

## MAKING INVESTMENT DECISIONS BASED ON DCF-MODELING

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*Resume - this article provides how the DCF-model is calculated and how an investor, based on it, makes a decision to buy / sell / hold shares.*

**Introduction.** Any investment of capital is the result of an investment decision, which is accompanied by specific uncertainties. To make decisions, an investor needs to know how much income he can count on and how much he will lose in case of failure. Forecasting and valuation are the main methods of researching investment potential. They help determine the amount of compensation, the possible profit for all participants in the process and make a conclusion about the final decisions. One of the methods for the future valuation of a company is DCF modeling.

**Main part.** DCF is a financial model based on discounted cash flows, which allows determining the fair value of an asset for the purpose of long-term investment or strategic purchase. In other words, it allows you to determine the value of an asset taking into account the discount rate. Thus, you can determine the return on investment in a particular asset. For example, a similar model is widely used in M&A transactions to measure the fair value of a transaction. Let's consider an example of applying the DCF-modeling method when making a decision to purchase shares of EPAM.

The Revenue was forecasted based on exponential regression, taking into account three stages: rapid growth, decrease in growth, growth stabilization and transition to terminal value. Revenue growth in 2021 was calculated as an average CAGR17-19 and 17-20 value by segments to smooth out the specific of 2020. Total revenue growth projected for 2021Y was 26.29%.

Cost of revenue was calculated as a percent of Revenue as a variable expense. We forecasted the Effective tax rate for EPAM at 19.1% based on the average for 2018-2020 years, excluding Deferred taxes. Tax expenses differ in financial and tax accounting. EPAM accrues defer tax (that is not an actual cash outflow) to recognize income and expenses in a proper time period. Owing to limited access to information we have made our forecast on the basis of accounting information. Deferred taxes were included in the EV to Equity adjustment.

Depreciation and amortization for income tax purposes was calculated based on CAPEX and Depreciation and amortization period. In view of the improvements in the dynamics of the working capital turnover, for the modeling, we took the average value in quarterly turnover in 2020.

Our terminal growth rate assumption of 2.3% is based on the long-term inflation rate in the USA and forecasts of long-term growth of the IT market (3%). We based our assumptions on USA rates only for simplifications and did not included CIS (where great part of costs is incurred) rates into calculations. The

main justification is that salaries in CIS IT sector are determined in US dollar. In addition to salary rent is usually also charged in US dollar or euro. In our opinion, EPAM will reach terminal revenue growth in 2040Y.

The firm generates consistent Free Cash Flows, which we forecast to slow down year on year, driven by lowering revenue and EBITDA growth. Next, to find the value of EPAM, we discount the cash flows using the WACC. We decided to take the WACC value of 10.62%. Specific risk premium is the main input that may be subject to manipulations, i.e. adjustment to take into account the increased risk of finding a business in Belarus and Ukraine. Beta for EPAM was taken as 1.36 [1] and we adjusted it too. To find share of debt and share of equity we took average among 14 largest companies in industry. A more detailed breakdown of our WACC assumptions is presented in the table below (Table 1). Based on WACC, we determined the discount factor at the middle of each forecast year to make the calculations more precise.

Table 1 - WACC Calculation

Indicator	Comment	Rate
Risk free rate	30Y USA government bond	1,65%
Country risk premium	30Y USA and 30Y Rus government bond spread	2,35%
Risk free rate in our region		4%
Equity risk premium	Duff&Phelps (December, 2020)	5,5%
Beta	Yahoo (5Y Monthly)	1,36
Adjusted beta	$Beta * 2/3 + 1/3$	1,24
Equity risk premium with Beta		6,82%
Specific risk premium	Adjustment for location in Belarus and Ukraine	1,0%
<b>Cost of equity</b>		<b>11,82%</b>
Share of equity	Own analysis based on similar companies, Yahoo	87,4%
Cost of debt (before tax)	Cost of EPAM credit line adjusted for long-term	2,77%
Income tax	Effective average income tax rate in 2018-2020	17,1%
<b>Cost of debt (after tax)</b>		<b>2,30%</b>
Share of debt	Own analysis based on similar companies, Yahoo	12,6%
<b>WACC</b>		<b>10,62%</b>

To find the terminal value according to Gordon's method, we used the predicted CFF value in 2040, taking into account all adjustments, predicted CFF in 2040 equals to \$4012.7M, the calculated WACC value (10.62%) and the projected terminal growth (g) as 2.3 %. Terminal value of EPAM was \$49.45B, and enterprise value was \$21.97B. The final EPAM's equity, according to our calculations, as for December 31, 2020, was \$23.61B. We know that as of this date, the number of EPAM's shares was 56.128 pcs, therefore the estimated EPAM's cost of 1 share was \$ 421.

Just for comparison purposes we used EV/R multiplier to calculate an alternative value of EPAM. The main advantage of EV/R method advantage that EV/R is that it can be used for start-ups and fast growing companies that generate profits. The enterprise value-to-revenue (EV/R) is 8.26, which is above the

market average EV/R. Based on this, we can conclude that EPAM companies' revenue-generating ability is high. We also calculated the EV/EBITDA multiple for clarity. EV/EBITDA takes into account operating expenses, while EV/R looks at just the top line. EV/EBITDA was 48.62, which also reflects the company's high ability to generate operating cash flows.

For a more complete understanding of EPAM, we conducted a sensitivity analysis, calculating the impact of the specific risk premium and terminal period on the EV, EQUITY and cost of 1 share indicators. After conducting the sensitivity analysis, it turned out that with a decrease in the Specific risk premium to 0.5%, EV = \$23.5B, Equity = \$25.2B, the cost of 1 share is 449\$, and with an increase to 4%, EV decreases to \$15.4B. Equity to \$17.1B, the cost of 1 share is \$305. If the output to the Terminal period increases until 2044 y, then the cost of 1 share will increase to \$504, a decrease until 2036 y makes the cost of 1 share equal to \$348. Share price is more sensitive to Terminal period time and specific risk premium value. Changes in these parameters may considerable distort the company's value.

**Conclusion.** Based on our analysis mentioned before, we calculated the range of EPAM's cost of one share as at 30 June 2021. Minimum target price is 412\$; maximum - 484\$. Current price of EPAM's share falls within the calculated range. Based on the calculated data above, the investor will be able to make a conclusion about buying/selling/holding shares. Thus, DCF modeling can be used as a way to visualize the company's financial results and future forecast based on the available data. Based on this method, it will be easier for an investor to assess the investment potential.

#### ЛИТЕРАТУРА

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#### **ВИЗУАЛЬНЫЕ ИЛЛЮЗИИ И ИХ ПРИМЕНИМОСТЬ В РЕКЛАМЕ**

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*Резюме – в статье рассмотрены виды визуальных иллюзий, их применение в рекламе и производимый на потребителей эффект.*

*Summary – the article discusses the types of visual illusions, their use in advertising and the effect produced on consumers.*

**Введение.** Современный мир стремительно развивается, а конкуренция на рынке растет. Для удержания статуса компании, и выхода на новый уровень, производители прибегают к рекламе. На сегодняшний день визу-