

THE ANALYSIS OF STRUCTURAL CHANGES IN THE LITHUANIAN ECONOMIC SECTORS UNDER CONDITIONS OF UNCERTAINTY

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Abstract. The research aims to analyse the structural changes in Lithuanian economic sectors from 1995 to 2022. Structural changes in this research are understood as changes in gross value added by an economic sector during the period analysed. The greatest decreases in GDP happened in 1999, 2009, and 2020. During this period, economic crises in Lithuania were recorded practically every 10 years. The economic recession of 1999 is partly related to the Russian economic crisis. The negative growth in GDP in 2009 is related to the global financial crisis. When the COVID-19 pandemic began, Lithuania recorded zero GDP growth. The analysis of the period 1995-2022 reveals that the Lithuanian economy was constantly affected by short-term external turbulence but remained resistant to serious shocks. During these fluctuations, changes were formed in the structure of the economy. Some sectors of the economy expanded more, others - less. In 2004, compared to 1995, the share of agriculture in the structure of the economy decreased by almost 60 per cent. The share of financial intermediation decreased by 13.6 per cent, and other sectors decreased by almost 23 per cent. Between 1995 and 2004, the most intense structural changes were in *agriculture, trade*, and other sectors. In 2009, compared to 2004, the share of agriculture in the structure of the economy decreased by almost 39 per cent. The share of manufacturing decreased by 16.8 per cent, and construction decreased by almost 9.6 per cent. From 2004 to 2008, the fastest development of the construction sector was recorded, which is related to the active development of real estate. In 2004-2009, the most intense structural changes were in the *agriculture, industry, and financial intermediary* sectors. In 2019, compared to 2009, the share of industry in the structure of the economy decreased by almost 2 per cent, the financial sector decreased by 12 per cent, and other sectors decreased by 6 per cent. In 2009-2019, the most intense structural changes were in the *agriculture, construction, and financial* sectors. From 2019 to 2022, the most intense structural changes were in *industry* and *financial* sectors. In the ideal case, the positive result of structural changes is economic progress. During economic progress, there is an even and long-term development of all economic sectors. Because the structure of the economy is a complex mechanism, changes in it must not be too speedy and not chaotic. Only then could economic progress be the result of structural changes.

Keywords: economic sectors, structural changes, economic growth, economic progress, economy of Lithuania

Introduction

The formation of the structure of the economy according to economic sectors depends on many internal and external factors. The government can directly affect the economy's structure through various investment programs (for example, attracting foreign investments) and financial and tax incentives. The development of economic sectors depends on structural policy priorities. A lot of research (Malakauskaitė, Navickas, 2008; Nissan et al. 2010; Liparā, 2011; Valodkienė et al. 2011; Maddison, 2013; Herrendorf et al. 2015; Constantinescu, Marinescu, 2016; Zygmunt, 2020; Hardt et al. 2021; Lewis et al. 2022) has been done on structural changes in the economy. Most scientists present similar conclusions regarding the periodicity of such changes.

Structural changes are constantly forming in the structure of the country's economy. They occur independently and due to the government's economic (and structural) policies. Partially, the scientific basis of structural changes is the theory of the Austrian economist Joseph Schumpeter about business cycles and innovation, presented in his book "The Theory of Economic Development"

(1911). The nature of business cycles evolves over the process of structural change. A positive result of structural changes is economic progress, which is described as the well-being of the country's economy. Structural changes in the structure of the economy form a complex system of adjustments. It can be assumed that it is the structural changes that indicate the deformation processes in the structure of the economy. Most of the foreign scientists (Herrendorf, Herrington, Valentinyi, Zygmunt, Maddison, Hardt, Barrett, Taylor, Foxon) who researched structural changes described these processes as "changes of proportions in the economic system that occur due to the influence of all structural factors". Therefore, structural changes are related to the future deformation and transformation of the economy's structure.

The **research subject** is structural changes in Lithuania's gross value added by economic sectors.

The **research aims** to analyse structural changes in Lithuanian economic sectors in 1995-2022.

The **objectives** are to describe structural changes in economic sectors, analyse the structural changes in the economy in Lithuania, and compare the intensity of structural changes in economic sectors.

Research methods include data extraction, handling, estimation, interpretation, and statistical analysis. To analyse structural changes, macroeconomic indicators of the 1995-2022 period are used. The data for macroeconomic indicators are annual and based on the Lithuanian official statistics portal (database) and Eurostat.

Chronological overview of the literature

It should be stated that insufficient attention is devoted to structural changes, their analysis, and evaluation. Many researchers analyse economic development but not economic progress as a positive result of structural changes in the economy. On the other hand, economic progress is difficult to define. However, it focuses on an important idea, i.e., positive structural changes in the country's economy.

