products and services** that the state can support by offering assistance in:

- exploring the demand of the world market;
- developing the skills of use of contemporary technologies;
- developing industrial designs and connecting them to the needs and possibilities of enterprises;
- associating the exported products with the accompanying services;
- developing new products and services for cooperation between enterprises.

From the point of view of **cost management**, the programmes targeted at developing process management within the framework of various links of enterprises' value chain are very important. This study draws attention to the previous insufficient substitution of Estonia's labour force with capital, as well as to the low productivity of capital. The state can help by offering assistance in:

- supporting cooperation between enterprises by conducting sector-specific analyses of performance, and disseminating relevant knowedge;
- exploring the contemporary methodology of cost management, developing its skill of use and disseminating the experience of Estonian enterprises;
- product development and optimising production costs;
- promoting cooperation between enterprises for a more effective use of resources;
- exchanging experience in the cost management of Estonian enterprises, which are successfully operating at international markets.

One of the presumptions for increasing productivity is **developing the capability of leaders and workers**. Here, it is necessary to adapt the general principles of the educational system to the new requirements. The educational system does not shape people with a sufficient learning capability; therefore, it is necessary to direct the educational system from being fact-centered to competence-centered. In order to raise the ability of leaders and workers to change, their attitudes, knowledge and skills must be developed by stressing the importance of both individual and collective knowledge. The state can help in:

- drafting and implementing professional development programmes for the leaders;
- implementing mentoring programmes;
- offering advantages for training the workers.

The analysis showed that the Estonian economy has reached a situation where a whole set of problems has accumulated that have rapidly started to decrease the international competitiveness of the Estonian economy. In this situation, the continuation of the former development path in an unchanged form is no longer possible, **changes are required both in the enterprise and government sector**. Performing these changes presumes the existence of sufficient motivation and necessary knowledge of what and how to change. In the stage of rapid growth of the Estonian economy, the motivation for change was very low and the required preventive measures for enhancing competitiveness were not launched. From the point of view of maintaining and enhancing competitiveness, it is important to pay attention to the following measures.

- **Ensuring the compliance and competence of administrative apparatus** with an objective to perform quick changes. It presumes a substantive analysis on how the state is able to bring about and accelerate necessary changes with its policy and adminstrative apparatus. In developing the capabilities required for performing the changes, it is necessary to include more experts from outside the government sector.

The continuation of the former development path in an unchanged form is no longer possible, changes are required both in the enterprise and government sector.

- **Changing the structure of the economy** (formation of knowledge and skills of the ones entering the labour market through the education system, consciously guided migration policy, selective inclusion of foreign investors, and development plans of strategically important fields).
- **Activities targeted at developing the abilities of leaders**, which would support the formation of knowledge, skills, attitudes and abilities (e.g., knowing the world market and contemporary technologies, the ability to see global business opportunities, formation of long-term strategic orientation, ambitious objectives).
- **Activities targeted at developing cooperation at all levels** with an objective to create and implement collective knowledge in a more efficient manner and use the limited resources of Estonia more effectively. It is necessary to strengthen cooperation between the enterprise sector and the government soon, to prepare and implement measures supporting competitiveness.

In order to avoid increasing the cyclic deceleration of the economy into an economic crisis, simultaneously with the activities targeted at inhibiting inflation a package of measures supporting the restructuring of companies must be applied immediately and quickly, which would be targeted at internationalisation of enterprises, investment into contemporary technologies, improvement of process management, and retraining of labour. Enterprises, branch associations and other cooperation partners should be vigorously included into this process taking advantage of the circumstance that their readiness for cooperation increases in connection with the deceleration of economic growth. More attention should immediately be paid to foreign investors by including new ones and better involving the existing ones in restructuring domestic enterprises.

We assume that such an activity helps to launch the movement of the Estonian economic structure in the condition of a strong pressure from the external environment towards a contemporary economic structure ensuring a high level of income.

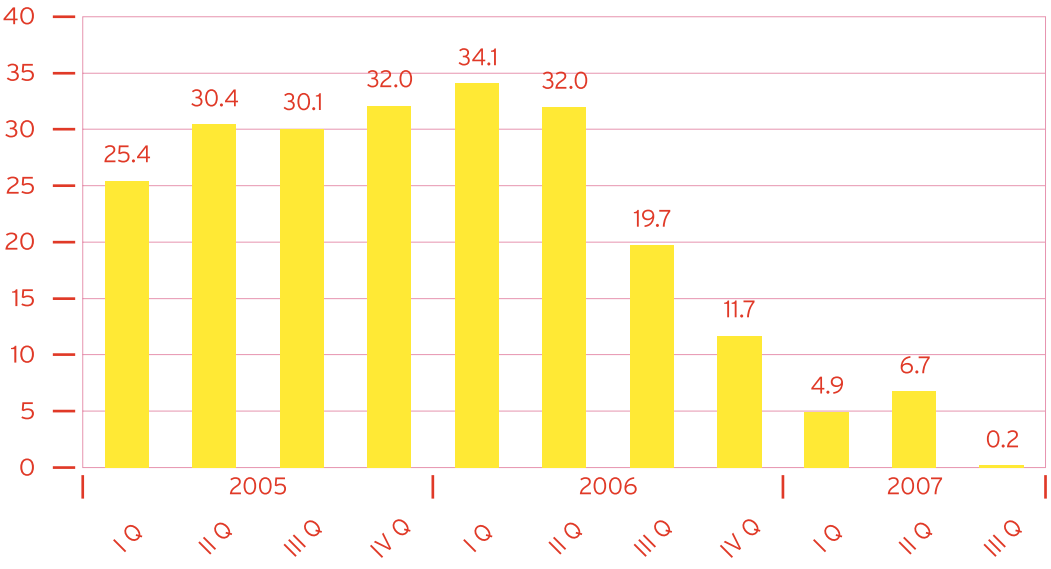
The fact whether we achieve success in reorganising the education system and creating knowledge-intensive export-oriented clusters in industry and service will be decisive in the following time perspective. It presumes consistency in also financing the science and education system in economically more difficult periods.

