

VALUE CREATION MECHANISM OF A SMALL TECHNOLOGY-BASED FIRM IN A CONTEXT OF GLOBALIZATION

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Abstract. Ability to create value may be considered a basis for a company's survival in a context of globalization and intensifying global competition. Small technology-based firms are especially vulnerable in that struggle because they are characterised by more volatile environment, higher risks and growth potential and therefore require a special approach. The article describes the path that value of the company follow from fundamental factors to market quotes.

Authors argue that the main fundamental strategic factor of value creation is capability for innovation, which is affected by access to new technology, reproducible competitive advantages, dynamic entrepreneurship and developed market for complimentary products according to an interpretation of M. Porter's Diamond concept.

Authors suggest the system of indicators (value drivers) that takes into account future growth opportunities and factors topical for technology-based firms. It is shown that such indicators directly affect company's intrinsic value and as a result its market value.

Authors argue that an analytical scheme suggested in the article may be used in strategic decision-making for financing decisions including IPO, internal control system and system of motivation of managers.

Keywords: globalization, value creation, small technology-based firms.

JEL Classification: F63, G32, L21, O32

1. Introduction

According to the Shareholder Value Concept, the main purpose of any private firm is value creation for its shareholders, which in turn positively affects welfare of all stakeholders of the company. For small and medium technology-based companies especially now in the context of globalization and intensifying international competition the problem of application of value-based management is becoming especially topical. Such companies face specific difficulties: high degree of uncertainty and risk, uniqueness of a product and rapidly changing strategic environment. For such companies the problem of value creation consists of two main components: how to create value and how to measure it.

The purpose of this research is to describe characteristics of value creation mechanism of small and medium technology-based firms in the context of globalization, and to develop a system of indicators, allowing to evaluate such companies through the prism of value creation.

2. Methods

Description of analytical scheme of value creation of a small technology-based company is based on the example of Company A which operates in Russian pharmaceutical industry (name has been changed for confidentiality reasons).

3. Theoretical background and Discussion

Global cooperative relations of Russia despite of their weakening due to sanctions remain relatively stable in the area of small business (*Korostyshevskaya E.M., Urazgaliev V.Sh., 2016, P. 977*). Support of small and medium technology-based firms is extremely important in order to overcome the crisis (*Gregova E., Dengov V.V., 2016*). The main approaches for business valuation are market-based and income-based approaches, some authors especially stress the significance of the discounted cash flow method, which requires some strong assumptions for a future period. (*Berzakova V., Bartosova V., 2016, P. 172*) They should be clear and reliable because the value of a small technology-based company is determined mostly by its future growth opportunities rather than by its current financial results. It could be proved by the fact that companies in more technologically intense sectors (software, electronics, biotechnology and electronics) tend to have higher P/E coefficient (*Damodaran, A., 2017*). According to recent researches, in order to successfully create value a company should be ready for major changes, demonstrate great commitment to the process of value creation (*Haspeslagh, P., 2001, P. 67*) and provide sufficient quality of management (*Naouar. W.B.A., 2016, P. 787–796*). Ability to analyze factors affecting company's value and to efficiently evaluate the outcome of investment decisions in conditions of uncertainty are the most important components of high-quality decision-making process. Thus, technology-based firms need analytical instruments for value measurement reflecting their specifics.

The influence of globalization becomes more and more important factor to consider for management teams of small technology-based firms. For instance, after the crisis of 2008 firms in IT industry began to follow the strategy of development of product innovations and internationalization of their activity. Such companies tend to expand their operations to the international market (*Colombo M.G. et al, 2016, P. 648, 664*) and innovation process is more intense in countries, which have greater internal cultural and research potential and more active spillover of knowledge. (*Garrone P. et al, 2014, P. 579-580*). Therefore, valuation of the company as well as its intangible assets should be taken into consideration in a context of globalization and increasing role of knowledge for generation of both technological and institutional innovations (*Čorejová T., Al Kassiri M., 2016, P. 329-336*).

Corporate strategy aimed for value creation focus on long-term planning (*Naouar. W.B.A., 2016, P. 787–796*), harmonization of corporate governance by interlinked strategic goals, higher extent of employees' involvement (*Dolan, L., & El Alaoui, M., 2010, P. 273–280*).

According to *Copeland T.E. et al* the value of a company passes four main stages: fundamental factors of value creation form a basis of competitive advantage; value drivers – financial and non-financial indicators which determine the value of a company, intrinsic value, market value of the company (*Copeland T.E. et al, 2000, P. 4-5,18-19*). This research will focus on the first two stages of value creation.

The Diamond Concept by M. Porter determines four basic components of a competitive advantage: firm structure and rivalry, demand conditions, related and supporting industries, factor conditions (*Porter M., 1990, P.78*). As for technology-based firms, we may argue that basic factor of their competitive advantage is innovation capability, which may be divided into four elements based on the Diamond Concept.

Dynamic entrepreneurship is necessary for survival in high-tech industries because it includes different methods and techniques as well as entrepreneurial talent, system of motivation and corporate architecture, which allow a company to efficiently allocate its resources and use market opportunities.