Misiūnas, Kaminskienė (1999) and Balčiūnas (2000) investigated and assessed structural changes when the Baltic states were creating a market economy. Katz (2000) identifies structural policy as the tool for structural changes in the economy used to solve structural problems. Carlsson (2004) understands that structural changes arise because of the formation of the New or Digital Economy. The economy's structure changes gradually during this process, and work processes are more automated in the economic sectors.

According to Danner, Rösing, Schmeling, and Schulz (2006), it is only an increase in the absolute values of life expectancy and income per capita indicators that can be considered partly as economic progress in the country. Malakauskaitė, Navickas (2008) note that economic progress is evaluated in the articles similarly to foreign authors, emphasising the importance of economic growth and reduction of social exclusion. The exception is the article by Matuzevičiūtė et al. (2010), which analyses the structural changes in the Gross Domestic Product of the Baltic countries. However, it does not evaluate either the structure of the economy or structural changes.

Chen et al. (2010) see structural changes as the result of the adapted structural policy. The authors believe that structural policy is the only way to achieve effective economic growth (stable, long-term, balanced). Cortuk, Singh (2010) provide main methods to evaluate structural changes in the economy that focus on interpreting their coefficients.

While researching economic progress, Liparā et al. (2011) analyse and evaluate positive changes in human capital, labour productivity, and society's income. In their article, Pileičikienė, Pukelis (2012)

associate higher education with economic progress and a better quality of life.

Maddison (2013) evaluates economic progress as an increase in GDP, national income, and labour productivity. Wen-Yi (2016) defines the result of economic progress as sustainable economic growth that increases society's income and life expectancy. Yelkikalan et al. (2017) understand economic, social, and political progress as sustainable GDP growth and financial and political stability in the country. Salustri (2019) analyses structural changes as economic and social imbalances in the economy. Neuss (2019) identifies the drivers of structural change, broadly defined as the process of reallocation of economic activity across three broad sectors, i.e., agriculture, manufacturing, and services. In his article, structural changes are evaluated by four determinants: income changes, relative (sectoral) prices, and input-output linkages.

Zygmunt (2020) identifies that the most important reason for changes in the economic structure is the impact on entrepreneurial activity. In Zygmunt's opinion, entrepreneurial activity in a transition economy is associated with new structural changes in this economy. Hardt et al. (2021) noticed the change in the sector share in output and final demand, where the goal could be an increase or a decrease in the sector share. Lewis et al. (2022) see structural changes as the result of changing trends in foreign and global trade. They identify that modern trade policy could focus on liberalising trade in services to foster the growth in world trade and estimate the projected gains from further reductions in trade barriers in either goods or services in the face of continued structural transformation induced by technical progress.

After reviewing research and scientists' articles and their opinions about structural changes in the economy and economic progress, it can be stated that different structural changes in the economy in different research periods have been identified. Each research period had a different result of structural changes in the economy. Some periods saw the increase in GDP only; some witnessed the rise of the Digital Economy; some saw increased labour productivity, life expectancy, and income. All this shows that this macroeconomic process is not static, and structural changes in the economy are always dynamic and never stop.

The theoretical concept of structural changes in the economy

Because structural changes are always dynamic, the result of such changes to the economy can be *positive* or *negative*. A positive result of structural changes in the economy is economic progress. The

negative result of these changes is future economic problems in the country. Every government should be interested in the fact that the result of structural changes in the country's economy would be economic progress, not regression. This is especially important in the conditions of a market economy when structural changes in the economy are left to the market to regulate it independently.

In 2008, the global financial crisis demonstrated that the economy needed an effective macro-prudential policy to achieve the objectives of supervising the financial sector. During the *positive* structural changes in the economy, the following processes result in economic progress, the formation of a new economic structure, and other changes (Fig. 1, compiled by the author).

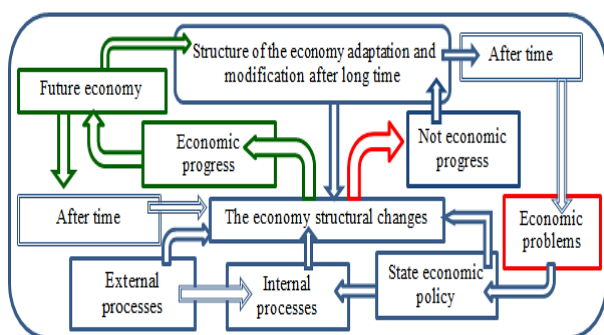


Fig 1. The link between the processes of structural changes in the economy

Internal processes are affected by both external processes and the economic policy formed by the government. They directly affect the structural changes in the economy. The internal processes can cause negative economic phenomena:

- increase inflation in the country;
- decrease the cash flow from investing activity (FDI – foreign direct investment);
- increase unemployment rate;
- decrease the number of residents who have acquired higher education;
- decrease population in the country, increasing emigration and other processes.

