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Visual analysis in identifying a typical indicators of financial statements as an element of artificial intelligence technology in audit

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Abstract

The use of analytical tools on the example of specific financial statements by checking it for the signs of manipulating data elements has allowed us to expand the range of the most effective analytical procedures for assessing the organization's involvement in questionable transactions.

Keywords: financial statement, assessment of probability of organization's involvement in questionable operations, audit, Beneish model, Roxas model, analytical audit procedures

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1. Introduction

In the context of continuous growth in the volume of various data in the economy, more and more attention of users of financial statements is aimed at studying the application of analytical procedures. The implementation of these procedures in the analysis of financial and non-financial information of economic entities is aimed at minimizing the costs of time, human and financial resources [1]. The object of the study, in relation to which the use of visual analysis tools was considered is the financial statements of private economic entities of the Russian Federation. In turn, the subject of the study was the analytical audit procedures as an effective way to assess the presence of distortions in the financial statements and, as a result, the involvement of the organization in questionable financial transactions. During the study, such methods were used as information and analytical intelligence, analysis of cash flow data and comparative analysis, coefficient analysis according to the Beneish and Roxas model, and charting.

2. Analytics in the audit

To identify fraudulent activities at the operational level and at the level of accounting information generation, the most effective is to build an effective internal control system and constant monitoring of the company's operating environment, that is, prevention. At the detection level, as the statistics of fraud detection shows, the most effective method of disclosing fraud with financial statements is to check the so-called analytical symptoms of events that go beyond normal practice [2].

It is necessary to clearly distinguish two different objects of analysis:

1. Immediate financial reporting;
2. Non-financial information that would lead to a finding of wrongdoing.

For the first case, analytical symptoms such as:

- Significant unjustified deviation of financial indicators compared to the previous period or other comparable data;
- Incomparable increase in expenses with a decrease in inventories;
- Increase in income with a decrease in the amount of cash receipts;
- Increase in inventories with decrease in accounts payable;
- Increase in sales with an increase in the unit price;
- Unnecessary purchases.

Critical: when trying to identify the analytical symptoms of strange economic behavior of the company, it is necessary to establish acceptable criteria for deviation of the indicators, considering the specifics of the company.

In classical formulation, the method of financial analysis is a system of theoretical and cognitive categories, scientific tools and principles of research of financial activity of economic entities. We pay attention that within the limits of the present article the financial analysis should be understood as: scientific toolkit and set of principles of research of financial activity on the subject of involvement in questionable operations. This thesis is also confirmed by the provisions of the International Standards on Auditing, namely ISA 520 "Analytical procedures" [3].

The auditor's toolkit also includes analytical procedures such as:

1. Horizontal analysis (or trend analysis) - a comparative analysis of a specific reporting indicator (e.g. balance sheet line) for several periods and identification of trends in changes in financial results;
2. Vertical analysis - analysis of the ratio of the selected reporting indicator to other indicators within a specific reporting period and identification of the structure of property, income, expenses and liabilities of the organization;
3. Comparative analysis - analysis of aggregate indicators for specific indicators within the organization and also analysis of the indicators of an individual company in comparison with similar data of competitors;
4. Factor analysis - study of the impact of a single factor on the company's performance using stochastic and deterministic methods.

These methods are constantly improved and widely used by auditors in practice, but the most effective are those procedures that allow you to take into account the relationship between financial and non-financial information, such as the Beneish model and its optimized version - the Roxas model, as well as the analysis using data from the cash flow statement [4].

In order to understand what indicators in Beneish and Roxas models lead to illogical results at first glance, it is necessary to build a map of deviations of these indices from the conventional norm. As it was decided earlier, the most effective would be to use the six-factor Beneish model and the four-factor Roxas model.

As you can see, for twenty companies the trend for 2016 and 2017 is approximately the same. For example, the greatest discrepancy is observed for the indicators - “Asset Quality Index” (AQI), then for “Sales Growth Index” (SGI) and “SG&A Expense Index” (SGAI) - it is approximately the same, the list of the four most varied indicators is completed with “Days Receivable Index" (DSRI).