Access to new technology is viable for technology-based firms because technology is a basis of competition in high-tech industries. Technology could be obtained from different sources: R&D cooperation, internal R&D facility, licensing or outsourcing. Access to new technology makes it possible to create new products or modify existing ones.

Developed market for complementary products is also important factor of company's innovation capability as it determines the size of potential market. For instance, development of medical services in oncology influence a demand for new cancer drugs.

Finally, **factor conditions** are internally generated factors of competitive advantage, which allow company to compete successfully in technologically intense market. Such factors include specific resources, equipment, qualified personnel etc. and distinct a company from its competitors (*Porter M., 1990, P.76*).

Fundamental factors of value creation lead to achieving quantitative indicators in different spheres of activity, which will be further referred to as value drivers. These indicators may serve different purposes such as key performance indicators for management and source of information for shareholders, which allow checking whether investment decisions lead to growth of the value of a company. In a context of globalization, the risk of hostile takeovers is increasing and the role of early warning system becomes more significant (*Kral P., Bartosova V., 2016*). Besides other purposes, such system should provide an opportunity to control the value of a company by determining the key factors affecting it.

There are different approaches to determination of value drivers. One of the models was suggested by S. Valdaytsev and consists of five financial indicators which finally lead to return on equity (ROE) as the main indicator of a company's activity (*Valdaytsev S. V., 2008, P.348*). This approach supposes that return on equity represents expectation of shareholders of the company and may be a measure for value, which they get from the company as their investment. A. Rappaport suggests other model of value drivers. He argues that free cash flow (FCF) which is considered the main indicator of value creation is composed of turnover growth, operating margin, capital expenditure, working capital change, the effective tax rate, cost of capital, and competitive advantage period (*Rappaport, A., 1998, P.32*).

Models mentioned above as well as their variations have certain limitations when applying them to fast-growing technology-based firms. For instance, ROE indicator may be used for short-term planning and may give a reliable estimate for the value of a company for a particular year but not in a long-term period where it is difficult to make a precise forecast of the target value of this indicator. Therefore, it is less suitable for long-term considerations. The same issue relates to the free cash flow model. Current FCF which Rappaport's model is based on does not represent future growth opportunities which are a major source of

company's value as it was argued before. Thus, existing models of value drivers need to be adjusted when used by small technology-based companies.

4. Measurement of value of a small technology-based firm

According to recent concepts of business valuation a company's value consists of two main elements: the present value of current projects of a company and the present value of future growth opportunities (see Formula 1):

$$PV = PV_e + PV_{FGO} \quad (1)$$

Where:

PV_e – the present value of existing projects of the company

PV_{FGO} - the present value of future growth opportunities (*Jaegle, A.J., 1999, P. 274*)

For small and medium technology-based firm influence of future growth opportunities may be determinant, which explains high P/E ratios of small technology-based firms. Hence, it is possible to come up with the authors' approach to value drivers, which contains elements of Valdaytsev's and Rappaport's models and some specific factors aiming to take into account the characteristics of small technology-based companies and future growth opportunities. It is possible to divide all the value drivers into three categories related to different functional strategies – production, marketing and finance (Table 1). These indicators affect different elements of the value of a company calculated using the classical discounted cash flow model.

Weighted average cost of capital (WACC) is the first financial indicator to be considered. A company normally tries to minimize this indicator due to inverse relation between WACC and the value of a business according to the DCF model. Analysis of industry-based financial data shows that small technology-based company tend to have higher WACC due to higher industry risk expressed by beta coefficient and higher non-systematic risk expressed by various risk premiums (*Damodaran, A., 2017*) related to higher uncertainty and lower information transparency. One may assume that after obtaining stronger market position cost of debt will reduce due to lowering credit risk therefore reducing WACC.

Liquidity and gearing indicators are the next important category of value drivers as they describe the financial position of the company and ability to attract funds for future projects. Current ratio or current assets divided by current liabilities of the company could be used as a basic liquidity indicator. Gearing ratio represents a debt burden of a company and is calculated as long-term debt divided by equity. According to researches conducted by different authors (*Damodaran, A. 2009*) и (*Fernandez P., 2002*) 30-50% could be considered as an optimal diapason for share of debt which means 0,42 -1 for optimal gearing ratio.

Profitability ratios represents a company's ability to generate cash flows and usually are calculated as EBITDA divided by other essential indicator of company's activity. Intangible assets may become such an indicator for technology-based companies. Research of Hong Kong stock exchange that the share of intangible assets reflects financial outcome for technology-based companies (*Li, H. & Wang, W, 2014, p. 108*). Therefore, intangible assets profitability may be used as a value driver for such firms (see Formula 2).

$$\text{IA Profitability} = \frac{\text{EBITDA}}{\text{IA}_t + \text{IA}_{t-1}} \quad (2)$$

Where:

IA_t – carrying value of intangible assets at the end of the period

IA_{t-1} – carrying value of intangible assets at the beginning of the period

Next category of value drivers represent characteristics related to production of finished goods or services. For a technology-based company technology is a critical element of a production process and therefore this element requires special evaluation techniques. Capacity ratio for research and development personnel could be considered one of the indicators reflecting effectiveness of an R&D process (see Formula 3).

$$\text{R\&D Capacity ratio} = \frac{\text{budgeted hours of R\&D personnel}}{\text{actual hours of R\&D personnel}} \quad (3)$$

Normally the value of this indicator will be close to one. The value lower than one means that overload of R&D personnel, higher value means inefficient use of R&D personnel.

