

Lithuania's labour productivity assessment

National Productivity Board

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Productivity concept

Productivity is, in a general sense, the amount of resources consumed per unit of product created — the ratio between the production cost and the cost incurred.

In the narrow sense, productivity can be defined as labour productivity or, more broadly, as the total factor productivity.

Usually labour productivity is measured by two indicators:

- value added per hour worked;
- value added per employee.

The total factor productivity is measured using a growth model incorporating not only labour, but also capital resources used to create added value. In this assessment, we will analyse productivity in the narrower sense as labour productivity.

Recommendation on the establishment of national productivity boards

The European Commission prepared a recommendation on the establishment of National Productivity Boards following the Five Presidents' report endorsed by the Council of the European Union (hereinafter – EU) on 20/09/2016 ([2016/C 349/01](#)).

The recommendation aims at identifying or establishing National Productivity Boards (NPB) to analyse trends and policies for increasing productivity and competitiveness.

The analyses prepared by the NPB are expected to be made public in the annual reports available to the EU Member States and the European Commission.

Lithuania's labour productivity report

The first report aims mainly at reviewing labour productivity developments and assessing the relationship between labour productivity and changes in value added, labour compensation and exports in the domestic economy.

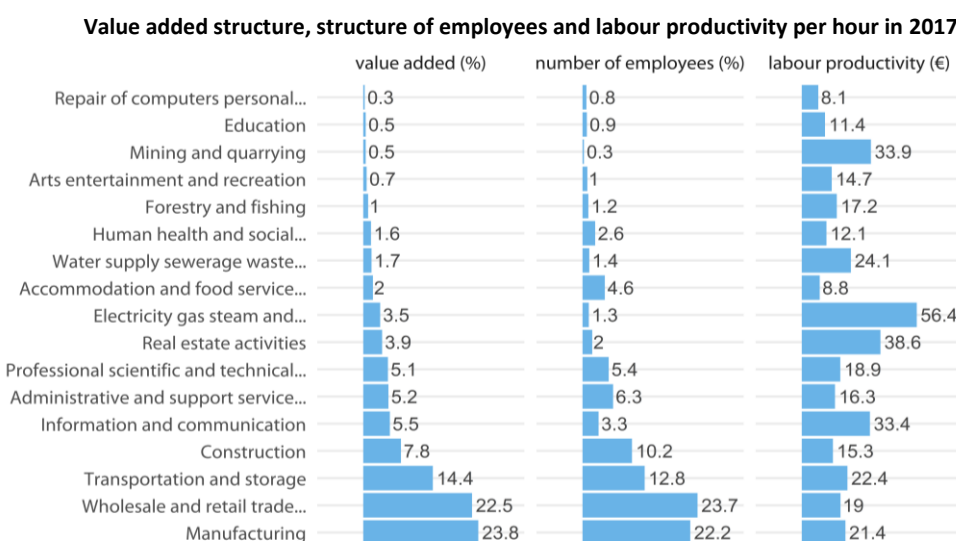
The main branches of the Lithuania's economy are as follows:

- manufacturing;
- trade;
- transport.

This assessment only deals with labour productivity in manufacturing, as this activity generates the highest value added. Key manufacturing indicators in 2017 (see Fig. 1):

- the value added was almost 24 percent of all Lithuania's value added and took the first place;
- there were more than 208 thousand employees. It was equal to 22 percent of all employees and took the second place;
- export of goods accounted for 35 percent of the total export of Lithuania and took the first place;
- nominal labour productivity was 21.4 euros and took only the 7th place by this indicator after electricity, gas, steam supply; real estate operations; mining and quarrying; information and communication; water supply and sewage treatment; transport and storage activities.

Fig. 1



Source: Statistics Lithuania; MEI calculations

Lithuania and global trends

Over the last decade, global labour productivity has decelerated by an average of 0.8 percentage points (pp) annually. This reduced global gross domestic product (GDP) by more than 8 trillion euros in 2017¹.

The main reasons for the slowdown in global labour productivity are as follows:

- there are difficulties in developing new technological innovations;
- investment in new technologies affects long-term outcomes.

The 2017 World Bank report identifies three groups of EU Member States by labour productivity growth:

- reducing;
- stagnant;
- increasing labour productivity.

