Phases of Evaluation of Projected Financial Results from Ordinary Activities of a Manufacturing Company

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Abstract: The present study covers such issues as evaluation of projected financial results using statistical estimations for forecasting, as well as principles for the balance sheet drafting. The proposed combination offers opportunities for an integrated and complex evaluation of planned business activities. The following indicators calculated at different phases are used as a result criterion: the difference between income and expenditures, the ability to provide cash flows, net assets in both the traditional assessment and based on revaluation of certain items as well as capital gains. All the above mentioned facilitates and accelerates the process of management decision-making.

Key words: Forecast evaluation, simulation, financial result, derivative balance sheet report, accounting, net assets

INTRODUCTION

Due to rapid changes in the economic situation, an immediate management decision making has become of vital importance, provided however that no time for a deep and comprehensive study of the problem is available. The use of mathematical methods and simulation helps to choose and correctly justify the best solution. Simulation of business processes and financial activities is not a new field of expertise but in the context of continuous improvement of technologies and control methods as well as introduction of new information systems, it is necessary to update the existing simulation procedures. Modern authors make quite a heavy use of accounting simulation in their research which results in a derivative balance sheet covering various aspects of activities of a business entity. Kolvakh (2000) introduced the concept of a Situational Matrix Modeling, where mathematical methods are used for the development of an operation matrix and matrix equations of balance sheets. Vysotskaya (2009) was developing and adapting ideas of Situational Matrix Modeling for the purpose of accounting simulation of financial results of corporate structures. Serebrennikova and Zimakova (2015) developed recommendations for the use of accounting simulation to analyze synergies for construction companies. Marchenkova (2015) recommended the use of a balance sheet structure simulation in order to enhance financial stability based on the desired (recommended) parameters. Tkach *et al.* (2015) was using the concept of Accounting Engineering when considering the simulation.

This study was based on the fact that financial results shall be evaluated on the basis of profit (loss) reported in the income statement as well as the amount of actual capital gains reflected in the balance sheet. It shall be noted that some authors generate derivative balance sheets that reflect the actual results. Cuddington and Khindanova developed a model integrating mathematically calculated sales forecasts with financial statements, showingthat such a combination allows you to make information clear and readily available for the audit, including the possibility to use traditional Excel spreadsheets. The present study covers the issue of evaluation of projected financial results with due regard to the time lag between the business transaction and cash flows as well as its impact on the capital of the business entity.

This study aims at the establishment of phases necessary to evaluate financial results from ordinary activities of the business entity by means of mathematical methods and accounting principles. It is also advisable to provide the possibility to select a method (way) of one of several alternatives at each phase.

MATERIALS AND METHODS

Based on the fact that simulation is a specific multi-functional research which shall be similar to but not repeat the original and no arbitrary modeling is allowed, statistical methods proposed by the authors in order to predict financial results were considered as well as accounting simulation techniques including a variety of

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valuations, consolidated accounting entries and generation of a balance sheet statement. The integrated use of recommendations is focused on the efficient management of financial results and a more realistic evaluation of forecast transactions.

RESULTS AND DISCUSSION

These days most authors agree that the company value is the main criterion for evaluating business performance and that there is a need in management of its cost (Knapova, 2011). Determination of actual financial results plays an important role in this respect. Profit specified in financial statements of a business entity is not money yet and it is unclear if it will turn into money supply as well as how much it will actually cost at the time of receipt-a similar situation is about costs and accounts payable. We shall consider many components of actual financial results in order to determine the latter. Simulation is advisable to be used for this purpose. Stiglitz noted that formal simulation in economic science had concentrated its attention on perfect information models for over one hundred years but even a very small amount of information imperfections may have the strongest impact on the balance character. A competitive model was transforming the economic science into an engineering industry while all participants in the economic process to engineers.

Being a socially dependent science, accounting shall use capabilities of modern information systems (while meeting business needs) in order to obtain detailed information that allows you to achieve certain quality characteristics as follows: efficiency in terms of both prompt receipt of useful information and optimally involved resource thereof; confidentiality which means protection from unauthorized disclosures; integrity and reuse of information regardless of the usage period; compliance which is related to conformance with those laws, regulations and contractual agreements of users derived from external and internal policies (Odunfunwa, 2008). Dandago and Rufai (2014) pointed out the necessity to develop approaches for data reflection in accounting information systems that provide the ability to manage profitability in various fields of activity.

All the above mentioned underscores the need to find new approaches required for the use of accounting information. Figure 1 shows the phases to evaluate the projected financial result from ordinary activities of the manufacturing company.

Phase 1: Forecast calculation of the financial result. There are two possible options:

Using mathematical and statistical methods: The moving average method; the method of exponential smoothing; the ordinary least square method.

