2013

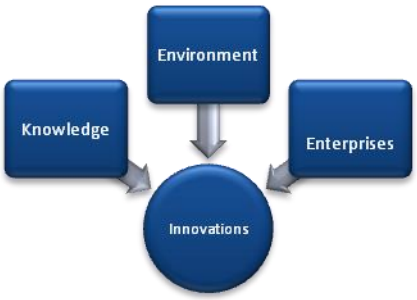
ASSESSMENT OF EXPORT POTENTIAL OF ECONOMIC SECTORS

Appendix 2

to the informative report “On the development of Smart Growth Strategy and determination of specialisation”

Contents

1. Summary



Economic growth that is sustainable, competitive and based on knowledge and innovations requires knowledge, enterprises and environment favourable for the transformation of knowledge into innovations.

Smart Growth Strategy (SGS) foresees the development of a vision for the future, distinguishing competitive advantages, strategic choice of priorities and policy that unlocks knowledge-based potential of the region to the maximum extent possible. The objective of SGS is to increase innovation capacity, and establish innovation system fostering and supporting technological progress of national economy.

Within the framework of the purchase made by the Ministry of Education and Science, "FIDEA" Ltd. (hereinafter – FIDEA) carried out the assessment of the Industry. Within the framework of the assessment these following activities were carried out:

- development of methodology for the determination of potential of economic sectors,
- compilation of proposal from the part of science regarding fields of development,
- clarification of entrepreneurs' opinion during discussions,
- obtained survey data on fields of science that may lead to a significant increase of the value of exports.

A website of the project has been created at www.ris3.lvhttp://ris3.fidea.lv/, which contains information on the process of the development of SGS and parties involved, and provides a platform for opinion exchange.

Potential of economic sectors

"FIDEA" Ltd. has developed a practical model to be used on a regular basis for the determination of quantitative growth of export value potential.

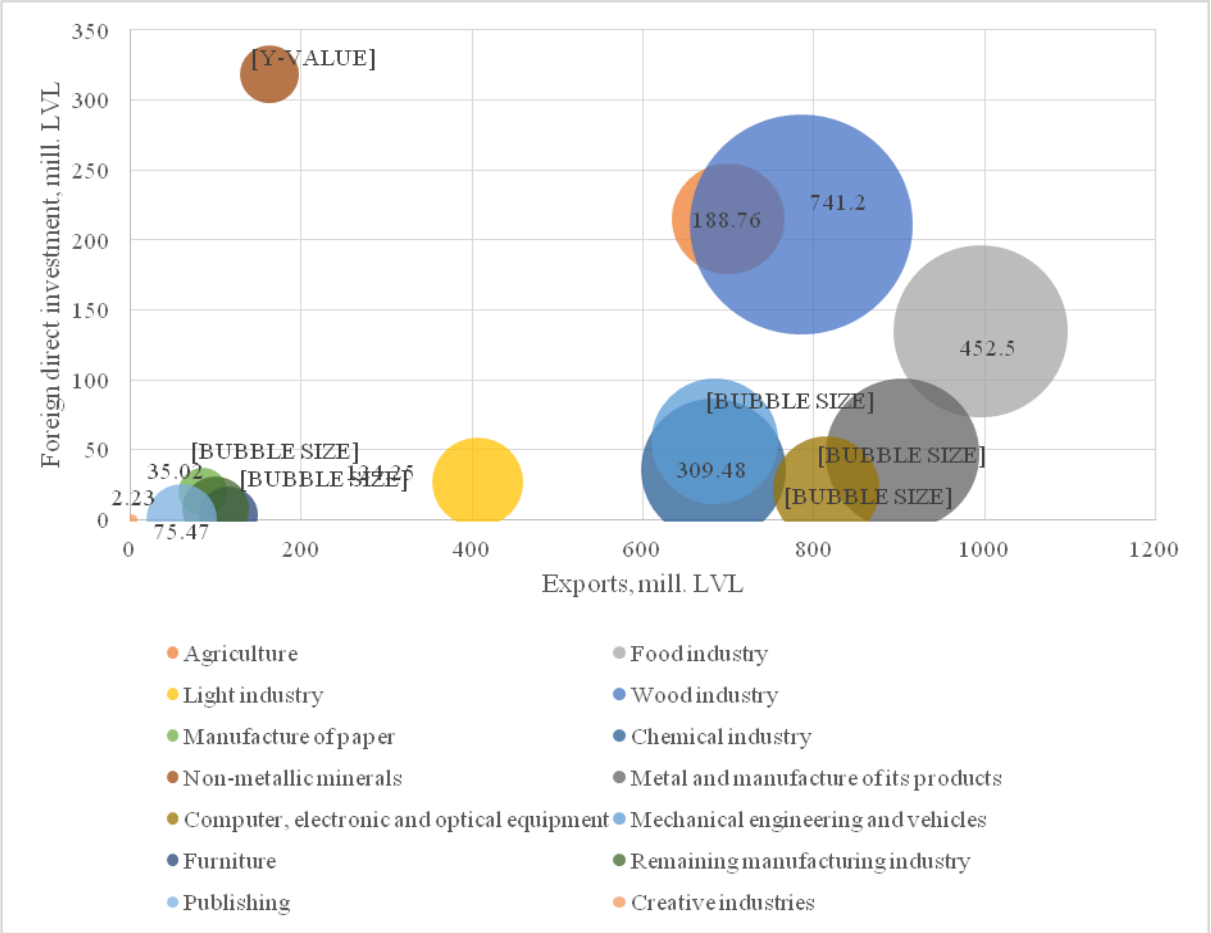
The following industrial sectors demonstrate the highest export value growth potential based on the related diversification strategy[1]: **woodworking, food industry, manufacture of metal and its products and chemical industry** 1).

