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RESEARCH OF DYNAMICS AND FORECASTING THE BUDGET INCOMES FROM EXCISE TAXATION: THE UKRAINE EXPERIENCE

ABSTRACT

The purpose of the article is to determine the priority methods of forecasting the number of tax revenues from excise taxation as a source of formation of budgetary resources, taking into account the patterns of their dynamics. A methodical approach of determining the general patterns of the dynamics of the number of tax revenues from the collection of excise taxes to the budget of Ukraine has been developed. On the basis of this approach, it was established that the formalized description of the patterns of dynamics of tax revenues from the collection of excise taxes to the budget of Ukraine has significant differences depending on the scale of measurements. The usage of time series to forecast the number of tax revenues from the collection of excise taxes is also not appropriate due to their anti-persistence and fractal similarity. The study of the uncertainty of the dynamics of tax revenues from the collection of excise taxes makes it possible to predict the onset of periods of crisis reduction, with high convergence of results, regardless of the scale of measurement.

Parametric forecasting of the number of tax revenues from the excise tax to the budget of Ukraine is carried out by taking into account the inertia of the dynamics of factors of influence, confirmation of causality between factors of influence, factors of influence and forecast indicators, determination of lag of causality, research of persistence of dynamics of the factors of influence. Due to the anti-persistence of the dynamics of some of the factors of influence, the forecasting of the number of tax revenues from the collection of excise tax was carried out using a set of parametric and scenario models. The results of forecasting the number of tax revenues from the excise tax on goods produced in Ukraine were lower than the official forecast by 10-12%. The results of forecasting the number of tax revenues from the collection of excise tax on goods imported to the territory of Ukraine coincided with the official forecast.

Keywords: tax revenues, excise tax, budget resources, patterns of dynamics, entropy, parametric forecasting, scenario forecasting

JEL Classification: G17, H21; H24; H29

INTRODUCTION

Excise taxes (both specific and universal) are one of the most important sources of budget resources, which contribute to the financial stability of the budget system [1], the development of finances of local communities, and improving the welfare of the population [2; 3], achieving socio-economic goals of society. Thus, the share of universal excise tax in the formation of all revenues of the Consolidated Budget of Ukraine (excluding transfers) for the period 2011-2021 ranges from 27.37% (in 2015) to 54.25% (in 2021) with an average value of 32.35%. The forecasting itself of the number of tax revenues in general as the main source of budget resources and the number of revenues from the excise tax, in particular, is an important task of public financial administration. Thus, determining the prospective amount of tax revenues is part of the group of forecasting tasks of the State Fiscal Service of Ukraine, the Ministry of Finance of Ukraine [4], and the Office of Financial and Economic Analysis in the Verkhovna Rada of Ukraine. However, the reliability of the obtained forecasts is usually low. Often the reasons for the incomplete adequacy of the received forecasts of the number of actual tax revenues are specific patterns of dynamics. Therefore, the study of the patterns of dynamics of

tax revenues from excise taxation should precede their reliable forecasting. Given that both rates and the list of excisable goods may change, expand the problem of forecasting the amount of revenue is given considerable attention.

LITERATURE REVIEW

The problem of adequate forecasting of the number of tax revenues to state funds of financial resources arises in many scientific and applied studies. In particular, revenue forecasting is the subject of applied activities of the Ministry of Finance or fiscal services in many countries around the world. Methods used to obtain official forecasts of tax revenues include extrapolation, temporal dynamic models and their various combinations, micro simulation models, regression models, expert ones, etc. [5, p. 5-6, 20]. There is even an IMF recommendation on time horizons and the desired reliability of the forecast (deviation should be 3-5%) of tax revenues [6]. However, post factum, the prediction error is almost always more significant than expected by the methods. Significant institutional changes in society or certain significant destructive influences (such as the COVID-19 pandemic or military action), the influence measure of which cannot be determined by tax revenues, are often the reason for the inconsistency of forecasts.

Regarding the forecasting of the volume of excise tax revenues in Ukraine, there is also an appropriate methodology, which is based on the parametric dependences on a set of factors of the volume of revenues. Usually, the normatively approved methods of forecasting the number of tax revenues determine narrow parametric dependences on nominal and real tax rates, changes in benefits, dynamics and conjuncture of the domestic market, dynamics and conditions of additional gross value, gross accumulation of equity [7]. In particular, this methodology takes into account the current value of excise tax rates and their potential growth.

According to the results of scientific research, various regression models or their combinations are most often used to forecast the number of tax revenues. The study [8] determines the relationship between the rates of customs duties and the number of revenues from them and proves that reducing rates does not lead to an increase in commodity circulation, but only reduces the fiscal value of tax revenues. Also, it is noted that the increase in excise tax rates does not lead to an increase in revenues, but rather causes a decrease in their physical consumption [9; 10, p. 20]. Accordingly, the change in excise rates on certain groups of goods has not so much fiscal influence but regulates consumption. Also, the change in rates is determined by government institutions, which makes it incorrect to use these rates in modeling revenue.

