FLUCTUATIONS OF LITHUANIAN ECONOMY: IDENTIFICATION RULES AND FEATURES

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This article is focussed on the problem of economic-statistical calculations and includes an economic-statistical research of economic fluctuations. The author also discusses the rules for statistical identification of economic welfare, economic development features of Lithuania after it became a member of the European Union. The notion of specific economic indicators, their classification issues, and the role and place of economic indicators presenting a systemic view of the country's economy through identification of economic activities and their development are also discussed.

The article deals also with the methodologies based on various statistical methods and offers a methodology for revealing the components of economic fluctuations. A common notion is that the methodologies using analytical time series smoothed with the least squares method for revealing economic fluctuation components are best. The author proposes a methodology for calculating and evaluating the components of economic fluctuations, based on gross domestic product data.

Introduction

Economic state and public conditions are usually identified as a country's welfare. Therefore, short-term economic trends, the current situation and the evaluation of the factors that determine it are always very relevant topics. These topic have been analysed from different angles by many authors, such as Aguiar, Gopinath (2004), Levine Stephan D., Krehbiel, Berenson (2005), Daniel, Terrell (1992), Kedaitis (1999), Rinne (1994), Wonnacott, Wonnacott (1994), Blanchard (2007), Blaug (1985, 1986), Debreu (1986), Martinkus, Zilinskas (2001), Friedman (1966), Gary, Hansen (2002), Jay (1980), Mankiw, Romer, Weil (1992), Snieska, Baumiliene, Bernatonyte (2001), Mendoza (1991), Bordo (2008) and a plethora of others. In the researches of these authors, we will find various methodical and methodological approaches which are used for economic cyclicality research. Nevertheless, a more rational methodology , which could be used to assess the economic fluctuations' peculiarities of interrelated numbers, a kind of integrated system language are missing. Systemic views in assessing or calculating concrete objects which reflect the situation and perspective of a certain country is also rather poor. The

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assessment is limited to the statement that during the last quarter of 2011 Lithuania's statistical data show the change in economic growth direction in which the economy moves into the growth stage. Nevertheless, today Lithuania is experiencing the effects of the political-economic decisions made at the beginning of the last decade of the last century. The current Lithuanian situation is characterized by a stratified society, division between the wealthy minority and the poor majority. For this reason, the country's social, cultural, moral and demographic situation is deteriorating. Despite this distinctive pessimism, Lithuania's economy is potentially getting closer to the change in trends. Nevertheless, the reliability of similar research is questionable, at least in some respects: the optimal statistical identification method was selected for these evaluations; therefore, the question arises whether the methodical side of calculations is optimal and provides reliable and optimal data for evaluation.

In this research, we will mostly focus on the last of the below mentioned historical development stages of Lithuania's economic-statistics practice and theory:

- 1918 02 16–1939 08 31. Formation of the national statistics, accumulation and adaptation of the experience of other countries to the Lithuanian conditions.
- 1939 08 31–1990 03 11. Isolation from the world's economic thought, the period of experiencing international statistics. The period of Soviet methodology of economic statistics.
- 1990 03 11–2004 05 01. The period of recovering the lost values. Adaptation of recommendations of international institutions and experiences of other countries in Lithuania. This is a period of using the advanced thought of economic statistics.
- 2004 05 01 – present. The period of converging statistical practices of Lithuania and other European Union countries and the further development of common economic statistics theory and practice.

The author will give priority to the explanation of the country's economic cycle consistent with the realities of the country, which is presented in the book "Ūkio statistika (Teorijos ir praktikos apybraižos)" ("Economic statistics. Essays in theory and practice") (1995):

- economic cycle is reflected by certain economic fluctuations observed in the overall economy of the country, when the economic activities are based on profit-based companies;
- economic cycle classification by periods: the economic expansion period, which is similar for all economic activities, and the economic recession period, which later develops into the economic expansion period of a next economic cycle;
- the course of these events is repetitive, but not periodical;
- the length of an economic cycle can fluctuate from one to twelve years;
- economic cycle cannot be divided into similar but shorter cycles whose the amplitude would be the same as of the main cycle (p. 65–66).

The aim of this research is to determine the way to statistically identify the components of economic fluctuations and to formulate the methodology of economic-statistical calculations.

The study object: components of economic fluctuations.

The study sources: analysis of scientific statistics and economic statistics literature, publications of the Lithuanian Department of Statistics and estimates of the country's gross domestic product.

The research methods: data collection, comparison, grouping, aggregation and other quantitative and specific economic-statistics methods.

The study results and practical significance comprise not only the discussed ways of identifying economic fluctuation components, but also the methodology for their numerical identification, their optimality which was tested using calculations on the experimental level.

Notions for statistical identification of economic welfare

The term "identification" includes a wide range of considerations. In the context of economic-statistical calculations and economic welfare assessment, "statistical identification" is more important than "identification". Nevertheless, to identify [Latin *identificare*] means to acknowledge, determine the same, establish the equivalence.

