algorithms of development for controlling evaluation system in enterprises

**Abstract.** Nowadays there is a strong trend for world economy globalization, that is why corporate entities tend to reinforce their economic power and influence, therefore, they are constantly looking for some new ways to increase the efficiency of their activity both at internal and internal markets. The stated circumstances urge corporate entities to boost paces of development by implementing innovations, saving costs and reducing risks. The issues, mentioned above, can be settled by controlling.

To implement controlling in order to reduce risks we should possess relevant external and internal data, therefore, the significance of internal audit ( control) mechanisms in enterprises becomes crucial.

The aim of the study is to develop the indicators for controlling efficiency evaluation at enterprises. Here are the following results and conclusion that possess scientific novelty and have been obtained by the authors of this article:

1. The authors have demonstrated that the controling efficiency evaluation mechanism in the internal audit (control) and corporate risks management system is able to create patterns that permit to increase efficiency enhance investment prospects of corporate entities.

2. The authors have proposed a pattern for controlling efficiency evaluation, have demonstrated the key algorithms for development of this pattern at enterprises that are based on strategic planning principles

**Key words:** controlling, development, evaluation system, audit, control, risk management.

**Introduction.** Difficulties in the national economy development, as well as foreign political and foreign economic crises demonstrate that the development and improvement of different elements of corporate entities management systems is vital. One of such elements is called controlling. Therefore, the development of controlling is crucial both for state and for private corporate entities.

It should be noted that nowadays there are many interpretations of the term controlling, many of them are similar to each other in their economic sense, others have certain differences. Different interpretations of the term controlling influence the decision-making process in corporate entities when we speak about the controlling structure and , respectively, the application of tools and methods of management that haven’t been used earlier by organizational changes implementation [1,2,3,4,5].

The studies have proved that D. Hahn [5], E. Mayer [6], А. Daile [1], P. Chorvat [2] et. al. have made the greatest contribution to the corporate controlling development. They have worked out some theoretical aspects and spheres of controlling application, but the mentioned authors use mainly international experience that is particular for each country.

If we speak about this definition in broad sense, than it should be noted that some scientists regard controlling as a separate area of management (D. Hahn, E. Mayer , M. Hauser, S. G. Falko, А.М. Karminsky, E.М. Korotkov, E.А. Utkin, А.М. Pavlov, V.А. Starykh, N.I. Olenev, А.G. Primak, etc.). Others regard controlling as an independent institution, type of economic activity (R. Nelson, R.Everta, N.G. Danilochkina, L.V. Popov, Т.А. Golovina, R.Е. Isakova, Е.L. Popchenko, etc ). Some scientists define controlling as the element (function) of management (P. Chorvat, А.К. Аndronova, Е.D. Pechatnova, etc). The diversity of opinions influences both theoretic conclusions and practical tools, which corporate structures use while establishing controlling system. However, it should be noted that the authors, mentioned above, give the highest regard for the possibilities and prospects of controlling as an internal management tool.

The comparison of the controlling application experience in Russia and abroad shows that the controlling system in corporate entities of the Russian Federation is to be developed and we should overcome the divergences that exist between the participants of the corporate economic relations and elements of external and internal environments, to increase the integrity and reliability of managerial and financial information. We believe that to develop efficient controlling system for corporate entities we should change both the mode of activities of the entities, structure and operational quality of key controlling management and create new tools to assess their performance.

The conducted analysis of Russian experience has revealed some common trends for corporate controlling development [7,8,9], to be exact:

* The improvement of methods and tools for controlling implementation;
* The development of patterns for controlling efficiency evaluation, based on the system of predetermined indicators and criteria.

The most urgent issue is to determine system of indicators and criteria that will give us the possibility to create the controlling efficiency evaluation pattern for corporate entities under constantly changing social- economic relations. It stipulates further development trends.

Many Russian corporate structures have to face inefficient resources use. It happens due to the lack of relevant information for managerial decision-making process, abuse acts on the part of management, intentional or unintentional hide of received data. To settle specified issues it is necessary to increase the recieved data transparency and therefore to enhance the internal audit (control) system, aimed at risk management.

The implementation and development of mechanism for internal audit (control) and risk management is the priority area, if we speak about controlling system in corporate entities. To begin with, this tool is the main supplier of internal financial and other data, which, in its turn, ensures efficient management. Secondly, the well- established internal audit (control) reduces risks significantly, and that is extremely important for corporate entities nowadays.