It is difficult to state the economic efficiency in the case of several sectors related to the public good, such as health services, therefore, solely export potential is characterised according to the methodology offered by FIDEA. On one hand, due to the ageing of the European Union, the market is growing, on the other hand, health sector already stands out due to the high concentration of talented professionals and export of educational services that testify to the high development potential. Economic effect of developed health sector definitely exceeds direct export indicators, therefore, integrated complex of medical education and health sectors shall be regarded as a potential field for the development. Education sector is among sectors related to public good that requires more profound research[2].

[1] Related diversification is a process, during which enterprises diversify their products by offering more sophisticated products with higher value added within the framework of research and innovations based on previously gained knowledge, production factors and scale.

[2] English is a language of instruction of competitive and "marketable" education.

1Illustration 1 Growth potential of sector export value (FIDEA, 2013)



Determination of potential of export value growth. The determination of potential of sectors is executed in conformity with gap [2] analysis model that conceptually conforms with Hausmann and Klinger (H-K) approach[3] applied within NIP. Basic assumption: it is possible to overcome the existing gap, therefore, potential of economics in particular product group is equal to the gap.

[2] In this case, gap means differences in productivity and efficiency in the use of assets, assuming that these differences can be overcome in the case of efficient economic policy. In this case, this difference expressed in terms of monetary amount would be the return from eventual economic policy.

[3] H-K approach is based on the model that foresees that productivity and welfare will be increased if a country starts producing the same products as produced in countries with higher level of welfare (Hausmann & Klinger, 2006).

2. Methodology for the assessment of export potential of economic sectors

2.1. Summary

Export potential of sectors is determined as possible additional export earnings, if upon changing of value and structure of export products in particular sector, the differences between Latvia and more developed countries would be overcome. Export potential is expressed as the growth of value of one export unit without changes in physical volume of the goods to be exported within the sector (data are measured in kilograms). It is assumed that the most significant part of the mentioned differences could be overcome due to the development of technologies and innovations, therefore, development potential should be used as a primary indicator in singling out the candidates for innovations. The determination of potential of sectors is executed in conformity with gap[4] analysis model developed by FIDEA, which conceptually conforms with Hausmann and Klinger method (H-K approach)[5], thus, RIS3 and NIP are mutually complementary. One of the assumptions is as follows: global capital will be bound to profit, therefore, it is dependent on total factor productivity (TFP)[6], thus, capital reserve will not be taken into account[7].

2.2. Justification of methodology

Alongside with NIP and NDP 2014-2020[8], RIS3 forms a united policy framework, therefore, methodology applied for the identification of RIS3 focus and objectives should be based on the same conceptual basis. With an aim to assess growth potential of sectors, researches carried out by Dani Rodrik, Ricardo Hausmann, economists from Harvard Kennedy School, and their co-authors were taken into account. Their researches focus on the identification of market gaps that hinder or may hinder the development of export-oriented sectors. The main objective of NIP is to increase the profitability of export basket. In conformity with the above mentioned method − the profitability of export basket is determined by the composition of products the export basket consists of. Thus, one of the objectives of industrial policy is to foster the companies' transition from less profitable product groups to more profitable ones.

There is a great need for the methodology enabling both to assess the achievements and timely detect potential and unavoidable policy deficiencies and implement corrective actions (the choice of RIS3 growth fields and development of suitable support mechanisms to a certain extent resembles "shooting a moving target").

H-K method applied within NIP is inconvenient for practical application on a daily basis, and the obtaining of data required for the application of this method is labour-consuming and complicated. In the case of RIS3 methodology offered by "FIDEA" Ltd., data on exports provided by *Eurostat* are used. These data are updated once per quarter, they are easily accessible and usable free of charge.

Methodology for the assessment of potential growth sectors (from the part of industry) applied by RIS3 is based on the same assumptions and logical principles as in the case of analysis carried out within NIP.

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[4] In this case, gap means differences in productivity and efficiency in the use of assets, assuming that these differences can be overcome in the case of efficient economic policy. In this case, this difference expressed in terms of monetary amount would be the return from eventual economic policy. "Gap analysis" is the appropriate English term for "nepilnību analīze".

[5] H-K approach is based on the model that foresees that productivity and welfare will be increased if a country starts producing the same products as produced in countries with higher level of welfare (Hausmann & Klinger, 2006).

[6] The term "Total Factor Productivity" represents country's ability to use the available capital and labour force in the efficient way. Often it is considered to be an indirect reference to innovations; the country's gross product may increase without the increase of capital and labour force and due to innovations. This indicator is used in *Cobb-Douglas* function while calculating the level of dependence of GDP on labour force and capital.

[7] It is possible that growth of productivity within particular sector has more capital than innovations. However, in situations when international funds invest money in treasury bills with negative return, the lack of capital is usually explained by other conditions, with availability of the capital itself. Usually, problems related to the availability of capital are solved upon solving of the above mentioned problems.

[8] "National development programme 2014-2020" hereinafter referred to as NDP.

The methodology for the assessment of industry encompasses the demand for the policy granularity included in the conceptual basis of RIS3 [9], for the determination of broad orientation and focus at a maximum level by applying entrepreneurial discovery principle. While characterising the role of the state in the promotion on innovations and choice of growth sectors, Dominique Foray, one of the authors of RIS3 concept, notes that "it is essential not to remain in a neutral position and mark a broader scope still remaining in a fully neutral position regarding the choice of specific application"*(Foray, November 2009)*. As it can be concluded from the aforesaid, the choice of technologies should not be done at a state-level, and at the same time national demand and supply policy may lead to the increase of the expected return from particular technologies by creating additional stimulus for the industry. For example, success story of Scandinavia related to the manufacturers of mobile equipment testifies to the fact that such approach from the part of state might be successful. However Latvia's small market will not have a significant impact on the prospect of export-oriented enterprise, therefore, there are reasonable doubts as to the efficiency of this approach.