Lithuania, together with the other Baltic States, Hungary, Germany, Luxembourg, Ireland, Romania and Slovakia, belongs to the group of countries with increasing labour productivity.

Labour productivity at constant prices per hour worked in EU 28 increased by 21 percent between 2000 and 2017, from 27.4 euros to 33.2 euros; in Lithuania, it increased twice, from 6.38 euros to 12.95 euros (see Fig. 2), and in 2017 reached 43.2 percent of the EU average. However, in 2017, Lithuania's labour productivity, in purchasing power parity, reached 75 percent of the EU average.

In two decades, Lithuania was one of the fastest growing EU Member States in terms of labour productivity (value added at constant prices per hour worked) and GDP (see Table 1). As a result of labour productivity growth, GDP per capita in purchasing power parity tripled between 2000 and 2017; in 2017, it reached 78.6 percent of the EU average (about 35 pp higher than in 2000). This was influenced by the increasing use of modern technology in industry and the relatively low base.

After the global recession, labour productivity growth was slowed by unfavourable external factors, but as geopolitical risks eased after the Russian embargo, exports moved to new markets and investment accelerated, labour productivity growth recovered to 7 percent in 2017 (see Fig. 3).

Increasing the share of knowledge-based activities in the economy through capacity building would help further reduce the labour productivity gap.

Fig. 2

Labour productivity per hour worked in labour productivity frontier countries, EU 28 and Lithuania

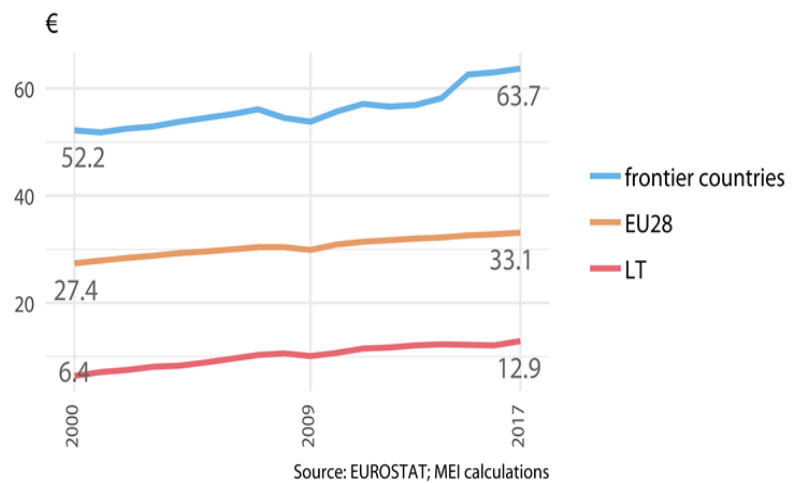
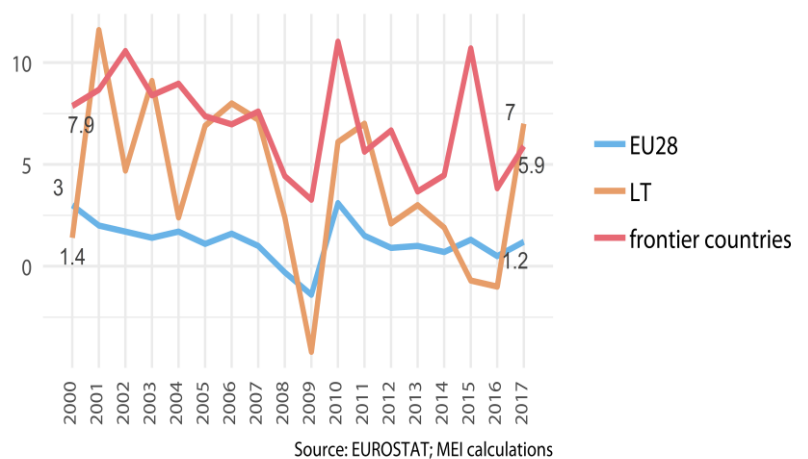


Fig. 3

Labour productivity per hour worked in EU 28, labour productivity frontier countries and Lithuania (percentage change)



¹ <https://openknowledge.worldbank.org/handle/10986/30588>

Importance of priority activities to promote labour productivity in manufacturing

When evaluating the growth prospects in manufacturing and policymaking, it is important to evaluate manufacturing having a significant influence in value added and exports in the long run.

