USING THE BOSTON MATRIX AT IDENTIFICATION OF THE CORPORATE LIFE CYCLE STAGE

Zdeněk Konečný[1], Marek Zinecker[1]

[1] Department of Economics, Faculty of Business and Management, Brno University of Technology, Kolejní 2906/4, 612 00 Brno, Czech Republic

Abstract

KONEČNÝ ZDENĚK, ZINECKER MAREK. 2015. Using the Boston Matrix at Identification of the Corporate Life Cycle Stage. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 63(1): 235–243.

The main aim of this article is to develop a new model supporting the identification of the particular corporate life stage within the corporate life cycle. This model will be derived from the Boston matrix. The main reason for using this approach as the base for making new model of the corporate life cycle is the fact, that every quadrant of the Boston matrix can be assigned to one phase of the product life cycle and there is supposed, that the phase, in which are most products, determines the phase of the corporate life cycle. For application the Boston matrix by identification phases of the corporate life cycle is necessary to define low and high values of both its variables using some quantities from the model of corporate- and market life cycle by Reiners (2004). So the interval of low and high sales growth is determined by comparing sales of the company and sales of the market and furthermore, there is considered the rate of inflation to eliminate the impact of price changes. And for determination low and high market shares, there are compared the shares of sales and shares of total assets. After that, there will be possible to identify all the quadrants and thus all the individual phases unequivocally, which is the basic advantage compared to most existing models of the corporate life cycle. The following aim of this article is to compare the occurrence of individual phases, identified by this modified model, depending on the sector sensitivity to the economic cycle, measured by the coefficient of correlation between sales on the market and GDP. There are selected two sectors of the Czech economy, namely one cyclical and one neutral sector. Subsequently there is selected a sample of companies from both these sectors. The data are collected from financial statements of companies and from analytical materials by the Czech Ministry of Industry and Trade and by the Czech Statistical Office. On the basis of this research, there were recorded differences especially in the number of companies in the phases of stabilisation and decline, depending on the sector sensitivity to the economic cycle.

Keywords: Boston matrix, corporate life cycle, market conditions, market share, rate of sales growth

INTRODUCTION

All companies go through the individual phases of their life cycle. This fact reflects especially in values of quantities describing the financial health of the company and the value deviations of these quantities, as the consequence of the switch from one to another phase of the corporate life cycle, can be, thanks to good corporate management, only moderated, not quite eliminated. There are some possibilities to moderate these deviations like innovative activities or using suitable marketing tools. But there will be never guaranteed a permanent growth for the company, because there is necessary to consider limited production capabilities, from which is derived, that there isn't possible to ever quite satisfy increasing requirements of customers. Furthermore, there is needed to consider the conditions of the market, where is the company acting, because the market saturation is possible.

The aim of this article is to modify the Boston matrix, originally made for managing the product portfolio, for the purpose of identification the corporate life cycle. So the novelty of this model and its basic advantage consists in defining intervals for low and high values of both its variables to identify the individual phases unequivocally.

THEORETICAL BACKGROUND

The theory of the corporate life cycle has its origin in biology, because there is supposed, that the company like all living organisms, goes through its life cycle. There is only substantial difference, that by living organisms, there is approximately set the length of individual stages from birth to death, whilst in the case of companies, the individual phases can considerably differ in their length and after expiration of all phases, the company doesn't have to cease to exist, but there can be started up a new life cycle, e.g. thanks to a good management.

Models of the Corporate Life Cycle

Models of the corporate life cycle can be, according to Reiners (2004), divided into four groups according to the criterion of their research:

1. **Models following from the course of the market** – the corporate life cycle, according to these models, directly depends on the product life cycle. So the individual phases are defined analogous to the product life cycle (phases of foundation, growth, stabilisation and decline) and in this case is the repetition of some phases or their skipping possible, too. But the practical applicability of these models is very limited, because the company offers to the market many products, that can be in different phases of product life cycles.

2. **Crisis models** – they are derived from the fact, that the company, during the existence, continuously goes through the process of changes. There are distinguished phases characterized ever by specific increased problems having either their external, or internal origin. Controlling of these crisis situations is, according to these models, perceived as the switch to the next phase of the corporate life cycle.

