
Statistical Methods for Analyzing Financial Statements of Russian Organizations in the Context of IFRS Implementation

E.M. Akhmetshin¹, L.N. Demidova², N.A. Prodanova³, O.V. Savchina⁴,
L.B. Trofimova³, K.S. Ratnikov⁵

Abstract:

In the context of the transition to international financial reporting standards (hereinafter - IFRS), issues of bringing Russian financial statements closer to an international format are of relevance.

In order to develop Russian reporting adapted to the new requirements of the format, the authors have conducted polls of the accounting services of large, medium and small business organizations about the desirability of including the indicators from the minimum list of international reporting articles in their reports.

Based on the methods used by the Institute of Statistics in the study of Russian financial statements methods of selective observation, questioning, methods of processing the data obtained, namely, calculating the proportion of reporting indicators using the A. Salai and V. Ryabtsev index, the authors justify the inclusion in the Russian financial reporting a series of indicators proposed by IFRS.

The results of the study can be used in the transformation of statements, as well as in the construction of consolidated financial statements generated in Russia in accordance with the requirements of IFRS.

Keywords: *IFRS, financial accounting, A. Salai index, V. Ryabtsev index, accounting balance sheet, financial results report (P&L statement).*

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¹Kazan Federal University, Elabuga Institute of KFU, Elabuga, Russia, elvir@mail.ru

²Moscow University of Finance and Law (MFUA), Moscow, Russia

³Plekhanov Russian University of Economics, Moscow, Russia

⁴Peoples' Friendship University of Russia (RUDN University), Moscow, Russia

⁵Russian state university of physical education, sport, youth and tourism (SCOLIPE), Moscow, Russia

1. Introduction

The rapidness of reforming the domestic system of accounting and reporting, the difficulties in overcoming the problems of its regulation and the simultaneous lack of scientific substantiation of the ways for solving them, determine the choice of the scientific field and the research topic. When solving the fundamental tasks of developing the methodology of international standardization of financial statements, there is a need to develop methodological and theoretical studies in the field of reporting reform of economic entities of small, medium and large businesses in accordance with the requirements of international financial reporting standards (hereinafter IFRS) (Chernopyatov *et al.*, 2018; Khairutdinov *et al.*, 2018; Mirazizov *et al.*, 2018; Nikolaeva *et al.*, 2018; Aleksandrova *et al.*, 2017; Korableva *et al.*, 2017). In order to identify and summarize the opinions of practicing accountants about the desirability of converging the Russian financial statements with the IFRS, the authors, have conducted a poll regarding the desirability of including in the Russian financial statements the indicators contained in the statements prepared in accordance with the requirements of IFRS (Trofimova, 2015).

Synchronization of the accounting system and the reflection of the main business transactions in reporting is primarily related to the need to provide users with a wider range of information (including at the macroeconomic level) on the types of movement of financial flows and business operations (Swaramarinda, 2018).

2. Literature review

The main conceptual foundations and prerequisites for the synchronization of IFRS and the system of national accounts were laid by Russian and foreign scientists (Table 1).

Table 1. *The main views of scientists on the synchronization of IFRS and the system of national accounts*

<i>Source</i>	<i>Interpretation of concepts, categories and other notions of IFRS and the system of national accounts</i>
Girbasova E.M. Karaseva L.A., Kazarinova S.E. Ivanov Yu.N.	The system of national accounts is considered as a system that allows to study the economy of each sector and their interrelations, and on the other hand, to calculate generalizing macroeconomic indicators. IFRS acts as a basis for the formation of indicators at the macro level (Girbasova, 2014), (Karaseva, and Kazarinova, 1996), (Ivanov <i>et al.</i> , 1996).
Ponomarenko A.N.	Within the framework of the system of national accounts, an enterprise is considered as an institutional unit involved in economic activities (both an organization and a household) and having the ability to independently manage assets, conducting independent accounting. To make the methodology for calculating macroeconomic indicators uniform, institutional units are classified by economic sectors (Ponomarenko, 2000).

