

# RISK ASSESSMENT VIA MULTIVARIATE REGRESSION MODEL IN ACCOUNTING AND REPORTING

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**Abstract:** The relevance of the research of risk assessment in accounting and reporting is determined by the need for quality improvement of accounting information, delivered to various user groups. In a digital society, the economic capacity of market relations' members depends upon the quality and volume of data and the efficiency of its application. Since the accounting information forms a substantial part of essential data, the demands to it have increased. It is to be not only comprehensive and accurate but as well as qualitative in general. The authors of this article try to enhance the scientific concepts of the ways of risk assessment in accounting and reporting by highlighting and improvement of existing quantitative models as well as by creating the applied tool based on mathematical statistics for indicating the level and place of mistakes. The applied research objective is to highlight the authors' suggestions on the improvement of methods of risk assessment in accounting and reporting via correlation and regression analysis. Fact-based data for the study was supplied by the accounting department of one of the largest Russian construction companies and included information on the number of mistakes as well as the influence of some internal factors on the accounting. The suggestion of this article's authors in relation to the content of these factors is that the number of accounting mistakes is influenced by the professional level of the accounting personnel and their work effectiveness. As an applied scientific result, the authors present the multivariate regression model, verifying the stated suggestion and allowing forecasting the potential number of mistakes in accounting for the coming reporting period. The article materials are of the theoretical value for methodologists working in the sphere of risk management and specializing in their identification, classification, and quantitative assessment, as well as for practitioners responsible for risk assessment and reduction of consequences of accounting mistakes and fraud.

**Keywords:** risk assessment, accounting mistakes, multivariate regression model, accounting financial reporting.

## 1 Introduction

The methodical basis of the struggle for quality improvement of accounting information is the enhancement of National and International Accounting and Audit Standards. Thus, International Standard on Auditing (ISA) 315, "Identifying and Assessing the Risks of Material Misstatement through Understanding the Entity and Its Environment", (1) points to the necessity of identification and assessment of risks of essential accounting misstatements entailed by fraud and mistakes alike. International Accounting Standard (IAS) 1 "Presentation of Financial Statements" (2) defines essential gaps or misstatements of accounting materials, which may influence their users' decisions, considering the misstatements characteristics and attending circumstances. International Financial Reporting Standard (IFRS) 7 "Financial Instruments: Disclosures" (3) includes the assessment requirements towards the evaluation of the financial risks on the base of accounting materials. In Russia, there are also legal acts determining the methodological terms of accounting risks analysis.

The National Standard of the Russian Federation "Risk management: methods of risk assessment" (4) comprises the methodological basis of risk management, including its analysis and assessment methods' application. The information of the Ministry of Finance of the Russian Federation № PZ-9/2012 (5) places the requirements for the disclosure of information on the economic activity risks of a company in annual accounting reports. However, the mentioned international and Russian documents do not contain any particular recommendations on the ways of indication, identification, and assessment of risks of mistakes in accounting and financial statements.

National and foreign scientific communities publish the results of their research on the ways of indication and assessment of risks of intentional and unintentional accounting mistakes.

Some of them advocate for the application of qualitative methods, which have a professional judgment in their foundation. Members of the Fisher School of Accounting,

Florida University, C. Olsen, A. Gold (6) have concluded on the relevant integration of auditor's professional judgement and neuroscience achievements in order to detect fraud activity. Relying on the exhaustive survey of the literature of 1980-2010, T.M. Montenegro, F.A. Brás (7) concluded that there is the necessity of audit quality concept enhancement through the use of the comparative approach. C. Seckler, U. Gronewold, M. Reihlen (8) reveal the possibilities of application of the multilevel error-handling model, based on the results of social and psychological research.

