

EIS 12/2018

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LatviaSubmitted
04/2018Accepted for
publication
10/2018

Productivity Trap in Latvia

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<http://dx.doi.org/10.5755/j01.eis.0.12.21871>

Abstract

Along with a more rapid economic growth tension can be observed in the Latvian labour market. Number of economically active population is decreasing because of negative natural increase of the population and emigration, while number of job vacancies is rising and labour shortages become more acute. As a result wages are rising rapidly, and it, in turn causes increase in production costs and negatively affects the competitiveness of domestic firms.

Changes in productivity and labour costs from 2011 to 2016 show that the increase in labour costs exceeded productivity growth more than two times in the manufacturing as well in the total economy of Latvia. Convergence of labour costs is inevitable in the conditions of free labour movement (open labour market), thus further economic growth of Latvia will largely depend on its ability to reduce the productivity gap with the advanced economies. The purpose of the research is to evaluate the dynamics of labour productivity in Latvia and its level in comparison with the EU average, as well as to reveal the most important factors limiting productivity increase in Latvia. The tasks of the research is to determine the main factors that influence labour productivity in Latvia in last 10 years, to compare productivity levels in Latvia and other EU country and to evaluate the current policy measures to increase labour productivity in Latvia.

Different quantitative and qualitative research methods are used in the analysis, for example analysis of scientific literature and economic policy planning documents, statistical data analysis methods, shift share analysis etc.

The results of the research show that productivity growth rate in Latvia was one of the fastest in the EU during the last five years that enhanced productivity convergence with the advanced economies. Raise of the productivity level was mostly influenced by the improved business conjuncture and optimization of the number of employees at the sectoral/firms' level. Nevertheless, the contribution of structural transformation was insignificant on productivity growth. The main conclusion of research shows, that two mutually interconnected processes determine increase of productivity level. First, they are the entrepreneurs' choices about competitive advantages on which their business strategies are based, which define the business management and technological decisions (to modernize production or to move resources across sectors, to other region or even other country). Second, it is the ability of the country to ensure the reallocation of the its resources to the most productive firms and sectors, i.e. to promote structural reforms or "technological upgrading".

KEYWORDS: productivity, labour cost, economic growth, structural changes.



Productivity is often used to evaluate countries economic development; it has been one of the most important determinant of economic growth, which is crucial factor to increase population's welfare. Over 60 percent of cross- country differences in income can be explained by productivity. The article's scientific problem is to determine how productivity can be increased in order to increase the life standards and population's welfare on a long-term basis. Productivity is close related to competitiveness. At the World Economic Forum (WEF) experts by developing Global Competitiveness Index (GCI), defines competitiveness as productivity (The Global Competitiveness Report 2017-2018). Experts believe that welfare and life quality level are defined by the productivity level, which depends on possibility to mobilize all resources in Economy. Productivity allows country sustain high level of salaries, stable and strong national currency and high level of capital return, and by them also high level of life standards.

Due to limited availability of resources and the increasing competition in the global markets, it is important for Latvia to support its economic growth through increased productivity. The novelty the article's is to identify the reasons for low productivity in Latvia and to identify the causes of the productivity trap. The scientific study's approach are based on OECD and Eurostat methodology of productivity measurement.

The purpose of the research is to evaluate the dynamics of labour productivity in Latvia and its level in comparison with the EU average, as well as to reveal the most important factors limiting productivity increase in Latvia. The tasks of the research is to determine the main factors that influence labour productivity in Latvia in last 10 years, to compare productivity levels in Latvia and other EU country and to evaluate the current policy measures to increase labour productivity in Latvia.

In the research to be used different research methods: literature review on the productivity, empirical analysis of data, shift share analysis etc. The main research sources include the information available in the databases of the CSB and Eurostat, as well as the studies and publications on the productivity by the Ministries of Economics Republic of Latvia, Bank of Latvia, European Commission, OECD, World Bank and IMF.

The results of the research show that productivity growth rate in Latvia was one of the fastest in the EU during the last five years that enhanced productivity convergence with the advanced economies. Raise of the productivity level was mostly influenced by the improved business conjuncture and optimization of the number of employees at the sectoral/firms' level. Nevertheless, the contribution of structural transformation was insignificant on productivity growth. The research practical value is related to OECD recommendation to monitor productivity in Latvia.