7. Annexes

Annex 1. Productivity of the growth of the Estonian loan burden (increment of GDP in kroons per Estonian loan burden and per one kroon increment of the loan balance of the Estonian banks)

Sources: Statistics Estonia, Bank of Estonia, authors' calculations

Annex 2. Incremental rate of the export of Estonian goods in the years from 2005 to 2007 (% in comparison with the same period of the previous year)



Source: Statistics Estonia, authors' calculations

Annex 3. Labour productivity (value added per employee) in Estonia in comparison with other EU countries in 2006 (per cent)

	Agriculture Forestry, Fishery	Industry	Construction	Trade, Hotel, Communication, Transport, Tele-communication	Finance, Lease, Real estate, Business services	Public sector*
Belgium	15.8	16.2	26	27.8	32.6	21.4
Bulgaria	96.7	232.2	275	289.7	217.6	257.5
Czech	101.8	64.3	80.7	85.3	120.6	64
Denmark	29.4	15.5	26.9	33.1	40.7	20.9
Germany	38.6	20.1	38.9	45.9	42	24.5
Ireland	13.4	10	23.1	34.8	28.4	18.3
Spain	32.3	29.1	38.9	39.3	46.6	29.9
France	18.1	20.1	27.2	35.4	39.2	21.2
Italy	32.9	22.5	28.2	24.5	30.9	24
Latvia	228.9	129.2	204.7	128.8	125.5	125.6
Lithuania	82.5	77.8	145.5	102.6	134.8	133.8
Hungary	63.5	62.8	115	108.2	73.8	56.6
Netherlands	21.1	15	26.1	37.5	55.6	21.5
Poland	29.7	78.7	73.3	82.4	131.7	77.4
Slovenia	27.8	49.1	70.4	63.1	91.8	37.6
Slovakia	80.2	72.9	80	103.1	122.2	98.1
Finland	16	17.1	29.8	31.5	40.7	25.9
Sweden	30.3	16.6	32.1	35.4	42.2	25.5

* Public administration and national defence, compulsory social insurance; education; health and social welfare; other fields of activity – in those fields, the level of productivity practically indicates the level of labour costs per employee.
** These positions where Estonia's productivity is higher, are highlighted.