The research of S. Perreault, J. Wainberg and B.L. Luippold (9) was focused on the influence of auditor – client relations' character on accounting mistakes and quality of reports. The result of their experiment showed a negative effect of positive mutual relations between client and auditor on the identification of mistakes. In their article Taiwanese scientists Y.-S. Hung and Y.-C. Cheng (10) make a hypothesis on information asymmetry according to which the complication of corporate information entails its transparency decrease and creates conditions for corporate fraud and risk increase. The Russian scientist from financial university D.A. Koroleva (11) has contemplated at a conference on the issue of the possible application of Bayesian approach, allowing estimation of the probability of an event, in strategic management accounting and audit and demonstrated the necessity to adjust the initial data taking new information into account.

Most of the researchers are advocates of quantitative approach and they suggest treating the accounting information via mathematical models in order to indicate and make a quantitative assessment of internal and external factors' effects on the veracity of accounting data.

In their article M. Alilou, I. Moulai, K. Rafatneia, M. Alilou (12) ponder the necessity of error prevention at the stage of financial reports preparation through the use of special methods and computer programs. Z. Drábková (13) from the University of South Bohemia presented a report on the application of risk assessment triangle of small agricultural enterprises' accounting, at the foundation of which there is the correlation between reported profit and net cash flow. The think tanks from America and Hong Kong V.W. Fang, A.H. Huang, W. Wang (14) have made the following conclusions. Errors and prejudice are immanent features of accounting, deteriorating its quality. Parabola with downward directed branches reflects the interrelation between intentional and unintentional accounting misstatements. The complications of generation and presentation of accounting information indirectly influence the number of mistakes. The more mistakes in the company's accounting materials, the less the response of the financial market to change in its yield.

Let us summarize the review of modern scientists' concepts of accounting risk assessment methods. This article's authors stand for the use of quantitative evaluation but accept the possibility of accounting mistakes entailed by external factors which are difficult to estimate quantitatively. Given a vast number of viewpoints of accounting risk objects, the ways of its diagnostics and the decisive factors' structure, we consider it worthwhile to present the results of our own achievements in this direction. The goal, this article's authors have reached, is the augmentation of scientific knowledge in the sphere of risk assessment in accounting and reporting, description of the suggested approach based on multivariate regression model and demonstration of its application toward the indication of accounting error given its unconscious preparation.

## 2 Materials and Methods

Revealing the issues of research methodology, we turn our attention to the number of key elements. The first is the definition of approach to risk analysis in accounting. The second

is the choice of the number of accounting errors as an estimation object. The third is the justification of multivariate regression as a way of processing accounting data on risk factors. The fourth is the stepwise description of risk research procedure in accounting and reporting via a multivariate regression model. The fifth is the statement of adaptation changes made by the authors in comparison with traditional methodical tools.

### 2.1 Management of accounting risks research based on a quantitative approach

Accounting and reporting risks assessment methods fall into two categories such as qualitative and quantitative. This article's authors are advocates of quantitative approach since qualitative assessment entails excessive subjectivism.

Quantitative risk assessment in accounting demonstrates the risk magnitude, collected through the use of analytical procedures and mathematical methods. In international standards (ISO/IEC) and the Russian standard "Risk management: methods of risk assessment" (5) there are five groups of quantitative methods of risk assessment: observation, supplementary methods, scenario analysis, functional analysis, statistical methods.

The research of this article's authors is based on statistical methods, which allow for quantitative identification of financial accounting risk and the range of variables directly influencing it, as well as for receiving the risk magnitude from enterprise information systems.

The research is conducted in several steps:

- determination of criterion (indicator), characterizing the error risk in accounting and reporting for key stakeholders;
- revealing of factors, influencing the target criterion, information about which is accumulated in information systems of business structures;
- selection of methodical tools, which allow for determination of the interrelation ways between the resulting indicator and each of essential factors;
- calculation of the range of indicators, reflecting the strength of the relationship between the target factor and influencing factors as well as analysis of final results

### 2.2 The number of accounting mistakes – universal criterion of accounting risk

The selection of risk criterion of accounting is to be guided by the content of international standards developed by professional communities «Committee of Sponsoring Organizations of the Treadway Commission (COSO)» and «International Organization for Standardization, Federation of European Risk Management Associations».