The authors of the book "Ūkio statistika (Teorijos ir praktikos apybraižos)" (1995) state that statistical identification is perceived as formulation of statistical definitions which allow to identify an economic phenomenon or a process (p. 8). Therefore, the concepts of most of the social sciences have to be concretized and adapted in order to numerically describe and investigate a particular economic phenomenon or process. Concretized notions become economic-statistical indicators.

According to Rinne (1994), economic-statistical indicators used to describe the economic activity are called economic indicators. They can be classified according to various features. The main classification feature is the indicators' classification based on their complexity. In dependence on this feature, economic indicators are classified into simple and general. General indicators are synthetic and assess the overall economic situation in a country. The class of general indicators is integrated. Combinations of simple indicators are attributed to this class.

Simple indicators are used to explain a separate economic phenomenon, its parts or independent components which describe the aims of economic policy and the ways of achieving them.

The above notions are general and may be adapted to various economic-statistical calculations, such as numerical description of a country's economic welfare. The main calculation premise in this description might be that the gross domestic product is an optimal indicator which provides a synthetic view of the economy. Historical gross

domestic data are an informational database which enables to thoroughly describe an economic development stage. The characteristics, features, contents and views of these development stages in Lithuania's economic-statistical practice and theory confirm them and relate to the overall context – features of the country's economic development. In its stages, and especially in the last stage when Lithuania became a member of the European Union, the notions of economic state and the statistical identification of its growth were formed. We will also assume that the indicators provided below can be attributed to these notions and will be sufficient for the statistical identification of the main economic features. Their main calculation notions are as follows:

- Gross Domestic Product (GDP) – an indicator which shows the economic development level of a certain territory. Gross Domestic Product and value added are calculated using the production method of the Lithuanian Department of Statistics, which corresponds to the requirements of the European System of Integrated Economic Accounts (ESA). The Department of Statistics calculates GDP data using the following formula: GDP = gross added value + taxes on products – subsidies on products. Gross added value is calculated by adding up added values created in separate economic sectors: gross added value = $AV_1 + AV_2 + ... + AV_{16}$.

This research uses added values created in the following economic sectors: manufacturing, wholesale and retail trade repair of motor vehicles, motorcycles, and personal and household goods sector, transport, storage and communication sector, real estate, renting and other business sectors, construction sector.

In order to evaluate the gross domestic product and its dynamics the author of this article used data from the EUROSTAT, Lithuanian statistics, financial and other institutions, periodicals. The author also used the material of conferences and symposiums, electronic references. The data and other information sources were used for evaluation of the following indicators:

- growth of Gross Domestic Product / chain-linked volume growth (%). It is the growth rate of sums of all final goods and services produced in a certain period and calculated using base year (comparable) prices;
- the average yearly change in the harmonized index of consumer prices (%) (HICP). It is a Laspeyres type "consumer inflation" index which methodologically corresponds to the indexes used by other EU countries. This index shows an average price change, while keeping constant household consumption expenditure's structure of the base year and consumer population composition. HICP shows the price change of goods that are most popular in the EU countries, while the consumer price index shows the price change of the goods most popular in our country;
- the average yearly change in consumer price index (%). It is the main inflationary indicator; its aim is to evaluate the average overall consumer price change and to estimate the price change trend in the country;

- unemployment rate (%). It is the economic indicator showing the fraction of the labour force that is not occupied; a ratio (%) of all residents who can and want to work but have no job to all employable residents (workforce);
- budget deficit / surplus. It is a difference between the State's expenditures and revenues; when expenditures are greater than revenues, it is a budget deficit, and when the State's revenues are greater than expenditures, it is a budget surplus;
- gross Domestic Product per capita, expressed in purchasing power parity. Purchasing power parity is a collective artificial currency unit used in order to eliminate price level differences among the European Union countries. Economic aggregates are expressed in purchasing power parity and obtained by dividing their initial value in national currency units from the corresponding purchasing power parity.

Nevertheless, statistical identification is inseparable from its methods and procedures. Statistical identification is a specific process in which statistical methods are important. However, using only statistical methods for the evaluation of economic-statistical country's welfare would not be sufficient. Statistical methods are, and must be, a content element of the statistical identification of welfare in its broader sense. According to Schlittgen (1993), Scharnbacher (1994), Cekanavicius, Murauskas (2000), Rinne (1994), Levine, Stephan, Krehbiel, Berenson (2005), Harding Pagan (2006), Francis (1993), Martisius, Vaiciunas. (2001) and others, effective results of economic-statistical calculations are possible when combining various methods. Similar views are also expressed in the literature analysing the problematic of economic activities of companies and other micro-objects (e.g., Mackevicius, 2005). We should also consider the matters that are important for the economic and tactical reflection of the country's welfare, its perspectives and other social-economic phenomena. One of statistical identification results is the nature of relation among economic-statistical indicators. Even though this is an important aspect, economic-statistical indicators can also be explained through their calculation consistency. This consistency is explained in Fig. 1.

Consistency of economic-statistical calculations presented in Fig. 1 is only a generalized view which shows the diverse interaction of statistical and other methods. Undoubtedly, the "beginning of all beginnings" is the statistical identification whether it is a particular macroeconomic or microeconomic phenomenon, economic-statistical calculations in a particular sphere of economic activities or a micro-object. Once the indicators are determined, data acquisition methods should follow, together with data precision and reliability, reporting procedures, analysis and modelling.