When inflation increases, consumers change their priorities, so changes in various sectors of the economy are going on differently, i.e., in one sector, they are more intense, and in other sectors, they are less. If the goods and services are not of the first necessity, these changes are more intense. When the consumption basket consists of goods and services that are first necessary, the changes will be less intense because consumers will still consume a little less.

The increasing unemployment rate slows economic growth, reduces the development of economic sectors, and creates negative structural

changes in the economy, which slows economic progress. It is important to properly identify the causes of unemployment to control the negative effects on the economy and economic sectors.

In a hypothetical sense, the decrease in the number of residents who have acquired higher education negatively affects the development of high-tech sectors (biotechnology, IT, lasers, etc.), so the structural changes in the economy in this sector are less intense. As a result, not only the progress of the country's economy but also the development of the whole economy slow down. Eventually, this process can form a primitive economic structure in which the sectors creating low added value dominate.

Economic sectors lose potential labour force because of the decrease in the country's population due to negative birth and emigration rates. Then, changes in the structure of the economy start. Some sectors adapt to market conjuncture, while others restructure or stop the activity. Such changes slow down economic progress and the potential for economic development.

External processes affect changes in internal processes and their dynamics. Higher wages in other countries tempt emigrating, thus reducing the number of residents and potential consumers. Emigrated residents pay local taxes and increase consumption in another country, thereby contributing to the economic growth of that country. In another country, a better investment climate and macroeconomic environment increase the attraction of foreign direct investment. Transferring the local capital to a better investment environment does not create jobs in their country and increases unemployment. Changes in the global price of oil increase inflation, which causes changes in economic sectors.

External processes are extremely important because country's economies become more and more open and participate in the world trade and economic processes that directly affect the structural changes of the economy. External processes can cause the following important negative economic phenomena:

- increase the dependence of the country on imports;
- reduce exports;
- increase the foreign debt of the country;
- generate large fluctuations in the exchange rate (currency instability).

If the country's economy depends on imports, it is not positive in terms of the economic policy, supposing a political conflict between countries from which goods and services are imported starts. Increasing import dependence on one or more countries is a negative phenomenon because there is

a risk of political pressure from importing countries. Under pressure, it is more difficult to defend the interests of the national economy, which slows economic progress. Increasing imports negatively affect structural changes in the economy because local economic sectors are uncompetitive and will eventually be forced to disappear.

To increase stable exports, it is necessary to search for new markets constantly. Declining exports show that there are lost markets abroad, and it is assessed negatively because if exports start to decrease, the development of the economy will slow down.

The increasing foreign debt of the country is assessed both positively and negatively. It is assessed negatively because there is a risk that the country will not be able to form a 100 per cent independent economic policy as it will have to consider creditors' economic and political interests. Foreign debt is assessed positively if the loans received are used to finance the development of various manufacturing projects and industrial sectors aiming at increasing exports. The increase in exports will accelerate structural changes in the economy and economic growth.

The exchange rate is an indicator of the macroeconomic situation of any country. Large fluctuations in the exchange rate indicate that the country has some macroeconomic problems. If the exchange rate increases significantly (~ 25-30 per cent per year) and other macroeconomic factors do not change, the prices of goods and services of local economic sectors become more expensive. Exports decrease, and imports increase. As a result, the economic growth and the formation of positive structural changes in the economy slow down. If the exchange rate decreases, the domestic production of economic sectors becomes cheaper, and eventually, exports increase. Increasing exports indicate the development of economic sectors in foreign markets, accelerating structural changes in the economy.

State economic policy. The implemented state economic policy influences changes in the country's internal processes. The government's decisions to raise taxes and (or) the intention of the central bank to increase the supply of money in circulation result in increased inflation. Depending on the rate of inflation, a different rate of economic growth is obtained. Higher sustainable economic growth intensifies structural changes in the economy. Targeted inflation and stable taxation of profits create a good macroeconomic climate and increase investment activity in a country. Investors have more confidence in a country with a correspondingly stable exchange rate. When the country has a stable macroeconomic climate, positive changes occur in the economy's structure,

where economic sectors receive foreign investments (FDI).

The economy structural changes. It can be assumed that structural changes indicate the deformational processes in the structure of the economy. The review of scientific articles and *Fig. 1* show that the main reasons for structural changes in the economy are related to the economic policy formed by the government (social, tax, export, economic structural, credit, etc.) and the global market conjuncture, i.e., international trade trends and the characteristics of consumption.

Structural changes can be assessed by their impact on the structure of the economy, i.e., changes that significantly change the old structure of the economy to a new one or change it slightly. Structural change is a change when the characteristics of the elements in the structure are modified, and it deforms the old economic structure into a new one.

The modification of the characteristics of the elements is understandable here. It can be expressed in quantitative indicators: *a change in the proportion of those elements, a change in per cent*, etc. Because the structural changes in the economy are forming over time, they are dynamic in nature. This means that they have been formed, are being formed, and will be formed because this is a continuous macroeconomic process.

