# An Innovative Approach to Examine Investment Project Profitability

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**Abstract**

The superior goal of company's activity is maximization of its market value. The way of this goal realization is investing. Investments being driving force behind the development contribute to company's value growth. The decision to invest is crucial for every company. Investments cause that a company is much more competitive through increase of working capacity, improvement of product quality or starting new product production.

Investment undertaking is connected with incurring financial outlays. As a rule, investment process is a long-term one, marked with a significant dose of uncertainty. Because decision to incur investment outlays is taken at present and investment inflows will be received in the future, in the phase of investment planning investor has to consider a lot of factors that can appear and, at the same time, may have influence on the investment profitability. That is why so important role, in the process of investment profitability calculation, plays taking into account factors of risk and uncertainty. In the literature a lot of methods that include risk factors can be found, like Certainty Equivalent, Risk Adjusted Discount Rate Approach, Scenario Analysis, Sensitivity Analysis and Monte Carlo Simulation.

The basic measure of investment project profitability is Net Present Value (NPV). The idea behind NPV is to determine cash flows over the life of a project and discount them by the appropriate opportunity cost of capital. In classical approach cash flows are forecasted as a single figure with no trace of uncertainty. The project risk is included in discount rate, exactly in the cost of equity that contains risk premium for company's investors.

Application of simulation process and receiving probability distribution of NPV as a result of simulation is an attempt of risk presentation in investment project. Having probability distribution we can calculate different sample statistics to obtain a variety of risk measures. One of them is Value at Risk (VaR) that shows that there is some % chance that certain variable (here NPV of a project) can be lower than the value indicated by the quantile value. In the paper I would like to present another risk measure that can be implemented in investment project profitability calculation, namely Expected Shortfall (ES). VaR provides no handle on the extent of losses (or lower positive values) that might be achieved beyond the threshold amount indicated by this measure. This additional information we can get using ES.

Since the methodology of VaR and at the same time ES are based only on market risk, the other types of risk could be controlled by real option. Real options analysis expands the concept of NPV including such factors as flexibility and learning valuation and provides more accurate estimate of value for corporate investments.

In the paper an innovative approach of investment profitability calculation is described. The presented model is based on Value at Risk, Expected Shortfall and real option application.