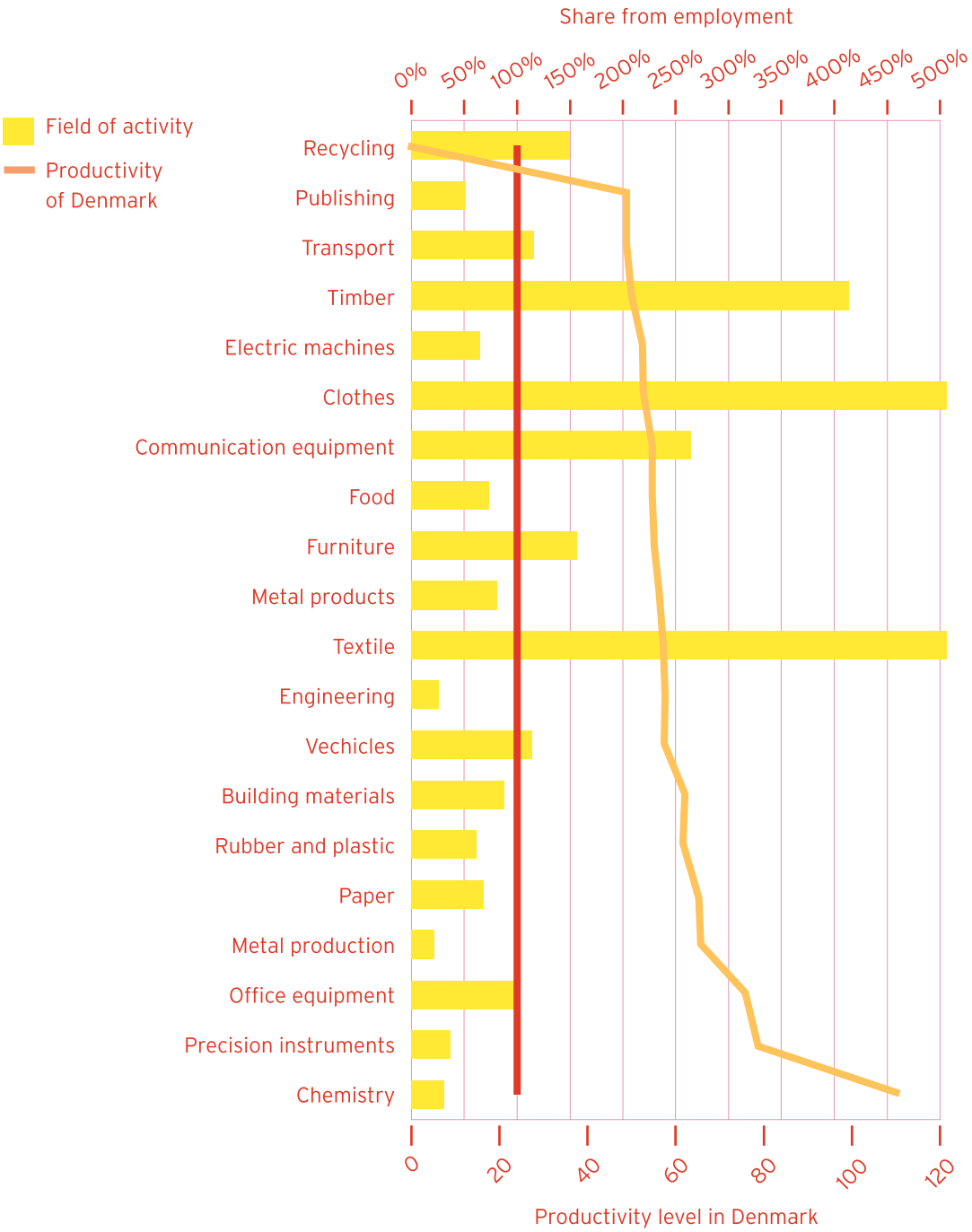
Source: Eurostat, authors' calculations

Annex 4. Employee productivity in the Estonian manufacturing industry in 2004 (% of the level of the relevant country)

	Ireland	Nether-lands	Finland	United Kingdom	Den-mark	Germany	Portugal	Poland	Czech Republic	Lithuania	Latvia
TOTAL industry	6.6	14.2	14.6	16.5	17.3	17.9	47.4	56.8	61.4	125.6	133.3
incl. food industry	6.8	13.5	18.4	14.8	18.0	23.1	40.1	57.2			128.6
Textile	23.6	16.4	16.3	21.9	14.4	19.0	52.6	91.1	78.1	134.4	151.9
Clothes	13.8	11.6	14.6	13.0	11.0	13.1	51.3	107.4	67.4	138.1	141.5
Leather	19.9	11.9	15.8	15.1		14.4	57.0	91.0	84.7	406.7	
Timber	17.9	21.3	22.9	20.7	22.1	25.8	61.7	98.2	73.0	213.5	132.1
Paper	18.1	19.6	14.0	24.1	22.0	22.4	27.0	58.1	63.8	126.5	164.4
Publishing	5.4	21.4	23.7	19.7	28.8	27.3	47.7	70.3	69.3	156.0	167.1
Chemical	4.1	15.6	20.0	20.6	19.3	23.2	44.2	68.6	73.3	125.1	172.6
Plastics	21.9	20.6	19.2	23.1	19.7	22.8	40.2	76.4	68.7	130.9	138.2
Building materials	30.3	30.0	34.1	32.1	34.9	39.6	77.2	113.0	100.5	233.3	173.6
Metal	12.9	8.5	8.2	13.3	12.7	11.7	20.3	28.6	33.5	133.3	27.1
Metal products	22.0	18.7	21.9	20.8	19.3	21.5	55.7	76.1	69.2	168.8	150.0
Machinery	18.5	16.6	18.0	18.2	18.7	17.8	40.9	75.0	75.5	140.3	163.6
Office machines	12.2		28.0	12.0	17.2	13.3	41.5	66.2	89.1	165.8	108.3
Electrical appliance	7.2	19.6	21.9	25.5	25.5	21.6	59.8	79.8	89.9	128.8	139.6
Electronics, communication	5.0		6.9	16.5	18.7	13.4	20.1	53.1	49.5	99.0	70.3
Precision instruments	14.6		23.6	21.1	19.3	27.6	62.6	107.8	100.0	156.7	226.9
Cars, trailers	26.6	17.7	34.5	25.9	28.7	23.6	47.6	63.1	65.6	123.0	233.8
Other means of transportation	20.6	20.3	25.2	13.7	22.1	17.3	47.0	91.6	74.1	117.2	175.8
Furniture		16.1	17.5	16.6	14.1	17.6	57.4	82.1	63.4	125.8	125.8
Waste conditioning	19.0	22.1	24.5	22.8		35.1	67.1	120.5	98.1	205.8	161.8