Using budgeting: During calculations, we used three fairly simple statistical methods proposed by different authors for the purposes of the forecast calculation of financial results being the difference between income and expenditures. In this case, we carried out separate calculations of income and expenditures. In the study, small and midsized groups of manufacturing companies were selected shown in Fig. 1. Evaluation of the accuracy level of projected values was based on calculation of the mean relative error (ε):

$$\overline{\varepsilon}_t \frac{1}{n} * \sum_{t=1}^{n} \frac{\left|\left(Y_t - \overline{Y}_t\right)\right|}{Y_t} * 100\%$$

Where:
Y_t = Actual values of the time series
$\overline{Y_t}$ = The rated value of the time series
n = No. of levels of the time series

Calculations performed showed that the moving average method is mainly suitable for the mid-sized and major manufacturing companies shown in Table 1. However, it should be noted that only the period of 2010-2014 was included in the study, when no significant fluctuations and shocks in Russian economic environment were observed. The use of the above mentioned small businesses in mathematical calculations showed significant deviations and inaccuracies. That was due to the fact that those businesses were mobile enough and actively controlled financial results to suit their needs. When loans or borrowed funds are required, they tend to increase the sales profit; so in the absence of this need, a decrease in financial results from the core activity is observed. For corporate associations, it is also difficult to use mathematical methods in forecasting financial results. Such corporate bodies consist of several business entities involved in various activities, so the number of factors that affect the overall result increases several times, which means that the forecasting error level increases. Consequently, it makes sense to make budgets of most entities in a direct way as well as to determine the projected profit (loss) from the core activity based on such budgets. Where a more accurate planning is required, calculations shall be based on the use of the direct method of budgeting.

In the current planning system, domestic researchers note one very important issue which is that planning in
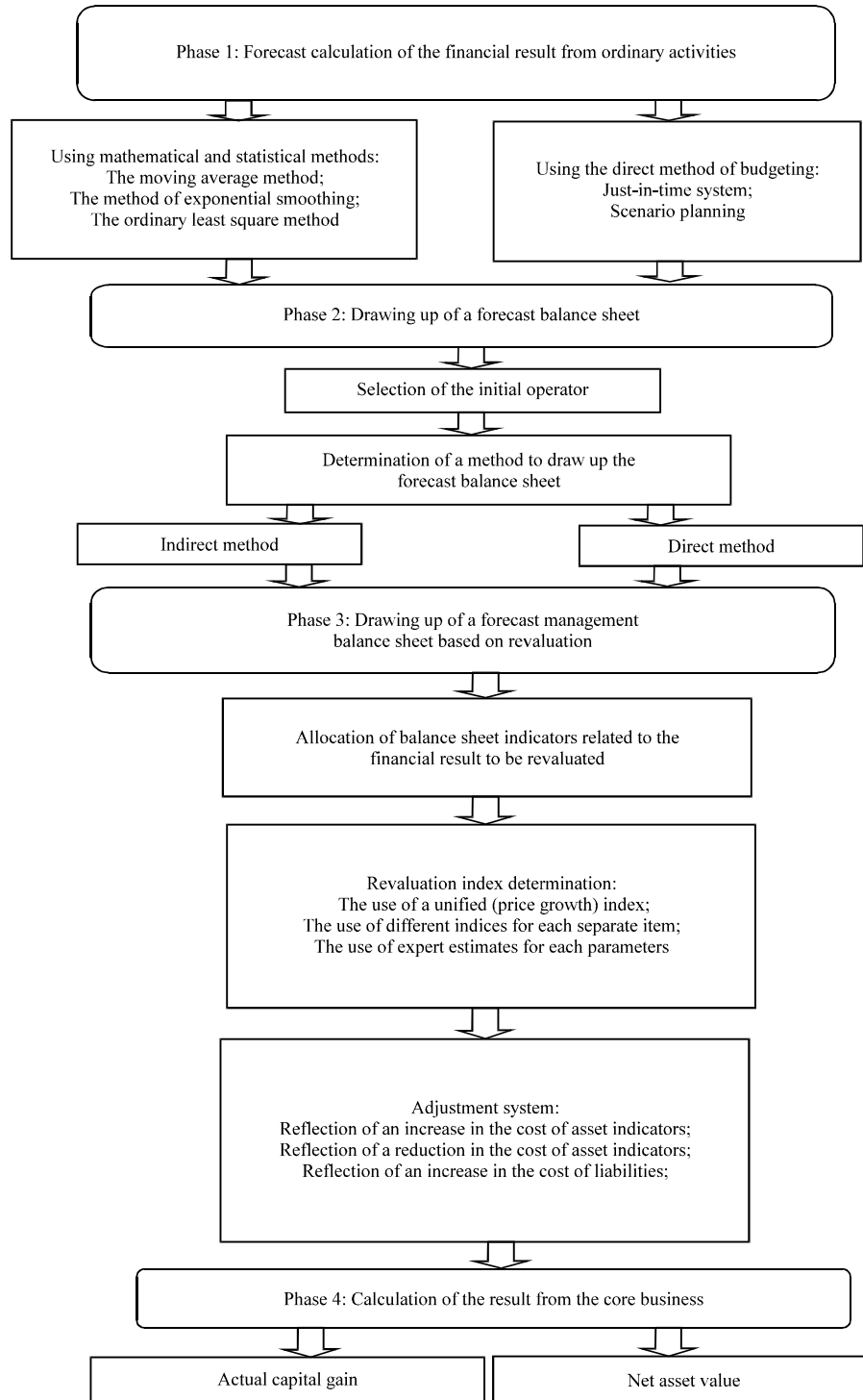
Fig. 1: Phases of evaluation of the estimated financial result from ordinary activities of the manufacturing company