One of the important points of parametric forecasting of the number of tax revenues is the selection of factors that determine them. The list of such factors, in particular, includes [11, p. 681-682]: GDP production, inflation growth, number of businesses, exports and imports volume, the hryvnia exchange rate to the US dollar and the euro, the share of tax payments in the structure of household expenditures, the money supply in the economy, etc. These factors characterize the state of the economy as a whole, so some of the instrumental shortcomings in their use do not arise. However, confirming the existence of causal links between these factors and determining their duration is a prerequisite for building an adequate forecast of tax revenues. It is the erroneous definition of causality or its absence in general that most negatively affects the adequacy of forecasts of tax revenues.

Preliminary historical data are also used for forecasting. However, temporal forecasts contain the biggest errors. Trying to avoid these errors, E. Sabaj and M. Kahveci [12] combine partial forecasts of the volume of tax revenues to the budget of Albania based on various means and regression for previous periods of recession. To predict the volume of tax revenues to the budget of Pakistan [13], time series based on quarterly data are also used, approximating them using autoregressive sliding and vector autoregression. To improve the reliability of forecasting tax revenues using the time series decomposition method, the resulting forecasts suggest adjusting the excise tax collection coefficient, the macroeconomic dynamics coefficient, the coefficient for comparing the conditions of the next financial year to the current year, the GDP forecast growth index, the coefficient of expected revenue growth in the next financial year [14, p. 242-243]. The combination of different methods of time series approximation describes the adequacy of forecasts of the size of tax revenues over a limited time horizon for a particular economy or region. Expansion of the object of study or a change in the time horizon leads to a loss in the reliability of the forecast.

Differences in the scale of measurements when using very similar methods give different results for assessing the patterns of dynamics and different forecasts [15]. Taking this into account, V. Martynenko [16] combines parametric forecasting and general patterns of dynamics of macroeconomic indicators, creating several scenarios for the volume of tax revenues to the budget of Ukraine.

Consequently, the use of different forecasting methods, different scales of measurement, and different time horizons gives significantly different results. The reason for the discrepancy between forecasts, even at the same object of study, is

considered to be a high shift in tax revenues. Such a shift was stated in the works of D. Bruce, W.F. Fox and M. N. Tuttle [17], J. F. Giertz [18], N. Seegert [19]. The range of fluctuations in tax revenues for comparable time intervals or similar objects of study is so significant that the very possibility of predicting them may be impossible. Exploring this issue, O. Scorba, T. Pasco, V. Babenko-Levada, and T. Tereshenko [7], come to the conclusion that their dynamics is fractal and antipersistent, which corresponds to the thesis of its unpredictability. An interesting observation about belonging to different types of patterns of dynamics for the volume of tax revenues from the collection of excise tax on goods produced in Ukraine, and for the volume of tax revenues from the collection of excise tax on goods imported into the territory of Ukraine was given in the same work. The thesis about the fractal nature of the dynamics of macro-indicators and indicators characterizing public finances is rather extraordinary, but it is also found in other scientific works. In particular, the study by F. Zhuravka, H. Filatova, P. Suler, and T. Wolowie [20] notes the fractal-like dynamics of the volume of Ukraine's public debt.

AIMS AND OBJECTIVES

The aim of the article is to determine the priority methods of forecasting the number of tax revenues from excise taxation as a source of formation of budgetary resources, taking into account the patterns of their dynamics. The objectives of the study are to develop a methodological approach to determining the general patterns of dynamics of tax revenues from excise taxes to the budget of Ukraine, establishing their relationship with macroeconomic indicators, and obtaining the forecast volume taking into account patterns of dynamics, parametric and nonparametric relationships with macroeconomic characteristics.

METHODS

Methodology and research methods. The research methodology is based on a systematic approach, within which tax relations are considered as a subsystem of financial relations, which is a holistic hierarchically organized system. Therefore, the quantitative patterns of the dynamics of tax revenues are perceived in the context of the general patterns of the dynamics of other financial indicators and related to them. To solve some research problems, the following methods were used: statistical analysis – to determine the parameters of time approximation of the amount of tax revenues from the collection of excise taxes in the dynamics; Fourier analysis – to determine the parameters of the temporal approximation of the amount of tax revenues from the collection of excise tax to the budget of Ukraine, taking into account their cyclical nature; one-factor dispersion analysis – to confirm the reliability of the obtained approximations; correlation-regression analysis – to confirm the causal relationship between the amount of tax revenues and macro indicators and to establish appropriate parametric relationships; probabilistic analysis – to determine the form of the probability density function for the number of tax revenues from the excise tax and as a basis for building scenarios in the scenario modeling of the same volume; entropy analysis – to assess the level of uncertainty in the dynamics of the number of tax revenues from the collection of excise tax; R | S-analysis – to confirm the fractal similarity of the dynamics of tax revenues; scenario modeling – to build scenarios of the projected amount of tax revenues from the collection of excise tax.

Technologies for the application of these methods are given in the works [21, 22, 23].

