

Structure of Cost of Equity as the Dependence on the Corporate- and Market Life Cycle

Zdeněk Konečný

Abstract:

Purpose of the article: Companies, like all living creatures, goes through their life cycle, which includes some partial phases. Each of these phases is specific. Depending up the corporate life cycle, there are changed managerial decisions, that have an considerable influence, among others, on financial indicators like liquidity (current ratio, quick ratio, cash ratio), return (on investment, assets, equity, sales), economic value added, or cost of capital. The purpose of this article is to show relations between corporate life cycle and the structure of cost of equity. Furthermore, there will be, besides the corporate life cycle, considered also the market life cycle and market positions, that can companies hold on the market, on which they are acting.

Methodology/methods: There is used a method, based on the analysis of secondary data, gotten from financial statements of selected companies and from statistical and analytical documents, published by Czech Ministry of Industry and Trade. There are selected 39 companies, acting on the czech market with motor vehicles production. The data are gathered for periods from 2002 up to 2010. There is used a model by Reiners (2004) to identify phases of corporate- and market life cycle and market positions. For finding out the structure of cost of equity there is used the constructional model by Czech Ministry of Industry and Trade.

Scientific aim: The selected companies are divided into groups with considering different phases of their life cycle and with considering their different market positions. There are for each period found out numbers of companies from these groups, that reached the minimal value, the value within the interval and maximal value of all risk rewards, that are, besides the riskless rate, components of cost of equity.

Findings: The greatest part of cost of equity, reached on the market, is the riskless rate. Other components (and their shares on the cost of equity, reached on the market) except risk reward to size of the company were increasing mostly since 2007. By researching the structure of cost of equity in the case of selected companies, there were found out only small differences between companies in different phases of their life cycle and only small differences between companies, that hold different market positions.

Conclusions: There are some limits connected with these findings. The constructional model for cost of equity calculation was developed for czech firms, so the generalizing for foreign companies and markets is limited. And the model by Reiners (2004) can identify phases of corporate- and market life cycle only using the interyear comparison of quantities, that are involved in the growth indicator, and furthermore, there isn't possible to identify corporate- and market foundation.

Keywords: constructional model, corporate life cycle, cost of equity, market life cycle, market positions, risk rewards,

JEL Classification: G32

Introduction

The theory of corporate life cycle has its origin in biology and psychology. Some centuries ago there was proven, that all living creatures go through the partial stages of their life from birth to death. In the second half of 20. century was this fact applied into the business economics, because there was an idea, that companies go through the life cycle during their existence, too. But there was shown, that there are two basic differences:

- 1) The lengths of separate phases of the corporate life cycle are not exactly determined, because the entrepreneurial environment, where the companies are acting on, can be for each company specific and a little different.
- 2) After the last phase of the life cycle, the company doesn't have to cease to exist, there can be started up a new wave of growth and thus a new corporate life cycle, e.g. because of the change of top managers, product innovations or more effective marketing activities.

Within the corporate life cycle there can be recorded some partial phases with some specifics. In each phase of corporate life cycle there can be recorded e.g. different business strategy, different human resource management or different financing of investments. These changes have an impact, among others, on financial indicators like the return (on investment, on assets, on equity, on sales), the liquidity (current ratio, quick ratio and cash ratio), the economic value added, financial structure and the cost of capital. In previous researches there were found out relations between corporate life cycle and most of these financial indicators.

This article should continue to these researches, especially to the research by Reiners (2004), that was aimed to cost of capital during the corporate life cycle. The main aim of this article is to study the partial components of the cost of equity and thus to show the course of the partial risk rewards, that are required by owners, during the corporate life cycle.

Besides the corporate life cycle there will be the market life cycle considered, too, because of the existence of different market positions, that are derived from combination of phases of corporate- and market life cycle. And the second cause for considering the market life cycle is, that there is necessary to know the average risk rewards for the whole market, on which the companies are acting.

1. Models of corporate life cycle

There are some tens of existing models of corporate life cycle, and they can be according to Reiners (2004) divided into four groups:

- 1) Models, that flow from the market course – by these models, the corporate life cycle depends direct on the product life cycle. So the individual phases are defined analogous to the phases of the product life cycle (the phases of foundation, growth, stabilisation and decline), and in this case, there is a possibility of recurrence or skipping some phases, too. But the practical applicability of these models is very limited, because of the putting many company's products in different phases, on the market.
- 2) Crisis models – they flow from the fact, that the company during his existence fluently goes through the process of changes. There are distinguished phases, that are characterized always by specific growing problems, that have either their external, or internal origin. Controlling these crisis situations is by these models understood as the switch to the next phase of the corporate life cycle.
- 3) Models, that consider changes of the organizational structure – the sequence of phases of corporate life cycle depends on changes of the organizational structure. For example, the informal organizational structure, which was made on the beginning of the existence of the company, can be changed into the hierarchical functional organizational structure, and this type can be consequently replaced with the matrix organizational structure.
- 4) Models, that consider changes of managing style – they are similar to the models that consider changes of the organizational structure. In comparison with other models, the corporate life cycle according to these models is getting more closer to the reality, because the phases are identified on the basis of considering not only quantitative, but also qualitative factors. The disadvantage of these models is the difficult applicability, because of using qualitative data by identification of phases.

Many authors engaged in the theory of corporate life cycle, and there were made about 40 models. Some of the most important models are mentioned by Shirokova (2009) and chronologic ordered in the following list, where there are by each model men-

tioned the sequence of phases, variables for identification of the phases and some more informations:

Model by Lippitt and Schmidt (1967):

- Phases: 1) Birth.
2) Adolescence.
3) Maturity.

Variables: age, management focus, different interest groups' priorities, crises and presence of confrontation, structure, management formalization.