3. **Models considering changes in the organisational structure** – the order of phases of the corporate life cycle depends on changes in the organisational structure. E.g. an informal organisational structure at the beginning of the existence of the company can switch to a hierarchical functional organisational structure, that can be subsequently replaced by a matrix structure.

4. **Models considering changes of decision-making style** – they are similar to models considering changes in the organisational structure. Compared to other models is the corporate life cycle, according to these models, closer to reality, because the phases are identified on the basis of considering not only quantitative, but also qualitative factors. But their disadvantage consists in a limited applicability because of using qualitative factors by identification the phases.

Many authors were dedicated to the theory of corporate life cycle and there were developed some tens of models. On Tab. I there are recorded, and ordered chronologically, some of them, including number of phases and number of variables, as mentioned by Shirokova (2009).

By choosing the model of the corporate life cycle is ever necessary to consider the purpose of its using. None of the models, mentioned above,

I: *Existing models of the corporate life cycle*

Authors of the model and year of its origin	Number of phases	Number of variables
Lippitt and Schmidt (1967)	3	6
Greiner (1972)	5	10
Torbert (1974)	8	7
Galbraith (1982)	5	10
Quinn and Cameron (1983)	4	8
Miller and Friesen (1984)	5	14
Schein (1985)	3	6
Smith, Mitchell and Summer (1985)	3	9
Flamholtz (1986)	7	10
Scott and Bruce (1987)	5	8
Kazanjian (1988)	4	6
Hanks *et al*. (1993)	4	6
Adizes (1999)	10	8
Lester, Parnell and Carraher (2003)	5	5
Hoy (2006)	5	3

Source: Shirokova (2009)

is usable universally, which follows from the fact, that every model of the corporate life cycle uses different variables and different number of phases and furthermore, the authors use also different names of the partial phases. But according to names of the phases and used variables, there can be found out some common characteristics, according to that there is possible to compare these models and divide them into groups. E.g. some models suppose, that the company, after a certain period, ceases to exist, or that there will be started up a new corporate life cycle, whilst according to other models, this situation will not happen, which can be rationalized, that in the moment, when the company is on the top of its life cycle, it comes to a merger or acquisition. Some authors, e.g. Torbert, Flamholtz, Kazanjian or Adizes involve in their models also the business idea itself as the first phase of the corporate life cycle. There is also possible, from the names of the phases and from the variables, to derive, on which characteristics is put the greatest importance by the authors of the model. E.g. Greiner, Torbert or Quinn and Cameron emphasize, that the corporate life cycle influences especially the management style or the level of formalization. Galbraith in his model emphasizes also the production processes. On the contrary, other authors put the greatest importance on business results, which is evident from the models by Miller and Friesen, Smith, Mitchell and Summer, Scott and Bruce, Kazanjian, Hanks et al. and Lester, Parnell and Carraher.

Identification Phases of the Corporate Life Cycle

Each of the mentioned models uses different variables and also different number of phases and their names. But the practical applicability of most models is very limited because of two basic problems connected with identification the phases of the corporate life cycle:

1. **There are too many variables** – values of some variables can signalize a certain phase of the corporate life cycle, whilst values of other variables are typical for another phase and furthermore, some variables can have a greater importance by the identification than others. This limitation is characteristic especially for models by Greiner, Galbraith, Miller and Friesen, Flamholtz, who use about 10 variables.

2. **Some variables have a qualitative character** – these variables are measurable difficultly, they can't be expressed numerally and this is the reason, why there isn't possible to set intervals of values for individual phases. This limitation is typical for all 15 models, described above.

So there is necessary to consider just few most important variables by identification the phases, which are quantifiable. The most suitable are the financial quantities, because of the following reasons:

1. the qualitative factors influence, in the upshot, the value of financial, and so quantifiable, indicators,

2. only at the moment of reflecting these qualitative factors in the financial quantities, there can be concluded, that the company goes through the phase of growth or decline.