The study used data of excise tax on excisable goods (products) produced in Ukraine, on excisable goods (products) imported into the customs territory of Ukraine, value-added tax on goods (works, services) produced in Ukraine, and on goods (works, services) imported on the territory of Ukraine in annual, quarterly and monthly terms for the period from 2011 to 2021 [24] on the receipt to the Consolidated Budget of Ukraine. Formalization of trends was performed for absolute values of revenues and for discounted revenues taking into account inflation, and the consumer price index was used as an inflation index [25]. To formalize the parametric relationships, the following factors were selected: retail trade turnover, electricity and fuel costs, tobacco and alcohol costs, imports (US dollars), exports (US dollars) [24], and household consumption expenditures [26]. All cost indicators are related to the consumer market, so they were discounted based on the consumer price index. The volume of exports and the volume of imports are given in the national currency, taking into account the average quarterly exchange rate of hryvnia to the US dollar. The source of information on the average hryvnia exchange rate for the period under study was the data of the National Bank of Ukraine [27].

RESULTS

Forecasting the number of tax revenues from excise tax to the budget is one of the most difficult forecasts in macroeconomic financial forecasting, as it takes into account not only potential changes in macroeconomic indicators but also partial changes in prices for excisable products, forecast dynamics of their consumption, changes in excise duty rates, etc. At the same time, the quality of the forecast of excise tax receipts according to the official forecasting method, approved by the Order of the Ministry of Finance of Ukraine dated 24.12.2010 №1646 decreases with the expansion of the forecasting horizon (Table 1). Inflation is not taken into account in this forecast, so the comparison of the nominal volume of actual revenues and the projected volume of revenues are not adequate.

Table 1. Estimated volume of revenues from excise tax collection according to the Office of Financial and Economic Analysis in the Verkhovna Rada of Ukraine, UAH mln. (Source: composed by the authors by [24, 28])

By groups of excisable goods	2019	2020	2021
Tobacco	56237	67962	80098
Fuel	11757.2	11134.2	10375.2
Electric energy	5669.7	5216.1	4798.8
Alcoholic beverages	7192.0	6561.0	5817.9
Beer	4729	4754	4790
Wine products	1380	1422	1466
Total projected revenue	86964.9	97049	107346
Actual revenue	86489.5	92483.9	90647.1
Error (relative), %	-0.55	-4.94	-18.42

The error of such forecasting is always negative, the forecast revenue is significantly lower than the actual volume of revenue and for the third year of forecasting is almost 20%. For the purposes of budget planning, such an error is not permissible, which confirms the conclusion of the Accounting Chamber. The shortcomings of the official forecasting methodology, the Accounting Chamber notes include [29]:

- neglect of a large number of factors that affect the amount of excise tax revenues, including changes in rates and calculation mechanisms;
- outdated methods;
- insufficient use of economic and mathematical modeling in forecasting the number of revenues from excise tax.

Given that some scientific works state the unpredictability of the dynamics of tax revenues, the task was to assess the existence of quantitative patterns of dynamics. Accordingly, a methodological approach to determining the general patterns of dynamics of tax revenues from excise taxes was developed. The content and sequence of operations to implement this approach is reproduced in Figure 1. Identification of general patterns of dynamics of tax revenues from excise taxes was the basis for formulating a hypothesis about the existence of their parametric dependence on economic development, establishing the existence/absence of cyclical fluctuations in the volume of revenue, defining the limits of random oscillations. The sequence of the study involves several repetitions of analytical operations with a change in the scale of the data used.

The results of the implementation of this methodological approach were as follows:

- on the scale of annual data – trends in the dynamics of tax revenues from the collection of excise taxes are linear, ascending, predicted with a high level of reliability. The variability in the number of tax revenues is not related to the formalized characteristics of their dynamics. The use of annual data to forecast the number of tax revenues is appropriate, but it is possible that there are significant deviations of actual data from the forecast;
- on a quarterly scale of data – trends in the dynamics of tax revenues from excise taxes are linear-periodic with a variable cycle length with an approximate duration of one year and an average level of variability. The existence of significant variability is due to the contingency of patterns of dynamics. The use of quarterly data to forecast the number of tax revenues is possible taking into account the cyclical and contingent patterns;
- on a monthly scale of data – trends in the dynamics of tax revenues from excise taxes are not determined by a sufficient level of reliability. The results of the R | S analysis show the fractal similarity and anti-persistence of the

dynamics of the volume of tax revenues from the collection of excise taxes on a monthly data basis. The use of monthly data to forecast tax revenues is impractical.