 To determine the level of controlling implementation efficiency we should use the methods of adequate evaluation of management results that are based both on internal and external data. However the exact methods that are able to comply with these requirements haven’t been found yet.

**Study methodology.** To resolve the set tasks we had to study economic, informational, social and other aspects of controlling application and to identify possible ways to increase its efficiency. This has defined the character of methods, employed in this study, which permitted to study different economic, operational, structural, temporal, logical and institutional aspects that influence controlling efficiency increase that is reached by the development and implementation of the internal audit (control) mechanism.

To assess the efficiency of controlling in corporate entities we have resorted to strategic management approaches, as well as the following methods:

* index method, which permits to calculate overall indices of corporation activity
* balance method, which gives the opportunity to assess the interrelation of business activity parameters;
* economic and mathematical methods, which permit to establish the most efficient management system to control corporate entity and its elements;
* function-cost analysis employed to determine the most efficient set of functions, performed by corporate entity and, respectively, the most efficient set of controls, etc.

**Results. If the corporate entity develops the internal audit (control) mechanism, it may be difficult to assess the efficiency of tasks performance and to determine the level of responsibility for persons, who are involved in this mechanism. To make it clear let’s set “the decision tree up**” (fig 1). This form of “decision tree” acts as board of management assistant. It helps to identify the overall level of organization and operation at the different stages of internal audit (control) system. It also helps to establish areas of responsibility.

Internal audit and control service

External a

Сorporate management

Internal environment

Favourable

Unfavourable

are reached

The set goals

are not reached

Causes identification

internal

external

low

Risk evaluation

high

evasion

Reaction on emerging risks

acceptance

mitigation

transfer

Control methods

Efficient

Inefficient

Figure 1. End/

Information and communication

Limited circle

Extended circle

Analysis

Monitoring

Management

regulation

Complies with the goal

Evaluation of carried out activities

Doesn’t comply with the goal

Efficient

Management efficiency

Inefficient

Fig. 1. The responsibility areas for internal audit (control) system at different operational stages

Let’s dwell on the functionality of the presented decision tree:

1. Internal environment. Corporative structures management maintains proper environment in the internal audit (control) system. Proper functioning and outcomes of internal audit (control) strongly depend on the internal environment of the entity (favourable, unfavourable). At this stage the responsibility area is corporative management. .

2. Proper goals setting. The managers shall define corporative goals properly. The internal audit and control service shall have the clear idea of tasks which have to be accomplished. At this stage the responsibility areas are the internal audit (control) service and management.

3. Causes identification. The internal audit and control service submits to the managers the data that helps to identify factors, which influence the process of reaching goals. Corporative managers decide what is the cause type (internal or external) and subdivides them into risks and possibilities. At this stage the responsibility areas are the internal audit (control) service and management

4. Risk evaluation . Corporative managers in cooperation with the internal audit (control) service identifies the possibility of risks emergence and work out risk mitigation measures. At this stage the responsibility areas are the internal audit (control) service and management

5. Reaction on emerging risks. If the risks emerge the managers shall take the corresponding risk mitigation measures. The risk reduction level depends on chosen strategy. At this stage the responsibility area is corporative management. .

6. Control methods. When all the necessary actions have been taken, the internal audit (control) service assesses their efficiency, by analyzing risk level changes . At this stage the responsibility area is the internal audit (control) service.

7. Information and communications. The internal audit (control) service gets the latest information and distributes it between concerned structural departments. Data exchange increases the motivation of employees, they feel themselves involved into the process and react on risks. At this stage the responsibility area is the internal audit (control) service.

8. Monitoring The corporate managers shall constantly monitor the received data and results, analyzes and manages risks, establish goals for internal audit (control) service. . At this stage the responsibility area is corporative management.

9. Evaluation of carried out activities, management efficiency. The qualified external auditors will detect the weak points of the entities’systems and will submit a detailed report to the management board . The external auditors will give an independent and objective assessment of risk-oriented pattern, its functions and the contribution of its members.

External auditors are crucial for ”decision tree”, pattern, for their activity is being assessed, and at the same time the act as the tools for determination of responsibility areas. These functions also can be fulfilled by internal audit (control) service.