Within financial quantities, the most usable, for identification the phases of the corporate life cycle, is cash flow. And one of the models using cash flow as a variable, is the model by Dickinson (2010). According to her model, there isn't decisive the absolute value of cash flow, but signs of values of partial components, that are cash flow from operating, investing and financing activities. But the model has some limitations, too, because there are considered just combinations of signs and there isn't considered the situation, when the cash flow from investing or financing activities can theoretically reach its zero value.

Another model using financial quantities, was made by Reiners (2004) and it identifies the phases according to a value of a growth indicator, which is an average inter-year change of three financial quantities, namely assets, sales and cash flow. But its limitation is derived from the fact, that there are set intervals of values just for the phases of growth, stabilisation and decline, not for the phase of foundation.

Boston Matrix

The Boston matrix, also known as Growth-share matrix, was developed by Henderson (1970) for the Boston Consulting Group. It is still used in strategic management by choosing the product portfolio. According to its alternative name, there is evident, that by assigning products to individual quadrants there are considered the rate of sales growth and the market share. So there are distinguished four types of products called question marks, stars, cash cows and dogs. The combinations
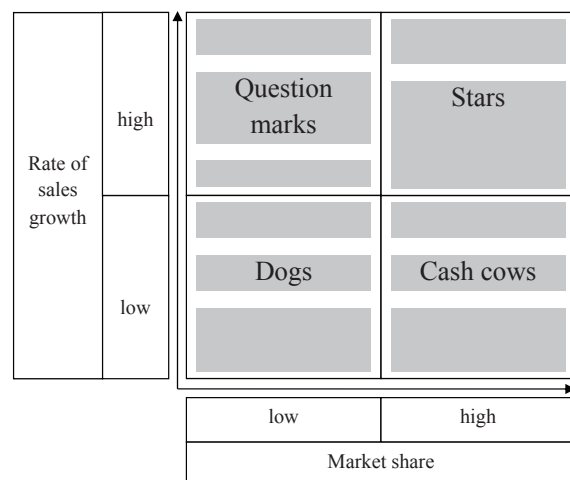
1: *The quadrants of products according to the Boston matrix*
Source: Henderson (1970)

of the rate of sales growth and the market share with naming the quadrants are illustrated on Fig. 1

The combination of the rate of sales growth and the market share has a considerable influence on generating cash flow. The question marks generate, according to Stern and Deimler (2006), ever a negative cash flow, whilst cash cows generate ever a positive cash flow. By the remaining two quadrants, there can be generated either a positive, or a negative cash flow.

Furthermore, Drews (2008) distinguishes investments and operational cash flow. The products representing the question marks are connected with large investments, but their generated operational cash flow is low. The stars need a high amount of invested money, too, but they already generate a high operational cash flow. The cash cows are characterized by the highest level of operational cash flow and by a decreasing level of investments compared to stars. And finally, the dogs are connected with a low amount of investments, but the generated operational cash flow is unsifficient, because it is even lower than the investments. So there is distinguished an offensive strategy for question marks, investment strategy for stars, drainage strategy for cash cows and divestment strategy for dogs.

There is evident, that the cash generated by cash cows, is, according to Nutton (2006), used for financing the investments needed by question marks and stars. So there was developed a modified matrix, mentioned by Fleβa and Westphal (2008), using different two variables to determine the quadrants, namely the rate of refinancing instead of market share and the welfare obligation instead of rate of sales growth. Furthermore, the question marks are termed as teststone and for dogs is used the term crop.

Ioana, Mirea and Bălescu (2009) refer to the risk, which is typical for question marks and stars. If the company doesn't implement the needed investments in question marks and also in stars, then these products turn into dogs, that have a little potential for profitability. Srivastava and Prakash (2011) emphasize, that the quadrant of cash cows is connected with risk, too, because if these products

are managed only for cash, there can be, after a short time, launched some substitution products by other competitors.

The individual quadrants are distinguished not only by generating cash, but also by many other characteristics, as mentioned by Betts and Taran (2003) and recorded on Tab. II.

Despite many distinguished characteristics, the quadrants of the Boston matrix are determined by the two basic quantities, which are the sales growth and the market share. Taggart and Harding (1998) recommend to measure the market share using data of such another competitor, which is the market leader. The rate of sales growth can be, according to Vollmuth (2008), measured as the percent share of sales planned for the next year to sales reached in the previous year.