Structural changes have objections. The term "structure" defines the systems comprising many elements, including stability. The elements here are economic sectors. In other words, structure is defined as an orderly arrangement of elements. Therefore, the conscious breaking of the strict order also indicates the formation of structural changes that encounter economic, financial, and social problems. In this way, the structure evolves, passing from one stage to another until a peak is reached and a structural crisis starts. During this crisis, the bankruptcy of a certain economic sector begins, and the changes in it are significant in both social and economic terms. As unemployment increases, the cycle of production and service provision begins to slow or stop altogether.

The result of the structural changes in the economy may be positive or negative. Changes are positive if *economic progress* is formed in the country over time. Negative structural changes in the economy eventually cause economic problems. The long-term neutral result of these changes is also viewed negatively because such a situation is similar to trampling in one place when changes are insignificant.

Future economy. A hypothetical view as a possible result of economic progress forms a new (advanced) economy based on the emergence of

future (innovative) economic sectors. These innovative sectors will shape the advanced structure of the economy and the economy of the future and include:

- space tourism;
- bio-architecture;
- innovative medicine, etc.

Space tourism covers activities related to organising trips to other planets (e.g., a trip to Mars, Jupiter, etc.). The main activity of the bio-architecture sector is aimed at increasing biological comfort for human beings. Air pollution in the city harms the human body, which reduces the level of comfort in life. Housing density per person is also an important indicator for achieving better living comfort. Therefore, the main task of the bio-architecture sector is to improve the level of public comfort maximally, e.g., increase the area of greenery (greening) in the urban surroundings, change the shape of buildings from rectangular to round, improve lighting, etc. It is no secret that every year, food quality deteriorates due to various chemical additives (e.g., palm oil), so food products lose their usefulness. All this harms public health; people fall ill with various diseases, so the state is forced to invest more money in treating people. The innovative medicine sector aims to improve public health, extend life expectancy, slow ageing, accelerate disease diagnosis, etc.

All the listed sectors are just a few examples of the progress of structural changes in the economy that will form the future economy. Since the economy is like a living organism, processes and various changes are constantly forming in it. Over time, more and more advanced sectors of the economy will emerge, which will innovatively solve various economic problems.

The adaptation and modification of the economic system after a long time. In the course of intensive structural changes in the economy, the structure of the economy adapts to the existing economic system in the country. If the changes greatly alternate the old economic structure to a new one, and the innovative sectors of the future are intensively formed, eventually, the economic system adapts to the new changes. If serious economic problems start in the economy (e.g., social exclusion in society increases, the prices of goods and services do not meet even the minimum human needs, etc.), and this process continues over a very long time, the system degenerates. To solve these problems, it is necessary to modify the system. The newly modified system will be good and suitable for a long time before new economic problems that do not resolve themselves begin to form again. Only in a properly and well-modified

system can one expect a positive result of structural changes in the economy, i.e., economic progress.

Changes in the structure of the Lithuanian economy

Since Lithuania could not model an independent structural policy for 50 years, the structure of the economy was formed based on the priorities of other countries. As Lithuania created and developed a market economy, it attracted more foreign investments, increasing the volume of exports, and it was easier to get loans for economic sectors. However, the rapid pace of investments and loans changed the economy's structure.

The structure of the economy of each country depends on internal and external factors. All the listed features shape the country's economic development and economic specialisation in the long term.

The time series analysed in this research covers the period from 1995-2022, which is divided into four stages:

1. 1995-2004, i.e., structural changes before joining the EU.
2. 2004-2009, i.e., structural changes after joining the EU.
3. 2009-2019, i.e., structural changes during the global financial crisis and recovery.
4. From 2019 up to now, i.e., structural changes during the COVID-19 pandemic and the war in the Ukraine.

A structural change in this research is understood as a change in the overall structure of gross value added (GVA) during the period analysed.

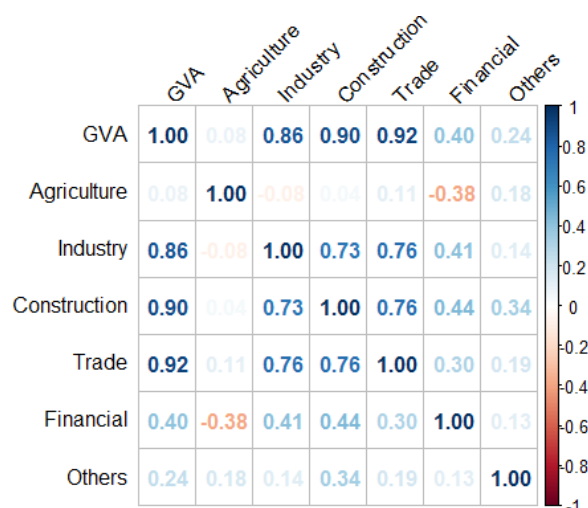


Fig. 2. Correlation matrix of changes in gross value added (Source: author's calculations)

The data of the correlation matrix show that the changes in gross value added are mainly determined by the changes in the industry, construction, trade,

and financial sectors. These sectors are the foundation of the economy. Based on the correlation matrix data, changes in the value added of the industrial sector are partly determined by the changes in the construction and trade sectors.