It should be noted that this decision tree”, pattern helps the management board to settle issues, related to the incentives for the employees while developing internal audit (control) system. The possibility to get additional revenues for reaching the goals of the company will urge managers (whose renumeration depends on the current state of things) to be more concentrated and to pay more attention to the long-term development of the corporate entity. It is crucial to distinguish between the interests of corporate structure and managers to prevent the situations when managers tend to use their revenues to the full extend and forget about possible future losses. They are increasing risks, acting like that. We believe that in the process og incentive programs development a special attention should be paid to the improvement of internal audit (control) service functioning .

To distinguish between competences of key elements of internal audit (control) system, represented by corporative managers and internal audit (control) service the management board should use ratings to assess their performance and set the amount of renumeration. They will serve as engine for further development of this system. Main indicators for performance evaluation of internal audit (control) system key elements are shown in fig. 2.

Financial indicators state

Compliance with current legislation

Properly set goals

Management

Risk mitigation measures

Management efficiency

Financial indicators state

Tasks accomplishment accuracy

Compliance with current legislation

Internal audit and control service

The reliability of the reported data, validity of chosen control methods

The mobility of relevant data distributions between departments

Source:

Compiled by author

Fig. 2. Main indicators for performance evaluation of internal audit (control) system key elements

Let’s have a look at the author’s rating for management performance evaluation in corporate entities. Let’s draw a graph (fig. 3).

**Y**

5

4

3

2

1

5

4

3

2

1

-1

-2

-3

-4

-5

-1

-2

**X**

-3

Properly set goals

-4

Compliance with current legislation

-5

Risk mitigation measures

Financial indicators state

Management efficiency

Fig. 3. Rating graph for corporate entity management

In the proposed pattern for internal audit (control) the rating of management activity should be calculated by the following formula:

$\acute{y}= x^{2 }- x,$(1)

where $\acute{y}$– management activity rating;

$x$–indicators for management activity evaluation

The explanations for management activity evaluation indicators are stated (x) in tables 1, 2.

Table 1.Management activity evaluation criteria

|  |  |
| --- | --- |
|  | **Points** |
| **Evaluation parameters** | **1** | **2** | **3** | **4** | **5** |
| proper goals setting,x | The goal hasn’t been reached  | The goal has been reached, but the expectations were higher  | The goal has been reached, moderate expectations | The goal has been reached. The expectations were lower  | the goal has been reached |
| Compliance with current legislation ,x | The current legislation has not been complied with | The current legislation has been complied with (below the average) | The current legislation has been complied with (average) | The current legislation has been complied with ( above the average) | The current legislation has been complied with |
| Risks mitigation measures,x | increased risks | the risks are above the average  | moderate risks | the risks are below the average  | the risks are minimal |
| management efficiency ,x | inefficient  | the efficiency is below the average  | average efficiency  | the efficiency is above the average | efficient |

The financial indicators state is measured in positive and negative results

Table 2. Activity assessment by financial indicators state

|  |  |  |  |
| --- | --- | --- | --- |
| financial indicators state , positive trend ,x | 1no changes | 2slight growth | 3significant growth  |
| financial indicators state, negative trend- x | **-** 1slight decrease | - 2moderate decrease | - 3significant decrease  |

If the arithmetic mean of financial indicators state is negative, then we should use the following formula:

$\acute{y}= - (x^{2 })-(- x). $ (2)

It is possible to create expert panel that will be responsible for assessment of management activity indicators. Such panel should be formed by the Management Board .Here are the possible members of this panel. The panel should have enough experience in economics and management (fig. 4.).



Economic development agency

Representatives of science and education

Management Board

Experts

External auditors

Independent directors

Рис. 4. The expert panel members

The management activity indicators assessment is registered in assessment sheet. Table 6 represents standard assessment sheet that can be used by other corporate entities В

Table 6. – standard assessment sheet for management activity indicators.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **the parameter was assessed by**  | Management Board  | independent directors  | External auditors | Economic development agency | Representatives of science and education | Experts | $$\overline{x}$$ | $$\acute{y}$$ |
| proper goals setting | 3 | 2 | 3 | 3 | 2 | 2 | 2,5 | 3,75 |
| compliance with current legislation | 3 | 3 | 3 | 4 | 3 | 3 | 3,16 | 6,82 |
| Risk mitigation measures  | 4 | 2 | 3 | 2 | 3 | 3 | 2,83 | 5,17 |
| Financial indicators state  | -1 | -1 | -1 | 1 | 2 | 1 | 1,00 | 0,00 |
| Management efficiency  | 3 | 2 | 3 | 3 | 3 | 2 | 2,66 | 4,41 |