The Boston matrix is, at the first sight, easy to use, but it has some limitations. According to Johnson, Scholes and Whittington (2008), there is problematic to decide, what rate of sales growth and what market share is low and high and so there is difficult to identify products belonging to individual quadrants, as mentioned by Kotler and Armstrong (2012).

Sequences of Quadrants of the Boston Matrix Describing the Product Life Cycle

There is necessary to include dynamics in the Boston matrix, because by the individual products of the company, there can be changed the sales growth and the market share, too. So the product goes through its life cycle. Drews (2008) assigns the phases of the product life cycle to the quadrants of the Boston matrix as follows:
1. The phase of foundation → Question marks.
2. The phase of growth → Stars.
3. The phase of stabilisation → Cash cows.
4. The phase of decline → Dogs.

Furthermore, Stern and Deimler (2006) distinguish the success sequence and the disaster sequence, as illustrated on Fig. 2.

As there was mentioned above, some models of the corporate life cycle are derived from the product life cycle. The main aim of this article is to develop

II: *Characteristics of individual quadrants of the Boston matrix*

Quadrant	Question marks	Stars	Cash cows	Dogs
Sales growth	high	high	low	low
Market share	low	high	high	low
Sales	low	high	high	low
Rent	low	high	moderate	low
Brand equity	weak	strong	strong	weak
Promotional strategy	push	mixed	pull	mixed
Promotional intensity	high	moderate	low	moderate
Channel involvement	high	moderate	low	moderate
Rent sharing	high	moderate to high	low to moderate	moderate

Source: Betts and Taran (2003)

a) Success sequence   b) Disaster sequence
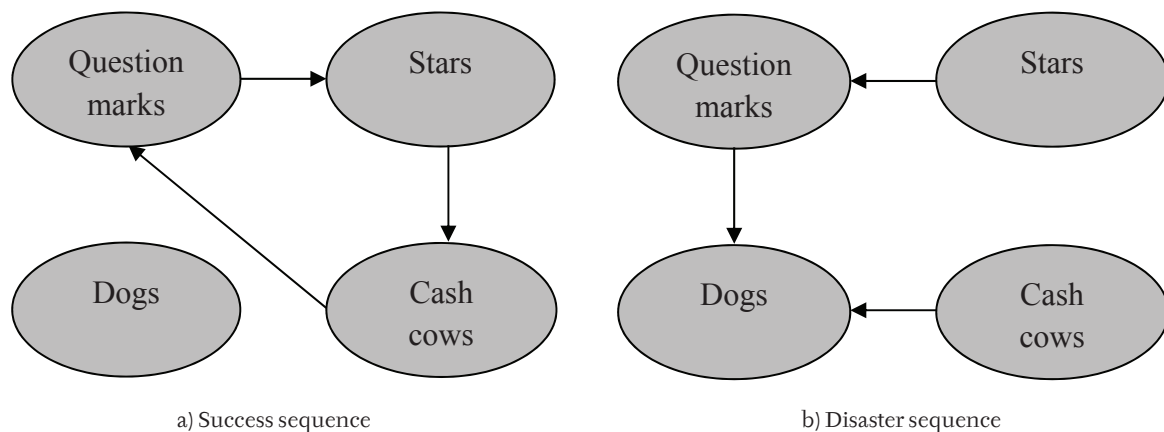
2: *Success and disaster sequence of the product life cycle using the Boston Matrix*
Source: Stern and Deimler (2006)

a new model supporting the identification of the particular corporate life stage within the corporate life cycle.

To fulfil this, there is necessary to set some partial targets like follows:
1. to specify the variables of the Boston matrix and to suggest an algorithm to set the intervals for low and high values of these variables,
2. to use this new model by identifying phases of the corporate life cycle by a sample of companies acting on a cyclical and neutral sector and so to verify the correctness of this model.

The contribution to the existing applicability of the Boston matrix is based on determination low and high values of both its input quantities, which means, that there will be possible to identify all the individual phases of the corporate life cycle, unequivocally.