The growth of certain key activities or their productivity could be one of the policy priorities.

According to the technology level, manufacturing is divided into 4 levels: high technology, medium-high technology, medium-low technology and low technology.

According to the ranking of manufacturing activities in Lithuania, only the 3 high technology and medium-high technology activities (see Table 2) fall into the top ten (by value added, export, labour productivity levels and growth):

- chemicals and chemical industry products;
- basic pharmaceutical products;
- computer, electronic and optical products.

In the current circumstances, the challenge is to reach the right balance between policies. Promoting viable and high technology activities must not be undermined by activities ensuring the economic development stability. The increase in labour productivity of these activities is also an important element of the country's faster economic growth.

Changes in value added and labour productivity in manufacturing

Real labour productivity growth in Lithuania's manufacturing is slowing down. In 2009–2017, labour productivity growth in manufacturing was lower than in between 2001–2008, but in 2017 labour productivity growth exceeded the pre- and post-global recession averages. Labour productivity increased as the number of hours worked decreased (see Fig. 4).

The share of frontiers (25 percent manufacturing activities with the highest labour productivity) value added in manufacturing remained unchanged between 2001–2017.

However, the share of higher labour productivity activities in relation to added value grew and had a very limited positive impact on manufacturing labour productivity. If the structure of value added in 2017 remained the same as between 2000–2008, labour productivity would be 23.5 euros, which is 1.5 euro less than the current 25 euros per employee.

By technology level, the structure of value added in manufacturing in Lithuania changed between 2000–2017 (see Fig. 5). The share of high technology was declining. In 2017, it reached only 5.2 percent compared with 8.4 percent in 2000. After the global recession between 2009–2017, the growth of high technology activities was not very rapid, only 1.5 pp.

Between 2000–2017, medium-high and medium-low technology growth was recorded (from 9.2 percent and 14.8 percent to 18.8 percent and 21.7 percent, respectively).

It should be noted that the share of low technology activities decreased from 67.6 percent to 54.3 percent between 2000–2017.

Fig. 4

Real labour productivity per hour worked, real value added and hours worked (percentage change)

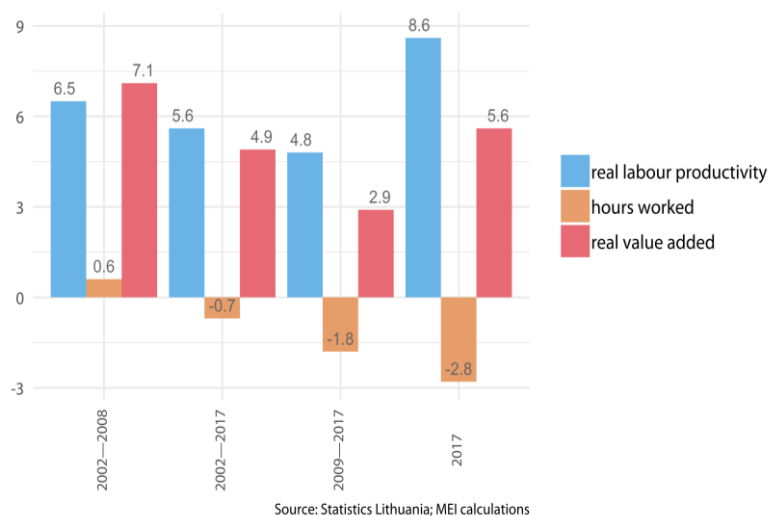
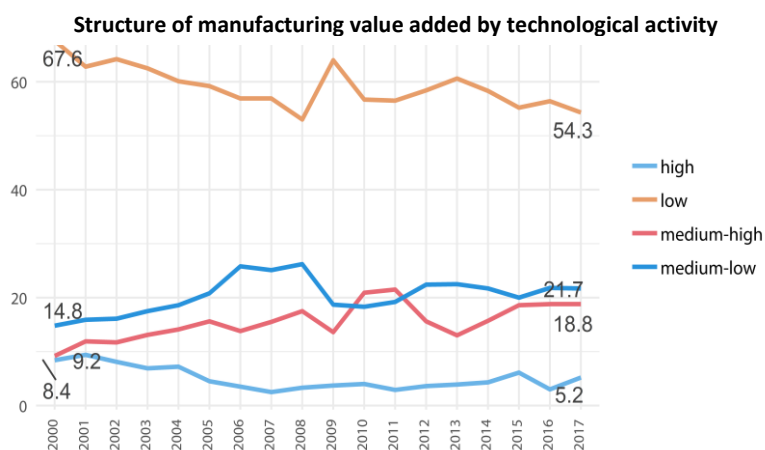