Source: author's calculations on the basis of Eurostat, 2007

Annex 5. Comparison of the division of employees in the Estonian and Danish manufacturing industry (relation of the share of employees employed in the relevant sector in Estonia to the level of Denmark, per cent, 2004)



Source: Eurostat, authors' calculations

Annex 6. Values of the general indicator (F1) characterising the development level of the post-industrial service economy

	2000	2001	2002	2003	2004	2005
Belgium	0,71	0,81	0,89	0,96	0,96	1,01
Bulgaria	-1,96	-1,90	-1,63	-1,56	-1,45	-1,26
Czech Republic	-1,39	-1,37	-1,17	-1,00	-1,23	-1,13
Denmark	0,61	0,70	0,81	0,93	0,98	0,92
Germany	0,56	0,59	0,70	0,73	0,68	0,61
Estonia	-0,52	-0,56	-0,47	-0,40	-0,34	-0,38
Ireland	-1,31	-1,12	-1,02	-0,59	-0,32	-0,01
Greece	0,03	0,01	0,09	0,14	0,32	0,39
Spain	-0,15	-0,08	0,03	0,09	0,17	0,30
France	1,19	1,23	1,34	1,44	1,49	1,59
Italy	0,08	0,14	0,23	0,38	0,39	0,52
Cyprus	0,91	0,90	0,98	1,19	1,20	1,26
Latvia	0,00	-0,11	-0,10	0,01	-0,09	0,02
Lithuania	-1,22	-1,27	-1,23	-1,34	-1,40	-1,50
Luxembourg	1,59	1,61	1,68	1,81	1,82	1,97
Hungary	-0,58	-0,40	-0,15	-0,09	-0,23	-0,12
Malta	-0,28	0,17	0,20	0,25	0,46	0,58
Netherlands	0,66	0,74	0,87	0,95	0,99	0,99
Austria	0,10	0,13	0,15	0,20	0,24	0,31
Poland	-0,74	-0,55	-0,43	-0,48	-0,77	-0,64
Portugal	0,28	0,36	0,46	0,59	0,63	0,75
Romania	-2,66	-3,06	-2,71	-2,30	-2,50	-1,91
Slovenia	-0,62	-0,58	-0,58	-0,52	-0,48	-0,39
Slovakia	-1,15	-1,11	-0,91	-1,07	-1,14	-1,20
Finland	-0,49	-0,45	-0,38	-0,29	-0,20	-0,10
Sweden	0,56	0,68	0,77	0,84	0,81	0,81
United Kingdom	0,68	0,85	1,09	1,25	1,37	1,35

Source: calculations are made on the basis of data on value added as presented in the Eurostat database by six aggregate economic sectors

Note: the values (factor loadings) characterising the level of general indicators of the economic structure are found with the help of factor analysis. Factor analysis helps to explain the variability occurring in basic variables with the help of a smaller number of general indicators (factors). Factor loadings are standardised; its value "zero" gives evidence of the fact that the value of the factor is in case of that survey (state) the sample's average. A positive factor loading indicates that the indicator's value in case of that survey (state) is above the sample's average. In case of a negative factor loading, the indicator's value is, however, below the sample's average.

Annex 7. Values of the general indicator (F2) characterising the environment of technological innovation

	2000	2001	2002	2003	2004	2005
Belgium	0,92	0,80	0,76	0,60	0,56	0,52
Bulgaria	0,77	0,57	0,57	0,66	0,52	0,32
Czech Republic	0,25	0,29	0,12	0,01	0,48	0,34
Denmark	0,63	0,68	0,71	0,57	0,55	0,56
Germany	1,43	1,55	1,64	1,70	1,79	1,90
Estonia	-0,47	-0,40	-0,45	-0,55	-0,69	-0,98
Ireland	1,33	1,26	1,28	0,77	0,50	0,18
Greece	-1,59	-1,94	-1,96	-2,20	-2,35	-2,15
Spain	-1,10	-1,31	-1,52	-1,66	-1,88	-2,13
France	0,84	0,71	0,64	0,55	0,52	0,43
Italy	0,51	0,36	0,32	0,26	0,23	0,14
Cyprus	-1,96	-2,04	-1,91	-1,68	-1,81	-1,84
Latvia	-1,44	-1,56	-1,61	-1,68	-1,86	-2,00
Lithuania	-0,85	-0,88	-1,27	-1,41	-1,33	-1,34
Luxembourg	0,09	-0,18	-0,40	-0,27	-0,28	-0,09
Hungary	1,17	0,96	0,88	1,12	1,11	1,18
Malta	0,01	-0,15	-0,23	0,08	-0,17	-0,33
Netherlands	0,22	0,21	0,11	0,25	0,32	0,47
Austria	-0,45	-0,37	-0,42	-0,54	-0,45	-0,35
Poland	-0,85	-0,79	-0,64	-0,30	-0,11	-0,25
Portugal	-0,48	-0,62	-0,57	-0,39	-0,46	-0,31
Romania	0,23	0,26	0,33	0,10	-0,07	-0,35
Slovenia	1,10	1,18	1,17	1,13	1,11	0,87
Slovakia	0,01	0,05	-0,14	0,26	0,22	-0,02
Finland	1,03	0,90	0,91	0,83	0,75	0,62
Sweden	1,57	1,41	1,36	1,36	1,33	1,27
United Kingdom	0,54	0,36	0,29	0,16	0,10	0,26