Outward appearances of accounting risks are many and varied and may be classified according to the number of characteristics:

- according to the prerequisites of record generation: existence; rights and obligations; fullness; accuracy and estimation; classification and clearness
- according to basic rules of accounting, generation and presentation of accounting records: risks determined by the insufficient development of accounting policy; risks connected with execution of primary and consolidated accounting documents; risks of incorrect reflection of economic operations in account books; risks of incorrect evaluation of property and liabilities; risks of discrepancies between actual presence of property and accounting records
- according to characterized object: single operations and events within the period; account balance at period's end; records on the company's activity and its property status within the period

- according to the time period of exposure: past, present, projected
- according to loss rate: insignificant; significant
- according to the level of predictability: predictable; unpredictable

All listed types of risks may be characterized by the term "accounting error", dependent upon misstatements of information and manifested in punitive sanctions.

### 2.3 Regression model as an instrument of processing records on factors, determining accounting risks

The works of modern researchers consider various application spheres of methods for defining the level of accounting risks.

In some cases, the experience is negative. The American researcher M.J. Nigrini (15) has doubted the correctness of the application of Benford's law to audit sampling through including the reporting indicators, which numerical values differed from values calculated according to this law. His research revealed that samples were too large and accuracy level was insufficient. On the basis of accounting reports of HealthSouth Corporation, which had been caught cheating, the author suggested considering types of checked data and different alternatives of sample size limit. The group of Czech scientists M. Paseková, B.Svitaková, E.Kramá, M.Otrusínová(16) studied the influence of intentional and unintentional accounting errors on the financial stability of 232 enterprises. The data was processed through the non-parametric statistical Friedman test. It was exposed that fundamental reasons for mistakes were the following: tax consequences, income inequality, difficulties in cost determination of stocks, fixed and financial assets. The risk of unintentional mistakes is subjectively estimated as the highest one in the sphere of hypothetical and corrective articles and the lowest one in asset classification. The above-mentioned application of Benford's law and statistical Friedman test is not relevant for the goals of our research.

The selection of multivariate regression as a method of data processing is preconditioned by the following factors:

- regression analysis allows formalizing the connection between analyzed characteristics in contrast to correlation analysis, which only states this connection's existence;
- regression analysis is traditionally used in economics as a method of expression of stochastic (probability) dependence between the examined indicators, characterized by independent variables and a resulting indicator which we earlier determined as the number of accounting mistakes
- in view of a selection of factors, influencing the accounting risks, the requirement of mathematical statistics is fulfilled, which means that for regression analysis application the variables must be independent
- regression analysis allows determining the value of the resulting equation, that is, the level of influence of selected factors on variation in terms of "accounting mistakes"

The regression analysis may be univariate and multivariate. If there is one independent variable, simple regression analysis is applied. In our case there may be several reasons for accounting mistakes independent from each other, therefore we use multivariate analysis. Regression model, in this case, will be expressed through the equation of linear regression.

### 2.4 The research of risk in accounting and reporting based on a multivariate regression model

In the foundation of risk research based on a multivariate regression model, there is to be a comprehensive approach, including the assessment of accounting and reporting risk into the line of risk management process in accounting (Figure 1).