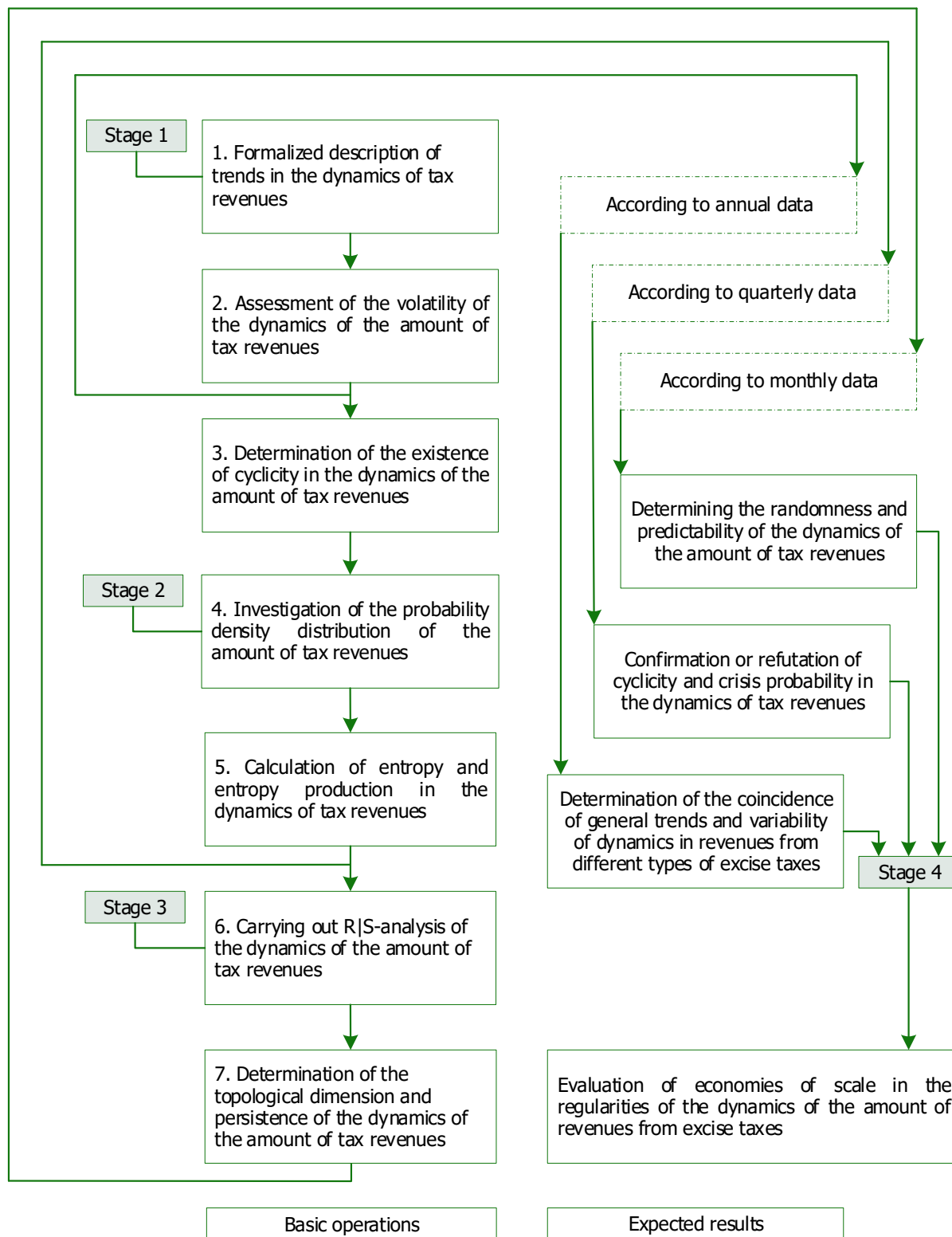


Figure 1. Methodological approach to determining the general patterns of dynamics of tax revenues from the collection of excise taxes to the budget.

The generalized results of the effect of the scale of measurements in the study of the patterns of dynamics of the number of tax revenues from the collection of excise tax are shown in Figure 2.

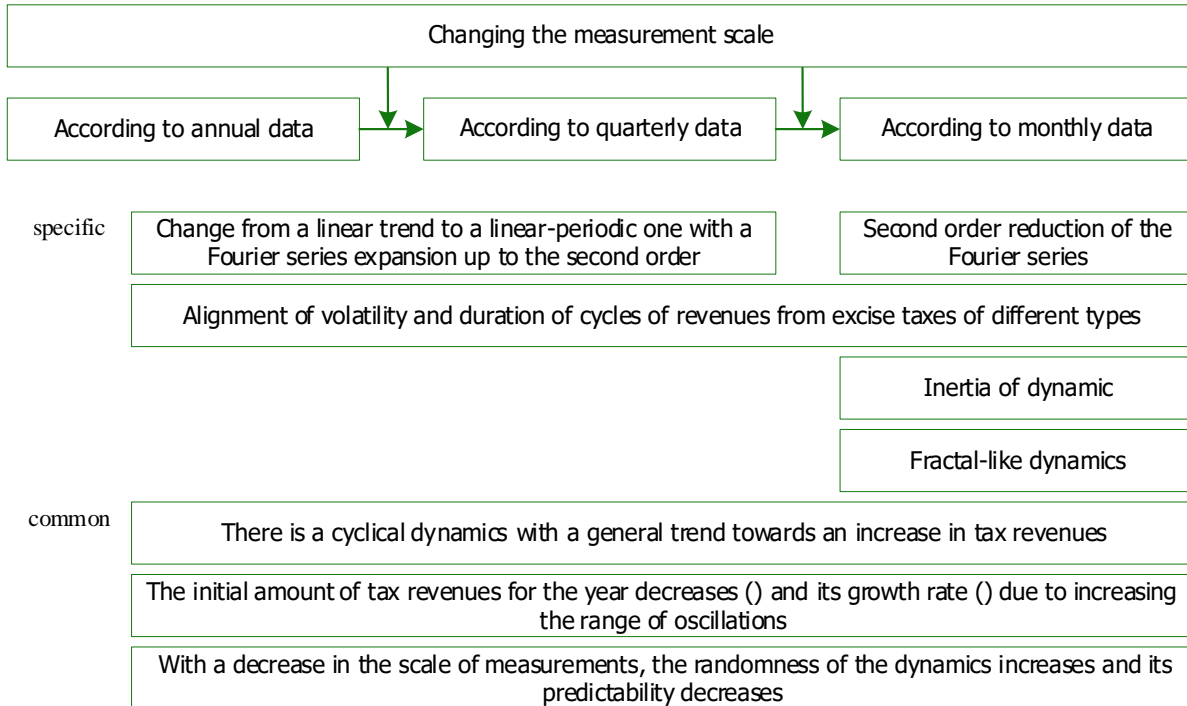


Figure 2. The main effects of the scale of measuring the dynamics of the number of tax revenues from the collection of excise taxes.