<i>Source</i>	<i>Interpretation of concepts, categories and other notions of IFRS and the system of national accounts</i>
Stone R.	The methodology of mathematical modeling of economic growth includes the use of the double-entry accounting principle, which allows not only to generate results, but also to control their flows at various levels of their formation: production - distribution - use (Stone Richard, 1967).
Hicks J.R.	Reporting and the system of national accounts is considered from the standpoint of earning income on a net, rather than on a gross basis, which, in accordance with the category of “income,” implies the maximum amount of money that a consumer can spend without reducing his national wealth (Klamer, 1989).
Shorina E.V.	The system of national accounts and IFRS are considered as a basis for the formation of indicators at the macro level. On the horizontal level within one statement, on the vertical one - within several statements (Shorina, and Yurkevich, 2013).

Source: Compiled by the authors based on the analysis and generalization of works (Dovbenko, and Osik, 2011; Kadochnikova, and Gatina, 2016; Karaseva, and Kazarinova, 1996).

Girbasova (2014), Ivanov *et al.* (1996), Hicks (1989) and other scientists consider IFRS only as a basis for generating indicators within the framework of the system of national accounts (Biraud, 2010; Klamer, 1989; Deane, 2011; Feleaga and Feleaga 2016; Afzal *et al.*, 2018). Shorina and Yurkevich, (2013) and other scientists consider the concept of convergence of the system of national accounts and IFRS at the horizontal level for the formation of statements of institutional units, at the vertical level - within the framework of several statements. However, due to the specifics of the formation of accounting and financial reporting, it is rather difficult to agree on a methodology for calculating many economic and financial indicators and create a statistical information base capable of reflecting at the macro level the main stages of the formation and distribution of gross domestic product (Goreeva *et al.*, 2016; Biraud, 2010; Ilinova and Dmitrieva, 2017). Some scholars also looked at the introduction of IFRS from the perspective of business size (small and medium) (Saucke, 2015).

There is a point of view of some scientists who believe that the differences in accounting indicators and the system of national accounts are temporary (Shorina, and Yurkevich, 2015; Girbasova, 2014). Subject to the further integration of the two systems, they will be synchronized to become able to provide a full range of necessary information both at the micro and macro levels (Samerkhanova *et al.*, 2018). In addition, institutional synchronization contributes to the further integration of these systems, as it is bound to minimize the cost of its implementation (Auzan, 2011; Dementiev, 2014; Usenko *et al.*, 2018; Yusoff *et al.*, 2016).

At the same time, one of the authors of the second direction Girbasova (2014) believes that financial accounting alone cannot serve as the only source of

information for the system of national accounts. Other methods of data acquisition for it should also be practiced here, including mathematical methods that will quantitatively describe the relationship between different indicators at different levels (Girbasova, 2014). In our opinion, this is logical, since some information can be obtained not only from institutional units (customs control data with various types of prices indicated in declarations, for which goods are considered, etc.).

3. Methodology

This scientific research is based on the results of statistical observation (questioning), conducted among practicing accountants of Russian entities of small, medium and large businesses in the city of Moscow. The indicators on the state of accounting and reporting in enterprises were filled in based on the results of a special assessment of the rationale for including in the typical Russian accounting balance sheet the articles proposed by standard IAS 1. The survey was conducted by the researchers based on leading economic universities in Moscow: The Financial Faculty of the Plekhanov Russian University of Economics (PRUE) and the Faculty of Economics of the RUDN University.

The questionnaire consisted of two parts. The first part, concerning the specifics of the construction of financial statements, included 29 questions. The second part of the questionnaire contained 38 questions, with a general poll of the administrative staff among them, and questions concerning the conditions of economic activity also included. The information in the questionnaires is presented like this:

- ✓ by regions of the Central Federal District (hereinafter - CFD);
- ✓ by individual types of economic activity (agriculture, hunting and forestry; wholesale and retail trade; manufacturing, production and distribution of electricity, gas and water; construction; transport and communications, and other industries).