Authors Phelps, Adams and Bessant (2007) mention, that by this model are all phases of the corporate life cycle predictable, at least approximately, like by all living creatures.

Model by Greiner (1972):

- Phases: 1) Creativity.
2) Direction.
3) Delegation.
4) Coordination.
5) Collaboration.

Variables: age, size, industry growth rate, evolution stages, revolution stages, organisation structure, formalization, top management style, control system, management remuneration emphasis.

Authors O'Rand and Krecker (1990) advert to the fact, that each of five phases includes two periods, where the first of them (evolutionary period) is relatively problem-free for the company, whilst during the second period (revolutionary period) there are occurring some crisis, that must be controlled by the management to switch to the next phase of the corporate life cycle.

Model by Quinn and Cameron (1983):

- Phases: 1) Entrepreneurial.
2) Collectivity.
3) Formalization.
4) Elaboration of structure.

Variables: age, size, organisation efficiency criteria, structure form, formalization, centralization, leadership, culture.

Authors Mack and Quick (2002) characterize the individual phases as follows. For the entrepreneurial phase, making product and his further developing to start up growth is the basic characteristic feature. The phase of collectivity is characterized as the beginning of the more structured organisation, where the employees have a formally divided responsibility for growing effectiveness and simultaneously, they are starting to associate with the company, and there is being created a good team of people. In the phase of formalization, there is more used a bureaucratic organizational structure in the company.

In the phase of elaboration of structure strives the company for revival, which is reached thanks to processes improvements and using new and innovative ways of managing.

More detailed specification can be found out by authors Walsh and Dewar (1987), too. The entrepreneurial phase is characterized by organizing available sources, a lot of ideas, intensive entrepreneurial activities, small emphasis on planning and coordination, looking for the gap on the market. In this phase, the company follows the motto "initiator seizes control over the market". For the phase of collectivity is typical informal communication and structure, sense for the collectivity, effectively utilized time, sense for task fulfilment, ongoing innovations and high devotion. In the next phase, there is formalized the management, the structure is stable, there is emphasized the effectiveness and its keeping, and there are used conservative and institutional procedures. In the phase of elaboration of structure there is developed the organizational structure in an effort to decentralization. The company tries to expand, or revive and adapt oneself to changing market conditions.

Model by Miller and Friesen (1984):

- Phases: 1) Birth.
2) Growth.
3) Maturity.
4) Revival.
5) Decline.

Variables: age, number of employees, sales growth, size, property concentration, stakeholders' influence, environment dynamics, strategy, formal control, internal communications, power centralization, resource capacity, differentiation, decision-making style.

The authors Miller and Friesen (1984) themselves specify individual phases of the corporate life cycle according to the variables, recording above, as follows:

- 1) Birth – the company is less than 10 years old, has an informal organizational structure and is controlled by owners, which are simultaneously managers.
- 2) Growth – the sales growth is higher than 15%, the company has an functional organizational structure and is starting to formalize its tactics.
- 3) Maturity – the sales growth is lower than 15%, the organization is more based on bureaucracy
- 4) Revival – the sales growth is higher than 15%, the company diversifies its activities and uses elaborated systems of control and planning.
- 5) Decline – demand for company's products decre-

ases, there is a low rate of product innovations and the return starts to decrease, too.

Additionally, authors Miller and Friesen (1983) distinguish successful and unsuccessful phases. Differences between them are in the rate and procedure of information processing, decision-making and implementing the innovations.

According to Cao, Chen, Wu and Mo (2011), who engaged in predicting the phase of decline with use of neural network, is the phase of decline the decisive among all phases of this model, because in this phase there is a danger, that the company will cease to exist. Nevertheless, sequential growth retardation in sales can signal a decline.

Model by Kazanjian (1988):

Phases: 1) Conception and development.
2) Commercialization.
3) Growth.
4) Stability.

Variables: age, size, growth rate, dominating management challenges, structure form, formalization, centralization.

A more detailed description of individual phases can be found by authors Moy and Luk (2003). The phase of conception and development is characterized by product and its design development, procurement of adequate financial sources and market development. In this phase don't exist formal procedures and most employees have assigned technical tasks. In the phase of commercialization increases the product popularity on the market and thus its marketability. The company has already reached a fixed level of revenue, and from time to time, can have some outstanding orders and there is an effort to keep the market position of the company. In the phase of growth increase sales and the number of employees. The management of the company aims to problems, how to produce and sell products to reach the requested return. In the phase of stability, the company develops second, or third generation of its products, or can introduce quite new products. The company tries to get a higher market share, or penetrates foreign markets. Furthermore, for this phase are formal organisational structure and formal procedures typical.

Individual phases are similarly characterized by Hwang and Park (2007). These authors researched also the causes, why do companies in individual phases create strategic alliances with their business partners. There was found out, that in the phase of conception and development are the main causes for entrance to strategic alliances an easier access

to financial sources (e.g. a strategic alliance allows to implement IPO more quickly) and the possibility of collectively implemented research and development. In the phase of commercialization enter companies into alliances because of getting collective distribution channels. In the phase of growth unites a company with another company because of better utilization of production capacity. In the phase of stability are strategic alliances created because of sharing collective sources and experiences to survive in the long term.

Model by Adizes (1999):

Phases: 1) Courtship.
2) Infancy.
3) Go-go.
4) Adolescence.
5) Prime.
6) Stability.
7) Aristocracy.
8) Salem City.
9) Bureaucracy.
10) Death.

Variables: age, size, normal and transition challenges, structure form, formalization of policies and procedures, leadership qualities needed, diversity, complexity.

Authors Owen and Yawson (2010) emphasize, that according to this model the corporate life cycle already begins with the entrepreneurial idea itself, which corresponds to the phase of courtship.