The results of the analysis of the level of entropy dynamics on quarterly and monthly data coincided with all types of excise taxes and made it possible to determine the periods of dissipation of revenues. This makes it expedient to use monthly data on the number of tax revenues from the collection of excise taxes to forecast potential crisis periods. Given the advantages and disadvantages of using data on the number of revenues from the excise tax, the most effective is the use of quarterly data.

In view of the results obtained, the use of temporal approximations of the number of tax revenues from excise tax for forecasting purposes was rejected. The main method of forecasting was to establish parametric dependences of tax revenues on a set of factors, the list of which is given above.

The sequence of forecasting operations was as follows:

- the inertia of the dynamics of factors influencing the number of tax revenues was analyzed. The task of this stage was to eliminate false connections between factors, between factors and the number of tax revenues due to the inertia of the dynamics;
- the existence of a causal relationship between factors, between factors and the number of tax revenues using correlation-regression analysis with lags from -8 to 8. The existence of such a relationship was the basis for constructing multifactorial parametric relationships between factors, between factors, and the amount of tax revenue. Formalization of the detected parametric dependences was carried out using the method of Gauss;
- the fractal similarity and persistence of the dynamics of each factor were analyzed, which gave grounds to distinguish some of the relationships between factors, between factors, and the number of tax revenues for further scenario modeling;
- a network of parametric and scenario models was built, on the basis of which further forecasting was carried out. Parametric models were built on the basis of identified causal relationships, scenario ones – if such relationships were not confirmed and if the dynamics of factors was fractal and anti-persistent. Scenario models were built by calculating the elasticity of the relationship between factors, between factors, and the amount of tax revenue.

To establish the existence of a causal relationship between the selected factors and the number of revenues from the excise tax, correlograms of relationships between them were built, taking into account the lags for the period 2011-2021, the results of which are shown in Figures 3, 4.

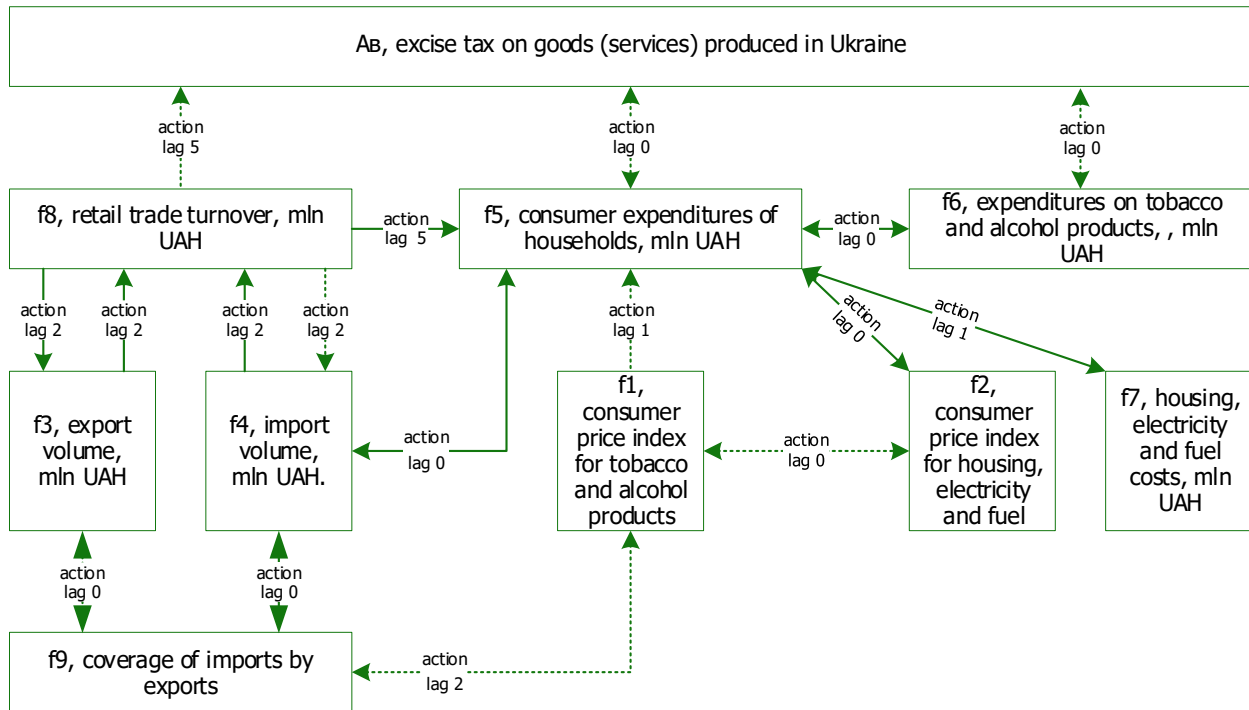


Figure 3. Correlogram of factors influencing the number of tax revenues from the collection of excise tax on excisable goods (products) produced in Ukraine.