Like other Baltic countries, Lithuania forms an independent economic (and structural) policy. 2023 marks exactly 33 years since a market economy was formed in Lithuania. During that time, structural changes were formed in the Lithuanian economy, which influenced the change in GDP.

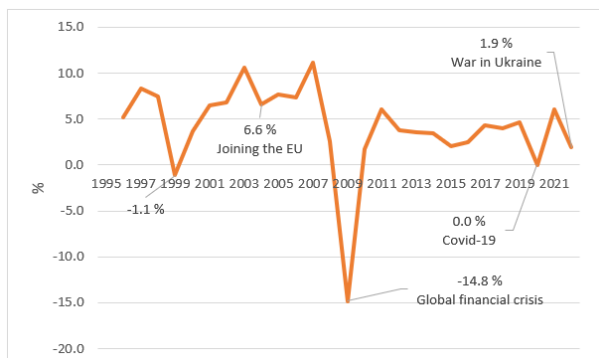


Fig. 3. Rates of GDP change in 1995-2022
(Source: Eurostat statistical database)

The data in Fig. 3 show that the greatest decrease in GDP in the period analysed was in 1999, 2009 and 2020. During this period, economic crises in Lithuania were recorded practically every 10 years. The economic recession of 1999 is partly related to the Russian economic crisis. The negative growth in GDP in 2009 is related to the global financial crisis. Based on the data in Fig. 2, when assessing the rates of GDP decline, the impact of the 2009 crisis on the Lithuanian economy was the strongest. That year, GDP decreased by 14.8 per cent compared to 2008. When the COVID-19 pandemic began, Lithuania recorded zero GDP growth. The analysis of the period 1995-2022 reveals that the Lithuanian economy was constantly affected by short-term external turbulence but remained resistant to serious shocks. During these fluctuations, changes occurred in the structure of the economy. Some sectors of the economy expanded more, others - less.

Table 1. GDP structure (per cent) in Lithuania in 1995-1999

Economic sector	1995	1996	1997	1998	1999
Agriculture	11.1	12.2	10.8	8.7	7.3
Industry	24.4	23.4	23.2	22.8	22.3
Construction	7.1	6.8	7.6	8.3	7.6
Trade	23.8	24.2	24.8	24.5	24.3
Financial intermediation	2.2	2.1	1.5	2.0	2.0
Others*	42.5	31.3	32.1	33.7	36.5
Total:	100.0	100.0	100.0	100.0	100.0

Table 2. GDP structure (per cent) in Lithuania in 2000-2004

Economic sector	2000	2001	2002	2003	2004
Agriculture	6.3	5.5	5.4	4.9	4.6 ↓
Industry	23.6	24.5	23.2	24.1	25.5 ↑
Construction	6.0	6.0	6.3	7.0	7.3 ↑
Trade	26.6	27.4	28.4	28.4	27.9 ↑
Financial intermediation	2.1	2.0	2.2	1.9	1.9 ↓
Others*	35.4	34.6	34.5	33.7	32.8 ↓
Total:	100.0	100.0	100.0	100.0	100.0

(Source: Eurostat statistical database)

*- information and communication, real estate activities, professional, scientific and technical activities; administrative and support service activities.

When creating a market economy in Lithuania, the economy's direction focused on developing the industry, construction, and trade sectors. In almost ten years, there was a transition to an industry and service-oriented economy. In 2004, compared to 1995, the share of agriculture in the structure of the economy decreased by almost 60 per cent. The share of financial intermediation in the economy's structure decreased by 13.6 per cent and other sectors by almost 23 per cent. There were positive changes in the industry. Its share in the structure of the economy increased by 4.5 per cent. The share of construction increased by 2.8 per cent, and the trade sector increased by 17.2 per cent. In 1995-2004, the most intense structural changes were in agriculture, trade, and other sectors.

As having joined the EU, the economy changed, and a new direction was taken, new structural changes were formed in the structure of the economy.