Probability of successful development of a new product represents company's ability to generate new products which will generate cash flow in the future and improve future growth opportunities. If company is involved in several stages of R&D this indicator may be calculated as multiplication of probabilities of successful completion of at each stage of development a company takes part in (see Formula 4):

$$P = p_1 * p_2 * \dots * p_n \quad (4)$$

Where:

P –probability of successful completion of a product

p_1, p_2, p_n - probability of successful completion of a particular stage of R&D

Marketing value drivers represent the outcome of company's activity and the ability to generate cash flows. Competitive advantage period suggested by A. Rappaport may be interpreted for small technology-based firms as maximum of two numbers: projected length of product lifecycle and term of validity of a patent it is based on. Indicators that take into account the market position of the company are consumer satisfaction index (CSI) and market share. CSI calculation consists of several stages: determination of indicators relevant for buying decision, their prioritization and calculation of level of consumer's satisfaction based on such indicators in comparison to "ideal model" or a closest competitor (*Molchanov N.N. & Polyakova O.A., 2012, P. 59*). Finally, market share reflects client base and ability to spread it.

All indicators mentioned above tend to influence long-term ability of a technology-based company to generate cash flow and therefore to form intrinsic value of a company.

Finally, after a company has performed an IPO and went public intrinsic value begins to affect market quotes of company's shares. At this point, an influence of external factors such as dynamics of the World's main stocks indices, M&A activity and reaction of the market on different events becomes more intense and forms new major area of consideration.

5. Results: Analysis of a value creation process of Russian pharmaceutical company

Company A is a Russian pharmaceutical company specializing in production of anti-viral drugs. This company is actively involved in development of new drugs and methods of production of pharmaceutical ingredients. During an IPO on the Russian stock exchange the Company attracted around 500 mln roubles for its projects including development of a new oncological drug which is co-financed by Rosnano JSC and other investors of the company.

The company could be considered a technology-based: high-tech industry, high share of R&D expenditure in total (48% in 2013), access to technology through own research department, existence of complementary market (medical services), access to shareholder funds, qualified R&D personnel and availability of friendly benchmarking with its shareholders which are mostly large pharmaceutical companies (including one US company).

Table 1 contains information regarding Company A's value drivers and recommendations to the management which may try to rise company's value by improving these indicators.

Table 1: Analysis of Company A's value drivers

Type	Indicator	Value	Assumptions	Findings, recommendations
Finance	WACC	21,2%	CAPM model, tax shield is 20%	High cost of equity, mostly due to market conditions. Moving to less risk markets may reduce WACC.
	Current ratio	5,32	Current assets/current liabilities, financial statements (FS) of the company for 2014	High liquidity. May consider increasing debt as cost of debt is lower than cost of equity
	D/E	0,24%	Long term debt/equity	Lack of long-term debt. May consider issue of long-term bonds
	Intangible assets profitability	-68%	Operating profit/intangible assets	Need for sales increase
Production	Share of R&D in expenditure	48%	Percentage of R&D in total expenses	Consider focusing efforts on the most prospective researches
	Probability of successful R&D	83%	Number of research projects not rejected during the year	Consider focusing efforts on the most prospective researches
	R&D labour capacity ratio	53%	Actual hours/budgeted hours regarding R&D employees	Low level of R&D capacity. Reconsider budget
Marketing	Competitive advantage period	100 months	Average useful life from the date of put in use	The company need to register new patents to maintain this indicator
	Market share	0,04%	Company sales/industry sales for 2014	Low market share, narrow niche
	Competitiveness of the company	No data	CSI of the company/CSI of the largest competitor (Novartis)	Consumer satisfaction index (CSI) based on set of parameters is compared to the largest competitor

Source: internal information

6. Conclusion

This research considered the problem of value creation of small technology-based companies. It was shown that the key fundamental factor of value creation for such companies is an ability to innovate, which consists of access to new technology, factor conditions, market for complementary goods and dynamic entrepreneurship.

It was argued that the value of a technology-based company is affected by certain indicators (value drivers) and therefore controlling these indicators is vital for constant increase of the value. Such companies need to be treated differently due to specific factors regarding their strategy and sources of value because major part of their value may be related to future growth opportunities rather than current results. Authors then suggest the system of value drivers that may be used for purposes of value control and comparison of small technology-based firms.

Finally, suggested approach was tested using the example of the Company A that operates in Russian pharmaceutical industry. Value drivers were calculated, main obstacles for value creation were identified and recommendations to the management of the company concerning the ways to enhance the value of the company were given at the end of the research.

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