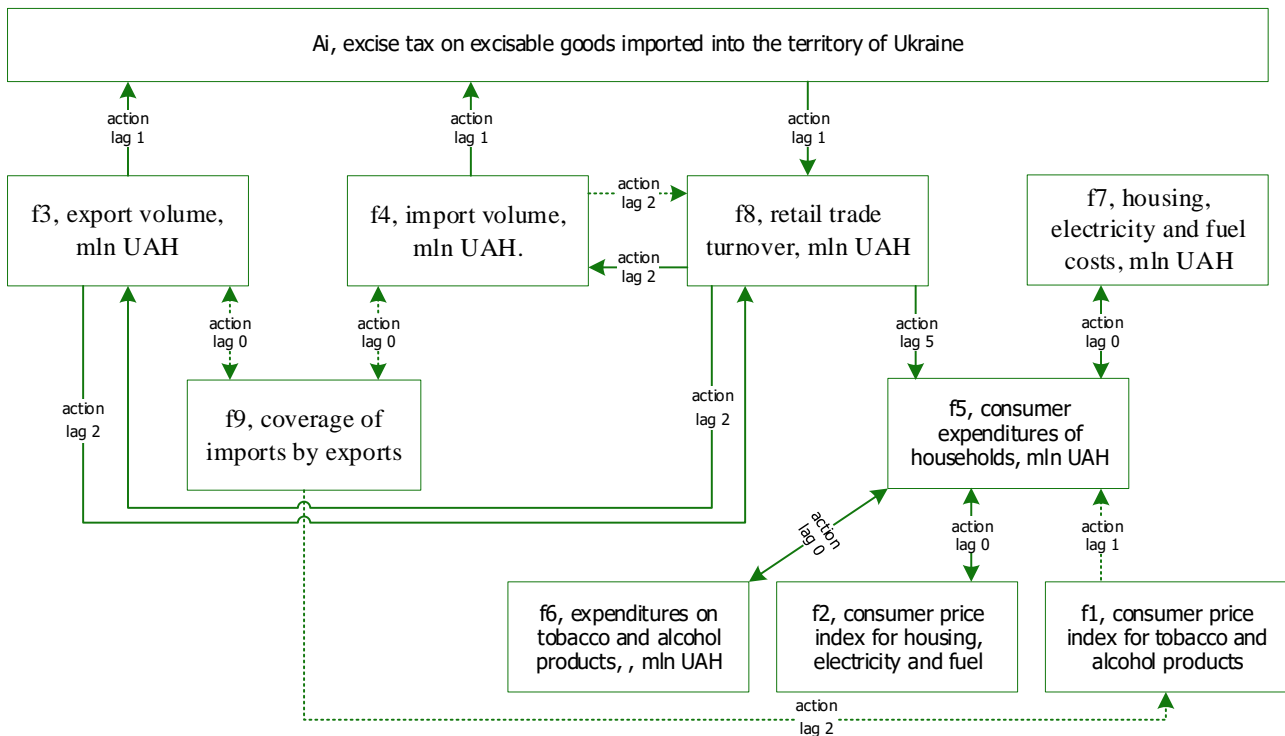


Figure 4. Correlogram of factors influencing the number of tax revenues from the collection of excise tax on excisable goods (products) imported into the territory of Ukraine.

As a result of the conducted researches it is revealed that for forecasting the volume of receipts from collecting the excise tax from the goods made in Ukraine, eighteen scenarios are formed, the basis of which is two scenario models $A_B(f_5, f_6), f_5(f_2, f_7)$ and three parametrical dependences $A_B(f_8), f_8(f_3, f_4), f_5(f_1)$. In Table 2, the obtained scenarios are arranged by the probability of their occurrence decreasing.

Table 2. Estimated amount of tax revenues from the excise tax on goods produced in Ukraine, UAH mln.

According to the scenarios	2022				2023	Scenario Possibility
	1 quart.	2 quart.	3 quart.	4 quart.	1 quart.	
Scenario 1	18238.2171	13615.93	14750.16	15303.91	15011.18	0.5566
Scenario 2	18368.419	13746.13	14880.36	15434.11	15141.38	0.1590
Scenario 3	18212.155	12777.41	13911.64	14465.38	14172.66	0.0795
Scenario 4	18238.4367	13616.15	14750.38	15304.13	15011.4	0.0655
Scenario 5	17872.3924	13250.11	14384.34	14938.08	14645.36	0.0384
Scenario 6	18237.778	13615.49	14749.72	15303.47	15010.74	0.0327
Scenario 7	18368.6385	13746.35	14880.58	15434.33	15141.6	0.0187
Scenario 8	18002.5943	13380.31	14514.54	15068.29	14775.56	0.0110
Scenario 9	18212.3746	13590.09	14724.32	15278.07	14985.34	0.0094
Scenario 10	18367.9799	13745.7	14879.92	15433.67	15140.94	0.0094
Scenario 11	17846.3303	13224.05	14358.27	14912.02	14619.29	0.0055
Scenario 12	18211.7159	13589.43	14723.66	15277.41	14984.68	0.0047
Scenario 13	17872.612	13250.33	14384.56	14938.3	14645.57	0.0045
Scenario 14	17871.9533	13249.67	14383.9	14937.65	14644.92	0.0023
Scenario 15	18002.8139	13380.53	14514.76	15068.51	14775.78	0.0013
Scenario 16	17846.5499	13224.27	14358.49	14912.24	14619.51	0.0006
Scenario 17	18002.1552	13379.87	14514.1	15067.85	14775.12	0.0006
Scenario 18	17845.8912	13223.61	14357.84	14911.58	14618.85	0.0003