Source: calculations are made on the basis of data on value added as presented in the Eurostat database by six aggregate economy sectors

Note: the values (factor loadings) characterising the level of general indicators of the economic structure are found with the help of factor analysis. Factor analysis helps to explain the variability occurring in basic variables with the help of a smaller number of general indicators (factors). Factor loadings are standardised; its value "zero" gives evidence of the fact that the value of the factor is in case of that survey (state) the sample's average. A positive factor loading indicates that the indicator's value in case of that survey (state) is above the sample's average. In case of a negative factor loading, the indicator's value is, however, below the sample's average.

Annex 8. Average rate of annual wages in migration destination countries and in Estonia by economic sectors

Field of activity	Average wage disparity (times) 2000	Average wage disparity (times) 2004	Average wage disparity (times) 2006	Decrease in disparity 2000–2006 (%)
Research and development	13.0	5.2	5.6	61.8
Renting of machines without an operator and letting out of household appliances	8.4	4.1	3.8	61.8
Real estate activities	9.6	5.8	4.6	57.7
Production of other machines and equipment	9.0	6.3	4.4	57.7
Manufacture of chemicals and chemical products	10.6	7.0	5.3	55.7
Hotels and restaurants	6.2	4.2	3.2	57.2
Wholesale and retail trade; repair of motor vehicles and household appliances	6.9	4.9	3.7	54.3
Postal services and telecommunication	6.7	4.8	3.8	51.5
Other business activities	6.8	4.9	3.9	50.4
Wood processing and manufacture of timber products	8.5	6.0	4.6	52.1
Building materials industry	6.4	4.7	3.6	52.1
Manufacture of means of transportation	8.1	6.1	4.7	47.5
Computers and the related activities	6.8	4.9	3.9	49.3
Construction	7.8	5.5	4.8	44.4
Manufacture of rubber and plastic products	8.0	5.6	4.8	46.1
Manufacture of metal and metal products	8.4	6.2	5.0	46.0
Unclassified production, incl. manufacture of furniture	8.1	5.6	4.9	45.0
Transport	6.5	5.1	4.1	43.2
Electrical energy, gas and water supply	7.7	5.7	4.9	41.3
Food and beverage production	7.2	5.9	4.8	38.4
Manufacture of electrical and optical instruments	9.1	6.7	5.9	40.1
Manufacture of paper pulp, paper and paper products; publishing	6.3	5.0	4.3	36.4
Coke, purified petroleum products and fuel fabrication	12.9	10.6	8.7	35.3
Mining	8.9	7.6	6.2	33.4
Manufacture of textile and textile products	7.9	6.8	6.0	27.4
Leather processing and manufacture of leather products	6.8	6.1	5.1	28.1

Source: Eurostat, ESA, authors' calculations

Migration destination countries: Finland, the United Kingdom, Ireland, Germany, Norway, Denmark, and Sweden. Decrease in difference = (difference in new percentage – difference in old percentage) / difference in old percentage.

The average wage for Estonia has been calculated as a rate of the wage costs of enterprises and the average annual number of employees. Wage costs for the European countries are found on the basis of Eurostat data. The average wage is calculated as a rate of wage costs of enterprises and the average annual number of employees. As the latest Eurostat data was from the year 2004, the average wages for 2006 were found as forecasts on the assumption that the growth of the average wage by fields of activities in the periods of 2002–2004 and 2004–2006 was equal.

Annex 9. Rate of the average annual wages of the Estonia's migration destination countries to the wages in Estonia, in 2006 (in times)