METHODOLOGY

There will be used a combination of the inductive and deductive approach, because there is developed a new model for identification the corporate life cycle, which will be consequently applied by a sample of companies, whose secondary data will be collected and analyzed.

The new model of identification the corporate life cycle will be grounded in the existing model by Reiners (2004), because there will be considered two its partial variables, namely sales and total assets. The sales, reached by the company and by the market, too, is the basic quantity to determine the quadrants of the Boston matrix and the ratio describing total assets of the company to total assets of the market will be used by determination the interval of low and high market shares.

There will be distinguished four phases of the corporate life cycle, termed as foundation, growth, stabilisation and decline. The reason for decomposition the corporate life cycle into four phases is based on the fact, that the Boston matrix has four quadrants and furthermore, these

phases are distinguished by Reiners (2004), whose approach is the base for making the new model of the corporate life cycle.

The sensitivity of the sector to the economic cycle will be considered by using the coefficient of correlation between sales reached on the market (= sector) and the gross domestic product. This statistical tool was, in a similar form, used by Berman and Pfleeger (1997) for finding out sectors, that are most and least correlated to fluctuations in the economic cycle. The formula for its calculation is the following:

$$Correl(sales, GDP) = \frac{\sum_{i=1}^{n}(sales_i - \overline{sales}) \times (GDP_i - \overline{GDP})}{\sqrt{\sum_{i=1}^{n}(sales_i - \overline{sales})^2 \times \sum_{i=1}^{n}(GDP_i - \overline{GDP})^2}}.$$

Explanatory notes:
$Correl(sales, GDP)$ ... coefficient of correlation between sales on the market and GDP,
$sales_i$ .... sales (for own products, goods and services) on the market, measured i-times,
$\overline{sales}$ .... average value of sales on the market,
GDP_i .... GDP measured i-times,
$\overline{GDP}$ .... average value of GDP,
n .... number of measuring sales on the market and GDP.

The coefficient of correlation can reach values from –1 to +1. There aren't set intervals for identification cyclical, neutral and anti-cyclical sectors. But the length of these partial intervals should be the same. The reason is, that the probability of occurrence will be identical for all three types of sectors and so there will be eliminated potential distortions by identification the sector sensitivity. So the interval, mentioned above, can be divided into three thirds, as follows:
1. interval of the coefficient of correlation for cyclical sectors: (0.33; 1>,

2. interval of the coefficient of correlation for neutral sectors: <–0.33; 0.33>,
3. interval of the coefficient of correlation for anti-cyclical sectors: <–1; –0.33).

There are calculated values of the coefficient of correlation for each czech sector according to CZ-NACE to assigning them to one group of sectors according to their sensitivity to the economic cycle. After that, these results are compared with the results by Berman and Pfleeger (1997), whose research was implemented across U.S. sectors and who used the coefficient of correlation between employment and GDP and between industry final demand and GDP. Subsequently, there is selected one typically cyclical sector and one typically neutral sector. There isn't selected any anti-cyclical sector, because no sector was identified as anti-cyclical sector in both researches simultaneously. But the following results, that are related to cyclical sectors, can be applied also to anti-cyclical sectors because of similar basic characteristics, especially the rate of risk, caused by the oscillation of sales. And finally, there are selected companies from the cyclical and neutral sector, operating in the Czech Republic.

The data are collected from analytical materials published on the website by the Czech Ministry of Industry and Trade (www.mpo.cz) and by the Czech Statistical Office (www.czso.cz) and from the financial statements of selected companies. So there are some limitations of the results, because by putting the financial statements together, there must be accepted the specific legislative requirements, that are different across countries. But on the contrary, the model of the corporate life cycle, based on the Boston matrix, itself, is applicable not only in the Czech Republic, but also in foreign economies, because it regards, among others, the rate of inflation, which is one of the macroeconomic indicator, whose value is, or can be, significantly different, in each country. Respecting the rate of inflation is a great advantage compared e.g. to the model by Reiners (2004).

RESULTS AND DISCUSSION

The model is based on the simplifying condition, that most products of the company lie, during each phase of the corporate life cycle, in one quadrant of the Boston matrix and the assigning is the same as mentioned by Drews (2008) and recorded above.