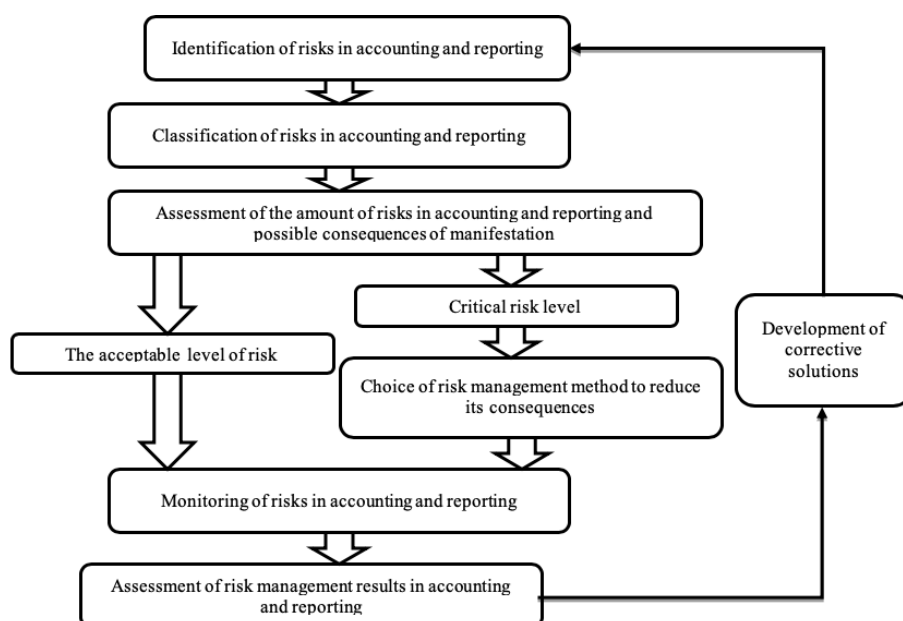


Figure 1. The Chart of Risk Management Process in Accounting and Reporting

Source: A.E.Shevelev(17)

The very process of risk research in accounting and reporting based on multivariate regression model includes the procedure of risk identification and determination of groups of independent factors influencing the level of accounting mistakes.

Let us consider the risk factors of accounting information given in the works of modern researchers.

As the results of accounting firms' research over 2012-2013, Taiwanese scientists have concluded that their successful activity is essentially influenced by accountants' experience and

accountant certificate. (18) Rumanian researchers revealed that psychological rejection of risks on the part of accountants influences professional creativity, but it is not the determining factor in the selection of accounting policies, which mainly depend upon the financial motivation of accountants. (19)

The authors of this article state the hypothesis that the level of accounting risk determined by the number of mistakes is influenced by the indicators of personnel professionalism and the effectiveness of their work (Table 1).

Table 1. The Significant Factors for the Number of Mistakes Made by the Examined Employee

<i>Indicators of personnel professionalism</i>	<i>Indicators of effectiveness of employees' work</i>
<i>significant for the number of made mistakes</i>	
The number of attested employees, persons	The employee workload measured as the number of documents per one employee
The number of employees satisfied with their work, persons	Automation level of accounting, point
The number of employees with seniority over 3 years, persons	Reporting periods of primary accounting documents from the date of their execution, days

Source: Compiled by the authors. Generated by the authors of the article on the basis of the stated hypothesis and analysis of statistical inquiry records of Russian companies.

## 2.5 The differential features of methods of risk assessment in accounting and reporting based on multivariate regression model in comparison with any other methodical tools

Suggested in this article, methods of risk assessment in accounting and reporting, based on the multivariate regression model, has the following features, compared to models and approaches pointed out by other authors:

1) As a quantitative criterion of accounting risk, we suggest the use of "the unit of accounting mistake" as a quantitative measure of resulting indicator in contrast to "intentionally misstated indicator of financial reporting"; (20)

2) It unites quantitative and qualitative factors, influencing the level of accounting mistakes, while other authors suggest the use of either qualitative or quantitative factors; (17)

3) This article's authors suggest the application of multivariate linear regression model instead of the M-score approach, offered by M. Benish and used by S.V. Arzhenovskiy and A.V. Bahteev (20) for identification of intentional misstatement of records.

4) The calculations, made on the base of the suggested method, confirm the authors' hypothesis on the fact that the resulting regression equation allows definitely determining the probable number of mistakes in accounting over the reporting period and, if necessary, forecasting their value. This is the difference from another method, which is based on the regression model and designed to estimate the dependence of financial results on nonfinancial, out-of-balance and market indicators. (21)

## 3 Results

### 3.1 The building of regression model of accounting risk assessment

The authors have made a quantitative description of main factors selected for model building via distributing questionnaires to

experts (personnel of accounting service, internal and external auditors) as well as using accounting data of a Russian construction company which formed the report article "Cost

price" over the period of 2014-2017. The number of accounting mistakes over the reporting period was taken as a resulting indicator. The received information is presented in Table 2.