Field of activity	Denmark	Germany	Ireland	Finland	Sweden	United Kingdom	Norway
Mining	7.8	4.3	5.6	3.8	4.0	6.9	11.3
Manufacture of food and beverages	5.4	3.5	5.5	4.9		4.8	
Manufacture of textile and textile products	8.6	5.9	5.4	5.6	5.6	4.9	6.2
Leather processing and manufacture of leather products		5.1	4.8	4.6	5.4	4.6	6.3
Wood processing and manufacture of timber products	5.8	3.7	4.5	4.6	3.9	4.3	5.3
Manufacture of paper pulp, paper and paper products; publishing	4.4	3.9	4.7	4.8	3.5	3.9	5.2
Manufacture of coke, purified petroleum products and fuel fabrication		11.3		9.3	6.5	10.6	5.8
Manufacture of chemicals and chemical products	6.1	5.8	5.1	4.9	4.1	5.3	5.6
Manufacture of rubber and plastic products	6.1	4.7	4.5	4.5	3.6	4.3	5.7
Building materials production	4.6	3.4	3.4	3.3	2.6	3.3	4.6
Manufacture of metal and metal products	5.9	4.8	4.6	4.8	3.6	4.2	6.9
Manufacture of other machines and equipment	5.4	4.8	3.8	4.3	3.1	4.0	5.4
Manufacture of electrical and optics instruments	6.6	5.9	5.2	6.2	5.1	4.6	7.5
Manufacture of means of transportation	5.3	5.8	4.0	3.4	3.6	4.7	6.3
Unclassified production, incl. manufacture of furniture	6.4	4.7		4.4	3.7	4.3	5.8
Electrical energy, gas and water supply	3.6	5.9		4.1	4.3	6.7	
Construction	5.3	3.4	7.1	4.2	3.6	4.6	5.5
Wholesale and retail trade; repair of motor vehicles and household appliances	4.7	3.1	3.5	3.9	3.4	2.9	4.2
Hotels and restaurants	3.1	1.9	3.4	4.4	3.3	2.4	4.1
Transport	5.2	3.3	4.8	3.9	3.0	4.3	4.5
Postal services and telecommunication	4.4	3.2	4.1	3.1	3.5	4.3	3.9
Real estate activities	4.1	3.6	4.1	5.6	5.6	4.0	5.5
Lease of machines without an operator and letting out of household appliances	4.1	3.3	3.0	4.2	3.9	3.6	4.7
Computers and related activities	4.7	3.9	3.3	4.1	3.7	3.7	4.2
Research and development	6.9	4.3	5.3	6.5	4.1	6.4	5.6
Other business activities	4.2	2.6	4.3	4.1	3.8	3.6	4.3

Source: Eurostat, authors' calculations

Migration destination countries: Finland, United Kingdom, Ireland, Germany, Norway, Denmark, and Sweden.

The average wage for Estonia has been calculated as a rate of the wage costs of enterprises and the average annual number of employees. Wage costs for the European countries are found on the basis of Eurostat data. The average wage is calculated as a rate of wage costs of enterprises and the average annual number of employees. As the latest Eurostat data was from the year 2004, the average wages for 2006 were found as forecasts on the assumption that the growth of the average wage by fields of activities in the periods of 2002–2004 and 2004–2006 was equal.

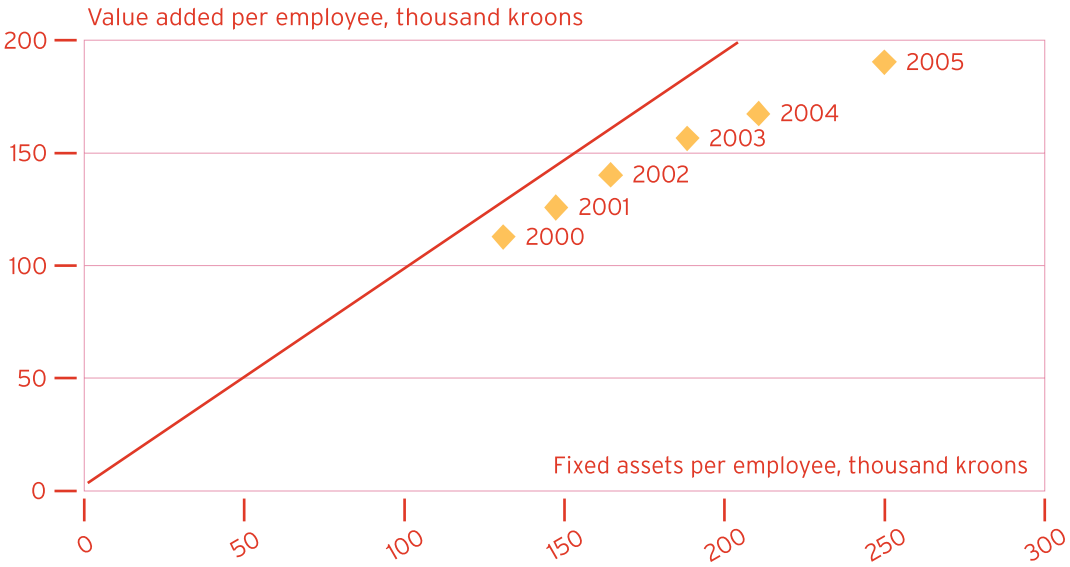
Annex 10. Residual profit per employee in the Estonian economy sectors, 1996–2005 (thousand kroons per year)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total fields of activities	8	15	14	12	29	29	39	51	57	70
Agriculture, hunting and forest management	1	5	8	-5	21	39	32	26	52	59
Agriculture, hunting and their servicing fields of activities	0	3	7	-11	14	36	22	16	49	48
Forest management, forest storage forest harvesting and their servicing fields of activities	4	15	14	25	52	49	72	64	62	96
Fishing	0	10	-9	-17	-22	35	6	30	5	47
Mining industry	3	5	1	11	1	-45	7	26	32	41
Manufacturing industry	6	15	11	12	24	28	32	36	36	44
Electric energy, gas and water supply	30	16	1	-16	-17	-218	-97	119	140	226
Electric energy, gas, steam and hot water supply					-27	-287	-148	121	138	241
Water storage, water collection, water purification and distribution					40	93	122	110	150	166
Construction	8	12	11	6	16	26	37	41	44	63
Wholesale and retail trade; repair of moor vehicles and household appliances	9	17	12	6	31	34	45	52	69	78
Sale, maintenance, repair of motor vehicles; retail sale of motor fuel	6	23	13	-1	16	34	47	56	56	71
Wholesale and intermediate trade	15	27	22	16	61	69	93	100	128	141
Retail trade, repair of household appliances	5	7	3	-1	12	8	8	11	20	25
Hotels and restaurants	4	8	2	2	11	13	15	16	20	26
Transportation, warehousing and communications	13	32	46	52	77	89	97	112	93	107
Rail transport			12	22	8	26	48	107		63
Other transport by land	2	2	4	3	17	29	28	28		23
Water transport	-45	15	-12	-70	-88	-25	-62	-2	-431	-312
Air transport			-110	-94		52	132	139	-3	90
Activities of travel agencies	44	87	117	147	220	234	198	179	194	198
Postal services and telecommunication	46	62	95	101	114	97	169	234	250	269
Postal and express service						7		9	12	20
Telecommunication						229		642	660	672
Real estate, renting and business activities	5	6	7	9	32	43	52	62	89	108
Real estate activities	0	-4	8	7	54	90	131	182	229	317
Renting of machines					73	85	113	132	181	101
Computers and the related activities	5	22	35	27	46	32	6	31	54	56
Research and development					13	0	-234	-61	-39	20
Other business activities	9	9	1	9	17	22	27	22	44	51
Education	2	8	9	-2	19	18	8	22	19	24
Health and social welfare	7	6	8	9	10	10	6	15	13	17
Other society, social and personal services	-14	-1	3	2	15	17	26	41	45	67
Disposal of wastewater and refuse					20	26	36	39	53	42
Leisure, cultural and sports activities					18	22	31	56	59	106
Other servicing					8	3	11	18	19	26