Table 3. GDP structure (per cent) in Lithuania in 2004-2009

Economic sector	2004	2005	2006	2007	2008	2009
Agriculture	4.6	4.8	4.3	3.9	3.7	2.8 ↓
Industry	25.5	25.0	23.8	21.8	21.3	21.2 ↓
Construction	7.3	7.8	9.5	11.2	11.2	6.6 ↓
Trade	27.9	28.2	27.5	27.9	28.1	29.5 ↑
Financial intermediation	1.9	2.2	2.9	3.5	3.4	2.6 ↑
Others*	32.8	32.0	32.0	31.7	32.3	37.3 ↑
Total:	100.0	100.0	100.0	100.0	100.0	100.0

Source: Eurostat statistical database

After Lithuania joined the EU, a new economic phase began. New markets have opened up for trade, and access to international financial markets has become easier. In 2009, compared to 2004, the share of agriculture in the structure of the economy decreased by almost 39 per cent. The share of manufacturing in the economy's structure decreased

by 16.8 per cent, and construction decreased by almost 9.6 per cent. From 2004 to 2008, the fastest development of the construction sector was recorded. This is related to the active development of real estate. Commercial banks made it easier to lend money to purchase real estate. However, in 2009, the development of this sector slowed down. Positive changes were in trade. Its share in the structure of the economy increased by 5.7 per cent. The share of the financial sector increased by 36.8 per cent and that of other sectors by 13.7 per cent. In 2004-2009, the most intense structural changes were in *the agriculture, industry, and financial intermediary* sectors. When Lithuania was in the EU, its economy became more open, so exports increased.

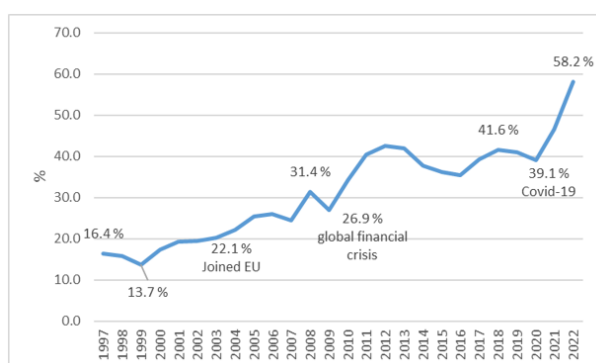


Fig 3. Share of exports in GDP in 1997-2022
(Source: Eurostat statistical database)

After Lithuania became a member of the EU, the share of its exports in 2008 GDP increased by 9.3 per cent. For a small economy such as Lithuania, it was a good start in finding new markets in the EU economy. In 2009, during the global financial crisis, the share of exports in GDP decreased by 4.5 per cent. In 2018, after the global financial crisis and before the start of COVID-19, the share of exports in GDP increased by 14.7 per cent, which indicates a quick and steady recovery from the crisis. In 2020, during COVID-19, the share of exports in GDP decreased to 2.5 per cent.

The Lithuanian economy was most affected by the global financial crisis, during which the share of exports in GDP decreased almost twice as much as during the COVID-19 pandemic. Lithuania's access to the EU common market made it possible to increase the share of exports in GDP by almost 36 per cent. Partially, this shows the successful integration of the Lithuanian economy into the global economy. At the same time, new challenges and new economic trends shaped structural changes in the economy.

Table 4. GDP structure (per cent) in Lithuania in 2009-2014

Economic sector	2009	2010	2011	2012	2013	2014
Agriculture	2.8	3.4	3.9	4.4	3.9	3.8
Industry	21.2	23.3	24.7	24.9	23.5	23.0
Construction	6.6	5.8	6.5	6.1	6.7	7.4
Trade	29.5	30.9	31.0	31.8	32.3	32.2
Financial intermediation	2.6	2.8	2.7	2.1	2.2	2.0
Others*	37.3	33.8	31.2	30.7	31.4	31.6
Total:	100.0	100.0	100.0	100.0	100.0	100.0

Table 5. GDP structure (per cent) in Lithuania in 2015-2019

Economic sector	2015	2016	2017	2018	2019
Agriculture	3.8	3.5	3.9	3.2	3.5 ↑
Industry	22.2	22.1	22.1	21.5	20.8 ↓
Construction	7.4	6.7	6.7	7.0	7.3 ↑
Trade	31.3	31.5	31.6	31.7	31.1 ↑
Financial intermediation	2.1	2.2	2.0	2.2	2.3 ↓
Others*	33.2	34.0	33.7	34.4	35.0 ↓
Total:	100.0	100.0	100.0	100.0	100.0

(Source: Eurostat statistical database)

The evaluation of the structural changes in the Lithuanian economy in the context of the global financial crisis in 2009 reveals that based on the data provided in Tables 3, 4 and 5, the agricultural, industrial and construction sectors were most affected by the crisis. In 2009, compared to 2007, the share of agriculture in the structure of the economy decreased by almost 28 per cent. The share of industry in the economy's structure decreased by 2.8 per cent, construction decreased by almost 41 per cent, and the financial sector decreased by almost 26 per cent. These four sectors reduced GDP in 2007-2009.