Term of productivity is a multi-dimensional and its definition might change according different situations. OECD, IMF, World Bank, the European Commission deal with different aspects of productivity. Productivity generally refers to the relation between the quantity of production produced (output) and the quantity of resources (production factors) used in the production process. In other words, productivity measures the efficient use of resources (work, magazine capital Materials, etc.) in the production of certain production in the enterprise, sector or economy as a whole (Jekabsone S., Skribane I., 2017). According to A.Ghobadian and T.Husband, definition of productivity can be divided in three major categories:

- 1) in the context of productivity technologies, it is the output and investment ratio that is used in the production process;
- 2) from engineering standpoint, productivity is the relationship between the output that can be produced and the potential output of the production;

Introduction

Theoretical aspects of productivity

3) productivity is the efficiency of redistribution of resources (Kashim, R., 2014).

There are different approaches to productivity measurement, their calculation and interpretation. Productivity can be divided as:

- _ One factor productivity, the output and the proportion of the investment of one particular resource (labour, capital),
- _ Multi-factor productivity (MFP), a ratio of output and multiple forms of investment (see table 1).

Table 1
Productivity types

Output types	Input types			
	Labour (L)	Capital (C)	Labour (L) and Capital (C)	Capital, labour & energy, materials, services (CLEMS)
Gross output	Labour productivity (based on output)	Capital productivity (based on output)	C&L multi-factor productivity (based on output)	CLEMS multi-factor productivity
Value added	Labour productivity (based on value added)	Capital productivity (based on value added)	C&L multi-factor productivity (based on value added)	
	Single factor	Productivity	Multi-factor	Productivity (MFP)

Source: : author's construction based on OECD methodology of productivity measurement.

As an example of one factor productivity, it is labour productivity, which shows what amount of products in certain time can be produced by using certain amount of work. It shows invested amount of labour force (time, effort and knowledge), which has been used during production process. On the Macro level labour force productivity is measured with amount of products and services, which has been produced during one working hour (added value on one worked hour) or output on one employee (the amount of real GDP per employee). At the level of some sectors, productivity is measured by dividing the benefit of the industry with the number of people employed there, for example, the number of components produced per employee. The productivity of capital (output per unit of capital) and energy productivity (output on a single energy joule) is also considered as one factor productivity.

Whereas multi-factor or total factor productivity (TFP) reflects the overall effectiveness, with which work and equity investments are used in the production process at the same time. Total factor productivity is an indicator, which explains growth in Gross Domestic Product, a part of growth, which cannot be justified by the accumulation of capital or increased labour. Consequently, the TFP can be interpreted as an economic capacity to organise the production process, therefore, in the performance of the research of productivity problems, scientists prefer the total factor productivity (KFP) analysis. TFP is not measured directly; rather it is acquired as a balance after the total output of all other factors of the production of the investment. In scientific literature, it is believed that this indicator encompasses economic technological development, but the researchers have observed that it is also influenced by the quality of the institutions, economic openness, the internal organisation of enterprises, staff education and effort level (the level of employee effort), health, and a number of other indicators. Although the concept of KFP is important in economic theory, it is difficult to apply in practice, as measuring capital is onerous and

it is necessary to make additional assumptions as to how labour and capital resources could be combined (the size of labour and capital share or investment in increase of productivity). Therefore further attention will be stressed to labour productivity, where essence of TFP is one of productivity growth factors. This can be reflected in simplified form using standard Cobb-Douglas manufacturing function (Sargent and Rodriguez, 2001):

$$Y = AK^a L^{(1-a)}, 0 < a < 1 \quad (1)$$

where Y is output, K is capital input, L is labour input and A is TFP, a parameter that governs the relation between the inputs, capital and labour, and output.

Dividing equation (1) by labour input (L), gives the following expression:

$$\dot{y} = \dot{A} + a\dot{k} \quad (2)$$

where lower case letters denote quantities per unit of labour input, so that y expresses labour productivity or output per unit of labour input while k denotes the level of capital intensity or the capital-labour ratio. The dots indicate the rate of change of each variable.

Equation (2) implies that the rate of growth of labour productivity (\dot{y}) is equal to the rate of growth of TFP (\dot{A}) plus a times the rate of growth of capital intensity (\dot{k}).