The forecasting results show that, even without taking into account the destructive impact of the war, in the 2-4 quarters of 2022, the number of revenues from the excise tax on goods produced in Ukraine should have been decreased. It should be noted that the total amount of revenues from the excise tax on goods produced in Ukraine in 2021 amounted to UAH 78,473.08 million, including UAH 1,648.3 million for the 1st quarter. According to the Law of Ukraine "About the State Budget of Ukraine for 2022", the amount of excise tax on goods produced in Ukraine in 2022 was to be UAH 85,823.5 million [27]. At the same time, the actual revenue for the first quarter of 2022 amounted to UAH 10,197.3 million. Thus, only losses from the excise tax on goods produced in Ukraine for the 1st quarter of 2022 amount to UAH 7,709.73 million. up to UAH 8075.55 million [24].

According to the peculiarities of the forecast dynamics of the volume of revenues from the excise tax on goods produced in Ukraine, all the scenarios can be divided into two groups:

- group 1 – optimistic scenarios – includes scenarios 1, 2, 3, 4, 6, 7, 9, 10, 12. The total probability of occurrence of these scenarios is 93.54%. The number of revenues from the excise tax on goods produced in Ukraine in 2022 – UAH 76731 million, including taxes for the 1st quarter – UAH 18272.85 million;
- group 2 – pessimistic scenarios – includes scenarios 5, 8, 11, 13, 14, 15, 16, 17, 18. The total probability of occurrence of these scenarios is 6.45%. The projected amount of revenues from the excise tax on goods produced in Ukraine in 2022 – UAH 75,263.47 million, including taxes for the 1st quarter – UAH 17,907.03 million.

Thus, the projected amount of revenues from the excise tax on goods produced in Ukraine in the optimistic scenario is lower by 10.59% than planned in the Law "About the State Budget of Ukraine for 2022" and by 12.3% in the pessimistic script.

According to the correlogram of factors influencing the number of tax revenues from the excise tax on excisable goods (products) imported into Ukraine (Figure 4), its forecasting is possible on the basis of parametric dependence on (volume of exports) and (volume of imports).

Using the method Gaus, it is determined that the form of such a parametric dependence with reliability of 0.802:

$$A_i(f_3, f_4) = 48079.01 + 0.112 \cdot f_{3_{i-1}} - 0.154 \cdot f_{4_{i-1}} \quad (1)$$

Exports and imports are subject to linear temporal forecasting. In particular, the linear trend in exports is described by dependence $f_3(t) = 66918 + 7164.4 \cdot t$ with reliability of 0,999972, and the linear trend of imports by dependence $f_4(t) = 95477 + 8071.2 \cdot t$ with a reliability of 0,999981. The forecast dynamics of the number of revenues from the excise tax on goods imported into the territory of Ukraine should be as shown in Figure 5.

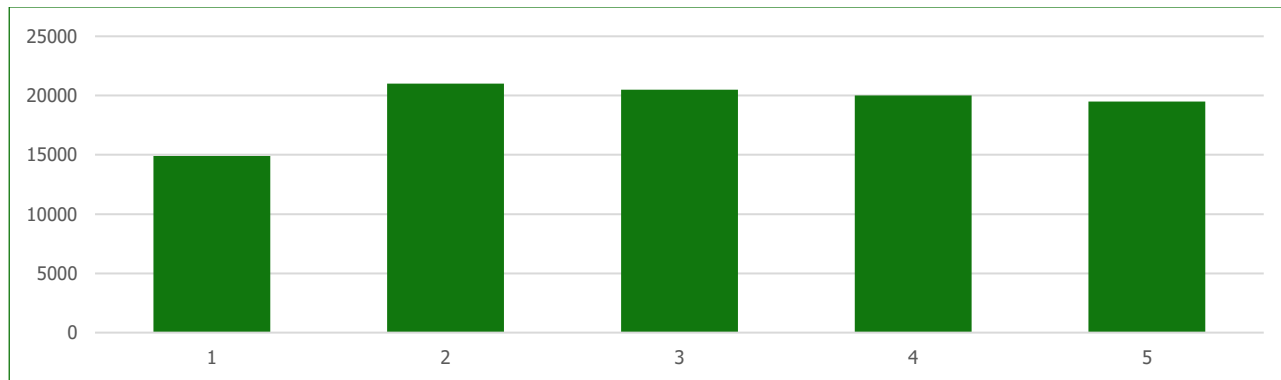


Figure 5. Forecast dynamics of revenues from the excise tax on goods imported into Ukraine in 2022.