Table 2. The Results of the Survey on the Number of Accounting Mistakes and Values of Most Essential Factors Influencing Them

Period	The number of mistakes	Probable factors					
		Employee workload, document per person	Automation level, point	The number of attested employees	The number of employees satisfied with their work	The number of employees with seniority over 3 years	Reporting periods of primary accounting documents from the date of their execution, days
	Y	X1	X2	X3	X4	X5	X6
1 <sup>st</sup> quarter 2014	112	1 000	2	5	11	7	15
2 <sup>nd</sup> quarter 2014	110	1 056	2	5	11	7	14
3 <sup>rd</sup> quarter 2014	120	1 204	3	5	11	7	20
4 <sup>th</sup> quarter 2014	119	1 219	3	5	11	7	16
1 <sup>st</sup> quarter 2015	68	883	3	5	11	7	7
2 <sup>nd</sup> quarter 2015	50	791	3	5	11	7	7
3 <sup>rd</sup> quarter 2015	71	1 039	3	4	10	6	4
4 <sup>th</sup> quarter 2015	70	1 034	3	5	10	6	10
1 <sup>st</sup> quarter 2016	77	808	3	5	11	7	10
2 <sup>nd</sup> quarter 2016	112	1 165	3	5	11	7	11
3 <sup>rd</sup> quarter 2016	93	1 047	3	5	11	7	7
4 <sup>th</sup> quarter 2016	81	1 002	3	5	11	7	7
1 <sup>st</sup> quarter 2017	39	616	4	5	11	7	7
2 <sup>nd</sup> quarter 2017	42	760	4	5	11	7	7
3 <sup>rd</sup> quarter 2017	31	742	4	6	11	7	6
4 <sup>th</sup> quarter 2017	48	866	4	6	11	7	8

Source: Compiled by the authors. Data was collected by one of this article's authors – Irina Olegovna Klimova – on the Russian companies "InzhStroyService" LLC and "ElectrostroyPlus" LLC according to accounting records forming the report article "Cost price" over the period of 2014-2017:

- data on the real value of the resulting indicator Y was collected from the conclusion on the internal and external audit.

- values of factors X4 and X5 were received through a questionnaire of accounting and finance employees of a large Russian construction company
- values of factors X1, X2, X3 and X6 were determined based on internal documents of a company.

In order to determine the type of correlation the graphic method was used which showed a linear connection between resulting indicators and exposures (Figure 2).

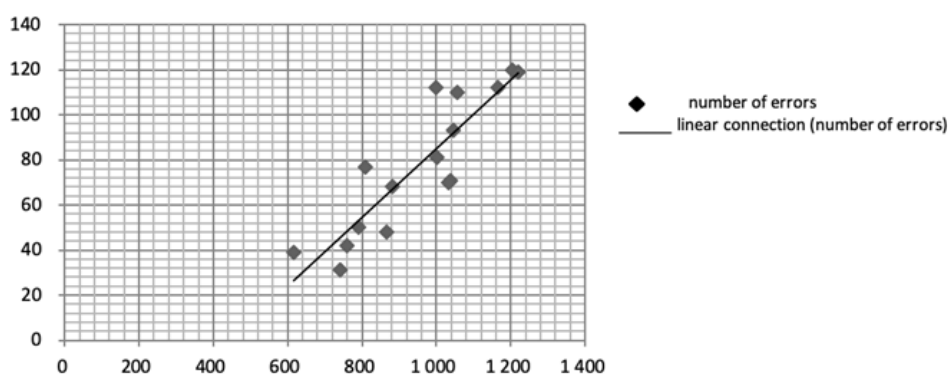


Figure 2. Determination of Connection Type via Graphic Method (Linear Connection)

Source: Compiled by the authors. The figure illustrates the connection between the number of errors and influencing factors, calculated by one of this article's authors - Irina Olegovna Klimova

Thus, for quantitative description of connection between the number of errors and influencing factors the multivariate linear regression model was chosen:

$$y = f(x, b) + e = b_0 + b_1x_1 + \dots + b_nx_n + e \quad (1)$$

where y – dependent (explicative) variable;

$x = (x_1, x_2, \dots, x_n)$  – vector of dependent (explicative) variables;

b – vector of parameters (to be determined);

e – random error (deviation).