Labour force productivity and TFP relevance can be reflected also as (Total Economy Database):

$$\Delta \ln y = \Delta \ln GDP - \Delta \ln H = \bar{s}_K \Delta \ln k + \bar{s}_L \Delta \ln L + \Delta \ln A \quad (3)$$

where $\Delta \ln y$ denotes labour productivity growth, measured as the difference between GDP growth and labour quantity growth, and k is capital deepening, measured as the difference between capital service growth for the relevant asset type (ICT or non-ICT) and labour quantity growth.

Relevance between labour productivity and total factor productivity can be illustrated also graphically (see Figure 1).

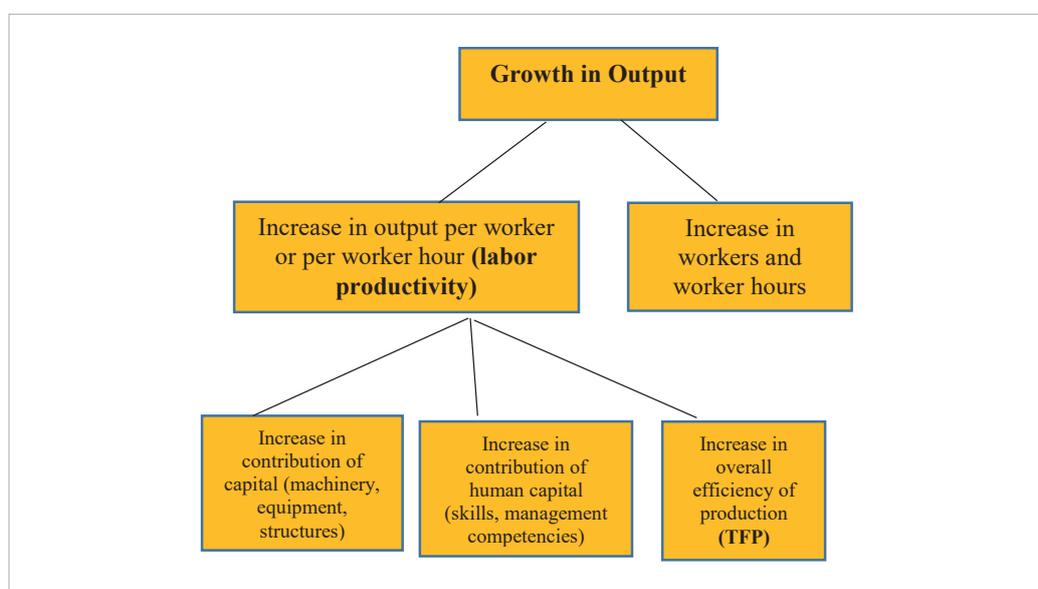


Figure 1

Relevance between labour productivity and total factor productivity (author's construction based on Total Economy Database)

As it can be seen in given picture economic growth (increase of amount of production) can be achieved either by increasing productivity or by attracting more resources, for example by increasing employment rate. However there are limits for resource attracting (especially for labour), for example demographical situation, which can reduce enterprise possibilities to increase amount of production. Besides the less resources are available, the higher price for them, which increases costs of production, thereafter negatively affect competition in internal and external markets. This is why sustainable development can be provided only by increasing productivity, which is increase of production with available resources, or sustain the same amount of production with fewer resources. Therefore, to increase productivity means effective use of existing resources or increase of production effectiveness and competitiveness.

Overall, in a small and open economy, productivity in the country (at macro level) is determined mainly by the average benefit of exported production per worker. It is export goods that determine the country's competitiveness on international markets, which leads us to question, does or economy gain profit because of high technology or we gain profit because of cheap labour force. If productivity is high, teachers and hairdressers shall have high income. If this implication is not complied, than in the internal demand-driven sectors (mainly service sectors), wages are growing faster, there is inflation, loss of competitiveness and exports shrink. This in turn has a negative impact on economic growth and the welfare of people. (See Figure 2).

Productivity has an impact on business competitiveness and is a key driver of economic growth and welfare of people. Over time, the country's capacity to improve living is almost entirely dependent on its ability to mobilise available resources and increase output per employee, so only increasing productivity can increase the welfare of people and maintain high standards of living in long term. Productivity allows country sustain high level of salaries, stabile and strong national currency and high level of capital return and by them high level of life standards.

The productivity of the labour force depends on the employees' working capacity (e.g. physical and mental talents, health, skills, experience), willingness to work, creative attitude to work, and other conditions conducive to work, tool support (e.g. modern machines and technological equipment, tools, workplace design). In addition, a significant impact on labour productivity is technological progress that increases labour efficiency, various organisational factors related to the organisation of work and management of the production process, as well as human resources management. (see Figure 3).

