open technology platforms, electronic reference and information systems, the creation of a single international format and content of financial statements in electronic form XBRL [4, p. 105]. This creates opportunities for building a national accounting system, which will integrate indicators characterizing the state of internal business processes of the organization and the external environment, indicators of integration of various types of accounting.

It is necessary to use theoretical results in the development of methods and specific recommendations. Their implementation in practice will contribute to the effective development of the accounting system. There is also a need to gain experience in accounting and disclosure of economic information in reporting on the basis of fundamental modifications in the field of obtaining, exchange and processing of economic information.

The development of the theory and practice of accounting is associated with the expansion of the information potential of the existing economic space, the digitalization of the economy. At the same time, information technologies cause significant modifications both in the methodology and in the applied direction of accounting science. In this regard, the transformation of accounting in accordance with new needs is a necessary step in its development. Changes and improvements in this method of accounting will help not to lose its relevance in the era of universal digitalization.

Список использованных источников

1. About the approval Of the state program "Digital Kazakhstan" the Resolution of the Government of the Republic of Kazakhstan of December 12, 2017 No. 827.

2. Karpova T. p. Directions of development of accounting in digital economy / T. p. Karpova // proceedings of St. Petersburg State University of Economics. – 2018. – No. 3 (111). – Pp. 52–57.

3. Ermilova Yu. a. Aspects of accounting and analytical support of innovative activity at the enterprise // Regional innovative economy: essence, elements, problems of formation, new challenges. Ulyanovsk., 2016. Pp. 18–21.

4. Sidorova M. I. Development of accounting models in the conditions of modern information technologies: abstract of dis. for the degree of doctor of economic Sciences. Moscow, 2013.

5. Varnavsky A.V., Buryakova A. O. Prospects of using the technology of distributed registers for automation of state audit // Management Sciences. – 2018. – No. 3. – Pp. 88–107.

6. Budovec Y. I. the Digitalization of corporate accounting // Human capital in the digital economy. Moscow., 2018. Pp. 117–125.

COMBINATION FORECAST APPLICATION ON LIQUIDITY FACTORS OF THE BANKING SECTOR PREDICTION

V. Suvalov,
Postgraduate student of economic faculty
Belarusian State University, Minsk

I. Karachun,
PhD in Economics, Associate Professor, Head of the Department
of Digital Economics Belarusian State University, Minsk

The need to build a high-quality and accurate forecast has led to the creation of a huge variety of forecasting methods. The appearance of this diversity is also associated with the difference in the properties of the predicted indicators and the methodologies for their analysis. As the result the idea to combine several forecast methods to obtain a new arose. Practice shows that this approach can improve the accuracy of the forecast. A number of authors argue that this is due to the fact that the combined model is more complex and flexible in relation to the models of which it consists [1].

Back in 1969 such authors as J.M. Bates and C.W.J. Granger discussed the reasons prompting the construction of combination forecast models in their article "Combination of Predictions" [2]. In the Combination of Forecasts 1989, R.T. Clemen reviews the theory and practice of using combination forecasts and their application based on an analysis of the research of many authors [3]. In subsequent years, the authors dealt with issues of improving the quality of combined forecasts, in particular with determining the optimal ratio of forecasting results included in the combined forecast [4]. It follows from this article that under optimal conditions the combination forecast can even exceed the accuracy of the forecast obtained from the most accurate model included in the combined forecast.

Based on the studies of predecessors' results, we consider that the combination of models can act as a relatively simple way to build a complex model that covers a larger number of variables that are significant for forecasting. Therefore, we was decided to apply a methodology for combining forecasts to obtain a forecast of liquidity factors of the banking system, which was implemented in an algorithm for automated analysis of liquidity factors.

The liquidity factors forecasting algorithm was supplemented with the ability to build a combination forecast, which is obtained in the form of a weighted average forecast based on the results of other models. Weights are determined based on the error value of each individual forecast. The proposed implementation of the combined forecast was tested, including with the aim of confirming or refuting the hypothesis that it is really able to exceed the accuracy of the forecast obtained from the best method included in it. For the proposed study, 10 time series were used: 5 of them – daily (from 01/01/2016 to 08/29/2019) time series for such indicators as banks cash collecting, banks cash reinforcement, tax outflows from the banking system, customs payments and government expenses. Another 5 time series were generated functionally with pre-known probability distributions and a similar frequency. Each of them was passed through the algorithm 500 times. At the same time, each time the series were re-divided into training and control samples, the best forecasting methods were determined, and the optimal method (combined or otherwise) was noted. As a result, the combined method was more accurate in the forecast and, as a result more preferable than the others, in 217 cases out of 5000.