To avoid problems in the financial sector in the future, a macroprudential policy was formed. Trade and other sectors increased GDP. In 2009, compared to 2007, the share of trade in the structure of the economy increased by almost 6 per cent, and other sectors increased by 18 per cent. The recovery from the global financial crisis was not easy, and it was different for all sectors. Agriculture, construction, and trade sectors recovered quickly. In 2019, compared to 2009, positive changes were made in agriculture, and its share in the structure of the economy increased by 25 per cent. The share of construction increased by 11 per cent, and the trade sector increased by 5.4 per cent. Industrial, financial and other sectors recovered more slowly. In 2019, compared to 2009, the share of industry in the structure of the economy decreased by almost 2 per cent, the financial sector decreased by 12 per cent, and other sectors decreased by 6 per cent. In 2009-2019, the most intense structural changes were in *the agriculture, construction, and financial* sectors.

In 2019, during the COVID-19 pandemic, some sectors of the economy were negatively affected more, and others were affected less. Provided there was no state support, i.e., subsidies for the most affected sectors of the economy, the results of business activities could have been worse.

Table 6. GDP structure (%) in Lithuania 2019-2022

Economic sector	2019	2020	2021	2022
Agriculture	3.5	3.9	3.7	4.4 ↑
Industry	20.8	20.4	21.2	22.9 ↑
Construction	7.3	7.3	7.1	7.1 ↓
Trade	31.1	29.6	29.0	29.1 ↓
Financial intermediation	2.3	2.5	3.0	3.2 ↑
Others*	35.0	36.3	36.0	33.3 ↓
Total:	100.0	100.0	100.0	100.0

(Source: Eurostat statistical database)

The evaluation of the structural changes in the Lithuanian economy in 2022, compared to 2019, reveals that the share of agriculture in the structure of the economy increased by almost 2.5 per cent. While analysing the characteristics of agricultural development, it can be seen that this sector remained stable and resilient during the global financial crisis and the pandemic. Positive changes were in the industry. Its share in the structure of the economy increased by 10 per cent, and the financial sector increased by 39 per cent. Partially positive changes in the industry were due to received subsidies and in the financial sector due to increased demand for credit during the pandemic. The partial short-term lockdown of the economy had a negative impact on the construction and trade sectors. In 2022, compared to 2019, the share of construction in the structure of the economy decreased by almost 2.7 per cent. The share of trade in the economy's structure decreased by 6.4 per cent and other sectors by almost 5 per cent. In 2019-2022, the most intense structural changes were in the industry and financial sectors.

In the ideal case, the positive result of structural changes is economic progress. During economic progress, there is an even and long-term development of all economic sectors. Then, unemployment in the economic sectors is at a natural level, and the long-term generation of money and investments in the economy and the creation of innovative sectors are ensured.

Table 7. Assessment of structural changes in the economy in Lithuania in 1995-2022

Economic sector	1995-2004	2004-2009	2009-2019	2019-2022	The result of structural changes for economic progress
Agriculture	60.0 % ↓	39.0 % ↓	25.0 % ↑	2.5 % ↑	Negative
Industry	4.5 % ↑	16.8 % ↓	2.0 % ↓	10.0 % ↑	Negative
Construction	2.8 % ↑	9.6 % ↓	11.0 % ↑	2.7 % ↓	0
Trade	17.2 % ↑	5.7 % ↑	5.4 % ↑	6.4 % ↓	Positive
Financial intermediation	13.6 % ↓	36.8 % ↑	12.0 % ↓	39.0 % ↑	Positive

(Source: compiled by the author based on Eurostat statistical database)

Although all economic sectors are interconnected, the backbone of the economy is the industry, finance, and trade (services) sectors. Therefore, negative structural changes in these economic sectors slow down economic progress. The structural changes in agriculture were assessed negatively during the 14 years (1995-2009) because they were very chaotic and speedy. The economy did not have time to adapt quickly to the new structure and structural changes. A similar situation was in the industry. The development of the construction sector was quite stable, except during the global financial crisis. The development of trade and financial sectors depended on the economic situation at that time. Because the structure of the economy is a complex mechanism, changes in it must be neither too rapid nor chaotic. Only then could structural changes result in economic progress.

Conclusions

The literature review shows that structural changes are always dynamic, and the impact of these changes on the economy can be *positive* or *negative*.

A positive result of structural changes in the economy is economic progress. The negative result of these changes is future economic problems in the country.

To reduce the negative effect of the structural changes in the economy, the government should take appropriate macro-structural (structural) policy measures in time.

In 2008, the global financial crisis demonstrated that the economy needed effective macro-prudential policy to achieve the objectives of supervising the financial sector.

In 1995-2004, the most intense structural changes were in the *agriculture*, *trade*, and other sectors. Positive changes were in the industry. Its share in the structure of the economy increased by 4.5 per cent. The share of construction increased by

2.8 per cent, and the trade sector increased by 17.2 per cent.