Model by Lester, Parnell and Carraher (2003):

Phases: 1) Existence.
2) Survival.
3) Success.
4) Revival.
5) Decline.

Variables: age, size, power, information processing, type of organisation structure.

Authors Lester, Parnell and Carraher (2003) themselves describe individual phases as follows. In the first phase (existence) is starting up the development, that means, that the company strives for viability of products and for getting a sufficient number of costumers. The decision-making authorities has usually one person, who is simultaneously only owner, or a few people. In this phase, companies establish or create their own entrepreneurial environments. In the phase of survival strive companies for growth, they create definite formalized organizational structures a establish their own characteristic competencies. The main aim in this phase is generating a sufficiently high revenue to implement activities to secure

further growth and to keep competitiveness. For the phase of success is typical, that working tasks, strategies, tactics and internal reporting are becoming more formal. The top management aims to planning and strategy, and ceeds common operational tasks to managers on the middle level. In the phase of revival tries the company to return to slimming down the organizational structure, and the team work supports innovations and creativity, which is often facilitated by using the matrix organizational structure and decentralized decision-making. The phase of decline is characterized, that employees including managers significantly prefer their own interests to corporate interests. A lot of companies aren't able to get back the costumers, that they had in previous phases, and therefore, they can lose the profit and a part of their market share.

2. Identification phases of corporate life cycle

All of mentioned models allows to identify individual phases of corporate life cycle, that is according to the values of variables, which are considered in these models. But by identification, there can occur some problems, which follows from two basic disadvantages of most existing models:

- 1) **There is a lot of variables in the model** – values of some variables can signalize one phase of the corporate life cycle, whilst values of other variables are typical for another phase, furthermore, some variables can have a bigger importance by identification phases than other variables.
- 2) **Some variables are qualitative** – these variables are problematically measurable, they can't be expressed by numbers, hence there isn't possible to determine intervals of values for individual phases.

So the practical applicability of most models of corporate life cycle is very limited. Therefore, there were been suggested easier methods of identification, which consider only minimal number of variables and all of them are quantitative factors. The most known method, which is mentioned e.g. by Kislingerová (2004), is identification of phases according to the value of cash flow. But there aren't exactly determined intervals of cash flow for individual phases and therefore is this method unusable, too.

In this research there will be used the model by Reiners (2004). This model distinguishes four phases of corporate life cycle:

- 1) Foundation.

- 2) Growth.
- 3) Stabilisation.
- 4) Decline.

These phases are identifiable according to the value of a growth indicator:

$$GI_c = \frac{\frac{Sales_t - Sales_{t-1}}{Sales_{t-1}} + \frac{Assets_t - Assets_{t-1}}{Assets_{t-1}} + \frac{CF_t - CF_{t-1}}{CF_{t-1}}}{3} \quad (1)$$

where:

- GI_c growth indicator for identification phases of corporate life cycle,
 $Sales_t$ incomes for own products, services and goods, reached by the company during actual period,
 $Sales_{t-1}$ incomes for own products, services and goods, reached by the company during last period,
 $Assets_t$ value of assets at the end of actual period,
 $Assets_{t-1}$ value of assets at the end of last period,
 CF_t cash flow reached during actual period,
 CF_{t-1} cash flow reached during last period.

Table 1. Intervals of values for phases of corporate life cycle

Phases of corporate life cycle	Intervals of values of GI_c
Expansion	$GI_c > 10\%$
Stabilisation	$-2\% \leq GI_c \leq 10\%$
Declension	$GI_c < -2\%$

Source: Reiners, 2004

The intervals for individual phases of corporate life cycle are recorded on Table 1. For the phase of foundation, there isn't determined the interval of values, because of high volatility of variables, involved in the growth indicator, during this phase.

3. Market life cycle and identification phases

Similarly to companies, markets go through their life cycle, too. But there are not many models of market life cycle, because only few authors were engaged in theory of market life cycle.

Authors Lu and Wu (2000) consider phases of growth, maturity and decline. The only quantity to identify these phases are the sales, reached on the market. In the phase of growth the sales are increa-

sing, during the phase of maturity are the sales approximately constant and for the phase of decline there is typical a decrease of sales. It follows, that for identification of phases, there isn't important the amount of sales, but their course in the long-term horizon.

According to Redondo, Juste and Palacios (2005), the market life cycle consists of five phases, which aren't termed, and every phase has some specifics:

- 1) **Phase I:** On the market were still acting no companies, only few companies are entering the market, no companies are leaving the market.
- 2) **Phase II:** Most of new companies are entering the market, at the end of this phase some companies are leaving the market.
- 3) **Phase III:** Many companies are entering the market and simultaneously many companies are leaving the market.
- 4) **Phase IV:** Number of companies, leaving the market is higher, than number of companies entering the market.
- 5) **Phase V:** There is a low number of companies, entering the market and companies, leaving the market, too. There is stabilized the number of companies acting on the market.

According to the model by Liang, Czaplewski, Klein and Jiang (2009), the market life cycle is divided into phases of introduction, growth, maturity and decline, and these phases are identifiable according to the accumulative share of companies, which already strengthen one's position. The least number of these companies is during the phase of introduction, and the model calls them first movers for market growth. At the end of phase of introduction new companies are already entering the market. During the phase of growth comes at first a market chaos and later a market shake-out. The phase of maturity is typical with the highest number of companies, which have already built their strong positions (according to this model approximately 80 % companies). And then, in the phase of decline, the share of these companies decreases.

The same phases takes into account the model by Digman (1995), mentioned in Wong and Maher (1997). The second common characteristic is the fact, that according to this model, comes the market chaos and then the market shake-out between the phases of growth and maturity. Quantities, that are used for identification of the phases, are sales, cash flow and profits. But there aren't exactly determined intervals of values of these quantities for individual phases.