In the course of monitoring, it was found that almost every increase in AQI, i.e., the value of non-current assets, from which the probability of receiving a return is lower than that of fixed assets, entails an overestimation of the composite index of the Beneish and Roxas models.

It was also noted that DSRI was seldom, or rather once, overestimated, which also led to an increase in the composite index. In another case, in 2016, DSRI was overestimated in conjunction with SGI, which did not cause exceeding the M-score norm. The indicators increased in approximately the same way – DSRI = 1,307 SGI = 1,213. This method significantly reduces the analytical value in cases where the management of the organization takes measures to conceal fraudulent reporting or redistributes the cash flows of the organization on different lines of the financial statements.

However, this type of analytical procedure is the first impression of the company, which will influence further conclusions about its possible involvement in manipulation of accounting records.

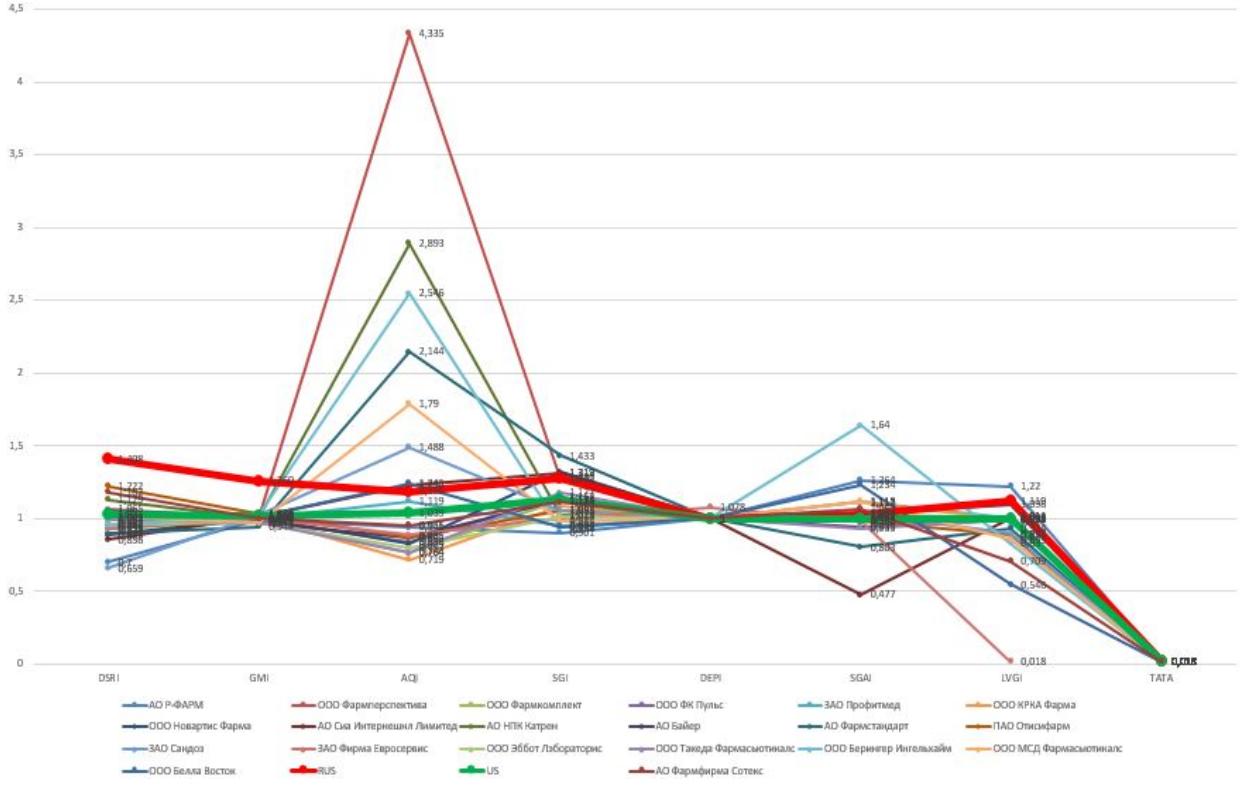

Fig.1.Overall picture for companies for 2016.