Description of the Model of Identification the Corporate Life Cycle Using Boston Matrix

As there was mentioned in the methodical part of the article, this newly developed model combines the characteristics of the Boston matrix and the existing model of the corporate- and market life cycle made by Reiners (2004).

The rate of sales growth is calculated as an year-on-year change of sales for own products, services and goods. To defining low and high sales growth, there are compared the growth of sales reached by the company and growth of sales reached on the domestic market. And furthermore, there is necessary to consider the rate of inflation, that can be different for each sector and thus to eliminate the impact of the change of prices. So there is calculated the sales growth, caused just by the change of amount of product, not by the change of its price. If the sales growth of the company is higher than the sales growth of the market, then is it a high growth and in an opposite case is it a low growth. As a low growth can be regarded also a decline of sales of the company. And if there is recorded a decline of sales reached on the market, then there is however high growth of sales reached by the company, regarded as a high growth.

The market share is considered relatively, considering the total assets of the company compared to total assets of the market, because there is expected, that an average market share is equal to the ratio of assets, that are handled by the company, and assets, whose summarizing value is officially published for the whole market. So if the ratio of company's to market sales is higher than the ratio of company's to market assets, than the company holds a high market share and in opposite cases is the market share of the company assessed as low.

A well arranged description of this modified model, including formulas for considering the quadrants of Boston matrix related to the phases of the corporate life cycle, is recorded on Tab. III.

Explanatory notes:

S_c ...... sales for own products, services and goods reached by the company,

S_c^t ...... sales of the company reached in the actual year,

S_c^{t-1} .... sales of the company reached in the previous year,

S_m ..... sales for own products, services and goods reached on the market,

S_m^t ..... sales of the market reached in the actual year,

S_m^{t-1} ... sales of the market reached in the previous year,

P_0 ...... price level on the sector in the previous year,

P .... price level on the sector in the actual year,

A_c ..... total assets of the company,

A_m ..... total assets of the market.

Practical application of the model identifying phases using the Boston matrix

There were selected companies acting on one typically cyclical and one neutral sector according to CZ-NACE, as mentioned in the methodical part.

Because of a big width of each sector, there is necessary to narrow it and after that, the sample will consist just of companies acting on a partial sector. But their market share, for the purpose of identifying phases, will be considered by using values typical for the whole sector, because there aren't published data for partial sectors according to CZ-NACE.

The values of coefficient of correlation, that are characteristic for the selected sectors, and data about