Model by Owyang (1999) considers three phases of market life cycle. In the first phase, the market

is building, consequently in the second phase, the market is developing, and finally in the third phase, the market is mature. This model observes only qualitative factors, that are managing of the company and corporate strategies during individual phases of market life cycle. It follows, that nor this model allows to exactly identify individual phases.

None of recorded models of market life cycle is usable for researches, therefore will be used the model by Reiners (2004), which is similar to his model of corporate life cycle. The phases are the same and they are identifiable according to the value of a growth indicator:

$$GI_m = \frac{Sales_t - Sales_{t-1}}{Sales_{t-1}} \quad (2)$$

where:

- GI_m growth indicator for identification phases of market life cycle,
 $Sales_t$ incomes for own products, services and goods, reached by the market during actual period,
 $Sales_{t-1}$ incomes for own products, services and goods, reached by the market during last period.

The intervals of values for individual phases are the same as in the case of corporate life cycle, recorded on Table 1, that means, that the phase of foundation of the market isn't identifiable, too.

4. Market positions of the company

According to the model by Reiners (2004), there can be identified phases of corporate life cycle and phases of market life cycle, too. So there can be found in total 16 combinations of corporate- and market life cycle and thus there can be distinguished three different positions, that hold companies on the market:

- 1) Business pioneer – the life cycle of these companies “foreruns” the market life cycle.
- 2) Business driver – these companies are ever in the same phase of their life cycle as the market.
- 3) Business follower – the life cycle of these companies “is behind” the market life cycle.

5. Cost of capital

Cost of capital are defined as the financial requirements of investors for putting their capital into the company. Nevertheless, there must be distinguished

the legal position of investors. The cause is, that the cost of capital depend especially on the rate of risk, beared by investors, and the risks are for owners usually higher than for creditors. But some risks are beared by owners and by creditors, too, because they are systematic. These risks are involved in the so-called riskless rate, which is a part of cost of debt and cost of equity, too.

The calculation of cost of debt is relative easier, because these cost are really paid. So the cost of debt are quantified as the proportion of all financial cost, that are caused by using debt (so not only the interests), to the amount of debt, which can have the form of either bank loans, or bonds. Furthermore, there must be considered the so called interest tax shield, because payment of interests causes the company some savings on the income tax.

The cost of equity calculation is more difficult, because these cost aren't recorded in the accountancy. There are some existing methods, mentioned *e.g.* by Kislíngrová (2001) or Režňáková (2005):

- 1) Gordon growth model.
- 2) Capital assets pricing model (CAPM).
- 3) Arbitrage pricing theory (APT).
- 4) Market model.
- 5) Construktional models – *e.g.* the model made by Czech Ministry of Industry and Trade.
- 6) Calculation based on the average return on equity reached on the market.
- 7) Calculation based on risk reward to cost of debt
- 8) Black-Scholes model for pricing options – used by Reiners (2004).

Relations between cost of capital and corporate life cycle were most researched by Reiners (2004), therefore will be recorded his results.

The average cost of capital are the highest at the beginning of the phase of foundation, which is caused by high risk. During the phase of foundation the cost of capital rapidly decrease whilst in the phase of growth there is recorded only a moderate decrease of cost of capital. During the phase of stabilisation is reached the minimum of cost of capital and they are approximately constant. At the beginning of the phase of decline the cost of capital rapidly increase, because of growing rate of risk.

Owner's risk rewards are the highest at the beginning of the phase of foundation and then, during this phase and during the phase of growth have the same course as the average cost of capital. The minimum of owner's risk rewards is reached during the phase of stabilisation too, but they aren't constant. At the beginning of the phase of stabilisation decrease the owner's risk rewards, consequently, they reached

their minimum and finally, at the end of the phase of stabilisation, they are starting to grow, because owners already realize growing risks. The most interesting findings is, that during the phase of decline, the owner's risk rewards increase only moderately, then is reached a maximum and then they start to decrease, because owners expect next wave of growth and for the opposite case they guarantee for their liabilities only to the amount of their put capital.

Creditor's risk rewards during the phase of foundation rapidly decrease, because there is decreased the risk, which is beared by them. Then, the creditor's risk rewards reached the minimum and remain the same during the phases of growth and stabilisation, which follows from the fact, that during the phase of growth, and during the phase of stabilisation, too, creditors are sure, that their requirements will be satisfied. During the phase of decline the creditor's risk rewards rapidly increase because of growing risk.

Furthermore Reiners (2004) was founding out, whether there is during all corporate life cycle kept the generally known rule, that debt is cheaper than equity, that means whether creditors bear lower risk than owners during all time of the existence of the company. There was found out, that this rule is broken at the beginning of the phase of foundation, when the debt is moderately more expensive than equity, and during the phase of decline, when debt is significantly more expensive, notwithstanding considered interest tax shield. The cause of this findings is in both cases the same. As mentioned above, losses of owners are limited, because they guarantee only to the amount of equity, whilst profits of owners are practically almost unlimited. During other phases is debt cheaper than equity, and the biggest difference between owner's and creditor's risk reward is at the end of foundation, consequently, this difference decreases and during the phase of stabilisation is debt only moderately cheaper than equity, because just in this phase of corporate life cycle is the enterprising least risky and it follows, that not only creditors, but also owners have almost guaranteed, that they won't lose their capital.

These results about cost of capital and owner's and creditor's risk rewards are peculiar to business driver according to Reiners (2004). In the case of business pioneer and business follower, there can be recorded some differences in relations between their corporate life cycle and researched financial quantities.