Statistical identification procedures become important in the context of data reliability, more than what is entered into a specific category. Finally, when the notion for calculating the indicator is defined, its calculation method should be chosen, the, indicator components must be identified, the ways of obtaining the needed data for

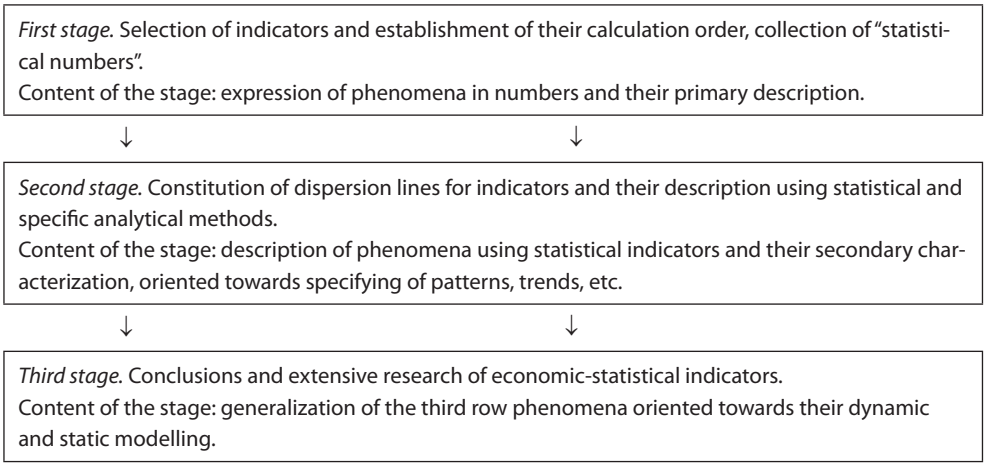

FIG. 1. **Stages of economic-statistical calculations**

calculations must be outlined, etc. These steps are important for the economic-statistical evaluation of the country's welfare. Nevertheless, based on the notion that the current calculations of the basic economic indicator – gross domestic product – used in statistical practice are favourable for the reliability of economic-statistical calculations performed on its basis, we can define the possible courses of analysis. Two main directions emerge: assessment of the overall situation and assessment of the situation in the context of economic fluctuations.

Economic development features of Lithuania after joining the European Union

The author presents the dynamics of the main macroeconomic indicators in Table 1 which describes Lithuania's economic state after joining the European Union.

TABLE 1. **Lithuania's main macroeconomic indicators, 2005–2010**

Indicator, in billion Euro	2005	2006	2007	2008	2009	2010
Nominal gross domestic product	20.9	23.9	28.4	32.3	26.5	27.4
Foreign direct investment	6.9	8.4	10.3	9.1	9.6	10.1
Export	9.5	11.3	12.5	16.1	11.8	15.7
Import	12.4	15.4	17.8	21.0	13.1	17.6

Table 1 shows that the macroeconomic indicators grew together with Lithuania's economy until the end of 2008, starting with 2009 the nominal gross domestic product, export and import shrunk. When comparing the year 2010 with 2009, we see a recovery of the economy, since the nominal gross domestic product grew together with the foreign direct investment, export and import. The data presented in Table 1 imply that the

country's economic welfare grew until the end of 2008, since its gross domestic product, export and import grew.

The starting point of Lithuania's new economic growth period is related to the membership in the European Union. According to the data of the Lithuanian Department of Statistics, the growth of the gross domestic product in the national currency in 2005 amounted to 14.9%. The highest growth of created value added was recorded in the sectors of manufacturing (1,736 million Lt, 14.7%), real estate, rent and other business activities (1.523 million Lt, 25.6%), wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods (1,353 million Lt, 13.6%), transport, storage and communication – (1,084 million Lt, 15.1%).

The gross domestic product grew by 10,732 million Lt (14.89%) in 2006 and reached 82,792.80 million Lt. The highest growth of created value added was recorded in the sectors of construction (1,637 million Lt, 33.3%), real estate, rent and other business activities (1,584 million Lt, 21.2%), manufacturing (1,420 million Lt, 10.5%). Nevertheless, private households created a less value added than in the previous years. The value added of this economic activity decreased by 21 million Lt. (19.9%).

In 2007, the gross domestic product reached 98,138.72 million Lt, and as compared with 2006 its growth amounted to 15.346 million Lt (18.5%). The following sectors, like in 2006, grew most rapidly: construction – 2.438 million Lt (37.2%), wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods sector's growth amounted to 2.172 million Lt. (17.4%), transport, storage and communication grew by 1.923 million Lt. (20.2%), manufacturing grew by 1.698 million Lt. (11.3%), real estate, rent and other business activity grew by 1,435 million Lt. (15.9%).

The gross domestic product in 2008 grew by 13,344 million Lt. (11.97%) and amounted to 111,482 million Lt. The highest growth of created value added was recorded in the sectors of real estate, rent and other business activity (2,878 million Lt, 2.5%), wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods sector's (2,405 million Lt, 14.8%). However, the added value created by the agriculture, hunting and forestry sector declined by 228 million Lt. (6.3%).