2.2.1. The choice of economic sectors

Within the framework of the assessment of the industry, all Latvia's industrial sectors of economic significance were analysed without restricting the analysis to the high- or medium-technology sectors. As it is stated in research report on Latvia's national innovation system by the World Bank (2001), "opposed to the prevailing opinion, high technologies are not always synonymous to high added value, high salary or rapid growth. On the contrary, transition economies, such as Latvia, may reach more success by increasing added value to low-technology sectors, such as forestry and food production, and not by attempting to create several products belonging to the high technology segments and industries"[10] (Watkins & Agapitova, 2001). This approach allows assessing such combination of high, medium and low technologies that takes into account current competitive advantages and based on them enables to develop new ones.

Methodology of the assessment is based on the *Guide to Research and Innovation Strategies for Smart Specialisation (RIS3)* (Foray, a.o., 2012), whereas, basic principles characterised herein and instructions are available at the web page of RIS3 platform[11]. Various approaches were used for the assessment of economic potential by striving for the adaptation of the approach to the context: specificity of industry, used resources, and production factors.

2.3. Determination of sector growth potential

2.3.1. Potential assessment model

The determination of the potential of sectors is executed in conformity with gap[12] analysis model made by FIDEA, which conceptually conforms with Hausmann and Klinger approach applied within NIP *(H-K approach).*[13] Basic assumption: it is possible to overcome the existing gap, therefore, potential of economics in particular product group is equal to the gap.

The potential of the sector might be unlocked through innovations and that equals to the growth of product value that might be reached within the sector in case the sector would operate (in terms of products, value and markets) in the same way as in the developed European countries. It is possible to indirectly assess TFP[14], which is claimed to be an indirect indicator of the level of innovations. As experts of the World Bank claim, „to some extent, knowledge is what lies behind

[9] In this case, it is a request for policy that is neither vertical, nor horizontal, meanwhile focusing the support towards fields of knowledge that exceed the needs of a single sector by transforming economy aiming at reaching higher productivity and sustainability.

[10] Translation.

[11] http://s3platform.jrc.ec.europa.eu/.

[12] In this case, gap means differences in productivity and efficiency in the use of assets, assuming that these differences can be overcome in case of efficient economic policy. In this case, this difference expressed in terms of monetary amount would be the return from eventual economic policy.

[13] H-K approach is based on the model that foresees that productivity and welfare will be increased if a country starts producing the same products as produced in countries with higher level of welfare (Hausmann & Klinger, 2006).

[14] Total factor productivity (TPF).

total factor productivity (TFP), which is the residual for the growth in output that is not explained by the growth [15] of inputs"[16] (IBRD/World Bank, 2010).

Model for the assessment of the potential of sectors is chosen and developed by observing the following criteria:

- concept:
  - the model foresees that the development of the country is oriented towards exports of refined and productive products[17];
  - assessment of the potential for development is carried out at sectoral level without specifying the application of particular technologies;
- opportunity for comparison and progress reports:
  - the model is comparatively easy to use (The results are clear and comparable);
  - the model should exclude differences in internal market of various countries, which may remain in force for a longer period, also after the equalisation of production skills, capital and productivity;
  - the model can be applied both for initial and progress assessment (Initial assessment and progress assessment are comparable);
  - data are comparable within different countries and industries;
  - raw data are reliable and the institutions compiling these data are independent and transnational;
  - data on all countries – Latvia and reference countries – are renewable, thus, the creation of progress reports on a regular basis is possible;
- result:
  - result is expressed in terms of monetary amount as a difference between the existing and possible situation that can be overcome due to innovations and technology.

For the possibility to achieve the level of productivity and welfare characteristic to developed countries to be credible, countries' performance in only export markets is compared. Thus, the differences in internal markets are excluded, especially, due to the fact that local market is too small for enterprises of Latvia.

2.3.2. Justification of model

Differences in skills, technologies, knowledge and capital are reliable indicators of the differences in ability to create export value per one export unit. Taking into account the fact that the capital is very mobile and during past years Latvia has been listed[18] among the countries safe for investment by several funds, capital should "follow" business opportunities. Thus, from the viewpoint of national policy, it is assumed that innovations may lead to overcoming such differences in value due to innovations in the wide sense. No doubts, global capital will "follow" profit, thus, it is dependent on total factor productivity[19]. Accordingly, capital reserve will not be taken into account[20].

Comparison has to be executed at such level so that in the chosen sector technological diversification that is wide enough would be possible within a particular industrial domain. According to McCann and Ortega-Argiles (2011) the related

[15] Within the framework of basic growth formula, the growth of GDP is explained by three basic components: labour force, capital and TFP, which is related to country's ability to combine labour force and capital (translation).

[16] Labour force and capital are production factors. (author's remark)

[17] It is a conceptually corresponding to H-K approach.

[18] In 2013, greater interest from the part of *Deutsche Bank, Goldman Sachs* a.o. representatives about investment possibilities in Latvia is observed due to the inclusion of Latvia in the list of "risk-free" investment countries.

[19] "Total Factor Productivity" *is English for "kopējo faktoru produktivitāte".* It represents country's ability to use the available capital and labour force in the efficient way. Often it is considered to be indirectly related to innovations; the country's gross product may increase without the increase of capital and labour force and due to innovations. This indicator is used in *Cobb-Douglas*function while calculating the level of dependence of GDP on labour force and capital.

[20] It is theoretically possible that growth of productivity within particular sector more rests on capital than innovations. However, in situations when international funds invest money in treasury bills with negative return, the lack of capital is most likely explained by the conditions that are not related to the availability of the capital itself.

diversification is advantageous, because it occurs in sectors that are wide enough, and these scale-related advantages might be used by technological diversification. Besides, part of production factors required for the production of other related products is usually available within the framework of a single sector.