The survey of the formation of new reporting in the context of the transition to the IFRS was conducted based on one-time sampling as of May 2017 (after the submission of annual reports). Based on the survey results, 527 questionnaires were collected, the following of which participated in the survey:

- ✓ 39 consolidated groups, such as PAO "TRANSNEFT", Shar Online, AO UK Ingosstrakh-Investitsii, OOO Geoinzhstroy, OOO Pervaya Ekspeditsionnaya Kompaniya (First Expeditionary Company), OOO GOSH, OOO Studia KTS, NESTLE LLC, Froneri LLC, Purina Petker LLC, Oriflame, OOO TSK Mosenergo, PANDORA, IRG Group of Companies, etc.;
- ✓ 27 large organizations: OOO Yevromash, OOO Inkom, OOO RIF Ametist, Shatura-Mebel, OOO Sever Plast, OOO Polimery Yuga, AO Tekhnodinamika, OOO Rolf Center Affiliation, etc.;

- ✓ 84 organizations classified as mid-sized business, they are ZAO Tekhnologia, Kvarts, Fitness Hall, OOO Gloria, OOO PPO Orbita, OOO Kotelno-Stroitelny Kombinat, OOO Coffee House, etc.;
- ✓ 377 small business organizations, comprising the largest group, with such companies as OOO Avitsenna, OOO Meridian, OOO RusAgroSnab, OOO GidroTekhAtom, OOO Sinerzhi, OOO Nashe Vremya, OOO AKT Navigator, OOO «MADO» and other companies.

This survey of managers of Russian enterprises of various forms of ownership between the ages of 18 and 65 makes up 0.6% of the total number of small, medium and large businesses, as well as consolidated groups. Organizations whose average number of employees does not exceed 1 person were not subject to examination. When conducting and forming the results of the survey, the following functions were performed:

- 1) development of a statistical survey methodology, including sampling methodology and guidelines for preparing and conducting a survey, processing the results obtained;
- 2) coordination, planning of the poll conducting operations and control of preparation, conducting and summarizing the survey;
- 3) development of methodology for processing the information obtained from the economic entities surveyed and conducting explanatory work on the survey issues;
- 4) development of methodology for assessing the information obtained.

The first part of the questionnaire is structured so that the interviewee comments on the desirability of including this or that item mandatory in the statement of financial position and P&L statement under IFRS into the Russian balance sheet and statement of financial results. The questions asked in the survey were related to aspects of the rationale for reflection in the reporting of certain types of resources of the organization (Figure 1). The system of questions and answers in the survey of subjects of small, medium and large businesses in the framework of the study is shown as a percentage of the total number of answers.

When processing questionnaire data method of calculation of specific weight of reporting indicators, A. Salai's index (Eliseeva, 2006), V.M. Ryabtsev's index (Zarova *et al.*, 2001) and method of selective observation are applied. To assess the accuracy of estimating statistical characteristics (indicators) based on the results of the survey, i.e. to get the quantitative measure of estimating the deviation from the actual values of the parameters, the authors used indicators based on the standard error of the sample (standard deviation) μ_x . It shows the average value of the estimate deviation from the parameter:

$$\mu_{\bar{x}} = \sqrt{\frac{\sigma_{\bar{x}}^2}{n}} = \frac{\sigma_{\bar{x}}}{\sqrt{n}} \tag{1}$$

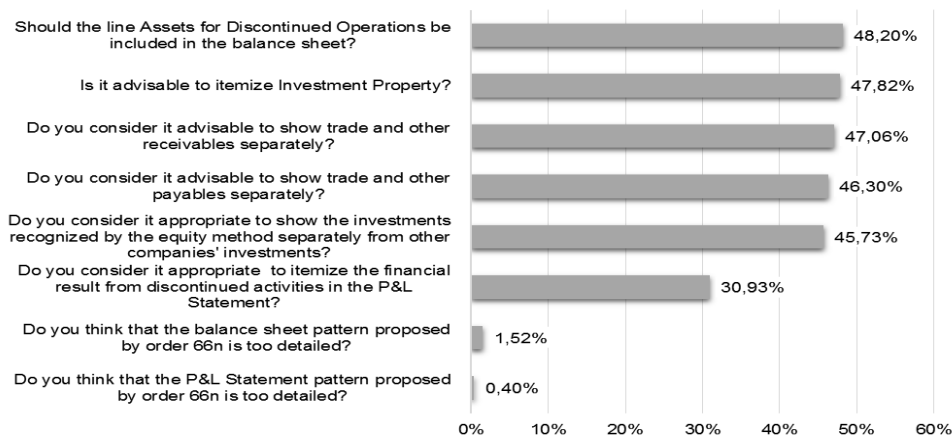
The calculations also used the indicator of the relative standard error of the sample (variation coefficient):