On the basis of questionnaires results the authors selected the following key factors, influencing the number of accounting errors (y):

- Employee workload, documents per person –  $x_1$ ;
- Automation level, point –  $x_2$ ;
- The number of attested employees, persons –  $x_3$ ;
- The number of employees satisfied with their work, persons –  $x_4$ ;
- The number of employees with seniority over 3 years, persons –  $x_5$ ;
- Reporting periods of primary accounting documents from the date of their execution, days –  $x_6$ .

For model specification, the authors determined paired correlation coefficients ( $r_{xy}$ ) of corresponding characteristics (y and  $x_i$ ).

$$r_{xy} = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum(x_i - \bar{x})^2 \sum(y_i - \bar{y})^2}}$$

(2)

Where  $x_i$  - i-value of exposure;

$\bar{x}$  – an average of exposure;

$y_i$  – i-value of resulting indicator;

$\bar{y}$  – an average of resulting indicator.

This allowed us including into the regression model the factors which are most essentially connected with the resulting indicator and simultaneously not connected between each other (Table 3).

Table 3. Paired Correlation Coefficients Matrix, Built Through the Microsoft Office Excel Software Progra

	Y	X1	X2	X3	X4	X5	X6
Y	1						
X1	0,886	1					
X2	-0,768	-0,593	1				
X3	-0,344	-0,325	0,456	1			
X4	0,092	-0,186	0,079	0,496	1		
X5	0,092	-0,186	-0,186	0,496	1	1	
X6	0,786	0,629	-0,505	0,009	0,245	0,245	1

Source: Compiled by the authors. The matrix was built by one of this article's authors - Irina Olegovna Klimova.

As follows from the analysis, the most essential effect on the resulting indicator, given insignificant multicollinearity, was exerted by such factors as employee workload ( $x_1$ ), accounting automation level ( $x_2$ ), reporting periods of primary accounting documents from the date of their execution ( $x_6$ ).

The refined regression model is written as:

$$y = b_0 + b_1x_1 + b_2x_2 + b_3x_6 \quad (3)$$

As a result of processing the initial data via methods of correlation and regression analysis through the use of "Regression" tool of the Microsoft Office Excel software program the following regression equation was received:

$$y = 21,593 + 0,087x_1 - 15,319x_2 + 2,162x_6 \quad (4)$$

### 3.2 Verification of quality of the received regression model of accounting risk assessment

In the course of verification of the quality of the received regression model, we decided to exclude the constant  $b_0$  as

statistically insignificant. The evaluation of the statistical significance of regression coefficients was made according to the Student criterion ( $t^*$ ):

$$t^* = \frac{b_i^*}{\sigma^*[b_i^*]}$$

(5)

where

$b_i^*$  - estimation of i-value of the theoretical regression coefficient,

$\sigma^*[b_i^*]$  - standard error of the i-value regression coefficient

The received values of t-statistics modulo are compared to the critical value  $t_{kp}$  for the set reliability (p) and freedom degree (k). If  $t^* > t_{kp}$ , the hypothesis on regression coefficient  $b_i$  being equal to zero is rejected. For the examined model the number of freedom degrees is  $k = 4$ . Given the reliability  $p = 0,05$ ,  $t_{kp} = 2,776$ .

Regression coefficients in the initial model are correspondent to the following t-statistics values  $t^*$  (Table 4).

Table 4. T-statistics Values for Regression Coefficients in the Initial Model

Regression coefficient	t-statistics
$b_0$	0,809
$b_1$	4,756
$b_2$	-3,244
$b_3$	3,121

Source: The values have been calculated by one of this article's authors - Irina Olegovna Klimova.

Thus, the constant  $b_0$  is advisable to be excluded from the model.

As a result of made correction the refined regression model is written as:

$$y = 0,098x_1 - 11,985x_2 + 2,195x_6 \quad (6)$$

Selected regression coefficients for this model are statistically significant ( $t_{kp} = 3,182$ ,  $p = 0,05$ ,  $k = 3$ ) (Table 5).