Profound comparative analysis within the framework of single sector compared to the analysis of portfolio of products of a more developed country [21], would disclose information on new opportunities for the industry, whereas, for the science it would be essential to single out obstacles preventing from the using of these opportunities. These data are for the good of the public, therefore, such researches should be carried out within the framework of RIS3 strategy.[22]

Within the model "FIDEA" Ltd. uses value of export unit obtained from *Eurostat* and Comext and this indicator enables analysing the differences in export value by sectors between reference countries and Latvia. Based on this model, weighted average value of export unit of reference countries within each sector is determined and compared to the respective value of the same sector in Latvia. Differences of the unit value within particular sector are multiplied with current export volume of Latvia. Taking into account the fact that *Eurostat* uses weight (kg) as a measure per unit, production sectors are comparable. The model foresees the retaining of the physical volume of exports, as well as application of conservative approach within the sectors related to natural resources (without the increase of use thereof). The growth of value is expected to increase due to innovations and not by the increase of volume. It is planned to transform technology and product basket so that it would be similar to the one of more developed countries.

Fixed export volume is used within the model due to the following reasons:

- RIS3 policy is oriented towards the change of the structure of innovations and national economy for higher value. The fixing of the volume basically conforms with the above mentioned policy;
- the majority of low-technology industries are based on resources that are used to full or almost full extent (such as timber). Besides, orientation towards growth with constant physical volume is a part of environmental policy, as the assumption that the volume of natural resources bound to the product correlates with its weight is highly reliable;
- working with the existing market is easier than creating a new one.

Additional assumptions which the assessments are based on:

- the potential of industries based on world's exhaustible resources might be measured as the difference between value added per one resource unit in Latvia and reference countries or regions. The calculation of potential (difference in absolute figures) is simplified due to the availability of fixed measures related to the obtaining and use of resources in Latvia. Innovations and technologies are among components for the assessment of potential. Industries that are bound to restricted resources have submitted their calculations, and the data of this model are compared thereto;
- all economic sectors may provide return "through innovations" regardless of their statistical belonging to the sectors of high-, medium-, or low-technologies.

2.3.3. Calculation of the potential

2.3.3.1. Obtaining of comparative data

To determine the optimal value of products of the field, 9 EU member states are used as references: Austria, Belgium, Denmark, Ireland, the United Kingdom, the Netherlands, Finland, Germany, and Sweden.

These countries are chosen due to the following reasons:

- these countries are more economically developed, therefore, it is logical to strive for that level or at least be near it;

[21] Such analysis is relatively easy to conduct within this model.

[22] At the same time, it is essential for the policy developers to avoid temptation to use these data for making decision related to the support of particular technologies. Particular solution, product or use of technologies and knowledge might be fully verified solely upon the application of entrepreneurial discovery principle.

- they are active Latvia's trade partners. Active trade is one of the most efficient means of knowledge transfer, therefore, within similar sectors, if such exist, faster knowledge transfer is possible from these reference countries rather than from other countries.
- these countries are in the same economic area (EU member countries) and share similar climate conditions;
- significant diaspora of Latvia's citizens and inhabitants exists there; Diaspora is a feasible knowledge transfer agent.

Trade database is used for the comparison *(*COMEXT*).* COMEXT system comprises 3 product description levels, which include 2-digit level (Group 01-96) with the lowest degree of detailed elaboration and conforms with NACE classification. 3-digit level is the first degree of detailed elaboration within the sectors determining the main products, whereas, 4-digit level is the highest degree of detailed elaboration.

4-digit level, which is the highest degree of detailed elaboration, is applied in the analysis, and "related diversification" is possible within the framework of thereof. It is likely that significant production factors of the goods produced within the framework of such single code would overlap. Common production factors decrease the number of obstacles that prevent the transition of industries from less productive products to more productive ones.

Data for each sector were selected from years 2010, 2011 and 2012 including data on export values in EUR and the number of units according to COMEXT 4-digit level. Average value of export unit for each product was determined by using the selected data. Analogous data attributed to Latvia were obtained for each of the sectors.

Particular data in *Eurostat* database are obtained upon applying the following parameters:

- export value – *VALUE_IN_EUROS*;
- export volume – QUANTITY_IN_100KG;
- in page *"Flow"* indicate "exports only";
- data from years 2010, 2011, and 2012 (from January till December in each year);
- the choice of products at 4-digit level.

Data from years 2009, 2010 and 2011(past years with full data available in the item of balance of payments) were used to determine the export value potential of the sectors of services, whereas, QUANTITY_IN_100KG is replaced by employment of the corresponding sectors. The population is not included in the calculation.

Calculating the potential of export value of electric power, *QUANTITY_IN_100KG* is replaced with *SUPPLEMENTARY_QUANTITY*.

2.3.3.2. Selection of countries for the particular product group

Countries are selected within each sector with an aim to create a selection of countries that would exclude those countries with small export volume, value or value added within particular sector.

Nine countries from the initial selection are divided into three separate lists within each product group depending on their export data:

- low specialization (Countries are arranged in descending order by the physical volume of their exports within the particular sector.)
- medium specialization (Countries are arranged in descending order by the total export value in EUR within the particular sector.);
- high specialization (Countries are arranged in descending order by the value of export unit, by value per unit).

The final selection is composed of first three countries of each list from the three selected lists. Each country can be chosen only once, i.e., if the country is included among the first three countries in more than one list, this country can be included in the final list only once, and total number of countries selected in the final list decrease.

2.3.3.3. Formula for calculation

The number of countries included in the list may vary from three to nine.

Gap calculation is executed in accordance with the following formula:

$$G_{eur} = Q_{LV} \times \left(\frac{\sum_{i=1}^{n} V_i}{\sum_{i=1}^{n} Q_i} - \frac{V_{LV}}{Q_{LV}} \right)$$, where

G_{eur} – Calculated gap within product group, Latvia, EUR (4 characters),

Q_{LV} – Latvia's total export volume (unit 100 kg) in the particular product group,

V_{LV} – Latvia's total export value EUR in the particular product group,

Q_i – Total export value 100kg in reference country *i* in the particular product group (principles of the formation of total selection of countries in particular product group are described in Section 2.3.3.2)

V_i – Total export value EUR of reference country *i* in the particular product group,

The obtained Latvian "export gap" in particular sector characterises potential difference between current and desired situation and hypothetically possible situation, which might be achieved in the case of efficient national economy, including application of innovation policy.