Fig. 5



Labour compensation and labour productivity in manufacturing

Between 2009–2017, labour compensation in manufacturing increased rapidly – by almost 49.2 percent or about 5.5 percent annually (see Fig. 6). In terms of labour compensation per hour worked (8.4 euros), Lithuania rose from the bottom three among EU 28 Member States to the bottom five.

The growth of labour compensation between 2009–2017 is the logical consequence of 8 years of consistent economy and export growth as well as relatively lower compensation at EU level.

It should be noted that the growth of labour compensation in the short run does not have a significant impact on Lithuania's competitiveness. From 2015 to 2017, corporate profit margins (6.1 percent, 8.2 percent, 5.5 percent) in manufacturing exceeded the average profit margins of 3.5 percent in 2009–2017.

Fluctuations in labour productivity and the growth of labour compensation are inevitable. Labour productivity growth does not necessarily have an immediate impact on labour compensation. It may outperform the growth of labour compensation for one period and vice versa. It should be noted that since 2015 the growth of labour compensation outstrips labour productivity growth. There is a risk to competitiveness, if the growth of labour compensation overtakes labour productivity growth and becomes a long-term trend.

Between 2009–2017, the real hourly rate of change in labour productivity in manufacturing amounted to 50.3 percent, which was close to the real change in labour productivity by 50.4 percent. In 2016 and 2017, their growth almost equalled.

This demonstrates the need to increase labour productivity from investments in physical capital (equipment, technology) to investments in human capital to reduce risks to competitiveness and sustainable economic growth, including the sustainable growth of labour compensation.

Linear regression models confirm that labour productivity growth has a positive association on labour compensation, profitability or corporate profit margins, while equipment investment is important to labour productivity growth itself.

There is a positive correlation between investment in equipment and changes in the number of employees, while the correlation between the number of employees and changes in labour compensation is strong and significantly negative. There is no correlation between labour productivity and changes in the number of employees (see Fig. 7).

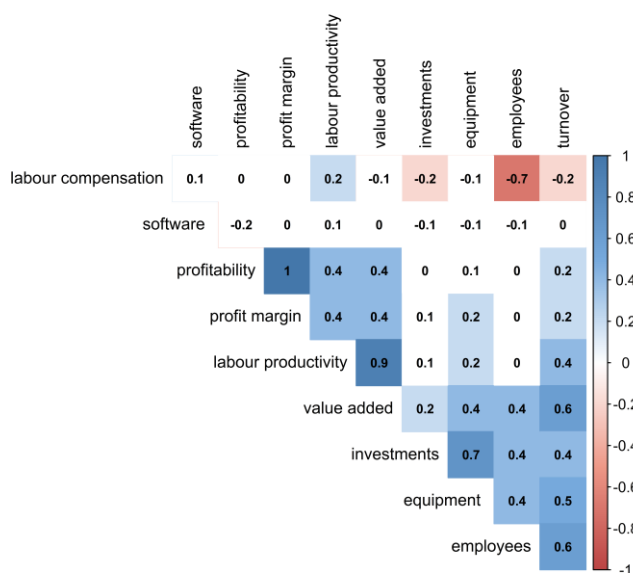
Fig. 6

Labour productivity and labour compensation per hour worked (percentage change)



Fig. 7

Correlation table*, period 2001–2017



*The correlation coefficient can range from -1 to +1. The Pearson correlation coefficient can range from -1 to +1 and it measures the linear relationship between two variables. If correlation coefficient is positive, it means two variables move in the same direction. If the correlation coefficient is negative, two variables move in different directions. If the correlation coefficient is equal to 0, there is no linear relationship between two variables – two variables are independent of each other. The closer the coefficient is to either -1 or +1, the stronger correlation between the variables.