It seems intuitively obvious that according to the results of the study the combination method is inferior to other forecasting methods in accuracy. However, in order to verify this, a statistical analysis of the simulation results was carried out. Each individual independent test of 5000 can be considered as an experiment with a Bernoulli distribution. In this case, two results are possible: "success of the combined method" and "failure of the combined method" Considering the totality of these experiments as one series, we can imagine a finite sequence of independent random variables having the same Bernoulli distribution. That is a binomial distribution by definition. Further, one can pay attention to the fact that for a sufficiently large number of experiments n (in our case n = 5000), the binomial distribution is close to the Poisson distribution.

This allows us to formulate the null and alternative hypotheses as follows: if the series has a Poisson distribution, then there is no statistically significant difference between the two forecasts obtained by different methods. Otherwise, if the Poisson distribution is not observed, one of the methods allows to obtain a better forecast in a statistically significant number of cases. This means that a particular method is preferable in predicting the proposed time series. Thus, the entire analysis can be reduced to testing the null hypothesis on the distribution of the number of successes according to the Poisson law, with the alternative hypothesis that the distribution of successes is different from the Poisson distribution.

We verify this hypothesis with a significance level of $\alpha = 0.05$. Omitting the calculations, we obtain the value of the Pearson statistics $\chi_{obs} = 105105.812$, which is compared to the only critical point $\chi_{crit} = 5165.614$, since the critical region for these statistics is always right-handed. As a result, we can reject the null hypothesis and conclude that the

number of successes is not distributed according to Poisson's law. Therefore, we can state that the combination forecast in our case is inferior to the methodology for applying the forecast with minimal error. The reasons leading to the results were analyzed.

An analysis of the success facts of the combination method allowed us to conclude that its success in some cases is due to the mutual leveling of forecast errors of the included methods. This means that the "overestimation" (excess of the forecast over the actual value) of one method was corrected by the "underestimation" (excess of the fact over the forecast) of the other. This situation made it possible to obtain a forecast value closer to the actual value of the series under study as a result of a combination of these methods. Otherwise, the combined method was inferior in accuracy of the forecast to the best method from its members, because accumulated errors of other methods.

We emphasize separately that "overestimation" should be understood only when the excess of the forecast over the actual value is relatively constant. This means that the forecast values exceed the actual ones in most cases. In addition, there is no sharp change in the sign of the forecast deviation.

Based on this, it should be concluded that if it is possible to clarify the direction of the forecast errors included in the combination forecast, then it might be preferred (provided that there is a relatively constant bi-directional error of the combined methods). On the other hand, when all the forecasts used have the same error sign or in a situation where the error direction of the methods used is inconsistent, an approach based on the method that gives the most accurate forecast should used.

List of sources used

1. Stock, J.H. Combination Forecasts of Output Growth in a Seven-Country Data Set / J.H. Stock, M.W. Watson. // Journal of Forecasting. – 2004. – Vol. 23. – P. 405–430.

2. Bates J.M., The Combination of Forecasts / J.M. Bates, C.W.J. Granger. // Operational Research Society. – 1969. – Vol. 20. No. 4 – P. 451–468.

3. Clemen, R.T. Combining forecasts: A review and annotated bibliography / R.T. Clemen. // International Journal of Forecasting. – 1989. – Vol. 5. – P. 559–583.

4. Armstrong, J.S. Combining forecasts / J.S. Armstrong. // Principles of forecasting: a handbook for researchers and practitioners. – 2001. – P. 417–439.

5. Thomson M.E. Combining forecasts: Performance and coherence / M. E. Thomson., A. C. Pollock, D. Önkal, M. S. Gönül // International Journal of Forecasting. – 2019. – Vol. 35. – P. 474–484.

INNOVATION TEACHING OF FOREIGN LANGUAGE ON ECONOMIC DEPARTMENT IN THE ESTABLISHMENTS OF HIGER EDUCATION

S. M. Tanana,
State Higher Educational Establishment «Pereiaslav-Khmelnitskyi State Pedagogical University named after Hryhoriy Skovoroda»,
Pereiaslav-Khmelnytskyi, Kyiv region, Republic of Ukraine

The democratic and humanization reforms which take place in Ukraine need renovating the process of teaching foreign languages, re-comprehending aims, tasks and contents of education, implementation of new educational technologies to master foreign communicative competence successfully.

The problem of using the innovation methods of teaching foreign languages on econonomic department at the higher educational establishments were also studied by R. Blair, S. Martinelli, L. Konoplianyk, O. Siutkina, H. Stern, Ye. Polat, M. Tailor and other.