The gross domestic product in 2009 shrunk by 19,957 million Lt (17.9%) and amounted to 91,525 million Lt. The highest growth of created value added was recorded only in the field of education (382 million Lt), whereas the added value in all other sectors shrunk: in construction by 4,608 million Lt. (87.3%), manufacturing by 4,580 million Lt. (33.9%), wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods sectors by 3,163 million Lt. (22.7%), real estate, rent and other business activities by 1,601 million Lt (13.6%), and financial intermediation by 1,429 million Lt (76.9%).

Lithuania's gross domestic product in 2010 started to recover and grew to 95,074 million Lt. Its gross domestic product per capita amounted to 28,926 million Lt. or by 1,402

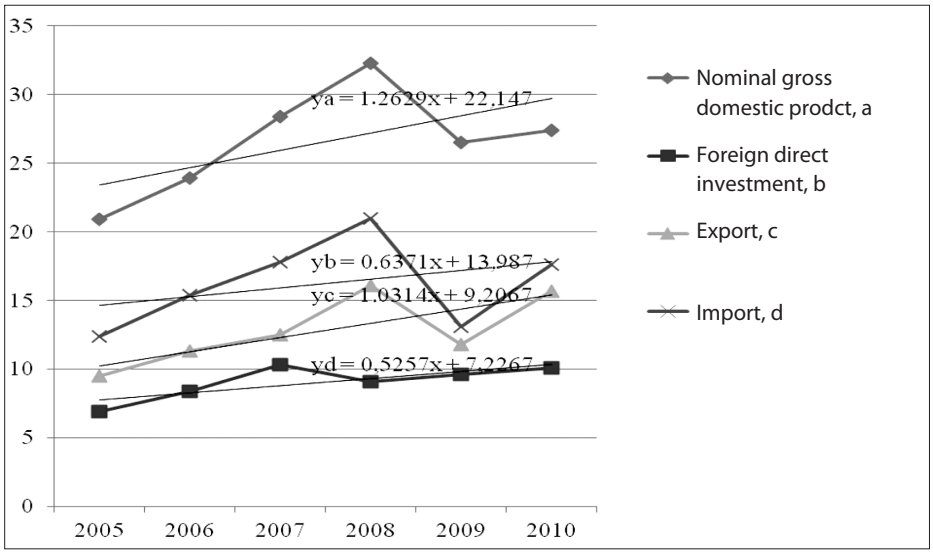

FIG. 2. **Trend of macroeconomic indicators in Lithuania, 2005–2010**

million Lt. more than in 2009. The highest growth of created value added was recorded in mining and quarrying – 327.7 million Lt (10 %), manufacturing – 16024.5 million Lt (9.9 %), financial intermediation – 2027.5 million Lt (8.4 %), and transport and storage – 9953.3 million Lt (7.2 %). A decline was noted in other economic sectors: construction – 396.4 Lt (7.3%), information and relations – 244.2 Lt (7.3%), real estate, rent and other business activity – 524.7 Lt (8.5%).

The year 2010 can be perceived as a breaking year in Lithuania's economic development. The author would like to stress one of the macroeconomic indicators mentioned in Table 4 – the gross domestic product. Nevertheless, the trend of the indicators could be evaluated as is shown in Fig. 2.

The year 2008 was exceptional during this period. The analysis of gross added value by industry for the period 2008–2009 has shown, that growth (million Lt) was recorded only in the sectors of education – 382 million Lt. (7.9%), electricity, gas and water supply – 132 million Lt (4.3%), healthcare and social work – 94 million Lt (2.9%). Value added in all other sectors declined: in construction – by 4,608 million Lt (46.6%), manufacturing – 4,580 million Lt (25.3%), wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods – 3,163 million Lt (18.5%), real estate, rent and other business activities – 1,601 million Lt (12.0%), agriculture, hunting and forestry – 937 million Lt (25.7%), transport, storage and communications – 806 million Lt (6.6%). Five economic sectors were most important: transport, storage and communication; real estate, rent and other business activities; trade, hotels and restaurants; construction; and other economic activities. Value added created by these sectors in 2008 had a greatest comparative weight in Lithuania's gross domestic product (see Fig. 3.).

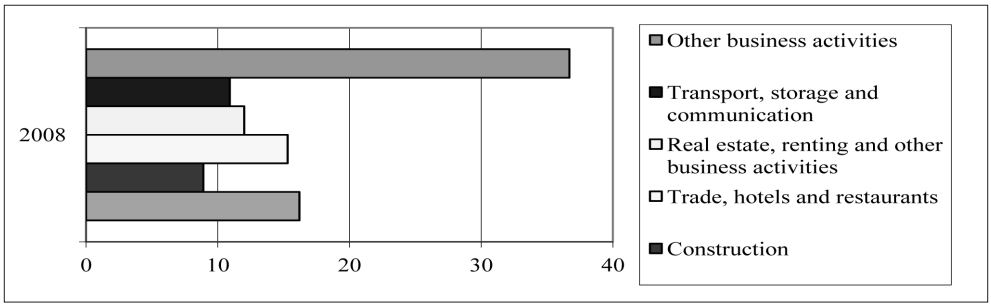

FIG. 3. **Comparative weigh of economic sectors in 2008 (% of GDP)**

The year 2008 brought a rapid grow in inflation, which almost doubled as compared with 2007.