Table 5. T-statistics Values for Regression Coefficients in the Refined Model

Regression coefficient	t-statistics
$b_1$	8,361
$b_2$	-5,281
$b_3$	3,218

Source: The values have been calculated by one of this article's authors - Irina Olegovna Klimova.

The authors have made further estimation of the quality of the refined regression equation. For this purpose, such indicators as determination coefficient ( $R^2$ ) and multiple correlation coefficient ( $R$ ) have been calculated.

$$R^2 = 1 - \frac{\sum_{i=1}^m (y_i - \hat{y}_i)^2}{\sum_{i=1}^m (y_i - \bar{y})^2} \quad (7)$$

$$R = \sqrt{1 - \frac{\sum_{i=1}^m (y_i - \hat{y}_i)^2}{\sum_{i=1}^m (y_i - \bar{y})^2}} \quad (8)$$

where

$R^2$  – determination coefficient

$R$  – multiple correlation coefficient

$y_i$  – i-value of resulting indicator

$\hat{y}_i$  – calculated value, corresponding to i-value of resulting indicator

$\bar{y}$  – an average of the resulting indicator

With the use of determination coefficient ( $R^2$ ) variance degree of the resulting indicator, explained by the regression model, was determined equal to 0,991.

With the use of multiple correlation coefficient ( $R$ ), the authors estimated the strength of the cooperative effect of factors on the result, and it was equal to 0,995. Given the value  $R$  close to 1, the regression equation gives an accurate description of factors influencing the result.

Made calculations confirm the authors' suggestion on the fact that the received regression equation allows definitely determining the probable number of mistakes in accounting over the reporting period.

#### 4 Discussion

The issues of risk assessment methods are considered by the researchers of various countries. West practice demonstrates the active development of standardization processes in the sphere of quantitative evaluation and management of risks both at the national and international levels. The confirmation is national standards of Australia and New Zealand, Japan, Great Britain, Canada, UAE, and many other countries.

The periodicals are rich with publications in the area of risk management, given the fact that risks are mainly considered from generally theoretical and practical points of their management, assessment methods as well as from the points of their reflection and disclosure in accounting and reporting.

Variety of viewpoints, stated in modern publications, is related to three aspects of the handled issue:

- outward appearance and quantity of accounting and reporting risks
- the range of factors, influencing the quantity value of risks
- the ways of defining the correlation between accounting risks and influencing factors.

*Regarding the outward appearance and quantity of risks*, there are different points of view, alternative to that of the authors. For example, American scientists E.M.Coyne, J.G. Coyne, K.B. Walker (22) speak on risk dependence on the stage of the life cycle of accounting data preparation or on information needs of its users. We suppose that the number of mistakes hinders the satisfaction of needs of information users. The stage of the life cycle of accounting data preparation, where the mistake has happened, does not matter. We believe that the universal characteristic of accounting risk is an accounting mistake, reducing the reliability of reporting information and depriving it of its major consumer property – authenticity. Expression of damage in monetary terms may be various for different users of accounting data.

*The issue of the range of factors, influencing the quantity value of accounting risks* remains open as well. As risk factors, the researchers point out different, not always internal, factors

Finnish specialists H. Höglund, D.Sundvik (23) revealed the positive effect of extended accounting outsourcing on the quality of accounting reports of small Finnish companies and the lack of such effect on the number of mistakes in a solution of the elementary reporting issues. We suppose that outsourcing as an independent factor of changing risk level is not advisable since the crux of the matter is qualification and workload of employees.

Another type of external risk factors, which are supposed by modern researchers to be used in accounting risk assessment, is the so-called “country” risk. This kind of risk is estimated by such international rating agencies as Standard & Poor's, Moody's, Fitch Ratings, etc. (24) We agree with the Russian scientist R.V. Kashbraziev (24) that political and economic risks may exert sufficient influence on the number of mistakes in accounting and reporting. In our opinion, the application of “country” risks in assessment models of accounting risks is advisable only when an investor selects from different countries' companies with principally different external risks. In the rest of the cases, the model will be overloaded with excessive variables.