2.3.4. Limitations of the model

Model has several restrictions that have to be taken into account during the execution of the qualitative analysis of the obtained data:

- the need of high-technology sectors for investments in research and innovations with an aim to maintain current position are not taken into account; in practice, actual difference of the choice between two policies (to invest or not to invest) would result in a greater difference than in the case of potential obtained in this way;
- the ability of scalable[23] industries to rapidly increase the volume is not taken into account;
- the model cannot be directly applied to the services; at the same time, services are usually non-scalable (they are dependent on a restrictive production factor), therefore, adapted method might be applied by comparing the difference between value added of restricted production factors
- in Latvia and reference countries.

2.3.4.1. Additional steps for verification

To determine the potential of the sector more accurately, theoretical methods should be used in the future, for example, analysing changes of potential production factors, including changes in labour productivity (The Bank of Latvia, 2009). In the case of separate sectors (such as agriculture and wood industry) that are non-scalable due to restricted production factors, the comparison of utilisation of these factors is included in the description of the sector.

The potential of industries based on world's exhaustible resources might be measured as the difference between value added per one resource unit in Latvia and reference countries or regions. The calculation of the potential (difference in absolute figures) is simplified due to the availability of fixed measures related to the obtaining and use of particular resources in Latvia, and innovations and technologies are certainly among the means for the use of potential. They were used upon the re-assessment of the obtained result, if respective data were available.

Scalable industries require more in-depth assessment. One of the assessment options is based on volume of earnings per employed person. Assessment of current profile of scalable industries is required. Taking into account the peculiarities of the competition[24] within such industries, it is justifiably assumed that production factors that are currently available refer solely on export-oriented part.

[23] Scalable industries are industries volume thereof is not influenced or is slightly influenced by production factors that can not be obtained rapidly. These industries have a very high value per product unit; they are based on non-material properties (know-how, patents or copyright). Usually, these include all creative industries. It should be noted that scalable industries are related to high risk, because these industries usually compete at a global level, and a successful competitor influence the success of a company based in a faraway country. Development and sale of mobile phone applications is a typical example of a scalable industry. Theoretically, the volumes of applications to be sold cannot be restricted by anything but competitors.

[24] Within such industries, each player competes against the whole world, therefore, it is unlikely that the part of the industry oriented towards internal consumption would be ready for competition and exports.

3. Assessment of the potential of economic sectors

Since 2000, the structure of national economy has not changed significantly, and the most notable fluctuations occurred during pre-crisis period (see Table). The share of transport and storage sectors within the national economy has increased significantly, whereas the share of public services sector has decreased. Small increase can be observed in other industrial sectors and agriculture, whereas, the share of manufacturing industry has remained almost unchanged amounting to 14.1%.

1Table 1. Structure of Latvia's national economy by value added within the period from 2000 till 2011 (Eurostat, 2013)

Sector	2000	2005	2006	2007	2008	2009	2010	2011
Agriculture	4.5	3.9	3.5	3.5	3.0	3.8	5.0	5.1
Mining industry	0.1	0.3	0.3	0.4	0.4	0.5	0.6	0.6
Manufacturing industry	14.4	12.9	12.1	11.7	10.8	10.9	13.3	14.1
Power industry	3.6	2.5	2.4	2.4	2.7	3.4	3.8	3.7
Water, sewage, waste	0.5	0.5	0.5	0.6	1.3	1.0	0.9	0.9
Construction	6.8	7.0	8.5	10.4	10.1	8.0	5.3	5.5
Trade	17.4	20.1	21.2	19.5	17.2	15.3	15.8	15.9
Transport and logistics	9.5	10.5	8.5	7.8	8.1	11.1	11.4	12.3
Tourism	1.1	1.6	1.6	1.7	1.6	1.6	1.5	1.7
ICT	5.8	4.9	4.4	3.9	4.2	4.4	4.5	4.2
Finance and insurance	3.1	4.3	5.6	5.4	4.9	4.0	3.2	3.5
Immovable property	8.0	7.7	7.9	8.2	8.4	9.3	9.7	9.0
Professional services	3.3	3.6	3.6	4.0	4.9	4.8	4.6	4.4
Administrative service activities	2.1	2.3	2.2	2.2	2.7	2.6	2.8	2.8
Public administration and defence	8.3	7.3	7.4	7.9	8.2	8.4	7.6	7.0
Education	5.3	4.8	4.5	4.6	5.2	5.4	4.6	4.2
Health and social care	3.4	2.9	2.9	2.8	3.1	3.2	3.1	2.8
Arts and entertainment	2.3	2.1	2.4	2.3	2.4	1.7	1.7	1.7
Other services	0.6	0.8	0.6	0.8	0.9	0.9	0.8	0.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