III: *Model of the corporate life cycle identified by quantities used in the Boston matrix*
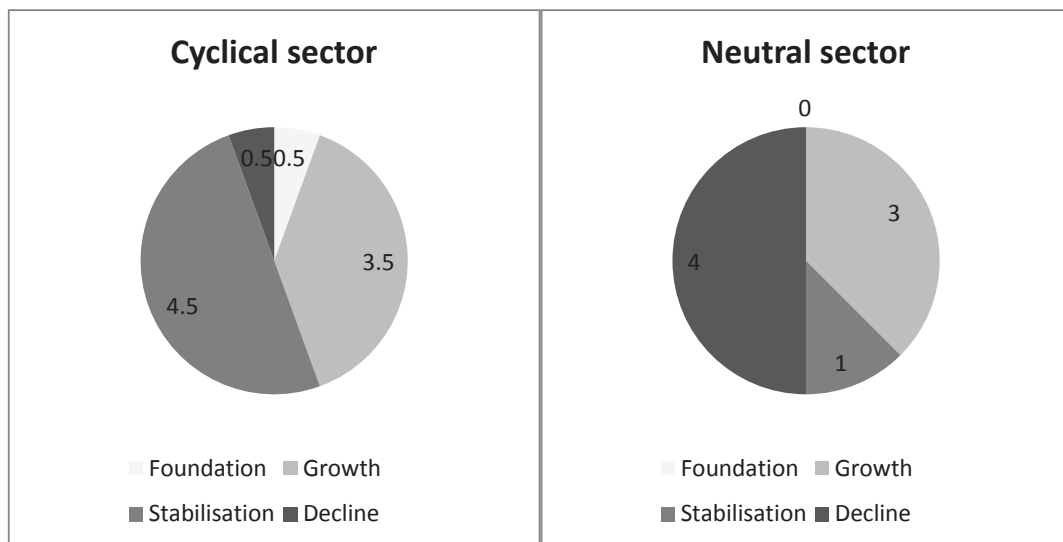
Phase of the corporate life cycle	Quadrant of the Boston matrix	Rate of sales growth		Market share	
		low	high	low	high
Foundation	Question marks		$\dfrac{S_c^t \times \frac{P_0}{P}}{S_c^{t-1}} > \dfrac{S_m^t \times \frac{P_0}{P}}{S_m^{t-1}}$	$\dfrac{S_c}{S_m} \leq \dfrac{A_c}{A_m}$	
Growth	Stars		$\dfrac{S_c^t \times \frac{P_0}{P}}{S_c^{t-1}} > \dfrac{S_m^t \times \frac{P_0}{P}}{S_m^{t-1}}$		$\dfrac{S_c}{S_m} > \dfrac{A_c}{A_m}$
Stabilisation	Cash cows	$\dfrac{S_c^t \times \frac{P_0}{P}}{S_c^{t-1}} \leq \dfrac{S_m^t \times \frac{P_0}{P}}{S_m^{t-1}}$			$\dfrac{S_c}{S_m} > \dfrac{A_c}{A_m}$
Decline	Dogs	$\dfrac{S_c^t \times \frac{P_0}{P}}{S_c^{t-1}} \leq \dfrac{S_m^t \times \frac{P_0}{P}}{S_m^{t-1}}$		$\dfrac{S_c}{S_m} \leq \dfrac{A_c}{A_m}$	

Source: own research

IV: *Characteristics of selected sectors with different sensitivity to the economic cycle*

Type of sector	Name and code according to CZ-NACE	Coefficient of correlation	Partial sector		
			Name and code according to CZ-NACE	Number of companies in total	Number of companies within the sample
Cyclical	Civil engineering (42)	0.5369	Construction of roads and railways (42.1)	57	9
Neutral	Manufacture of chemicals and chemical products (20)	−0.1035	Manufacture of fertilisers and nitrogen compounds (20.15)	44	8

Source: own research

3: *Occurrence of phases of the corporate life cycle depending on the type of sector*
Source: own research

numbers of companies acting on partial sectors in total and companies within the sample are recorded on Tab. IV.

By each company within the sample, there were identified phases of the corporate life cycle for periods from 2008 to 2012. The data were collected

from financial statements and from analytical materials published by the Czech Ministry of Industry and Trade.

Because of the existence of four phases and five researched periods, there is evident, that at least in two periods was each company in the same phase. So there was determined the prevailing phase. There can exceptionally happen, that there is no prevailing phase because of the same frequency of occurrence of two different phases. For the purpose of depicting data in graphical form are such companies separated into two halves.

On Fig. 3 there are compared frequencies of occurrence of individual phases of the corporate life cycle according to the sector with different sensitivity to the economic cycle.

The phase of foundation isn't very frequent in any type of sector. The share of companies in the phase of growth is approximately the same in the cyclical and neutral sector. But in the case of remaining two phases, there is recorded a significant difference. In the cyclical sector are about 50% companies in the phase stabilisation and very few companies are in the phase of decline, whilst in the neutral sector is it vice versa.