A business pioneer holds the position of the innovator on the market, and it follows, that he doesn't have strong competitors, therefore he can reach high

sales and profits. He can also get a high market share, and can as a business pioneer keep it easier. On the contrary, he bears a high risk, that there will be no or little interest in his new products on the market, and so he can reach a loss. Owner's and creditor's risk rewards have a similar course as in the cause of business driver, nevertheless, there are two small differences. At the end of the phase of growth and during the phase of stabilisation of the company reach creditor's risk rewards almost the zero value. The second difference can be recorded in the phase of decline. Whilst by business driver decrease the cost of equity, in the case of business pioneer, they slowly increase.

A business follower enter the market only, when there are already a lot companies acting on the market. Therefore, he must expect, that he get much lower market share than a business pioneer. When researching owner's and creditor's risk rewards during the corporate life cycle, there can be found out only one small difference in comparison to business driver, that is, that in the phase of decline can owner's risk rewards reach negative values, which means, that the cost of equity are lower than the riskless rate.

6. Used methods

For the research there are used secondary data, that are got from the financial statements of the companies and from the analytical and statistical documents published by the Czech Ministry of Industry and Trade.

There is selected the market with motor vehicles production, because this branch is one of the most important branches of the czech economy. On this market act in total about 100–150 companies. In the sample, there are involved 39 of them with following characteristics:

- companies of all sizes,
- joint-stock companies and companies limited by guarantee,
- companies, that publish full financial statements,
- companies, whose accounting period is a calendar year,
- companies, that were acting on the market from 2002 up to 2010.

For the identification phase of corporate- and market life cycle, there was used the model by Reiners (2004), because this model allows to identify phases of the corporate life cycle unequivocally. There were determined phases of the market life cycle and

phases of the life cycle of each company for every of nine researched periods (years 2002–2010).

For calculation cost of equity was used a constructional model by Czech Ministry of Industry and Trade, described on their website, because it allows to monitor partial risk rewards.

7. Results and its discussion

First of all, there were researched partial risk rewards including the riskless rate, that were required on the whole market.

On Figure 1 there is illustrated the structure of cost of equity, required on the market with motor vehicles production, for periods from 2002 up to 2010, and below each period, there is recorded the phase of the market life cycle.

The greatest part of the cost of equity was in every period the so-called riskless rate (r_f), in which there are considered systematic risks (e.g. economic, inflationary or political risks), which are connected with every type of investment. From 2002 up to 2007 created the riskless rate about one halve of cost of equity. During the decline in 2008 and 2009 wasn't the share of the riskless rate so considerable because of the increase of some other components. And finally, in 2010, during a new wave of growth, the riskless rate was only a little greater than the risk reward for financial stability, which was in this period the second greatest component of cost of equity.

The risk reward to size of the company (r_{LA}), which depends on amount of fund sources, didn't have in any period an considerable influence on the cost of equity and this component remained approximately the same for all periods.

The risk reward to entrepreneurial risk (r_{POD}), which is dependent especially on creating earnings before interest and taxes (EBIT) with considering the amount of total assets, was constant from 2002 up to 2007, but in 2008, at the beginning of the world financial and economic crisis, was significantly increasing. In 2009, there was reached a maximum of the risk reward to entrepreneurial risk and during the growth in 2010, this risk reward moderately decreased.

The risk reward to financial stability ($r_{FINSTAB}$), which is derived from the liquidity of third level didn't have an considerable share of cost of equity up to 2008, but in 2009, during market decline, this risk reward rapidly increased and in 2010, during the phase of growth, remained the same and furthermore, in this period the share of this risk reward on cost of equity was almost so great, than the share of the riskless rate.

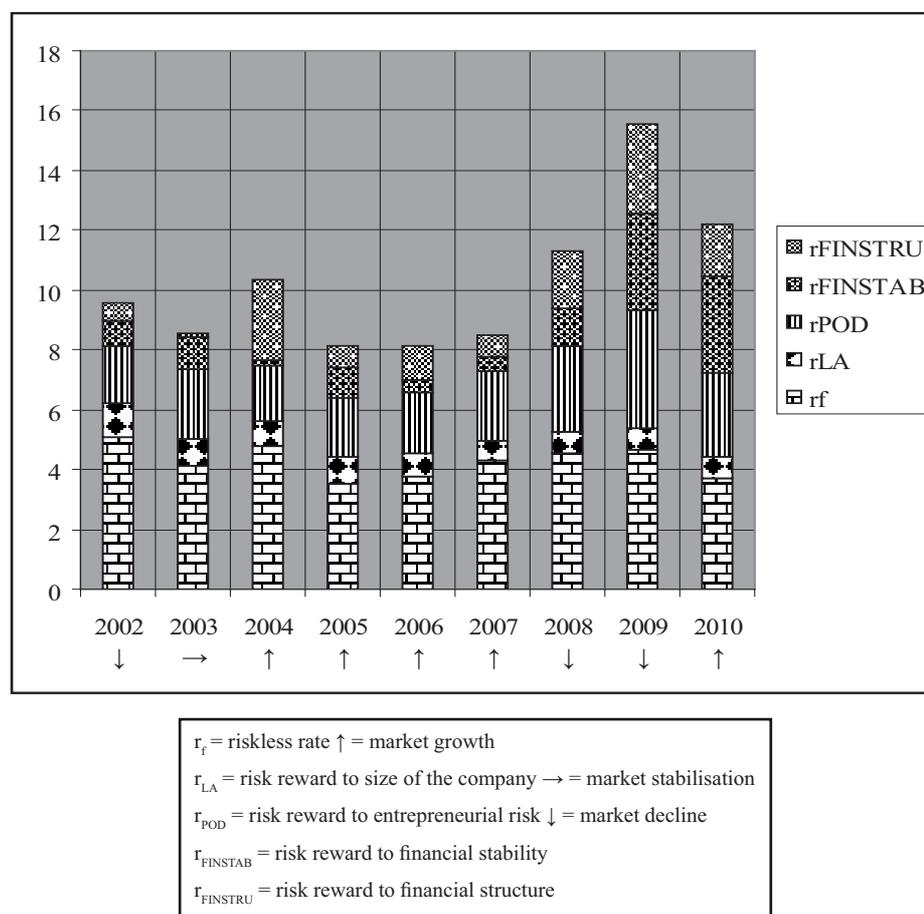


Figure 1. Structure of cost of equity (in %) on the source: Financial analysis of market with motor vehicles production for periods industry and construction, 2002–2010 with considering the market life cycle available on www.mpo.cz

And finally, the risk reward to financial structure (r_{FINSTRU}), which is the difference between alternate cost of equity and weighted average cost of capital (WACC), was the highest in 2009, during the economic crisis and simultaneously during the decline of the market.