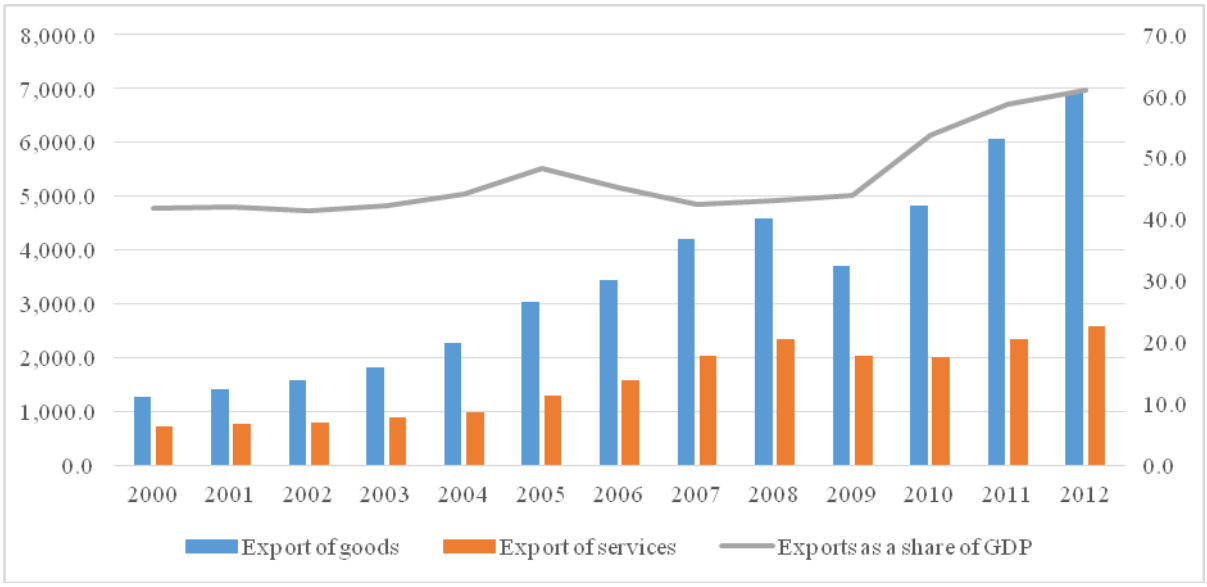
Contrary to the structure of national economy taking into account value added, significant changes have occurred in the structure of employment, and the number of employed has decreased significantly - especially in agriculture and manufacturing industry (see Table); while, the number of employed has increased in several sectors of services. Unemployment level has significantly decreased – in 2011 unemployment level was 16.2%, it is by three percentage points lower compared to year 2010.

2Table 2. Structure of national economy by the number of people employed, (numbers in thousands). (Eurostat, 2013)

Sector	2000	2005	2006	2007	2008	2009	2010	2011
Agriculture	132.3	114.7	117.8	104.0	88.3	83.8	81.1	75.2
Mining industry	2.1	2.6	2.6	3.0	3.1	3.1	3.3	3.1
Manufacturing industry	163.0	166.3	168.8	164.6	159.8	129.7	130.7	117.5
Power industry	15.3	13.6	13.1	12.0	148	13.7	13.2	12.5
Water, sewage, waste	8.0	7.6	7.8	8.4	8.7	8.5	8.9	7.1
Construction	55.9	90.4	102.2	126.4	128.5	78.7	63.4	59.3
Trade	152.7	182.7	190.5	202.8	209.7	181.7	168.7	140.6
Transport and logistics	70.2	75.3	82.4	82.2	82.9	79.5	80.8	69.0
Tourism	17.8	25.9	28.7	31.7	33.3	27.0	25.8	22.8
ICT	16.8	18.8	19.2	21.4	23.6	22.3	21.2	20.5
Finance and insurance	13.3	17.4	19.1	20.5	21.6	19.3	17.3	17.4
Immovable property	22.6	20.1	22.9	24.2	27,6	27.1	25.9	21.9
Professional services	19.3	26.2	28.6	34.2	38.6	36.7	32.1	30.3
Administrative service activities	17.5	21.4	25.7	28.3	30.1	30.0	33.1	35.5
Public administration and defence	64.4	66.8	67.7	69.4	67.3	61.0	56.3	55.6
Education	83.7	83.6	84.1	85.9	88.0	81.8	80.2	81.7
Health and social care	51.4	49.0	49.4	48.8	52.5	49.8	46.4	47.5
Arts and entertainment	19.2	21.5	22.1	24.0	24.3	22.1	21.8	19.0
Other services	14.2	21.4	21.9	21.1	21.0	19.7	19.5	18.5
Total	941.7	1027.9	1078.7	1117.4	1127.7	979.3	932.5	856.5

Since 2000 there has been a positive export growth tendency for the export of goods, especially export of goods of processing industry (see Illustration). It is explained by the inflow of local and foreign investments in comparatively advantageous sectors. Currently export volumes of goods and services have reached historically the highest level; total export volume is higher by nearly 20% compared to the highest volume of pre-crisis period. In 2012 export of goods and services of Latvia increased by 8.3%, whereas, in the 1st quarter of 2013 - by 2.9 percent (Ministry of Economics, June 2013). Private consumption was by 15% lower compared to the level of the 1st quarter of 2008 (then the decrease of private consumption started). Faster renewal of private consumption is still restricted by the high level of unemployment.

2Illustration 2. Dynamics of Latvia's export within the period from 2000 till 2012 (Eurostat, 2013)



After the assessment of export potential of sectors, it can be concluded that its cumulative value reaches 3.91 billion LVL (1.97 billion LVL - production of goods, 1.93 billion LVL - services). The greatest export potential in production of goods lies in the following sectors: **wood industry, metal production, mechanical engineering, food production**, whereas within the sector of services the greatest export potential is detected in the sector of **information and communication technologies**. (see Illustration *Illustration*). Export sector of **health services** deserves to be singled out. Though currently this sector forms a very small part of the total export volume, still export potential of health services is high as compared to the current export volume. The following advantages of the use of future potential of the sector can be

