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FINANCIAL MODELING IN BUSINESS VALUATION

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Abstract
This scientific article will highlight the theoretical foundations, methodology and practical application of financial modeling in the process of business valuation. The financial model is the most important analytical tool for forecasting future cash flows of a business, assessing risks and determining the value of a company. The article describes processes such as discounted cash flow (DPO), scenario analysis, sensitivity analysis, capital structure optimization on a scientific basis.

Keywords: Business valuation, financial modeling, DCF, risk analysis, cash flows, cost of capital, investment valuation, multiples, discount rate.

Introduction

Today, in the conditions of market economy, the process of valuation of an enterprise plays an important role in making strategic decisions. Increased competition, development of capital markets, and increased investment activity increased the necessity of accurate determination of market value of business. The effective organization of this process is based on financial modeling. A financial model is a system that mathematically and analytically represents the future activities of an enterprise, it provides scientific support for decision-making.

Theoretical Foundations of Financial Modeling

Financial modeling is an economic and mathematical process that reflects the activity of an enterprise in numbers and allows you to determine its value. Its main components are as follows:

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1. Forecasting

- Forecast of revenues, expenses, tax bills, investment costs and asset changes.
- Employees of our services

2. Assessment Parameters

- Cost of Capital (WACC), Risk Ratio (Beta), Inflation Rate.
- Asset renewal cycle, depreciation, capital investments.

3. Cash Flow Analysis

- Operating cash flow
- Investment cash flow
- Funding cash flow

4. Mathematical methods

- Discount formulas
- Regression and Variation Methods of Statistics
- Calculation with Excel, Python, R and special finance software

The role of financial models in business valuation

The financial model performs the following functions in determining the value of a business:

1. Valuation

Business value is often determined through the DCF model. In this model, future generated free cash flows (FCFs) are brought to present value using a discount rate.

2. Risk Assessment

- Scenario analysis (optimistic, pessimistic and realistic)
- Sensitivity analysis (effect of changes in sales volume, price, cost)
- Monte Carlo simulation

3. Strategic Decision-making

Through the financial model, the following decisions are made:

- Acceptance or rejection of investment projects
- Capital structure optimization

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- Formation of dividend policy
- Market extension or plans for a new product release

Examples of Basic Financial Models used in business valuation

1. Discounted Cash Flow Model (DCF)

Formula:

PV = Σ (FCF_t / (1 + WACC)^t) + Terminal value

This model is the most common valuation tool and clearly shows a company's future profitability.

2. Multiplier-based evaluation model

In the world market, companies are mainly compared by the following indicators:

- EV/EBITDA
- P/E
- P/B
- P/S

This model is highly sensitive to market conditions.

3. Residual Income modeli

The portion of a company's income higher than the capital cost is considered separate and assessed as value added.

Modern technologies used in financial modeling

- **Excel** is a basic model creation tool.
- **Python** — Big Data and Automated Forecasting.
- **R** — Statistical Analysis and Regression Models.
- **Power BI, Tableau** — visualization and interactive analytics.
- **ERP** systems — financial monitoring based on real-time data.

Case study: Results from a simplified DCF model

As an example, the following parameters are chosen for a small business:

1. Initial FCF: 500 million sums
2. Growth rate: 10% per annum
3. Stavkasi discount: 18%
4. Terminal o'sish sur'ati: 4%

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After the calculations, the total present value of the company's value is determined and the valuation result is applied in strategic decisions.

Conclusion

Financial modeling in business valuation is a central element of modern management and investment decision-making. The financial model provides an in-depth analysis of the current state of the enterprise, assessing its prospects for future development and accurately measuring the factors that affect value. Especially in the context of increasing global competition and economic instability, risk management using financial models, anticipating outcomes across scenarios, and optimizing capital structure will become strategically important.

Also, financial modelling provides a scientific and analytical approach, reducing subjective approaches in the valuation process. A combination of the DCF model, multipliers, recidual income approaches, scenario analyses, and statistical methods allows for much more accurate determination of a company's value. This serves as a reliable information source for investors, creditors, shareholders and governing bodies.

In conclusion, it can be said that financial modeling is not only a technical tool necessary for the evaluation process, but also a strategic management mechanism ensuring long-term sustainable development of the enterprise. Proper organization of the enterprise plays an important role in increasing the market value, strengthening the investment attractiveness and strengthening of the competitiveness of the enterprise.

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