The work was carried out using MS Office Excel. The necessary data was collected from open sources, as well as summarized in separate tables.

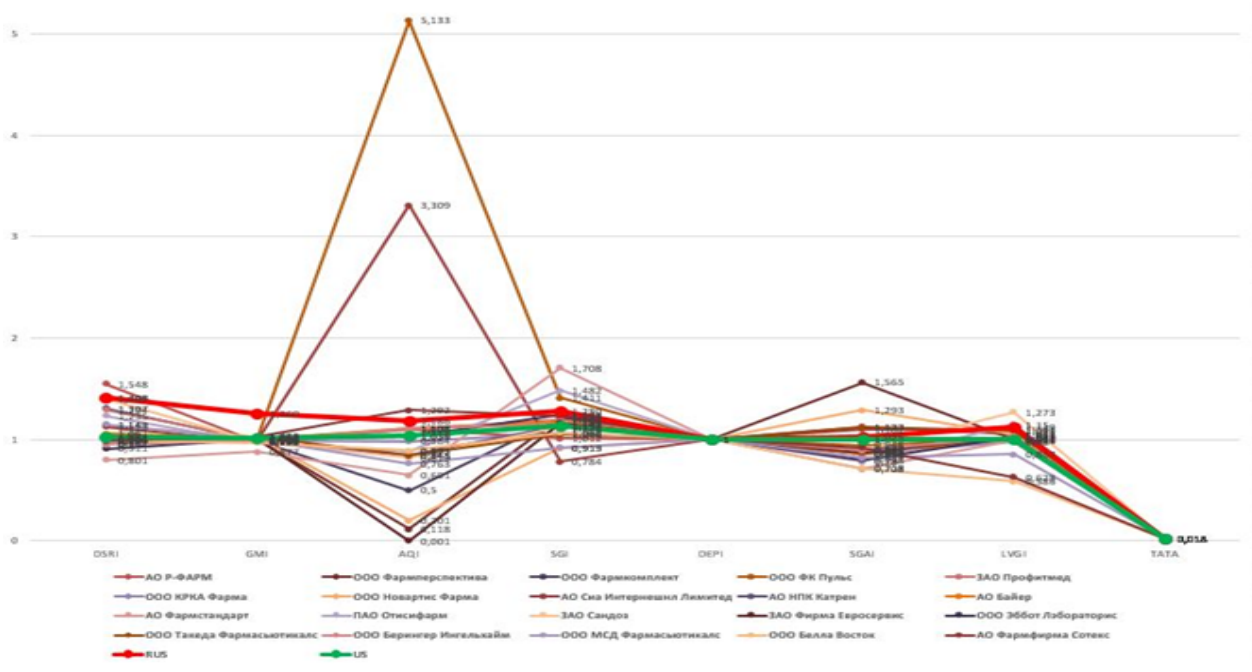

Fig.2. Overall picture for companies for 2017.

Figure 1 provides an overview of the results of the analysis of the companies' financial statements for 2016, and Figure 2 provides an overview of the results for 2017. A broad red line indicates the conditionally normative indicators previously identified by Russian experts, and a broad green line - by American experts.

3. Analysis of the results

Summing up the results of this article, it is necessary to note the following observations:

1. “Reliable companies” with strong market positions show strong fluctuations in AQI, SGAI and, in many cases, DSRI;
2. The indicators change in conjunction, the most common examples: AQI - SGI, SGI - LVGI, SGAI - LVGI.

It can be seen from the constructed graph that for 35% there are large discrepancies between the values of cash flow and operating profit, which means either an uneven distribution of cash, or can serve as a sign of distortions in the statements.

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