manufacturing companies starts with production and calculation of the production cost but not with determination of potential sales volumes (Lauta, 2005).

Therefore, both suitable approach definition and production cost calculation methods are very important and significant tasks.

Table 1: Description of mathematical methods used for the projected calculation of income and expenditures of a commercial company

Mathematical method	Equitation used	Mean relative error	
		Small businesses	Midsized companies
The moving average method (Goryunov and Kornienko, 2012)			
Calculation of the forecast for income and expenditures	$y_{t+1} = m_{t-1} + 1/n \times (y_t - y_{t-1})$ where $t+1$ is a period of forecasting; t is a period preceding the period of forecasting; Y_{t+1} is a projected indicator; m_{t-1} is a moving average for two periods prior to the period of forecasting; n is a number of levels included in a smoothing interval; Y_t is an actual value of the investigated phenomenon for the preceding period; Y_{t-1} is an actual value of the investigated phenomenon for two periods prior to the period of forecasting.	76% for income 76% for expenditures	3.27% for income 1.29% for expenditures
The ordinary least square method (Prokuratova and Neklyudova, 2014; Naumov and Naumov, 2011)			
Calculation of projected values of income and expenditures	$Y_{t+1} = Y_p = a*X+b$, where t+1 is a period of forecasting; Y_{t+1} is a projected indicator; Y_p-rated (smoothed) values of the time series; X is a designation of time; a and b are coefficients calculated using the following equations: $b = \sum Y_f/nl\ a*\sum X/n$ where Y_f is an actual value of the time series; n is the number of levels of the time series. **The method of exponential smoothing**	Over 100%	6.92% for income 3.38% for expenditures
Calculation of projected values of income and expenditures	$U_{t+1} = \alpha \times y_t + (1-\alpha)*U_t$ where t is a period preceding the period of forecasting; t+1 is a period of forecasting; Ut+1 is a projected indicator; α is a smoothing parameter; yt is an actual value of the investigated phenomenon for the preceding period; Ut is an exponentially weighted average for the period preceding to the period of forecasting; α is a smoothing parameter	57% for income 59.9% for expenditures	7.25% for income 5.28% for expenditures

Phase 2: Drawing up of a forecast balance sheet: This phase includes reflection of the projected financial results in relevant sections of the balance sheet.

Selection of the initial operator: The balance sheet shows that each element has its value but has no value all by itself, so the very combination of such elements makes it possible to determine the true value. Therefore, the balance sheet at the beginning of the period is selected as the initial operator.

In this case, the simulation involves careful layer-by-layer economic and legal analysis of business operation items leading to the receipt of the financial result (profit or loss) from ordinary activities as well as their subsequent generalization and reflection in a derivative balance sheet aimed at a comprehensive multi-assessment of the results of activities.

Determination of a method to draw up the forecast balance sheet: Based on the above mentioned, the two possible options to draw up the forecast balance sheet shall be assumed:

- The indirect method
- The direct method

The indirect method is based on the hypothesis for behavior and correlation of critical items and parameters of a financial plan such as sales volume, the structure of costs and current assets, the percentage of dividend payment, the cost of capital, etc. Great efforts are usually made to create estimates of deferred expenses. Adoption of the hypothesis for proportionality of expenses to income dramatically simplifies the financial planning model. This method is used in the case, when mathematical methods were used in the forecasting of income and expenditures.

The direct method for calculation of financial budgets is typically used as part of generation of a consolidated budget of an enterprise, which includes the sales budget, direct cost budgets, general production and overhead costs, selling expenses and three financial budgets. Generation of financial budgets is the final step in the process of making a consolidated budget, where the direct calculation of planned payments of main expenditure items, sales income and accounts receivable is used.

Therefore, if the method of budgeting was used in the forecasting of financial results the forecast balance sheet would be a result of prepared budgets.