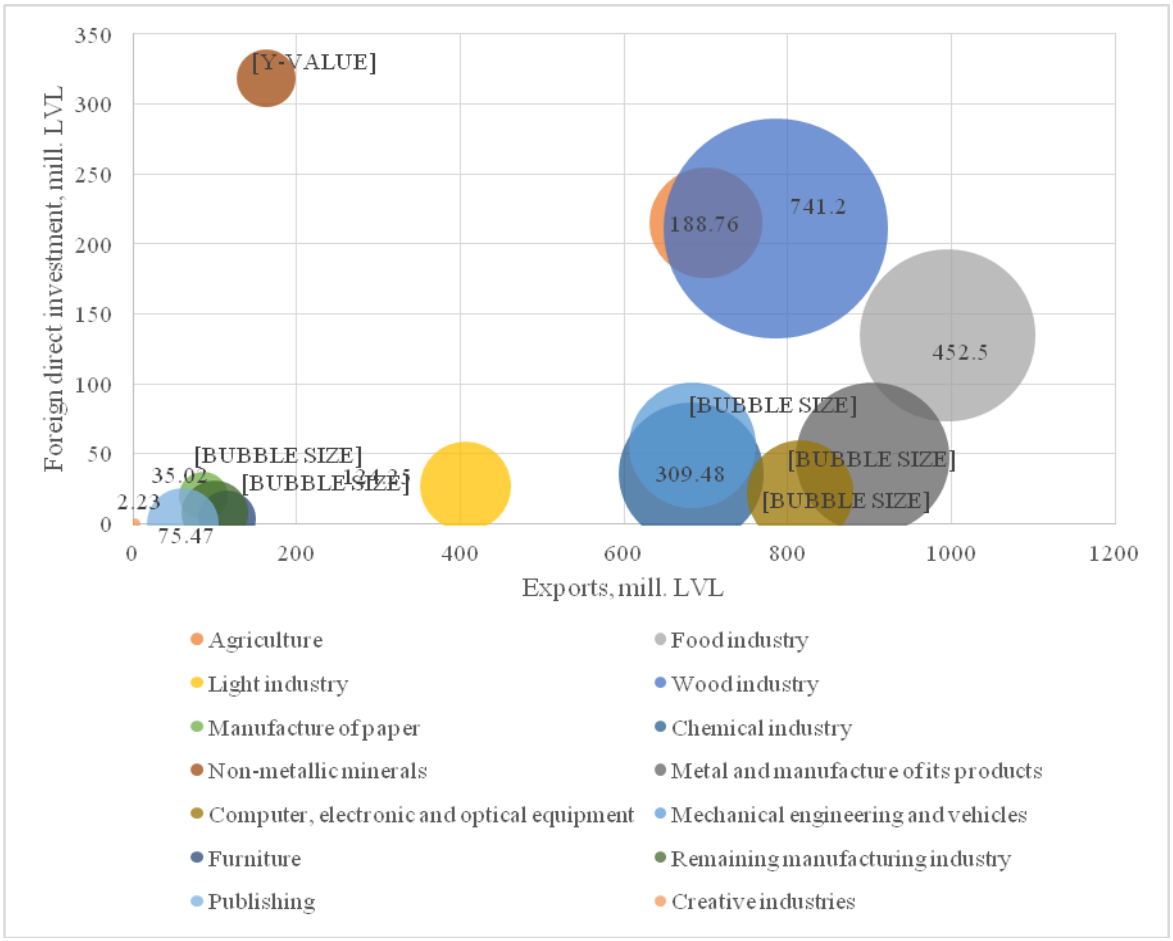
singled out: the basis for development in Latvian and European markets, concentration of talents of high international level, thus, clearly demonstrating *critical mass* within the field of medical science, as well as gradually ageing population that forms additional demand for medical services.

In 2012, rapid growth in exports was detected in the sectors of production of agricultural goods and beverages - with 97% and 66% respectively; whereas, decline in export volumes were detected in the following sectors: forestry, pharmacy and manufacture of vehicles and trailers - decline by, 21%, 12% and 10% respectively. Latvian export indicators in NACE classification from 2007 till 2012 are summarised in Table 2. Detailed calculation of export potential of sectors of national economy is available in expanded table (see Table *Table*).

33. *Latvia's exports of goods within the period from 2007 till 2012 according to NACE classification, million. LVL (Eurostat, 2013)*

NACE CLASSIFICATION	2007	2008	2009	2010	2011	2012
01	120.4	237.7	229.2	277.2	267.1	527.4
02	178.5	138.0	93.0	170.7	183.7	144.9
03	11.2	16.4	17.1	17.9	23.9	27.3
05	0.0	0.2	0.1	0.4	2.7	1.3
06	0.0	0.0	0.0	0.1	16.9	20.1
07	0.0	0.1	0.0	0.0	0.0	0.2
08	45.4	54.0	59.4	68.3	73.6	76.9
10	304.4	354.7	312.2	371.2	457.2	559.7
11	118.8	162.9	130.0	215.5	283.3	435.6
12	46.8	32.1	22.3	11.8	15.7	15.7
13	115.0	102.1	72.0	91.9	103.9	111.8
14	164.9	171.9	132.1	149.3	205.2	248.6
15	18.3	19.9	18.5	19.4	27.7	46.1
16	680.8	577.4	455.7	657.9	746.5	785.4
17	57.1	57.0	45.3	60.3	80.4	85.2
18	0.0	0.0	0.3	0.8	1.0	1.3
19	85.6	67.9	94.7	138.5	314.5	382.6
20	191.8	258.1	173.7	200.6	276.3	317.0
21	142.9	152.4	159.4	197.2	217.2	191.1
22	104.5	107.2	82.4	126.9	157.2	174.0
23	78.9	101.5	71.4	102.3	143.0	162.9
24	403.9	510.6	295,7	427,2	514,0	660.7
25	130.8	163.1	126.8	169.2	219.2	242.9
26	171.6	246.0	234.1	312.0	479.7	525.9
27	138.1	144.6	116.8	159.1	225.0	289.1
28	232.6	299.0	256.4	275.4	352.9	375.7
29	230.9	272.5	201.8	235.3	340.5	308.1
30	51.1	68.5	52.3	43.1	54.8	56.7
31	100.9	91.0	73.1	87.6	96.3	114.8
32	44.4	65.6	63.1	67.9	76.2	99.6
35	8.0	11.1	25.1	41.7	77.1	50.1
38	129.9	166.3	111.6	183.5	271.0	249.2
58	13.1	16.5	20.2	36.5	50.7	60.1
59	1.3	1.7	0.6	0.5	5.6	1.7
71	0.5	0.0	0.0	0.2	0.0	0.1
74	0.0	0.0	0.0	0.0	0.0	0.0
90	0.0	0.0	0.0	0.1	0.3	0.2
91	0.1	0.0	0.5	0.1	0.2	0.1
TOTAL	4 122.6	4 668.2	3 746.8	4 917.5	6 360.6	7 350.0