The most significant factors of productivity essentially do not change (they are listed in a number of researches and differ only to the degree of details). Some authors emphasise the importance of research and innovation (Lopez-Rodriguez & Martinez-Lopez, 2017), others pay attention to structural changes in the economy and the allocation of resources of the party's aspects (Harada, 2015; Hartwig, 2015), yet others analyse technological factors. Besides there are different activities implemented to increase productivity by improving these exact factors. It should be stressed out, that the impact of these measures on productivity growth can be very low if the ecosystems operational principles are complied with, it is when separate actions does not creates increase of effectiveness of ecosystem. On the contrary, a change in one element may weaken and even frustrate existing feedback and in result creates weakening of the economic transformation capacity, or the ability to increase the efficiency of existing resources. Conversely, if the ecosystem has weak capacity to respond to technological globalisation and challenges, the economy gets into a trap.

Each measure of improving the performance-influencing factor must therefore be assessed in

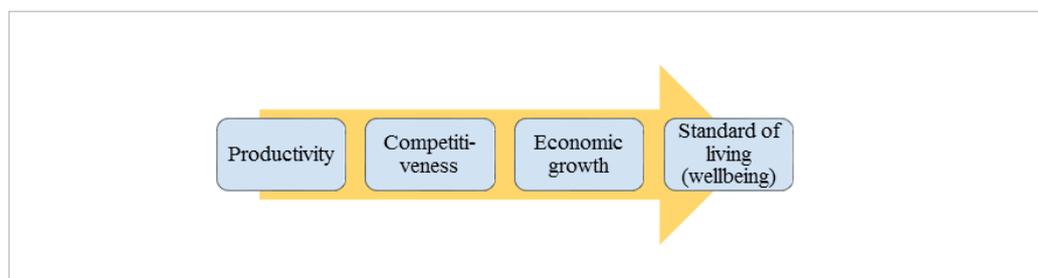


Figure 2

Role of Productivity in Economic growth and welfare of people (Authors')

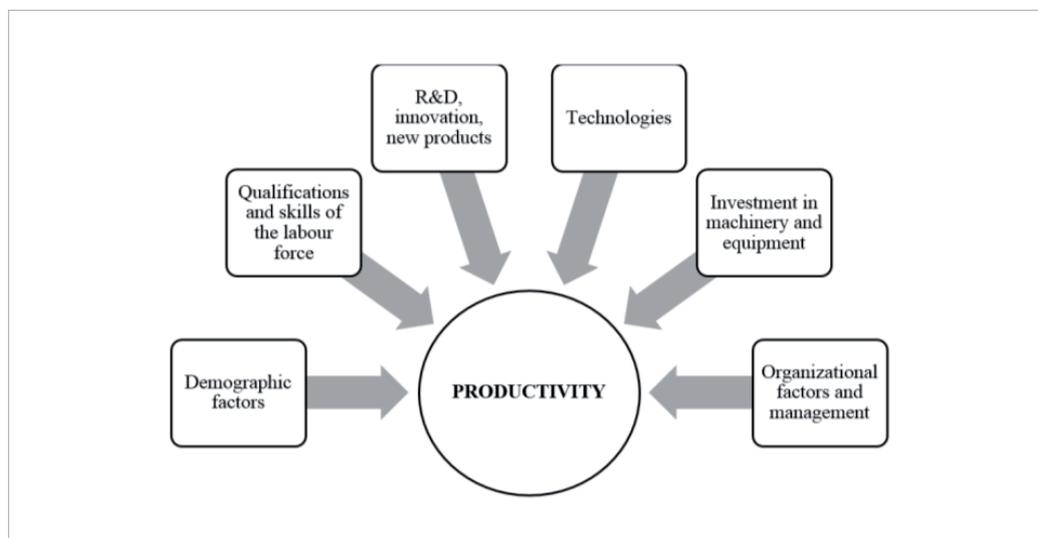


Figure 3

Factors of Labour productivity (Authors')

the context of the overall ecosystem where the change in one element undeniably calls for qualitative and quantitative changes in other elements. For example, the use of new technologically advanced equipment is not possible without proper training of employees as well as without proper care of this particular equipment.