According to the Law of Ukraine "About the State Budget of Ukraine" [30], the amount of excise tax on goods imported into the territory of Ukraine was to be UAH 75,994.8 million in 2022. According to the results of forecasting in the research, the amount of excise tax on goods imported into the territory of Ukraine should have been UAH 76018.45 million. Deviations from the official forecast of UAH 23.65 million. or 0.0311%, which is quite acceptable. Therefore, parametric forecasting of the number of revenues from the excise tax on goods imported into Ukraine, despite the selection of different sets of factors, gives convergent results, which confirms its reliability. At the same time, the actual amount of revenues for the first quarter of 2022 amounted to UAH 11,531.4 million, i.e. losses from the excise tax on goods imported into the territory of Ukraine for the 1st quarter of 2022 amounted to UAH 2,952.171 million. Total losses of the State Budget of Ukraine from the collection of excise tax on all groups of goods in the 1st quarter of 2022 amounted to 10661.9 million UAH. up to UAH 11027.72 million. or $\approx 33.3\%$.

CONCLUSIONS

With the help of the proposed methodological approach to determining the general patterns of dynamics of the number of tax revenues from the collection of excise taxes, it is established that they depend on the scale of measurement (annual, quarterly, and monthly data). When the scale of measurement decreases, the linear trend changes to linear-periodic, the variability of excise tax revenues of different types and duration of cycles is equalized, the inertia of dynamics is revealed and its chaos increases until a number of anti-persistence and fractal dynamics is reached. The last one reduces the grounds for using methods to build trends of forecasting the number of tax revenues from the collection of excise taxes to the budget of Ukraine. At the same time, the time of onset and duration of dissipation periods, determined on the basis of probabilistic analysis and entropy calculation, coincide regardless of the scale of measurement, which makes it appropriate to use time series to determine periods of crisis reduction in budget revenues.

The results of parametric forecasting of excise tax revenues in Ukraine are more reliable than the results of trend forecasting. The projected amount of revenues from the excise tax on goods imported into the territory of Ukraine coincided with the results of the official forecasting methodology up to 0.03%. The results of forecasting the number of revenues from the excise tax on goods produced in Ukraine were lower than the official forecast by 10-12%, and the results of forecasting the number of revenues from the excise tax on goods imported into Ukraine coincided with the official forecast. The most significant changes in the proposed forecasting sequence compared to the official methodology are: taking into account the lag of action between the factors used in forecasting, between factors and results; taking account the network of relationships between factors; taking into account the anti-persistence of the dynamics of individual factors, which conditioned a combination of parametric dependencies and scenario modeling in forecasting the number of revenues from the excise tax on goods produced in Ukraine.

The prospect of further research is to improve the administration of excise taxation as a necessary condition for ensuring stable revenues to state and local budgets from individual and specific excises, taking into account the institutional environment of the country.

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ДОСЛІДЖЕННЯ ДИНАМІКИ ТА ПРОГНОЗУВАННЯ ОБСЯГУ НАДХОДЖЕНЬ ДО БЮДЖЕТУ ВІД АКЦИЗНОГО ОПОДАТКУВАННЯ: ДОСВІД УКРАЇНИ

Метою статті є визначення пріоритетних методів прогнозування обсягу податкових надходжень від акцизного оподаткування як джерела формування бюджетних ресурсів, зважаючи на закономірності їх динаміки. Розроблено методичний підхід до визначення загальних закономірностей динаміки обсягу податкових надходжень від справляння акцизних податків до бюджету України. На основі зазначеного підходу встановлено, що формалізований опис закономірностей динаміки обсягів податкових надходжень від справляння акцизних податків до бюджету України має суттєві відмінності в залежності від масштабу вимірювань. Використання рядів динаміки для прогнозування обсягів податкових надходжень від справляння акцизних податків не є доцільним також у зв'язку з їх антиперсистентністю та фракталоподібністю. Дослідження невизначеності динаміки податкових надходжень від справляння акцизного податку дає змогу прогнозувати настання періодів їх кризового зменшення, з високою збіжністю результатів незалежно від масштабу вимірювання.

Параметричне прогнозування обсягу податкових надходжень від справляння акцизного податку до бюджету України проведене з врахуванням інерційності динаміки факторів впливу, підтвердженням причинно-наслідкових зв'язків між факторами впливу, між факторами впливу та прогнозованими показниками, визначенням лагу реалізації причинно-наслідкових зв'язків, дослідженням персистентності динаміки факторів впливу. У зв'язку з антиперсистентністю динаміки частини факторів впливу прогнозування обсягу податкових надходжень від справляння акцизного податку здійснено за допомогою комплексу параметричних і сценарних моделей. Результати прогнозування обсягу податкових надходжень від справляння акцизного податку з товарів, вироблених в Україні, були меншими від офіційного прогнозу на 10-12 %. Результати прогнозування обсягу податкових надходжень від справляння акцизного податку з товарів, увезених на територію України, співпали з офіційним прогнозом.

Ключові слова: податкові надходження, акцизний податок, бюджетні ресурси, закономірності динаміки, ентропія, параметричне прогнозування, сценарне прогнозування

JEL Класифікація: G17, H21, H24, H29