Then we should calculate the arithmetic means for management activity indicators, using the formula:

$\overline{x}= \frac{1}{n}\sum\_{i=1}^{n}x\_{i = }\frac{x\_{1} +x\_{2} + ...+x\_{n }}{n}.$ (3)

To calculate renumeration ratio use the formula:

$I\_{\acute{y}}= \frac{\frac{1}{n}\sum\_{i=1}^{n}\acute{y}\_{i }}{\frac{1}{n}\sum\_{i=1}^{n}\overline{x}\_{i }}=\frac{\acute{y}\_{1} +\dot{y}\_{2} + ...+\dot{y}\_{n }}{n}\frac{}{}\frac{\overline{x}\_{1} +\overline{x}\_{2} + ...+\overline{x}\_{n }}{n}.$ (4)

$$I\_{\acute{y}}= \frac{20,15}{12,15} ≈ 1,65. $$

Let’s state the groups, which determine the ratio of coefficient to management renumeration rating (fig. 5.).



Highly efficient (3,01 – 4)

Efficient (2,01 -3

Low efficiency ( 1,01-2)

Inefficient (0-1)

Fig. 5. Groups formed by ratio of the coefficient to the renumeration rating.

The stated rating groups can perform several functions: they can be employed to make overall assessment of management in internal audit (control) system; to calculate the renumeration coefficient (renumeration amount) for managers. The Management Board has to decide, what source of payments the obtained ratio should be assigned to.

The conducted analysis shows that the management renumeration ratio is equal to 1,65; That means that the encouragement and operational efficiency of management in the given internal audit (control ) system are average.

**Discussion.** The prominent scientists [5,6,10,11,12] argue that controlling belongs to information assurance system, targeted at results of company management. Globalization processes in economic relations along with changing technologies and the development of the information and telecommunication space in the world (increase in data volumes) urge corporate entities to evolve controlling system constantly. Such development should be based on collection and processing of external and internal data. This is the key principle of internal audit (control) system.

The internal audit (control) has been commonly used by many companies in Russia. Nevertheless the companies’executives haven’t been fully aware of essence of this process and its goals. The Management Board should set strategic goals in terms of enterprise activities, should be responsible for internal audit implementation and use. The internal audit permits to assess relevance and efficiency of managerial decision-making process in enterprises. Many enterprises neglect the internal audit upon the pretext that they are conducting the external one. To improve the internal audit control mechanism the following actions should be carried out:

- to create detached controlling body that should include qualified audit specialists, middle managers and international experts ;

- to redistribute responsibilities in order to increase the efficiency of controlling bodies;

- to implement budgeting system that will help to set the budget for certain entity structures, to stimulate the employees, so that they could obtain planned results, to reveal advantages and disadvantages of the entity;

- to create database of suppliers and customers;

- to create methodical and methodological base, taking into account the international experience;

- to implement advanced automated accounting systems for making proper managerial decisions;

- to develop efficient risk-oriented systems that are based on estimated values.

The development of efficient risk-oriented systems that are based on estimated values is the key element of internal audit (control) mechanism, however, it should be noted that the foreign companies haven’t decided yet what methods to employ to comply with these requirements.

That is why the algorithms, considered in this study will help to accomplish the set goals, related to the development of the unified internal audit, control and risk management system, will increase the efficiency of controlling, will improve financial stability and investment prospects of foreign and Russian corporations.

**Conclusion.** There are many large medium and small state and private corporations in Russia and abroad, activity and scale of operation of which are to be observed. These observations should facilitate the development pf more accurate and opportune solutions and their further implementation. If we consider both international and national experience of internal audit system application, we can conclude that the key elements of this system are the internal audit and control service and management.

If corporate entities managers employ the proposed pattern of estimated values, they can foresee the possible operational risks. The implementation of the elaborated rating of estimated values for internal audit (control) and risk management system will enable them to find the ways to improve corporate controlling system, to consider particular interests and advantages of all to whom it may concern, both internal and external elements, will help the corporate entities to increase their operational efficiency under the conditions of constantly changing ambient environment and, respectively, will make it possible to take more reasonable corporate managerial decisions, aimed at internal environment upgrading.

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