Data in Fig. 4 show that the consumer price index decreased by 0.3% in December 2009, since the second half of that year was dominated by a deflationary trend. This trend was reversed only briefly in September, after the value added tax was increased from 19% to 21% and the cigarette excise tax augmented. Foreign direct investment also slightly decreased in 2008, whereas the unemployment level increased. Nevertheless, the change in the level of direct foreign investment and unemployment in 2008 had no great influence on Lithuania's business conditions. However, the rapid growth in inflationary pressures during the first quarter of 2008 became an important negative factor in the country's economic development.

Conclusively, the above data show that Lithuania's gross domestic product fell in the fourth quarter of 2008, inflation increased together with the price level due to a higher excise burden, but foreign trade augmented. Even though Lithuania's economy did not yet reach its pre-crisis level, it rebounded well. During the mentioned, period gross domestic product adjusted to inflation grew by 53%. Lithuania experienced a robust economic development during the period 2001–2007. During this period, the country's economy grew at an average rate of 8% per year.

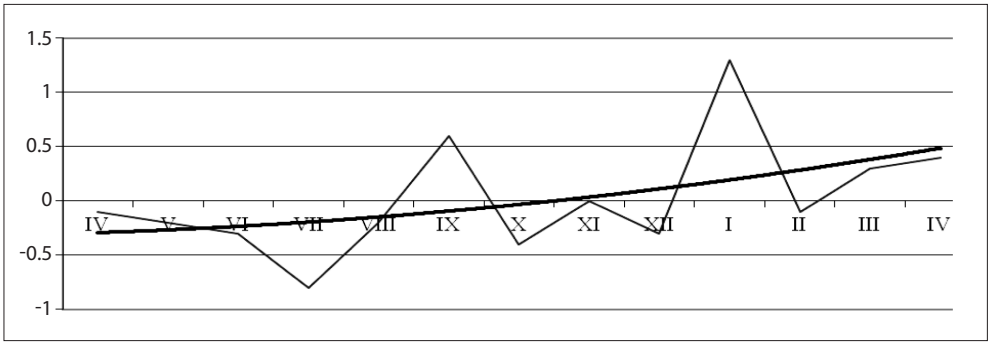

FIG. 4. **Monthly changes in harmonized index of consumer prices, compared with previous period**

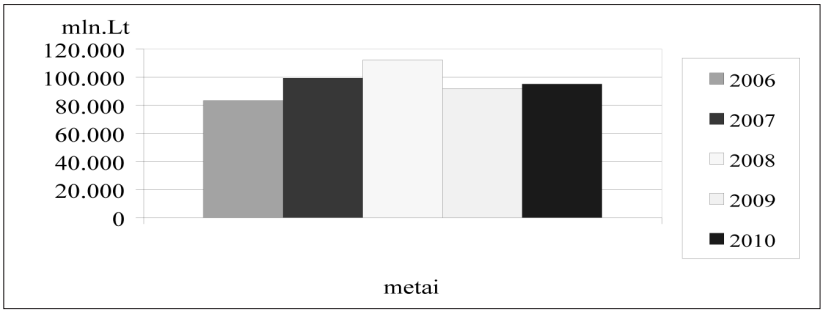

FIG. 5. **Lithuania's gross domestic product, 2006–2010**

As one can see in Fig. 5, Lithuania's gross domestic product is inclined to grow. During the period 2006–2010, it increased by 2961.75 million Lt. on average per year, i.e. by 3.38%. In this context, the year 2008 could be distinguished, since this year the gross domestic product of the country started to decline and rebounded to the positive trend only in 2010. The Lithuanian economy started to grow again due to the recovering demand from the European Union and the Commonwealth of Independent States.

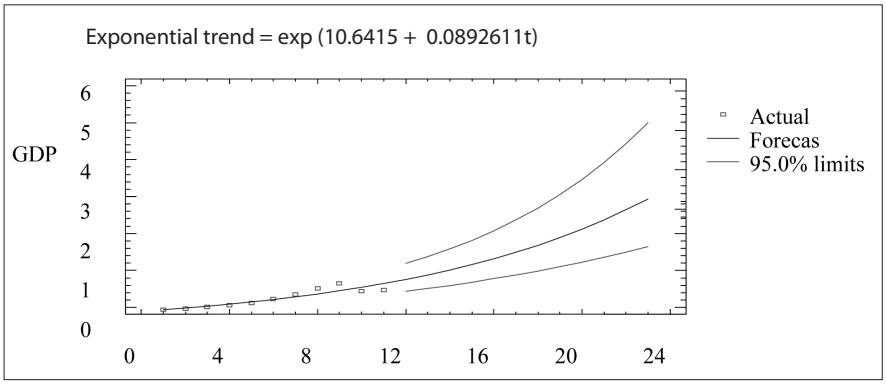

FIG. 6. **Dynamics of Lithuania's gross domestic product, 2000–2010**

In Table 2, the main modules sufficient for the description of development trends of Lithuania's gross domestic product during the period 2000–2010 are presented.