For the 39 selected companies is each risk reward (except the riskless rate, which is the same as for the whole market) recorded separately on following four tables. There is for each period mentioned the number of companies that reached min. value, value within the interval and max. value of each risk reward and there are ever distinguished companies in different phases of their life cycle and different market positions.

The results concerning r_{LA} are illustrated on Table 2.

Most companies in the phase of growth reached the maximal value of r_{LA} (5%). That means, that companies in the phase of growth are mostly small.

Only few companies in the phase of growth reached the minimal value of r_{LA} (0%) and that was in 2006, 2007 and 2010, so during the market growth. The number of companies in the phase of growth, that reached r_{LA} within interval of its values was in four periods approximately two times lower and in other five periods the same or a little higher than the number of companies in the phase of growth, that reached the maximal value of r_{LA} .

In companies in the phase of stabilisation was required r_{LA} either on the level of its maximum (cca 50% of companies), or within the interval of values. None from these companies reached the minimal value, so that means, that all of these companies are small or medium-sized.

By companies in the phase of decline, was the highest number of companies, achieved the max. value of r_{LA} , and only a little lower was the number of companies with r_{LA} from the interval of values. Only

Table 2. r_{LA} required in selected companies in individual phases of their cycle in years 2002–2010.

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of companies reaching min. r_{LA}	1	1	1	1	2	2	1	2	1
within: ↑	0	0	0	0	1	2	0	0	1
→	0	0	0	0	0	0	0	0	0
↓	1	1	1	1	1	0	1	2	0
Number of companies reaching r_{LA} within interval of its values	13	16	15	15	16	16	18	18	19
within: ↑	5	6	5	2	3	5	4	5	6
→	1	2	0	1	1	0	3	1	0
↓	7	8	10	12	12	11	11	12	13
Number of companies reaching max. r_{LA}	25	22	23	23	21	21	20	19	19
within: ↑	12	6	10	5	7	5	4	5	5
→	1	3	1	0	2	0	2	0	2
↓	12	13	12	18	12	16	14	14	12
	business pioneer		business driver		business follower				

Source: own research

few companies in the phase of decline reached the min. value. So most of these companies are either small or medium-sized, too.

Approximately one half of business pioneers reached the maximal value of r_{LA} , a little less business pioneers reached the value within the interval and very few business pioneers reached the minimal value of r_{LA} .

Among business drivers, there was the highest the number of companies, that reached the max. value

of r_{LA} , a little less of them reached the value within the interval and only by few business drivers was required the min. value of r_{LA} .

Almost one half of business followers reached the max. value of r_{LA} and the another half the value within the interval. None of them reached the min. value.

On Table 3, there are recorded numbers of companies, that reached the min. value, values within the interval and the max. value of risk reward to entrepreneurial risk (r_{POD}).

Table 3. r_{POD} required in selected companies in individual phases of their cycle in years 2002–2010.

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of companies reaching min. r_{POD}	20	23	23	20	16	19	14	10	18
within: ↑	7	8	9	5	6	6	6	2	8
→	1	4	1	1	1	0	0	0	1
↓	12	11	13	14	9	13	8	8	9
Number of companies reaching r_{POD} within interval of its values	16	12	15	17	20	18	21	18	13
within: ↑	8	1	5	2	5	6	2	5	1
→	1	1	0	0	1	0	5	1	1
↓	7	10	10	15	14	12	14	12	11
Number of companies reaching max. r_{POD}	3	4	1	2	3	2	4	11	8
within: ↑	2	3	1	0	0	0	0	3	3
→	0	0	0	0	1	0	0	0	0
↓	1	1	0	2	2	2	4	8	5
	business pioneer		business driver		business follower				

Source: own research

Table 4. r_{FINSTAB} required in selected companies in individual phases of their cycle in years 2002–2010.

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of companies reaching min. r_{FINSTAB}	14	18	17	18	18	21	18	20	22
within: ↑	6	5	7	5	6	5	6	4	9
→	2	3	0	0	1	0	2	1	2
↓	6	10	10	13	11	16	10	15	11
Number of companies reaching r_{FINSTAB} within interval of its values	18	14	15	15	17	12	14	11	10
within: ↑	7	4	5	2	4	5	1	4	2
→	0	1	1	1	2	0	2	0	0
↓	11	9	9	12	11	7	11	7	8
Number of companies reaching max. r_{FINSTAB}	7	7	7	6	4	6	7	8	7
within: ↑	4	3	3	0	1	2	1	2	1
→	0	1	0	0	0	0	1	0	0
↓	3	3	4	6	3	4	5	6	6
	business pioneer		business driver		business follower				

Source: own research

In almost all periods was by companies in the phase of growth required the minimal risk reward to entrepreneurial risk, which corresponds, according to the methodologies by Czech Ministry of Industry and Trade, to the minimal value of r_{POD} , reached on the market. So these companies create earnings before interest and taxes (EBIT), which is greater than the amount of fund sources multiplied by the interest rate. Almost the same number of companies in the phase of growth reached r_{POD} within the interval of values, that means that their EBIT is positive but lower than fund sources, multiplied by the interest rate. Only few companies in the phase of growth reach the maximal value of r_{POD} (10%), which is derived from the fact, that these companies create a negative EBIT.