Residual profit is that part of the profit earned by the enterprise which remains after covering the costs connected to the replacement of labour and capital.
Residual profit = value added – labour costs – depreciation.

Source: Statistics Estonia, authors' calculations

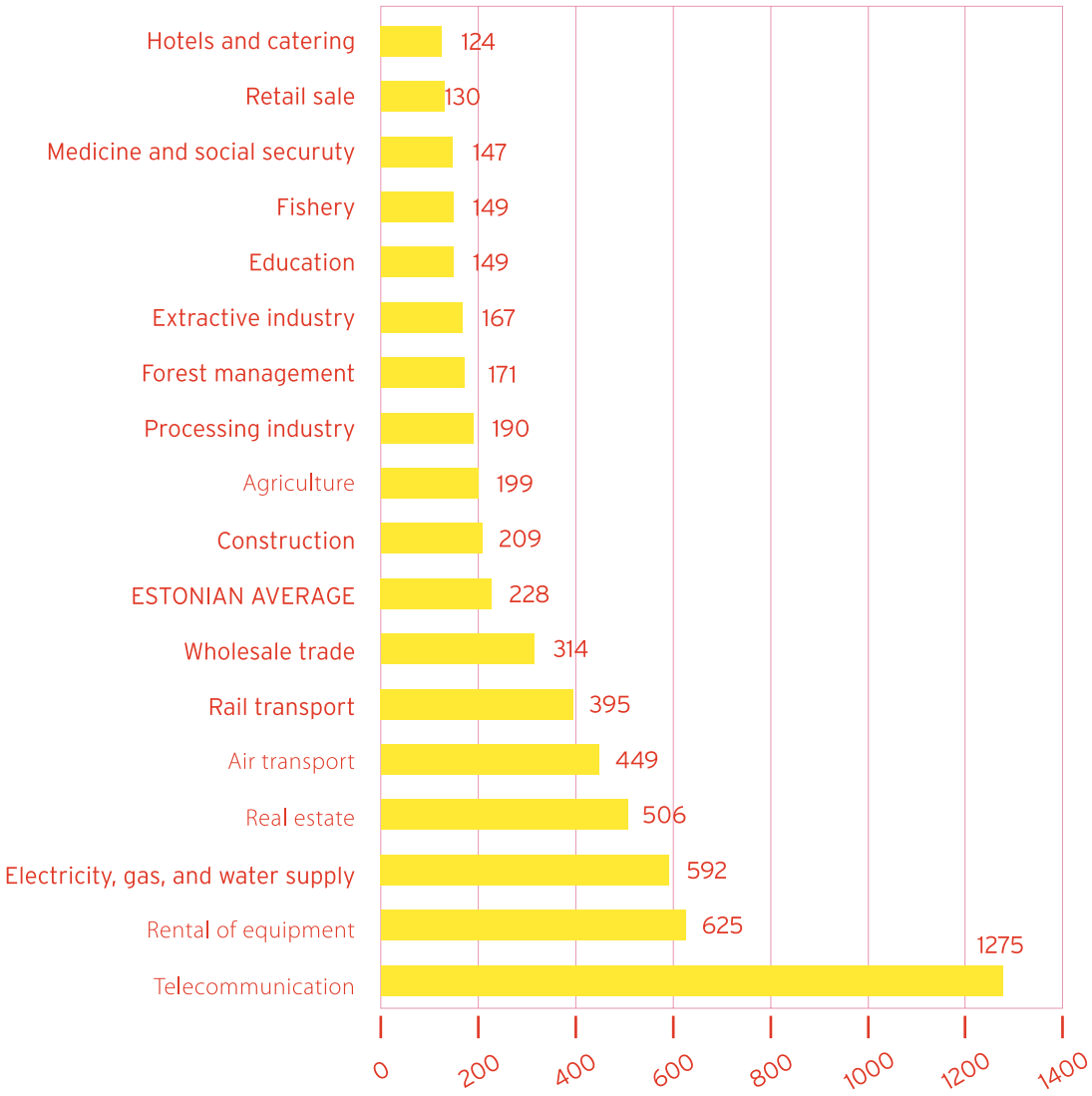
Annex 11. Development of provision with productivity and fixed assets in the Estonian manufacturing industry, 2000–2005 (thousand kroons per employee a year)