*The issue of the ways of defining the correlation between accounting risks and influencing factors* is not settled either. For example, H. Paino (25) considered cases of fraud in accounting reports misleading investors and creditors, based on logistic regression. Apart from different modifications of regression, there are other types of quantitative and qualitative assessment of correlation between accounting risk and influencing factors. Suggested by foreign and Russian researchers, risk assessment models in accounting have significant meaning for risk evaluation in economic entities.

Regression models, used by most of the mentioned researchers, are accepted by this article's authors as the instrument base of research of factors influencing accounting data misstatement.

Comprehensive use of the theoretical background of risk management and methods of analysis and modelling allowed the authors determining as a risk indicator the probable number of errors in accounting and factors, influencing it.

Both foreign and national authors consider the currently used quantitative assessment methods of accounting misstatement risks as a consequence of unscrupulous data preparation. These irregularities impede the efficiency of the internal control system.

Apart from intentional accounting and financial mistakes as a result of conspiracy or abuse on the part of management, there

are other factors influencing the authenticity of reports, and it is possible to devise control procedures to minimize them. Having examined the experience of different countries' research on accounting risk assessment methods, the authors have tried a scientific-based selection of factors, which may be related to the number of accounting errors. As a result, we have selected such factors as employee workload, automation level, reporting periods of primary accounting documents from the date of their execution. The quality estimation of the regression model of accounting risk assessment confirmed the authors' suggestion that it allows determining the probable number of mistakes in accounting over the reporting period.

Nowadays the methodology and practice of quantitative risk assessment in accounting and reporting are not completely set. The stated research results, their scientific and practical parts reflect the current vision of accounting risk, its reasons and ways of identification on the base of internal data of Russian companies for the second decade of XXI century. Surely, in the course of evolution of reporting paradigms, methods and systems the risk manifestation will be changing. The gradual transition from double entry to tetra graphic paradigm of accounting and reporting implies the switch of risk characteristics to certain users' interests. Automation of processes of record of nonfinancial indicators will enable deeper research of social and psychological and other reasons for accounting risks. Integration of reporting systems with the external environment will allow for more precise estimation of influence which both internal and external factors exert on accounting risks. This is yet for us to come. Further, we will suggest the research results corresponding to the current state of accounting systems

## 5 Conclusion

The authors of this article demonstrate the research on accounting and reporting risks, based on the work of researchers from different countries and direct experience in the sphere of accounting and reporting in Russia. The authors defined an accounting mistake as the universal characteristic of accounting risk, reducing the major consumer property of accounting data – authenticity. The authors considered methods of accounting and reporting risks assessment, illustrated in theory and widely accepted in practice.

Basing on the experience of foreign and national researchers, the authors suggested regression assessment model of risk indicator – the number of accounting mistakes made over the reporting period, which allowed for the identification of influencing factors.

As a result of the information processing via correlation and regression analysis with the use of the Microsoft Office Excel software program, the factors which exert the most essential influence on the resulting indicator are following: employee workload, accounting automation level, reporting periods of primary accounting documents from the date of their execution.

In the course of quality verification of the regression model of accounting risk assessment, we decided to exclude the constant  $b_0$  as statistically insignificant, which allowed for the increase of variance degree of the resulting indicator up to 0,991. Computed using the statistical data, multiple correlation coefficient showed that the factors, selected for the regression equation, essentially influence the result, and this fact confirms the direct connection between influencing factors and the number of accounting mistakes.

Suggested by the authors accounting risk assessment model is useful for the determination of venture accounting areas and may be applied by the accounting department, internal and external auditors.

The worthwhile direction for future research is the unification of this model, which implies an indication of reasons for accounting mistakes, common for most companies. The result may be the regression model ready to be applied by the wide

range of companies, which will sufficiently enhance the risk assessment in accounting and reporting. Here it is necessary to provide the possibility of the model specification for each specific company.

## Literature:

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**Primary Paper Section: A**

**Secondary Paper Section: AH, AE**