These kinds of systems naturally occurs in economy. Economical agents, whether they are banks, consumers, enterprises or investors, constantly adapts to new challenges when it comes to making decisions and changing its strategy, considering the benefits and losses. In the economy, you can find several examples of such customization. For example, the introduction of the "Micro Concept " (micro tax) in Latvia in the recession helped reduce the negative impact of the global financial crisis on entrepreneurial activity, which can be seen as a positive effect (in the short term). However, nowadays, it is a disincentive factor for increasing productivity; for example, there are large number of micro-enterprises with low innovative capacity in Latvia comparing with other EU countries (which have resulted from a micro-concept). Another example of week ability to effectively use of resources is high structural unemployment and large emigration flows. Although in Latvia investment in human capital is significantly lagging comparing to the higher income level EU Member States, these investments are often benefiting other countries, which can offer an income corresponding to professional qualifications. Consequently, not only every element of the ecosystem needs to be strengthened, but the feedback between the individual elements should also be strengthened, thereby reducing mismatch between them and promoting the overall efficiency of the ecosystem in the use and redistribution of resources.

The analyses of productivity issues in Latvia

Dynamics of productivity in Latvia have been more rapid in recent years than on average in the EU, as a result since 2010 productivity gap has decreased for 9% points with EU average level. In 2017 productivity in overall Latvian economy, described as GDP per one employee reached 46,3% of average EU level. (See Figures 4 and 5).

Still it is necessary to mark that in the long-term perspective productivity growth rates in Latvia tend to shrink. If pre-crisis years (2004-2007) productivity increased by 7.4% each year, then in the last five years (2013-2017) by 2.2%, which is almost three times slower.

Figure 4

Productivity Changes in Latvia and EU (author's construction based on Eurostat databases)

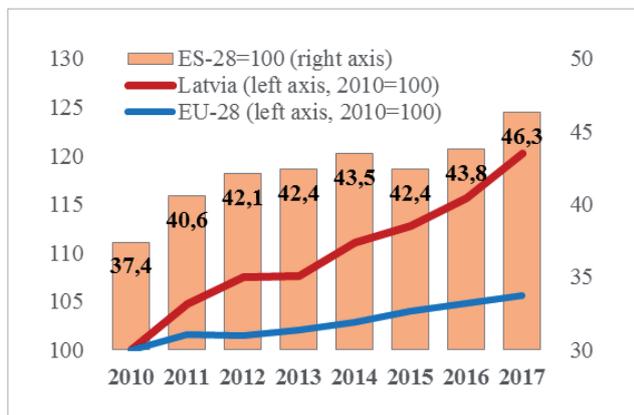


Figure 5

Productivity in Latvia (EU28 =100) (author's construction based on Eurostat database)

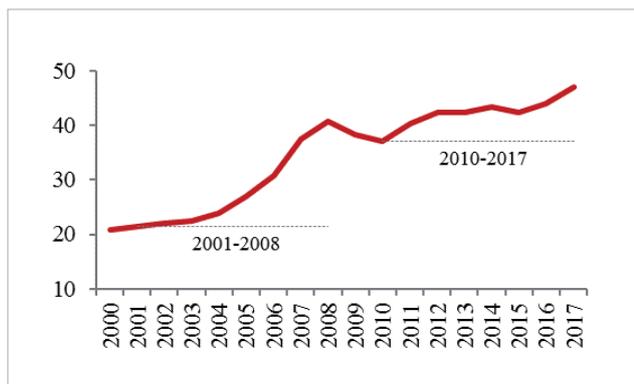
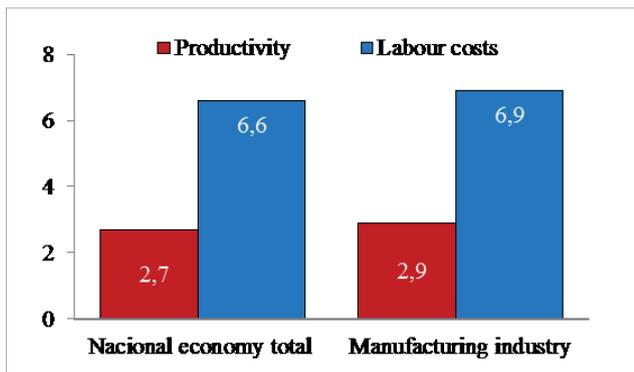


Figure 6

Productivity and labour costs (average increase per year in %) in Latvia from 2011 until 2017 (author's construction based on Eurostat databases)



While Latvia is in one of the leading position between EU member states in its productivity growth rates, labour costs has increased rapidly comparing to productivity growth, which leads to decrease of competitiveness among enterprises in terms of costs. The decrease in competitiveness in terms of costs reveals an increase of price of nominal labour unit. (See Figure 6).