$$V = \frac{\sigma_{\bar{x}}}{\bar{x}} \cdot 100 \% \tag{2}$$

Confidence interval - the range in which the true value of the parameter lies at a given level of confidence probability (confidence coefficient) is:

$$\bar{x} - \Delta_{\bar{x}} \leq \bar{X} \leq \bar{x} + \Delta_{\bar{x}} \tag{3}$$

Figure 1. The list of questions and the number of positive answers (in percent) in the survey of small, medium and large businesses



Source: Valculated by the authors based on the data of the survey.

4. Models and Results

The sampling error with a probability of 0.863 does not exceed 1.12% for large business entities, 1.2% for medium-sized businesses and 0.2% for small businesses (without microenterprises). The units of selection are enterprises of various forms of ownership; the observation units are working citizens aged 18 and older who are owners (co-owners) or employees of these enterprises. To identify the intensity of structural changes that may occur in the structure of responses on questionnaires in the context of business size (large, medium, small), we used indicators characterizing their significance:

A. Salai Index:
$$I_s = \sqrt{\frac{\sum \left(\frac{V_1 - V_2}{V_1 + V_2}\right)^2}{n}} \tag{4}$$

where:

V_1 - is the share of answers of the i -th type of business;
 V_2 - is the share of answers of the j -th type of business;
 n - is the number of questionnaire responses.

This indicator takes its values in the range from 0 to 1, and the closer the A. Salai index is to unity, the more significant the structural disparities become (Eliseeva, 2006). With index values just above 0.3, structural differences are considered significant. However, it should be taken into account that the index value will strongly depend on the number of elements into which the whole body is divided. The more of them, the more the index will be leveled.

$$\text{V.M. Ryabtsev Index: } I_R = \sqrt{\frac{\sum(v_1 - v_2)^2}{\sum(v_1 + v_2)^2}} \quad (5)$$

The V.M. Ryabtsev Index we have obtained does not depend on the number of gradations of the structure of the body. The scale of assessment of the significance measure of disparities in structures according to the V.M. Ryabtsev criterion is presented below in Table 2.

Table 2. *The boundaries of the structural differences' significance by V.M. Ryabtsev criterion (Zarova et al., 2001).*

The interval of the criterion values	Measure characteristics of structural disparities
0.000 – 0.030	identity of structures
0.031 – 0.070	a very low level of disparities
0.071 – 0.150	a low level of disparities
0.151 – 0.300	a significant level of disparities
0.301 – 0.500	a substantial level of disparities
0.501 – 0.700	a very substantial level of disparities
0.701 – 0.900	an opposite type of structures
0.901 and higher	the direct opposite of structures

Thus, in the responses of the questionnaires by type of business in 2017 there were significant structural differences, due to factors such as the size of the business, the type of activity, etc. (Table 3).

Table 2. *The results of the calculations of the A. Salai and V. M. Ryabtsev indexes in the polling of economic entities in the framework of the study*

Group Number	Types of business entities by comparison between groups	Salai Index	Ryabtsev Index
1	Large and medium businesses	0.3864	0.0863
2	Large and small businesses	0.3931	0.1006
3	Small and medium businesses	0.1473	0.0829
4	Large and consolidated businesses	0.5448	0.1129

Source: Calculated by the authors based on the data of the polling.

Calculations of the A. Salai index show that the most noticeable differences in the structure of responses were between large and consolidated businesses (the index value was 0.5448). However, not all the results of comparisons had a substantial index value (above 0.3). When comparing small and medium businesses, the answers did not have substantial disparities in the structure.