Relationship between labour productivity and exports in manufacturing

The relationship between labour productivity and exports is relevant to decision-making and economic policymaking in the field of labour productivity and export development.

The analysis shows a close correlation between labour productivity and exports, which can reach up to 0.69 depending on the sample size.

Growth in labour productivity helps reduce the negative risks of the growth of labour compensation. In most cases, the productivity growth of the main exporters was faster than that of manufacturing. In some key sectors, labour productivity growth was significantly higher than that of the country. In 2017, more than half – 8 out of 12 – of the main export sectors exceeded the average of labour productivity in manufacturing, while less than half – 4 sectors – exceeded the national average.

Labour productivity growth in the main export activities (see Table 3) between 2009–2017 is 1.8 times slower than between 2001–2008.

By the share of the total high technology exports, only in 2015, Lithuania reached the highest level of the pre-crisis period, which made 7.3 percent (in 2007) and slightly exceeded it by 0.8 pp.

At higher labour productivity levels, maintaining a rapid rate of labour productivity growth is difficult. The labour productivity level of the main export activities is more than 2.1 times higher than that of other export activities.

It should be noted that the main export activities and labour-intensive companies in manufacturing are featured by higher profit margins (1.4 pp and 7.3 pp) and lower labour cost margins (8.3 pp and 8.8 pp).

The 3-year rolling average of investments in equipment of the main export activities was higher than the average of other export activities or the country average since 2012 (except for 2015, when the 3-year investment growth reached 9.6 percent). One way to influence future productivity growth would be to invest more in equipment, software and skills.

Company structure and labour productivity in manufacturing and across the country

Between 2001–2017, the structure by size and number of manufacturing companies in Lithuania remained virtually unchanged.

The part of very small companies (with up to 9 employees) between 2001–2008 was 59 percent of all the companies in Lithuania, and between 2009–2017, the number increased slightly and reached 62 percent.

The structure of manufacturing companies and labour productivity trends reflect the country-wide tendency that after the global recession very small companies became even smaller and their growth decreased.

Between 2013–2017, the profitability of very small companies was up to 3 times higher than that of larger companies. However, they invested up to 20 times less productively and up to 10 times less often financed their next tax period investments in fixed assets with their profit².

Larger companies are increasingly involved in international trade, research, development and innovation activities³.

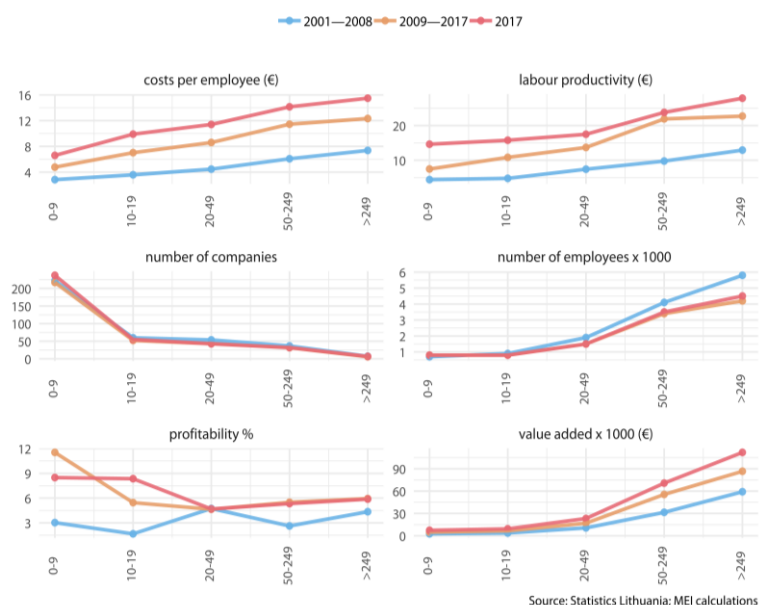
They are more durable, more growth-friendly (employ more workers and create more added values), pay higher average labour compensation, bring less volatility into the labour market and, on average, are more productive⁴.