Slow productivity growth in comparison with the growth of labour and other production costs leads to price increase of final consumer goods and services, which negatively affect producers' competitiveness both in domestic and foreign markets and it leads to the decline in sales and inappropriate usage of producers' capacity, thus economic growth rate is decreasing.

When analysing factors affecting productivity (see Figure 3), it is possible to conclude that low productivity level can have different reasons (insufficient labour qualification, old production technologies with low effectiveness, weak management, etc.), however authors wish to emphasize structural aspects, namely that economic structure of Latvia is predominated by the low technology sectors. Analysing the production structure in Latvia by technological intensity, shows that more than

50% of it consists of low-tech industries, while the high and medium high-tech industry are only less than 20%. Thus, producing cheap items cannot generate more value and increase productivity, so it creates **productivity trap** (See Figure 7).

Productivity trap - situation when enterprise or state reaches certain productivity level and after that it's growth slows down essentially, staying in a relatively low level for long time (productivity growth stopping).

In academic literature, there is no generally accepted methodology,

which would allow to evaluate, whether state has got into the productivity trap. Several authors analyse productivity trap in enterprise level (for example, Bahar, D. (2018), Syverson, C. (2016) and others), focusing on factors, which determine productivity differences among several enterprises within one sector (enterprise size, production diversification, access to financing, innovation, etc.). However, in macrolevel this topic is poorly researched. Authors consider that one of the indicators which indicates on the productivity trap on state level could be the decline in productivity convergence.

Figure 5 shows productivity trap in Latvia, where we can see that since 2013 productivity (GDP per 1 employed) increase is weak, thereby also convergence speed of Latvia is slowing down. OECD evaluates it by the annual difference in labour productivity gap (OECD, 2018) and gap on average in the EU is not reduced (on average in the EU). Eurostat data shows that until 2008 productivity gap in Latvia decreased on average by 2,5 percentage points annually, but in post-crisis period (since 2011) only by 1.4 percentage points (Eurostat, 2018), which could indicate on fact that Latvia is close or already in the productivity trap.

Only by allocating resources to the production of higher value added products at the enterprise level and by reorienting the economic structure towards high added-value sectors, there will be higher-level productivity; increase of welfare level and economy will overcome the productivity traps. Such changes in a market economy (free competition) should take place in the natural way and should be called "creative destruction", but there are a number of factors in reality, which slows these processes, for example unfair competition, administrative obstacles, etc. The process of reallocating resources also depends on the quality of the institutional framework (legislation, state aid, economic and political institutions), which ensure the efficient functioning of the markets for products and resources by minimizing the costs of the redistribution process and the risks, thereby reinforcing the country's competitive advantage. It is also important that entrepreneurs have an interest in changing the existing business model and investing in the development of new technologies and staff. This is crucial in a situation where a labour force availability is exacerbated by the deteriorating demographic situation. Thus, in order to increase productivity in Latvia, attention must be paid not so much how to produce but to produce by moving "up the technology ladder". According to data, at the moment Latvia is lagging behind both in high and low technology sectors. (See Figure 8).