Calculations of V.M. Ryabtsev index show that in all types of business in the structure of the answers there are no significant disparities. Business executives and accountants in the survey had the same opinion on all kinds of questions regarding the formation and reflection of statements. Bearing in mind that VM. Ryabtsev index has a more reliable differentiation of the obtained values and does not depend on the number of gradations, it is the most reliable criterion for assessing the significance degree of disparities in the structure of answers to the questionnaire. So, the calculated indices of pairwise comparisons of types of business in the context of their size (large, medium, small) indicate the presence of insignificant differences in the responses of heads of enterprises. Consequently, both business leaders and practicing accountants consider the proposed reporting reform appropriate. And, therefore, the reporting reform being launched is very rational.

Thus, most of the groups of large and medium-sized businesses, as well as consolidated groups of companies, have voted in favor of the advisability of including the following lines in the balance sheet:

- ✓ investment property;
- ✓ investments recognized by the equity method;
- ✓ trade receivables;
- ✓ other receivables;
- ✓ assets for sale for discontinued operations;
- ✓ trade payables;
- ✓ other payables;
- ✓ commitments for sale for discontinued operations.

After analyzing and summarizing the results of the polling, one should note the need to create a unified reporting form in accordance not only with the international accounting and reporting system, but also with international statistical accounting forms.

5. Discussion

The problem of quantifying reporting in other countries with IFRS standards was considered by Ponce *et al.* (2015). However, their assessment dealt with a small number of companies included in the Romanian listing. Besides, the evaluation was based on the standard statistical package SPSS 21, which does not provide an assessment of structural differences by type of business. Such scientists as Honková

(2015) used Friedman's rank analysis of variance, which does not assess the significance level of the disparities between the characteristics.

Thus, based on current research on this topic, the authors applied the most effective and adapted to the Russian conditions' methods, allowing to quantify the structural differences in a sample survey and polling on the convergence of Russian accounting regulations and IFRS (Ballas *et al.*, 2010; Plotnikov *et al.*, 2013; Peshkova *et al.*, 2018).

6. Implementations

In order to study the advisability of including indicators from IFRS in the Russian financial reporting system, the authors have conducted a polling survey. The results showed that most of the respondents, executives and accountants of both large and medium, as well as small businesses were in favor of the convergence of balance sheet indicators. The evaluation of structural disparities in the responses by type of business has shown that for all their types there are no significant differences. A quantitative assessment of significance in the structure of the questionnaire responses has shown that the calculated indices of pairwise comparisons of types of business in the context of their size (large, medium, small) also indicate the presence of insignificant differences in the responses of enterprise managers. Thus, both the heads of enterprises and practicing accountants consider the proposed reforming of reporting to be advisable, therefore, the reforming of the Russian financial statements is highly rational.

7. Conclusion

The reform of the institutions of accounting and the provision of statistical information in accordance with the IFRS was the result of the transformation of state intervention in the economy. The role of the state in the economy is reduced here to the formation of a new concept and purpose of providing information. Through such transformations of accounting and statistics, economic entities get involved in the global economy. In the context of the formation of Russian financial reporting in the direction of bringing it in line with IFRS, there has occurred a dramatic change in the requirements of small, medium, large businesses, as well as integrated companies to the quality of information reflected in the financial statements of economic entities.

A list of balance indicators recommended for inclusion in Russian report format has been determined in the process of collecting the opinions of managers and representatives of accounting services of large, medium and small businesses organizations on the advisability of amplifying the accounting with indicators from the minimum list of financial statement items required by IFRS. Practical application of sampling techniques, questionnaires, methods of processing the data obtained, namely, the calculation of the proportion of reported indicators using the A. Salai

and V. Ryabtsev index, made it possible to identify and justify the favorability of including several items of the IFRS obligatory minimum in the Russian financial statements. The study has indicated a close relationship between accounting and statistical institutions, that makes it possible to obtain comprehensive transparent financial statements. Moreover, at the application level it has proved the helpfulness of using statistical methods in collecting and processing opinions of small, medium and large businesses administration officials of Russian companies. The results of the study may be useful for facilitating the transformation of Russian financial statements into statements prepared in accordance with the IFRS requirements, as well as for building consolidated financial statements in the current conditions of globalized economic processes.

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