TABLE 2. **Main trends of Lithuania's gross domestic product, 2000–2010**

Main development trend	Mean absolute error, %
Linear = 36440.1 + 6371.98 t	7.75594
Quadratic = 30915.1 + 8921.97 t ± 212.499 t^2	8.51788
Exponential = exp (10.6415 + 0.0892611 t)	7.46298
S-curve = exp (11.4215 ± 0.890427 /t)	17.5758

Data presented in table 2 show that the trend of Lithuania's gross domestic product can be described using a first-degree polynomial and an exponent. The most rational approach is an exponential trend, since its mean absolute error is the lowest, showing the functions' optimality. Based on this assumption, we can forecast that Lithuania's gross domestic product in the upcoming years will be described by values presented in Table 3.

TABLE 3. **Forecast of Lithuania's gross domestic product (model: Exponential trend = exp (10.6415 + + 0.0892611t)**

Period	Forecast	95% confidence interval of the difference	
		Lower boundary	Upper boundary
2012	122102	91598.6	162764
2013	133502	98982.1	180062
2014	145967	106826	199449
2015	159595	115165	221168

These calculations are based on the known trends and processes of the time and disregard the dynamics of this field. Currently, we have a unique situation when today's exports exceed the volume of exports before crisis. Nevertheless, this fact does not allow much optimism. It can be a reflection of the Lithuania's struggle to attract the streams of wanted and ambitious foreign direct investment. There is a plethora of reasons: the lack of qualified and economically active residents, interpretation dynamics of rational economic policies, corruption, emigration trends, etc. Emigration processes and the trends of natural growth rate might be the reasons for the rapidly decreasing number of economically active residents. The search for work abroad is stimulated by worsening expectations and salary differences: the average salary in Lithuania is almost seven times lower than in the richest EU countries.

Gross domestic product and components of economic fluctuations

For this research, the author makes an assumption that gross domestic product is the totality of economic fluctuation components, the totality of long-term, seasonal, cyclical and irregular fluctuations. The origins of rational calculations in support of this assumption are presented in Fig. 7.

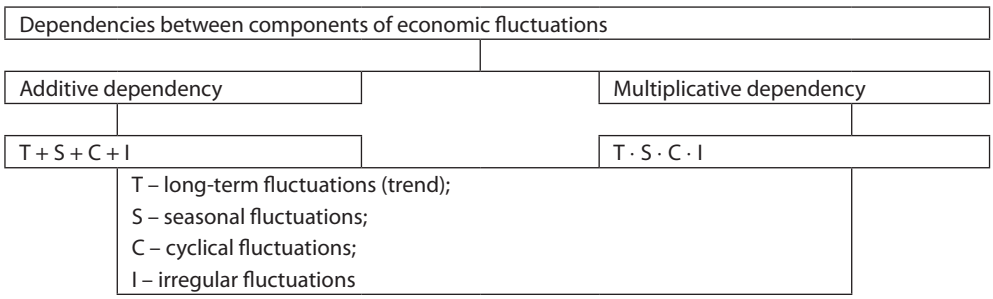

FIG. 7. **Components of economic fluctuations and their dependencies**

Such authors as Kucinskas (2011), Kedaitis (1999), Estrella (2007), Daniel, Terrell (1993), Levine, Stephan, Krehbiel, Berenson (2005), Harding, Pagan (2006), Martisius, Kedaitis (2010) and others, formulate somewhat different provisions. Nevertheless, information presented in Fig. 7 could be perceived as a basis for the methodologies used for a numerical identification of economic fluctuation components. The author perceives this methodology as rational and useful and offers a possible identification methodology of economic fluctuation components in Fig. 8. Six calculation stages are highlighted in this figure:

1. Calculation of long-term fluctuations.
2. Calculation of cyclicality coefficients.
3. Calculations of seasonally adjusted indexes.
4. Calculation of cyclical and irregular fluctuations.
5. Calculation of cyclical fluctuations.
6. Calculation of irregular fluctuations.

More complicated are the later stages of calculation. Their thorough content is as follows: firstly, the gross domestic product is adjusted by seasonally adjusted indexes.