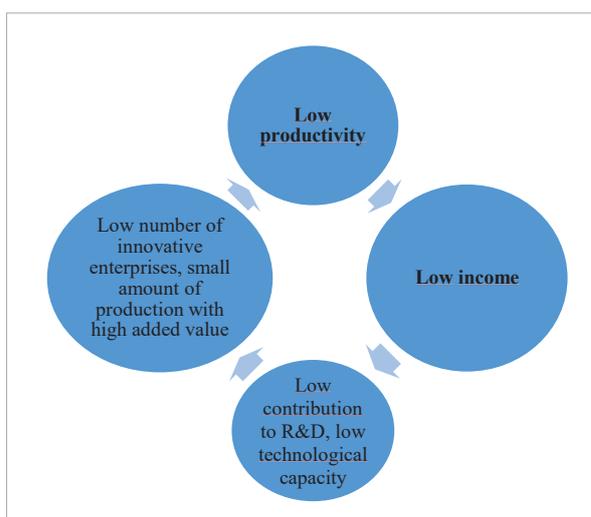
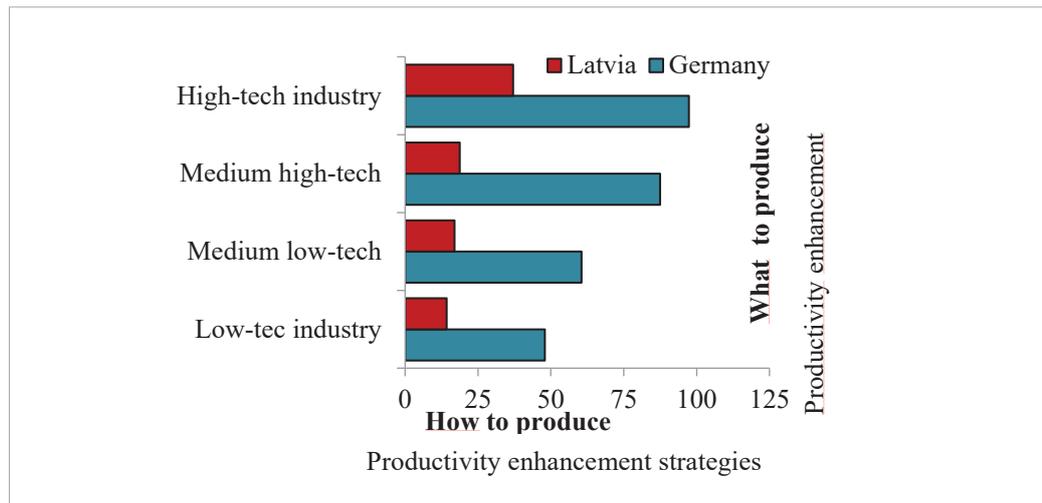


Figure 7

Productivity trap
(Authors')

Figure 8

Productivity (thousands EUR per one employee) in manufacturing industries by technological intensity (author's construction based on Eurostat databases)



According to data shown in Figure 8, the greatest lag behind is observed exactly in medium-high and medium-low sector groups, but in high technology sectors productivity level differences are not so large. Thus, it is possible to conclude that mitigation of the productivity gap in medium-low and medium-high technology sectors will give significant positive impact on the increase of the total productivity level, however it will not strengthen competitiveness of Latvian producers and will not promote development of production potential in a long-term. It means that in order to increase the total productivity level it is important both to identify problems of certain sectors (study of obstacles on a level of certain enterprises and sectors) and promote structural transformation in economics (progress towards high technology sectors).

If low productivity stability continues to persist, it can significantly limit Latvia's growth, wage increases and welfare level. Nowadays world faces age of technological transformations, which is also called the 4th Industrial revolution. This is why it is so important to understand, whether are we ready to face new challenges of competitiveness, are we capable to gain benefit from future production, decrease risks, also are we flexible enough to react on possible future turmoil's. On the need to strengthen the capacity of production industry points out article of Europe Commission, stressing out, that EU need to strengthen our industry's ability to continuously adapt and innovate by facilitating investment in new technologies and embracing changes brought on by increased digitisation and the transition to a low-carbon and more circular economy. But companies must do their part by upgrading the technology base, future-proofing business models, internalising sustainable development principles and embracing innovation (EC, 2017). According to The World Economic Forum research "Readiness for the Future of Production Report 2018" methodologies, country readiness to future challenges set by the current production base, its structure, as well as the development level of main drivers (including technologies and innovations, human capital, participation in international trade, quality of institutional system etc.). (WEF, 2018) According to the World Economic Forum (WEF) evaluation, the 4th Industrial Revolution will significantly transform the world's production and few countries are ready for its challenges. As the results of the research show, currently Latvia is characterised with a poorly developed base of production (a low level of manufacturing in GDP) and a low level of technological development which significantly restricts economic readiness for the new competitive challenges (see Figure 9).