DISCUSSION AND CONCLUSION

Companies go through their life cycle and there are some tens of models of identification the individual phases. But the applicability of most of them is very limited. This article has its aim to suggest a new model based on the Boston matrix, which identifies four quadrants using two quantities describing business results of the company. According to this approach, there is possible to assign each quadrant to one phase of the product life cycle. And there is expected, that the actual phase of the corporate life cycle is identical with the actual phase of the life cycle of most products of the company. The modification of the Boston matrix, for the purpose of identification phases of the corporate life cycle, is based on setting intervals of values for both variables. To defining low and high market share and low and high rate of sales growth, there are considered sales reached on the market and the relative size of the company, measured as the amount of total assets of the company divided by the relevant value for the whole market. So the contribution to existing theory of the corporate life cycle and to the Boston matrix is based on identification the individual quadrants and thus the individual phases unequivocally. The limitation of this modified model is derived from the simplifying precondition, that most products are in the same phase as the company. Consequently, there was selected a sample of companies operating on two sectors with different rate of sensitivity to the economic cycle and there were, by using this approach based on the Boston matrix, identified phases of their corporate life cycle to finding out potential differences between the cyclical sector and the neutral sector, identified using the coefficient of correlation, describing their sensitivity to the economic cycle. The research results showed, that just few companies acting on the cyclical and neutral sector are in the phase of foundation. The share of companies in the phase of growth is approximately the same in the cyclical and in the neutral sector. But there was recorded a considerable difference by the share of companies in the phases of stabilisation and decline. In the cyclical sector is one half of companies in the phase of stabilisation and very few companies are in the phase of decline, whilst in the neutral sector was recorded quite an opposite situation.

REFERENCES

BERMAN, J. and PFLEEGER, J. 1997. Which industries are sensitive to business cycles? *Monthly Labor Review*, 2: 19–25.

BETTS, S. C. and TARAN, Z. 2003. Brands, Rents and the BCG Matrix: A Portfolio Approach to Brand Maintenance. *Proceedings of the Academy of Marketing Studies*, 8(1): 1–6.

DICKINSON, V. 2010. *Cash Flow Patterns as a Proxy for Firm Life Cycle*.

DREWS, H. 2008. Abschied vom Marktwachstums-Marktanteils-Portfolio nach über 35 Jahren Einsatz? Eine kritische Überprüfung der BCG-Matrix. *Zeitschrift für Planung & Unternehmenssteuerung*, 19: 39–57.

FLEβA, S. and WESTPHAL, J. 2008. Leistungs-programmplanung karitativer Nonprofit-Organisationen als Instrument des Ethik-Controlling. Eine exemplarische Analyse des Portfolios diakonischer Sozialleistungsunternehmen in Vorpommern. *Zeitschrift für Wirtschafts- und Unternehmensethik*, 9(3): 345–362.

HENDERSON, B. 1970. The Product Portfolio. *BCG Perspectives*, 66.

IOANA, A., MIREA, V. and BĂLESCU, C. 2009. Analysis of Service Quality Management in the Materials Industry using the BCG Matrix Method. *Amfiteatru Economic*, XI(26): 270–276.

JOHNSON, G., SCHOLES, K. and WHITTINGTON, R. 2008. *Exploring Corporate Strategy*. 8nd Edition. Harlow: Prentice Hall.

KOTLER, P. and ARMSTRONG, G. 2012. *Principles of Marketing*. 14th Edition. New Jersey: Prentice Hall.

NUTTON, S. E. 2006. Management Accounting – Business Strategy. *Financial Management*, December/January 2006/07: 43–46.

REINERS, M. 2004. *Finanzierungskosten im Lebenszyklus der Unternehmung. Ein optionspreistheoretischer Ansatz*. Hamburg: Verlag Dr. Kovač.

SHIROKOVA, G. 2009. Organisational life-cycle. The characteristics of developmental stages in Russian companies created from scratch. *Journal for East European Management Studies*, 1: 65–85.

SRIVASTAVA, R. and PRAKASH, A. 2011. Growth-Share Matrix as a Tool for Portfolio Planning: Evidence from the Indian Telecommunication Services Industry. *The IUP Journal of Business Strategy*, VIII(2): 22–33.

STERN, C. W. and DEIMLER, M. S. 2006. *The Boston Consulting Group on Strategy. Classic Concepts and New Perspectives*. 2nd Edition. New Jersey: John Wiley & Sons, Inc.

TAGGART, J. H. and HARDING, M. S. 1998. The process of subsidiary strategy: a study of Ciba-Geigy Classical Pigments. *Management Decision*, 36(9): 568–579.

VOLLMUTH, H. J. 2008. *Controlling-Instrumente von A–Z*. 7th Edition. München: Haufe.

Contact information

Zdeněk Konečný: konecnyz@fbm.vutbr.cz
Marek Zinecker: zinecker@fbm.vutbr.cz