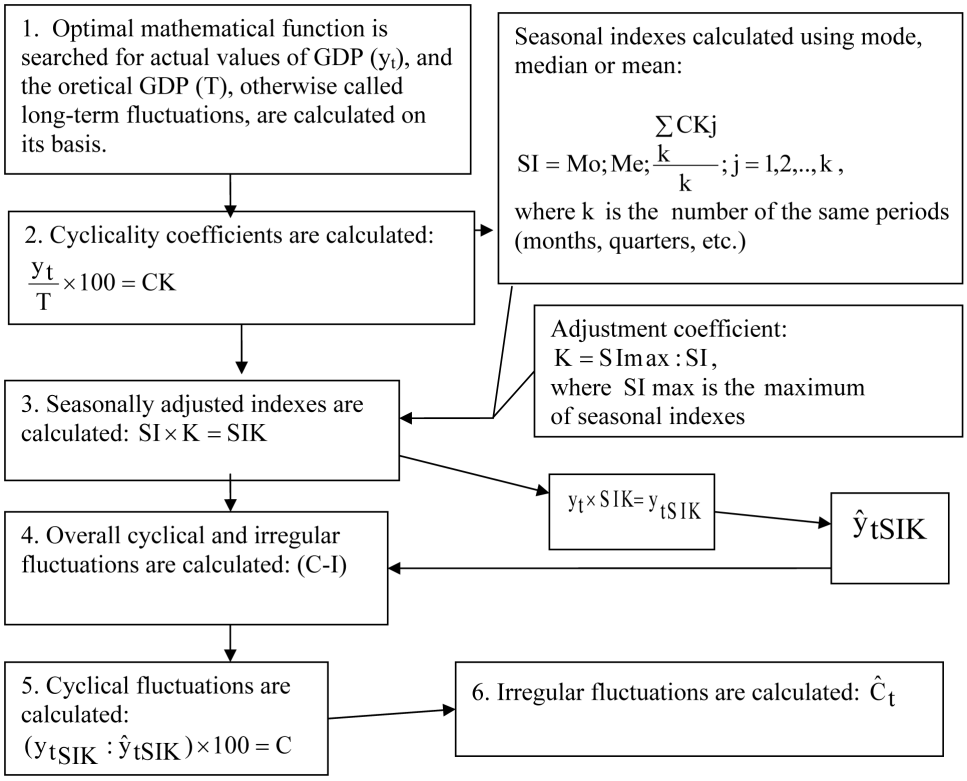

FIG. 8. **Research of economic fluctuation components using analytical smoothing technique**

Later, the author describes the adjusted data using the optimal mathematical function and calculates the theoretical numbers – an overall cyclical and irregular fluctuation. Then, the seasonally adjusted gross domestic product is divided by this indicator, and an indicator showing cyclical fluctuations is obtained. These fluctuations are described by an optimal mathematical function, at the base of which irregular fluctuations are calculated.

Two main methodology features are seen from the information presented above:

- The research of economic cycle components is performed using analytical smoothing and the least squares method.
- Selection of an optimal mathematical function for calculation stages of the main economic cycle components.

These features of the methodology at hand are closely related, since the least square method was also used for selecting the type of mathematical function. It is essential for the function to be optimal on the basis of certain criteria. Selection of the optimal function using the least square method is natural. In Levine, Stephan, Krehbiel, Berenson (2005), Daniel, Terrell (1992), Martisius, Kedaitis (2010), Rinne (1994), Schlittgen (1993) and in many other publications we will find a theory of statistical conclusions, inferential statistics, which makes it easier to discuss the decisions in this context. The following solution is proposed in the book "Ūkio statistika (Teorijos ir praktikos apybraižos)" (1995): "the function that reflects the trend of the analysed process best must be determined when there are many functions. In order to obtain the answer to this question, we need to calculate the mean absolute error (%), the standard mean error (%), the root-mean-square deviation and the sum of squares" (p. 82). The minimum of these statistics will be the criterion of the optimal function. In this case, the following statements are helpful in selecting the type of the function, the direction and content of calculations:

- F test: if the actual value (F) of the Fischer criterion is lower than the critical value for the selected confidence interval α (F_α; sufficient results are obtained in research of economic fluctuation components with $\alpha = 0.05$, degrees of freedom $k_1 = -1$ and $k_2 = N - m$, where m is the number of equation parameters and N is the length of the time series), in other words, $F < F_\alpha$, then the correct function is selected;
- A first-degree polynomial is selected: $\hat{y}_t = a + bt$, where a and b are the equation parameters and t is time. Then the equation parameters are calculated, and the hypothesis is tested:

  H_0: the increase in the degree of the polynomial causes the residual variance to decrease, but this decrease is statistically insignificant;

  H_1: the increase in the degree of the polynomial causes the residual variance to decrease, and this decrease is statistically significant.

The hypothesis is tested using the F test and comparing the values of residual variances. H_0 is accepted, if $F < F_{\alpha}$, where F is the ratio of residual variances: $\sigma^2_{\text{linear residual}}$: $\sigma^2_{\text{parabola residual}}$; o $F_{\alpha} = F_{\alpha,\text{ linear}}$: $F_{\alpha,\text{ parabola}}$. In the other case, H_0 is accepted, if $\sigma^2_{\text{linear residual}} < \sigma^2_{\text{parabola residual}}$.

The calculations were performed using the proposed methodology of calculating economic fluctuation components and data of Table 1 (constant prices, million Lt).

TABLE 4. **Lithuania's gross domestic product, million Lt**

I quarter	II quarter	III quarter	IV quarter
5286	5928	6738	6151
5427	5989	7262	6560
5649	6492	7708	7226
6129	7142	8024	7164
6032	7000	7496	6823
6366	6999	7936	7086
6588	7463	8353	7647

Calculations were performed using STATGRAPHICS Ceturion XVI software. The following analytical expression of gross domestic product quarterly change is obtained while taking into account the mean absolute error: $\hat{y}_t = 5726.28 + 100.4727t - 1.356457t^2$; in other words, the gross domestic product increased each quarter by 100.4727 million Lt at the decreasing pace – 1.356457 million Lt. This trend function is the basis for calculating the long-term fluctuation. Data in Table 5 have been obtained by the above calculations.