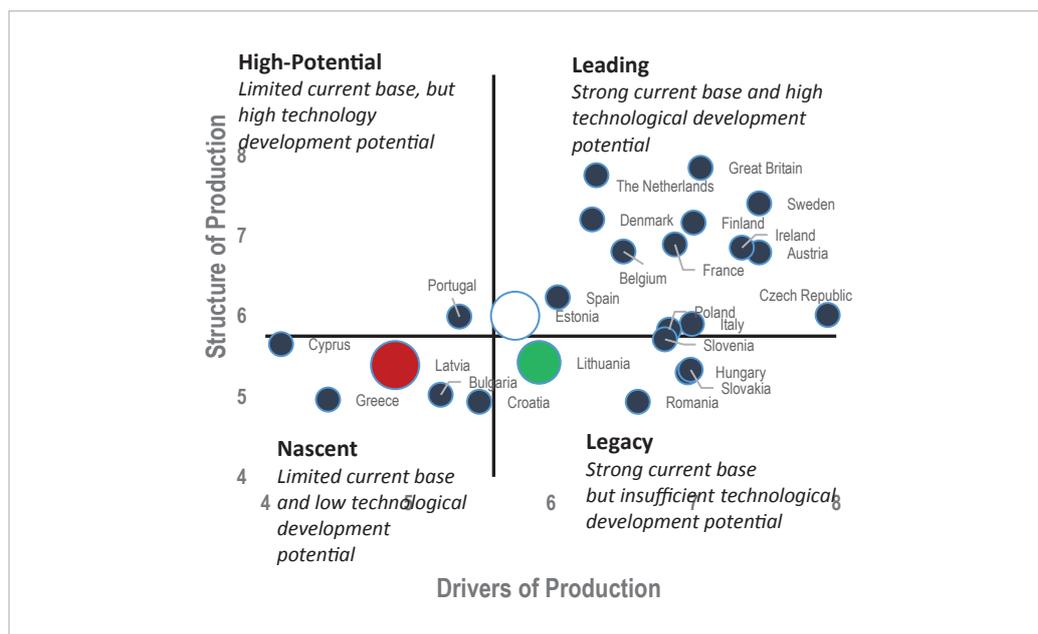


Figure 9

Assessment of current state of preparedness (author's construction based on World Economic Forum data)

As shown in the picture below, Estonia is ranked among the leaders, one of the 25 countries of 100 included countries in research. successful group, comprising 25 of the 100 countries included in the study. Latvia, compared with leaders, has a lower assessment at the development of key production drivers (including technologies and innovations, human capital, participation in international trade, quality of structural system etc.), which significant restricts readiness of economy to future competitive challenges.

To provide fast industrial development in future, it is necessary to promote high technology field. To be based on low cost labour force and extensive use of local resources (mainly it refers to wood-processing) fast development cannot be promised in the future. Vital structural changes are not one day task. It takes time and appropriate politics of industry development. One of the essential issues of industrial policy is to clearly identify the direction of structural transformation by establishing effective mechanisms for implementing it. To strengthen the Latvian production base and its readiness for the future challenges crucial will be the rapid development of high-technology sectors, including attraction of foreign capital and reinforcing channels of knowledge and technology transfer. While the effectiveness of industrial policy is mainly determined by the quality and competitiveness of the institutional environment.

- _ Productivity measures effectiveness of used resources in production process of certain amount of production (in enterprise, sector or in economy as a whole).
- _ Labour productivity, or productivity, reflects the amount of labour input that is consumed and used in the production process and is expressed in quantities of goods and services, which has been produced per one working hour (benefit per one worked hour) or output per employee (real amount of GDP per one employee).
- _ Latvia currently has a poorly developed base of production (a low level of manufacturing in GDP) and a low level of technological development which significantly restricts economic readiness for the new competitive challenges.
- _ 2008 productivity gap in Latvia decreased on average by 2,5 percentage points annually, but

Conclusions

in post-crisis period (since 2011) only by 1.4 percentage points, which could indicate on fact that Latvia is close or already in the productivity trap, i.e. situation, when productivity growth stopping).

- At the moment Latvia is lagging behind both in high and low technology sectors, but the greatest lag behind is observed exactly in medium-high and medium-low sector groups.
- To increase the total productivity level in Latvia it is important both to identify problems of certain sectors (study of obstacles on a level of certain enterprises and sectors) and promote structural transformation in economics (progress towards high technology sectors).
- The role of the Government's economic policy in increasing the total productivity level is to provide a high-quality institutional and business environment so that entrepreneurs would be interested and able to invest.
- One of the more significant productivity challenge in Latvia is the need to strengthen the production capacity and capacity of the industrial sector, in order to be able to adapt to the challenges of the new industrial age by encouraging investment in new technologies. Therefore, it is important to understand whether we are prepared for the new challenges of competitiveness, i.e. whether we are able to benefit from future production opportunities, reduce risks, and can be flexible in responding to future shocks.

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Fields of research interests

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