Phase 3: Drawing up of a forecast management balance sheet based on revaluation: Halir (2012) emphasized the importance of management reports drawn up in several dimensions at once which allows us to meet the requirements for reliability and prudence of displayed information and able to support the long-term decisions, although a certain degree of subjectivity is denied. Therefore, it is expected to prepare a balance sheet at this phase based on the information needs of senior managers.

Allocation of balance sheet indicators related to the financial results to be revaluated: Accounting rules do not always allow for an unbiased and comprehensive evaluation, so when calculating various cost indicators used to assess the business or making certain managerial decisions, adjustment of financial statement indicators shall be assumed. Armstrong *et al.* (2010) drew attention to possible conflicts between managers, directors and shareholders as well as referred to the need for transparency of financial statement information. It is proposed to not only transfer forecast estimates to financial statements but also to re-evaluate certain indicators affecting the financial result.

As a result of the case study of profit management issues based on interests of directors, shareholders, other parties concerned and the GAAP (DePree and Grant, 1999) came to the conclusion that it is difficult to make interests of different groups of users balanced and that special attention shall be paid to ethics of persons who construct reporting indicators.

We believe that the following balance sheet indicators shall be revaluated: inventory (materials, work in progress and finished goods), accounts receivable, accounts payable, retained profit, deferred tax assets, deferred tax liabilities and reserves.

Revaluation index determination: The problem related to unbiased evaluation of the business entity activity performance is the provision of data in a generalized report on financial results. Needles *et al.* (2003) noted that in the presence of an annual US inflation, data specified in financial result reports did not reflect the actual situation and therefore had to be recalculated. In this case, the design factor was the indicator of the price growth index (at the end of the year) to the average price index (for the corresponding year) ratio. There are several options for revaluation:

- The use of a unified (price growth) index
- The use of different indices for each separate item
- The use of expert estimates for each parameter

Calculations have shown that when using a unified index (the price growth index was used in our study), higher indicators in the balance sheet assets and liabilities are obtained. The expert opinion provides the most objective information about the fair value of assets and liabilities. Shaffer (2012) emphasized that the fair value was more useful to investors as well as for managerial decision-making and he also paid special attention to a separate fair assessment of each derivative reflected in the balance sheet. However, it should be noted that involvement of experts is expensive and takes a long time which is unacceptable for small and mid-sized companies. Therefore, the best option is to use a variety of revaluation indices for each group of items within the balance sheet. The discount factor is then used as a basis, only that the discount rate shall be changed for every indicator.

Adjustment system: The accounting theory analysis performed by Italian and British scientists has shown that the net equity is derived from income. The economic value of the company is the present value (discounted) of future receipts. When assessing the economic value, the assets have no independent meaning, but play an important role in the process of income generation. From this point of view, both the capital and income measurement depend on the future, not the past (Alexander *et al.*, 2012). At revaluation, the size of changes in selected indicators is determined as follows:

- If the asset indicators increase, capital gains are observed and the following record is made
- "Current Assets of the Balance" for debit and "Capital and Reserves" for credit
- If the asset indicators decrease, capital reduction if observed and the following record is made
- "Capital and Reserves" for debit and "Current Assets of the Balance" for credit
- If the liability indicators increase, capital gains are observed and the following record is made:
- "Short-Term Liabilities" for debit and "Capital and Reserves" for credit
- If the liability indicators decrease, capital reduction if observed and the following record is made:
- "Capital and Reserves" for debit and "Short-Term Liabilities" for credit

Thus, the actual capital gains volume is determined as the result of activities of the business entity:

- Calculation and evaluation of the projected result from the core business
- Calculation of capital gains
- Calculation of the net asset value

Using a non-standard approach for evaluation of balance indicators allows us to calculate actual financial results and to consider it both as the difference between income/expenditures and as a source of net equity ensuring company operation. The use of discounting methods with regard to receivables and payables make it possible to assess the company's ability to generate cash flows as well as its solvency in the prospect of carrying out of certain business transactions and the applicable payment policy. Performed calculations showed challenging results when using different methods and proved the requirement to provide an alternative choice to the user.

CONCLUSION

The proposed Phases for evaluation of the financial result from ordinary activities of the company are based on the use of statistical methods for calculating the forecasting income and expenditures or on methods of direct budgeting as well as elements of accounting simulation in the preparation of the forecast balance sheet, various methods of revaluation of certain items and generation of a derivative management balance sheet. The above recommendations make it possible to obtain a more realistic and comprehensive evaluation of financial results expressed in the increase (decrease) in capital and net assets, as well as to analyze the financial solvency prior to and after revaluation of the balance sheet items which enhance the possibilities of situational planning and facilitate managerial decision-making.

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