In companies in the phase of stabilisation, there is mostly required either min. r_{POD} or r_{POD} within the interval of values. Only one company reached in one period the max. value.

The risk reward to entrepreneurial risk was in companies in the phase of decline mostly the minimal, or within the interval.

Only few business pioneers reached the max. r_{POD} , numbers of business pioneers with the min. value of r_{POD} and with the value within the interval were approximately the same.

Most of business drivers reached the min. value of r_{POD} , and a little less of them reached the value within the interval, whilst almost by no business drivers was required the max. value.

By business followers are the numbers of them with the min. value of r_{POD} and the value within the interval approximately the same and less companies reached the max. value of r_{POD} .

On Table 4, there are mentioned findings about r_{FINSTAB} depending up the individual phases of the corporate life cycle and different market positions.

Most of companies in the phase of growth reached the min. value of r_{FINSTAB} , which is 0 %. That means, that the liquidity of third level of these companies is higher than the liquidity of second level, reached on the market. The number of companies in this phase reaching the value within the interval (= companies, whose liquidity of third level is higher than the liquidity of first level reached on the market, but lower than the liquidity of second level reached on the market) was a little less and number of companies with the max. value of r_{FINSTAB} (10%), that means, whose liquidity of third level was less than the liquidity of first level reached on the market, was even less.

Among companies in the phase of stabilisation dominated companies, reaching either the min. value of r_{FINSTAB} or within interval.

And in companies in the phase of decline, was mostly required r_{FINSTAB} either on the min. level, or within the interval of values, too.

By business pioneers, there were required mostly the min. value of r_{FINSTAB} , or the value within the interval. Only few business pioneers reached the maximal value.

Table 5. $r_{FINSTRU}$ required in selected companies in individual phases of their cycle in years 2002–2010.

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of companies reaching min. $r_{FINSTRU}$	28	27	30	28	27	21	24	27	26
within: ↑	13	8	12	5	7	7	6	7	9
→	2	4	1	1	2	0	3	1	2
↓	13	15	17	22	18	14	15	19	15
Number of companies reaching $r_{FINSTRU}$ within interval of its values	9	10	8	9	10	13	10	8	10
within: ↑	3	3	3	1	4	3	2	2	3
→	0	1	0	0	1	0	2	0	0
↓	6	6	5	8	5	10	6	6	7
Number of companies reaching max. $r_{FINSTRU}$	2	2	1	2	2	5	5	4	3
within: ↑	1	1	0	1	0	2	0	1	0
→	0	0	0	0	0	0	0	0	0
↓	1	1	1	1	2	3	5	3	3
	business pioneer		business driver		business follower				

Source: own research

Business drivers reached the min. value of $r_{FINSTAB}$ in more cases than the value within the interval and the number of business drivers, reaching the max. $r_{FINSTAB}$ was very low.

Numbers of business followers, reaching the min. value of $r_{FINSTAB}$ and business followers, reaching the value within the interval, were approximately the same, whilst number of them, reaching the max. value was much lower.

And finally, the relations between the corporate vs. market life cycle and $r_{FINSTRU}$, which is the last component of cost of equity, are illustrated on Table 5.

By companies in the phase of growth, there dominates number of them, reaching the min. value of $r_{FINSTRU}$ (0%). Number of companies, where was required a value within the interval is much lower and number of them, that reached the max. $r_{FINSTRU}$ (10%), is even lower.

Companies in the phase of stabilisation reached mostly the min. value of $r_{FINSTRU}$, only few companies the value within the interval and in no companies in the phase of stabilisation was required the max. value of $r_{FINSTRU}$.

By companies, that were in the phase of decline, was the number of them, reaching the min. value of $r_{FINSTRU}$ approximately two times higher than the number of them, reaching the value within the interval and in only few companies in the phase of decline was required the max. value of $r_{FINSTRU}$.

Most of business pioneers reached the min. value of $r_{FINSTRU}$, much less of them the value within the

interval and the max. value was reached by very few business pioneers.

By business drivers was mostly required the min. value of $r_{FINSTRU}$, in less cases the value within the interval and in very few cases the max. value.

Business followers reached mostly the min. value of $r_{FINSTRU}$. Numbers of business followers reaching the value within the interval or the max. value were much lower.

Conclusion

This article was focused on the relations between the structure of cost of equity and corporate life cycle and there was also considered the market life cycle and thus the market positions, which companies hold.

There was used a model by Reiners (2004) to identify phases of the corporate- and market life cycle positions of business pioneer, business driver and business follower.

To find out the structure of cost of equity, there was used a constructional model for calculation cost of equity, made by the Czech Ministry of Industry and Trade.

There were selected 39 companies acting on the Czech market with motor vehicles production and the data were gotten from their financial statements and from the analytical and statistical documents by the Czech Ministry of Industry and Trade, both for years 2002–2010.

There was found out, that the greatest share of the cost of equity is the riskless rate (r_f), which created in periods 2002–2007 about one half of cost of equity. Among other components, r_{LA} remained approximately constant for all periods, r_{POD} was approximately constant from 2002 to 2006, then it was increasing up to 2009 and in 2010 there was recorded a moderate decrease. The risk rewards to financial stability ($r_{FINSTAB}$) and to financial structure ($r_{FINSTRU}$) were held from 2002 to 2007 on low levels, but in 2008 and especially in 2009, they increased and their share on the cost of equity increased, too.

Companies, that were in the phase of growth, reached mostly the max. value of r_{LA} , the min. value of r_{POD} , or the value within the interval and min. value of $r_{FINSTAB}$ and $r_{FINSTRU}$.