33. *Growth potential of the value of export unit, million LVL (FIDEA, 2013)*



44. Growth potential of the value of export unit, million LVL (Eurostat, 2013)

Sector	Export, 2012	FDI, 2013	Export potential
Wood industry	**785**	**211**	**741**
Food industry (total), incl.	**995**	**135**	**452**
Food production	*5*	*9*	*400*
	60	*7*	
Beverage production	*4*	*3*	*52*
	35	*8*	
Metals (total), incl.	**904**	**47**	**348**
Metal production	*6*	*4*	*242*
	61		
Metal products	*2*	*4*	*106*
	43	*3*	
Chemical industry (total), incl.	**682**	**36**	**309**
Chemical industry	*3*	*1*	*169*
	17	*5*	
Pharmacy	*1*	*6*	*73*
	91		
Rubber and plastic production	*1*	*1*	*67*
	74	*5*	
Mechanical engineering and vehicles (total), incl.	**684**	**56**	**242**
Mechanical Engineering	*3*	*1*	*187*
	76	*4*	
Vehicles	*3*	*4*	*55*
	08	*2*	
Agriculture (total), incl.	**700**	**215**	**188**
Agriculture	*5*	*8*	*80*
	28	*6*	
Forestry	*1*	*1*	*91*
	45	*28*	
Fisheries	*2*	*1*	*17*
	7		
Computer, electronic and optical equipment (total), incl.	**816**	**22**	**169**
Computers, electronics and optics	*5*	*2*	*72*
	27		
Electrical equipment	*2*	*2*	*97*
	89	*0*	
Light industry (total), incl.	**407**	**27**	**124**
Manufacture of textiles	*1*	*7*	*96*
	12		
Manufacture of clothes	*2*	*2*	*12*
	49	*0*	
Leather products	*4*	*0*	*16*
	6		
Publishing	**60**	**0**	**75**
Remaining manufacturing industry	**100**	**8**	**65**
Non-metallic minerals	**163**	**318**	**51**
Furniture	**115**	**4**	**50**
Manufacture of paper	**85**	**21**	**35**
Creative industries	**2**	**0**	**2**
Mining industry	**77**	**40**	**0**
Total			**2851**

Additionally, labour productivity in several sectors was compared, and potential of the value of export unit in national economy was detected by applying similar methodology (see Table *Table*). Compared to reference levels, the highest labour productivity is observed in the sectors of transport and logistics – 36.3%, whereas, the level in agriculture and

manufacturing industry is significantly lagging behind the productivity level of reference countries – 17.9% and 16.4% respectively.

55. *Potential of the increase of value added and labour productivity, LVL (FIDE, 2013)*

Sector	Productivity of reference (3 year-average), thousand LVL	Latvia's productivity (3-year average), thousand LVL	Potential of added value, million, LVL	Potential of productivity, LVL/employee per year
Agriculture	22.7	4.1	1 496.17	18 694.35
Mining industry	234.1	14.8	697.26	220 185.97
Manufacturing industry	47.3	7.8	5 004.14	39 725.93
Power industry	118.3	15.8	1 353.53	103 060,93
Water, sewage	73.1	8.1	533.52	65 329.20
Construction	31.2	6.7	1 651,64	24 602,41
Trade	30.2	9.3	3 430.87	20 962.55
Transport and logistics	36.0	13.1	1 761.07	23 040.57
Tourism	18.4	5.0	339.87	13 486.90
ICT	71.3	16.5	1 172.07	54 940.99
Financial services	82.2	20.4	1 117.67	62 092.59
Professional services	39.0	9.8	968.33	29 313.60
Administrative and support services	25.8	5.2	681.07	20 722.24
Public administration, defence	37.0	9.1	1 610.68	27 947.09
Education	28.0	4.4	1 925.86	23 707.79
Health services	26.0	4.7	1 021.07	21 316.62
Art, entertainment services	27.6	6.5	444.83	21 216.17
Other services	25.6	3.0	436.15	22 676.69
Total			25 645.81	

Alongside with the risk related to labour productivity, economic energy intensity is a significant risk, as in Latvia it is significantly higher compared to average indicator within the EU, however, since 2000, this indicator has decreased significantly, upon the increase of GDP (the growth of intensity occurred as a result of economic correlations in 2008) (see Table *Table*).

6 *6. Energy intensity of the economy of Latvia and reference countries (kg of oil equivalent per 1000 EUR) within the period from 2000 till 2010 (Eurostat, 2013)*

Country	2000	2005	2006	2007	2008	2009	2010
Belgium	211.2170	194.3780	187.3140	177.8510	184.2170	184.6620	190.8260
Denmark	101.6020	95.3320	98.5880	94.8970	89.4910	96.8580	93.7350
Germany	159.1410	155.5450	151.2570	142.6440	142.3920	142.8990	141.8860
Ireland	110.9020	93.2020	90.1830	88.3580	90.7030	91.2950	92.8150
Latvia	429.7420	346.8510	321.8130	302.2800	301.5230	345.3940	363.3370
The Netherlands	159.2500	160.7400	151.0920	155.7410	149.4530	150.6460	157.7880
Austria	129.3100	140.2620	135.6390	129.4850	128.3770	126.2170	131.8200
Finland	238.0820	222.6820	232.6000	218.5090	209.1360	216.2110	225.3330
Sweden	182.4220	173.4150	162.1420	156.3290	156.4380	150.7020	159.4180
United Kingdom	145.2090	126.3940	121.5240	113.1890	112.7670	111.3410	111.8650

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5. List of illustrations

6. List of tables