The line drawn in the figure shows a situation where the increase of provision of the employee with fixed assets by one unit would give as large an increase in productivity.

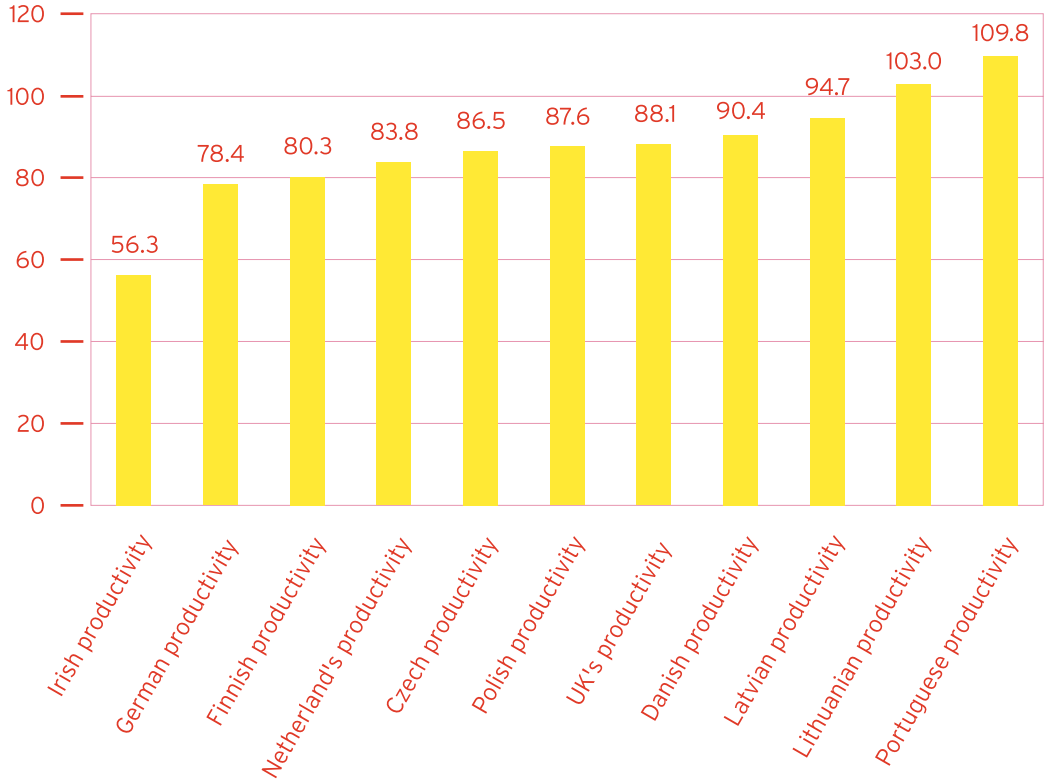
Source: Statistics Estonia, authors' calculations

Annex 12. Sequence of Estonian economic sectors on the basis of labour productivity (value added per employee) in 2005, thousand kroons



Source: Statistics Estonia, author's calculations

Annex 13. Estonia's level of productivity (value added per employee) compared to similar countries and in the case of Estonian industrial employment structure as a percentage of the level of these countries



Explanation: if everyone engaged in the Estonian manufacturing industry would work with the productivity of Ireland, but continuously in the same industrial sectors as before, the productivity of Estonia would be 56.3 per cent of the Irish level. Thus, 43.7 % of the difference in productivity originates from the differences in the employment structure.in productivity originates from the differences in the employment structure.

Source: Statistics Estonia, author's calculations

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