TABLE 5. **Theoretical levels of Lithuania's gross domestic product, million Lt.**

I quarter	II quarter	III quarter	IV quarter
5825	5922	6015	6106
6195	6280	6363	6443
6521	6595	6667	6737
6803	6867	6923	6986
7042	7095	7145	7193
7238	7280	7320	7356
7390	7421	7450	7476

Table 5 reflects long-term economic fluctuations. The authors of the book "Ūkio statistika (Teorijos ir praktikos apybraižos)" (1995) state that long-term economic fluctuations or trend reflect what was consistent during the study period (p. 66). In other words, this type of economic fluctuations reflects long-term and consistent changes in economic activities.

Calculation results are presented below in Table 6. Calculations were performed using the discussed methodology and Table 4 data.

TABLE 6. **Seasonal, cyclical and irregular economic fluctuations, %**

Components of economic fluctuations	I quarter	II quarter	III quarter	IV quarter
Seasonal fluctuations	88.26	99.04	111.87	100.83
Cyclical fluctuations	100.81	101.95	121.70	96.55
	72.95	89.03	120.68	97.49
	73.04	93.74	125.21	105.46
	78.07	101.83	128.97	103.59
	76.23	99.12	119.75	98.13
	80.06	98.67	126.27	101.53
	82.57	104.90	132.53	109.29
Irregular fluctuations	102.25	101.4	100.65	99.98
	99.4	98.92	98.52	98.22
	98.01	97.89	97.86	97.92
	98.07	98.31	98.64	99.07
	99.58	100.19	100.89	101.68
	102.55	103.52	104.88	105.74
	106.98	108.31	109.74	111.25

The content of seasonal, cyclical and irregular economic fluctuations' data presented in Table 6 in the context of proposed methodology would be:

- seasonal fluctuations result from seasonal time changes, various national or religious holidays, customs;
- irregular fluctuations are unforeseen changes in economic fluctuations, which result from different changes of the atmosphere, new technological discoveries or political events;
- cyclical fluctuations are long-term and irregular economic fluctuations. They are caused by factors formed in the country's economy, internal factors of the economy, which are part of the common economic life in the country (Ūkio statistika (Teorijos ir praktikos apybraižos), 1995, p. 66).

Data in Tables 5 and 6 confirm the vitality of the discussed methodology in the statistical identification of economic fluctuation components. They offer a more precise view than dves classical research of economic fluctuation components composed using the moving average methodology, in comparison to methodologies using partial content cases of fluctuation components' connections. Nevertheless, it is not unconditional for the presented calculations and methods. This methodology is a provisory but often sufficient way to perform calculations. Economic fluctuations, causes creating them, their interrelations are diverse and their thorough identification is a task of a different type.

Conclusions

- Economic state and public conditions are usually identified as a country's welfare components. Gross domestic product is one of the indicators of the economic

development in a territory. These economic indicators are used to reflect what is not visible from the "outside". Nevertheless, economic indicators are also used to identify the factors forming the components of economic fluctuations. The optimal set of economic indicators and a rational analysis methodology are a way to identify different economic fluctuations and to make their predictions. In the list of these indicators, besides the gross domestic product, there is a space for indicators such as the growth of gross domestic product / chain-linked volume growth, the change in the harmonized index of consumer prices, the change in the index of consumer prices, the level of unemployment, budget deficit / surplus, and gross domestic product per capita expressed in purchasing power standards.

- During the period 2006–2010, Lithuania's gross domestic product on average grew by 2961.75 million Lt per year, which amounts to 3.38%. Starting from 2008, the country's gross domestic product started to decrease, and Lithuania's economy started to recover only in 2010 due to the recovered demand from the European Union and the Commonwealth of Independent States. The unique factor currently is that Lithuania's exports exceed the volume of exports before the crisis.
- A Rational methodology of the identification of economic fluctuation components is the methodology that which includes calculations of long-term fluctuations, cyclical factors, seasonally adjusted indexes, common cyclical and irregular fluctuations, cyclical fluctuations and irregular fluctuations. This methodology is valuable, since the benefit of understanding this multiform phenomenon and development of its components cannot be seen outright. This methodology has two distinctive features: the research of economic cycle components is performed using the analytical smoothing technique, the last-squares method and the selection of an optimal mathematical function in the main stages of naming the economic cycle components. It offers a more precise view than the classical research of economic fluctuation components composed using the moving average methodology, in comparison to the methodologies that use partial content cases of fluctuation components' connections. This methodology is a provisory but often sufficient way to perform calculations. Economic fluctuations, factors creating them, their interrelations are diverse, and their thorough identification is a task of a different type.
- The research based on the proposed methodology of numerical identification of economic fluctuation components has shown that there have been no dramatic changes in the economic fluctuation components and their effect on the dynamics of the country's gross domestic product. The only significant change was an increase in the seasonal influence.

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