On the other hand, large companies are also creating demand for small companies and driving their growth. So, the focus should be on removing initiatives or growth barriers, encouraging companies to stay small. Respectively, companies with an annual income of less than 300,000 euros and employing up to 10 employees, pay 5 rather than the regular 15 percent of the corporation tax rate, so this tax relief should be reconsidered.

² - M. Kalanta, J. Pesliakaitė, "Very small companies in Lithuania: economic significance and growth", Enterprise Lithuania.

³ - "The importance of (firm) scale: Large firms in small advanced economies", Landfall Strategy Group.

Fig. 8
By manufacturing company type depending on the number of employees



⁴ - Mihnea Constantinescu, A. Proškutė, "Firm heterogeneity and macroeconomic dynamics: a data driven investigation"

Summary

The assessment of labour productivity developments in the EU Member States and Lithuania has shown that over two decades Lithuania was one of the fastest growing EU Member States in terms of labour productivity and GDP growth. Between 2000 and 2017, Lithuania's labour productivity per hour worked (at constant prices) almost doubled, in comparison with 21 percent in the EU Member States. This was influenced by the application of modern technologies in industry. Despite the rapid increase in Lithuania's labour productivity, in 2017, hourly labour productivity reached 43.2 percent of the EU average. However, labour productivity in PPP in 2017 was 75 percent of the EU average.

The main purpose of this work was to assess the relationship between labour productivity and changes in manufacturing value added, labour compensation and exports.

Key conclusions:

The relationship between labour productivity and manufacturing value added:

- in terms of technology level, the value added structure of manufacturing production has changed between 2000–2017. The share of high technology and low technology activities decreased, but growth in medium-low and medium-high technology activities was recorded;
- if in 2017 the value added structure remained the same as between 2000–2008, labour productivity would be 23.5 euros – 1.5 euros less than the current 25 euros per employee.

The relationship between productivity and labour compensation:

- between 2009–2017, labour compensation in manufacturing increased rapidly — by almost 49.2 percent or about 5.5 percent annually. This is the result of 8 years of consistent economic and export growth as well as relatively lower labour compensation at EU level. However, nominal labour productivity increased by almost 72 percent, or 8 percent annually between 2009–2017;
- labour compensation, which is growing faster than labour productivity, has no significant impact on Lithuania's competitiveness in the short run. On the other hand, it can make a difference in the long run. It should be noted that since 2015 the growth of labour compensation overtakes the productivity growth.

The relationship between productivity and exports:

- the main export activities and manufacturing companies which are leading in terms of labour productivity are characterized by higher labour productivity, higher profit margins and lower labour cost margins;
- the productivity level of the main export activities is more than 2.1 times higher than that of other export activities.

The assessment has shown that the labour productivity growth has a positive impact on labour compensation and profitability or on corporate profit margins. Investment in equipment and technology has a significant impact on the labour productivity growth. Larger companies are more productive, since they are more durable, have better growth rates, pay higher average labour compensation and contribute less volatility to the labour market.

Recommendations

- to define and approve an ambitious and realistic long-term goal for labour productivity incorporating it into long-term economic policy goals;
- to develop fiscal policies enhancing confidence in macroeconomic stability;
- to strengthen ties between business taxation and income through a review of tax / benefit policies;
- to continue the implementation of balanced structural policies stimulating the overall economic development. The promotion of viable and high technology activities must not weaken the performance of the activities ensuring economic development stability;
- to increase the value added of viable and high technology activities by promoting investment in skills, technologies and equipment and involvement in strategic value chains in manufacturing;
- to develop export promotion initiatives focused on the growth of the value added of Lithuanian exporters, as well as the growth of the share of exports of high technology goods and knowledge-intensive services (higher value added) in terms of gross exports structure;
- to strengthen research and analysis-based policy decisions. To improve the quality and accessibility of statistical data, including the digital economy, and more actively involve Statistics Lithuania in the development of the Interdepartmental tax data storage.

Further actions

This initial assessment mainly dedicated to labour productivity in manufacturing. Further actions will be to monitor the evolution of Lithuania's labour productivity in the EU context with a stronger focus on the services sector, human capital, investments in equipment and technology, the importance of which is increasing rapidly as the standards of living increase.