In 2004-2009, the most intense structural changes were in *agriculture*, *industry*, and *financial* sectors. Positive changes were in trade. Its share in the structure of the economy increased by 5.7 per cent. The financial sector increased by 36.8 per cent, and the share of other sectors increased by 13.7 per cent.

In 2009-2019, the most intense structural changes were in the *agriculture*, *construction*, and *financial* sectors. Positive changes were in agriculture. Its share in the structure of the economy increased by 25 per cent. The share of construction increased by 11 per cent, and the trade sector increased by 5.4 per cent.

In 2019-2022, the most intense structural changes were in *industry* and *financial* sectors. Positive changes were in the industry. Its share in the structure of the economy increased by 10 per cent, and the financial sector increased by 39 per

cent. Partially positive changes in the industry were due to received subsidies and in the financial sector due to increased demand for credit during the pandemic.

In the ideal case, the positive result of structural changes is economic progress. During economic progress, there is an even and long-term development of all economic sectors. Therefore, negative structural changes in these economic sectors slow down economic progress. The structural changes in agriculture are assessed negatively because they were very chaotic and speedy during the 14 years (1995-2009). A similar situation occurred in the industry, where structural changes were very fast. Because the structure of the economy is a complex mechanism, changes in it must be neither too rapid nor chaotic. Only then could structural changes result in economic progress.

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ŪKIO STRUKTŪRINIŲ POKYČIŲ ANALIZĖ LIETUVOS EKONOMIKOJE NEAPIBRĖŽTUMO SĄLYGOMIS

Santrauka

Šiame straipsnyje pateikiama 1995–2022 m. Lietuvos ekonomikos struktūrinių pokyčių analizė. Struktūriniai pokyčiai šiame tyrime suprantami kaip bendros pridėtinės vertės struktūros pasikeitimas per analizuojamą laikotarpį. Nagrinėjama laikotarpiu BVP labiausiai sumažėjo 1999, 2009 ir 2020 m. Šiuo laikotarpiu ekonominės krizės Lietuvoje buvo fiksuojamos praktiškai kas 10 metų. 1999 m. ekonomikos nuosmukis iš dalies susijęs su Rusijos ekonomikos krize. Neigiamas BVP augimas 2009 m. susijęs su pasauline finansų krize. Prasidėjus COVID-19 pandemijai, Lietuvos BVP augimas buvo nulinis. Analizuojant 1995–2022 m. laikotarpį pastebėta, kad Lietuvos ūkį nuolat veikė trumpalaikiai išorės neramumai, tačiau šalis išliko atspari rimtiems sukrėtimams. Šių svyravimų metu susiformavo pokyčiai ekonomikos struktūroje. Vieni ūkio sektoriai plėtėsi labiau, kiti – mažiau. 2004 m., palyginti su 1995 m., žemės ūkio dalis ūkio struktūroje sumažėjo beveik 60 proc. Finansinio tarpininkavimo dalis ūkio struktūroje sumažėjo 13,6 proc., o kitų sektorių – beveik 23 proc. 1995–2004 m. intensyviausi struktūriniai pokyčiai buvo žemės ūkyje, prekybos ir kituose sektoriuose. 2009 m., palyginti su 2004 m., žemės ūkio dalis ekonomikos struktūroje sumažėjo beveik 39 procentais. Pramonės dalis ūkio struktūroje sumažėjo 16,8 proc., o statybos – beveik 9,6 proc. Nuo 2004 iki 2008 m. buvo užfiksuota sparčiausia statybų sektoriaus plėtra – tai susiję su aktyvia nekilnojamojo turto plėtra. 2004–2009 m. laikotarpiu intensyviausi struktūriniai pokyčiai buvo žemės ūkyje, pramonės ir finansinio tarpininkavimo sektoriuose. 2019 m., palyginti su 2009 m., pramonės dalis ekonomikos struktūroje sumažėjo beveik 2 proc., finansų sektoriaus – 12 proc., o kitų sektorių – 6 proc. 2009–2019 m. laikotarpiu intensyviausi struktūriniai pokyčiai buvo žemės ūkyje, statybų ir finansų sektoriuose. 2019–2022 m. laikotarpiu intensyviausi struktūriniai pokyčiai buvo pramonės ir finansų sektoriuose. Idealiu atveju teigiamas struktūrinių pokyčių rezultatas yra ekonomikos progresas. Ekonominės pažangos metu vyksta tolygus ir ilgalaikis visų ūkio sektorių vystymasis. Kadangi ekonomikos struktūra yra sudėtingas mechanizmas, pokyčiai joje neturi vykti dideliu greičiu, ne chaotiškai. Tik tada ekonomikos progresas galėtų būti teigiamas struktūrinių pokyčių rezultatas.

Reikšminiai žodžiai: ekonomikos sektoriai, struktūriniai pokyčiai, ekonominis augimas, ekonomikos progresas, Lietuvos ekonomika

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