By companies in the phase of stabilisation, there was mostly reached the max. value or a value within interval of values of r_{LA} , min. or a value within interval of values of r_{POD} and $r_{FINSTAB}$ and min. value of $r_{FINSTRU}$.

And companies in the phase of decline, achieved max. value of r_{LA} , or the value within the interval of its values, the min. value or the value within the interval of values of r_{POD} and $r_{FINSTAB}$ and the minimal value of $r_{FINSTRU}$.

Most of business pioneers reached the max. value of r_{LA} or within the interval, the min. value or within the interval of values of r_{POD} and $r_{FINSTAB}$ and the min. value of $r_{FINSTRU}$.

By business drivers was mostly required the max. value of r_{LA} , or a value within the interval, the min. value of r_{POD} or a value within the interval and the min. value of $r_{FINSTAB}$ and $r_{FINSTRU}$.

And business followers, reached the max. value of r_{LA} , or within the interval, the min. value of r_{POD} and $r_{FINSTAB}$ or values within interval of values of these two risk rewards and the min. value of $r_{FINSTRU}$.

The research showed, that by finding structure of cost of equity, there are only small differences between companies in different phases of their life cycle and small differences between companies, that hold different market positions.

Furthermore, there are some limits with used methods. The findings are valid mostly for czech markets, because the constructional model for calculation cost of equity was developed for czech firms. So generalizing for markets all over the world is limited. And the model by Reiners (2004) allows to identify phases only in interyear comparison of values of used quantities and there isn't possible to identify neither the phase of corporate-, nor the phase of market foundation.

References

- Cao, Y., Chen, X., Wu, D. D. and Mo, M. (2011). Early warning of enterprise decline in a life cycle using neural networks and rough set theory. *Expert Systems with Applications* 38. pp. 6424–6429.
- Hwang, Y. and Park, S. H. (2007). The organizational life cycle as a determinant of strategic alliance tactics: Research propositions. *International Journal of Management*. vol. 24, no. 3, pp. 427–435.
- Kislingerová, E. (2001). *Oceňování podniku*. 2nd ed. Praha: C. H. Beck. 367 pp.
- Kislingerová, E. *et al.* (2004). *Manažerské finance*. Praha: C. H. Beck. 714 pp.
- Lester, D. L., Parnell, J. A. and Carraher, S. (2003). Organisational life cycle: A five-stage empirical scale. *The International Journal of Organizational Analysis*. vol. 11, no. 4, pp. 339–354.
- Liang, T. P., Czaplowski, A. J., Klein, G. and Jiang, J. J. (2009). Leveraging first-mover advantages in internet-based consumer services. *Communications of the ACM*. vol. 52, no. 6, pp. 146–148.
- Lu, J. and Wu, Ch. (2000). Cost and benefit models for logic and memory BIST. *ACM*. pp. 710–714.
- Mack, D. A. and Quick, J. C. (2002). And inside view of a corporate life cycle transition. *Organisational Dynamics*. vol. 30, no. 3, pp. 282–293.
- Miller, D. and Friesen, P. H. (1983). Successful and unsuccessful phases of the corporate life cycle. *Organisation Studies*. vol. 4, no. 4, pp. 339–356.
- Miller, D. and Friesen, P. H. (1984). A longitudinal study of the corporate life cycle. *Management Science*. vol. 30, no. 10, pp. 1161–1183.
- Moy, J. W. and Luk, V. W. M. (2003). The life cycle model as a framework for understanding barriers to SME growth in Hong Kong. *Asia Pacific Business Review*. vol. 10, no. 2, pp. 199–220.
- O'Rand, A. M. and Krecker, M. L. (1990). Concepts of the life cycle: Their history, meanings, and uses in the social sciences. *Annual Review of Sociology* 16. pp. 241–262.
- Owen, S. and Yawson, A. (2010). Corporate life cycle and M&A activity. *Journal of Banking & Finance* 34. pp. 427–440.
- Owyang, K. (1999). When margins fall: The market life cycle. *Public Utilities Fortnightly*. vol. 137, no. 11, pp. 30–31.

- Phelps, R., Adams, R. and Bessant, J. (2007). Life cycles of growing organizations: A review with implications for knowledge and learning. *International Journal of Management Reviews*. vol. 9, no. 1, pp. 1–30.
- Redondo, Y. P., Juste, M. V. B. and Palacios, L. L. (2005). Firm's survival over the market life cycle: an empirical analysis in the franchise system. *Sciences de Gestion* 65. pp. 263–283.
- Reiners, M. (2004). *Finanzierungskosten im Lebenszyklus der Unternehmung. Ein optionspreistheoretischer Ansatz*. Hamburg: Verlag Dr. Kovač. 334 pp.
- Režňáková, M. (2005). *Finanční management*. 3rd ed. Brno: Akademické nakladatelství CERM. 125 pp.
- Shirokova, G. (2009). Organisational life-cycle: The characteristics of developmental stages in Russian companies created from scratch. *Journal for East European Management Studies* 1. pp. 65–85.
- Walsh, J. P. and Dewar, R. D. (1987). Formalization and the organizational life cycle. *Journal of Management Studies*. vol. 24, no. 3, pp. 215–231.
- Wong, Y. Y. and Maher, T. E. (1997). New key success factors for China's growing market. *Business Horizons*, pp. 43–52.

Doručeno redakci: 28. 2. 2012
Recenzováno: 18. 5. 2012
Schváleno k publikování: 31. 5. 2012

Ing. Zdeněk Konečný
Brno University of Technology,
Faculty of Business and Management,
Department of Finance,
Kolejní 2906/4,
612 00 Brno,
Czech republic,
Tel.: 541 143 787,
E-mail: konecny@fbm.vutbr.cz