Terms

Gross domestic product (GDP) is one of the main indicators describing the state economic development level. GDP is defined as the final value of goods and services produced in a country over a period.

Gross added value is the value of products determined by basic prices, minus intermediate consumption.

Labour cost margin is the ratio of labour costs and turnover (sales).

Productivity is the added value per hour worked or per employee.

Labour compensation is the sum of gross wages and salaries including employers' social security contributions.

Equipment is a set of appliances, equipment, instruments and other technical devices.

Frontiers are countries or economic activities that fall within a decile (10 percent) of the highest-performing countries or activities by a certain indicator (e. g. labour productivity level).

Nominal labour productivity is the added value at current prices per hour worked or per employee.

Main activities are activities that have a significant impact on added value, exports in the long run and constitute a significant part of them.

Main export activities are export activities selected on the basis of the volume, impact and growth of exports of goods.

Profit margin is the ratio of profit and turnover (sales).

Purchasing power parity (PPP) are spatial deflators and exchange rates eliminating the effects of differences in price levels between the Member States and allowing the comparisons of the scale of GDP components and price levels. PPP represents the number of national currency units of a given country to acquire the same set of goods and services that can be purchased for a common artificial currency of the group of countries.

Real labour productivity is the added value at constant prices per hour worked or per employee.

National productivity board (NPB): the NPB function performance is assigned to the Economic policy unit of the Ministry of the Economy and Innovation of the Republic of Lithuania responsible for economic and analytical activities.

High technology activities include the manufacturing of basic pharmaceutical industry products and pharmaceutical preparations, computer, electronic and optical products.

Medium-high technology activities include the manufacturing of chemicals and chemical industry products, electrical equipment, n. e. c. machinery and equipment, motor vehicles, trailers and semi-trailers, other vehicles and equipment.

Medium-low technology activities include the manufacturing of rubber and plastic products, other non-metallic mineral products, basic metals, fabricated metal products, except for machinery and equipment, repair and installation of machinery and equipment.

Low technology activities are the manufacturing of food, beverages, textile, clothing, leather and leather products, wood and cork products, except for furniture, straw and plaiting materials, paper and paper products, printing and reproduction of recorded media, furniture, as well as manufacturing of other products.

Table 1

Labour productivity frontier countries

	1	2	3	4
2000	IE	LV	BG	
2001	RO	CZ	LT	
2002	SK	LV	RO	
2003	SK	LV	LT	
2004	EE	RO	LV	
2005	LT	SI	LV	
2006	RO	CZ	LT	
2007	SK	LV	EE	
2008	LT	HU	RO	
2009	ES	LV	PL	IE
2010	PL	HU	IE	
2011	PL	IE	LT	
2012	LV	EE	RO	
2013	LT	SK	RO	
2014	RO	MT	IE	
2015	RO	MT	IE	
2016	SI	BG	RO	
2017	RO	LV	LT	

Source: Eurostat; MEI calculations

Table 2

List of main manufacturing activities in 2017

Name of the activity	Ranking place	Technology levels
Chemicals and chemical industry products	1	mid-high
Basic pharmaceutical industry products	2	high
Rubber and plastic products	3	low
Beverages production	4	low
Furniture production	5	low
Wood, wood and cork products	6	low
Paper and paper products	7	low
Computers, electronic and optical products	8	high
Food production	9	low
Production of basic metals	10	mid-low
Other vehicles and equipment	11	mid-high
Other non-metallic mineral products	12	mid-low
N. e. c. machinery	13	mid-high
Motor vehicles, trailers	14	mid-high
Repair of machinery and equipment	15	low

Source: Statistics Lithuania; MEI calculations*

* Moderate scenario rating

Table 3

List of main manufacturing export activities in 2017

Name of the activity
Food production
Beverages production
Production of wood and wood and cork products
Production of chemicals and chemical industry products
Production of basic pharmaceutical industry products
Production of rubber and plastic products
Production of basic metals
Production of fabricated metal products, except for machinery
Production of computer, electronic and optical products
Production of electrical equipment
Production of motor vehicles, trailers
Furniture production

Source: Statistics Lithuania; MEI calculations