Struktura rizikových přirážek vlastníků dle citlivosti odvětví na hospodářský cyklus

Structure of owner's risk rewards depending on the sector sensitivity to the economic cycle

Zdeněk Konečný

Abstract:
Purpose of the article: All national economies go through their economic cycle and partial sectors of these economies go through their market life cycle, too. But the course of the market life cycle doesn't have to ever be the same as in the case of the economic cycle. So, there exist sectors with different sensitivities to economic cycle. The sector sensitivity can considerably influence many financial quantities, especially quantities describing the entrepreneurial risk, which can be expressed in form of cost of capital. The main aim of this article is to find out the structure of cost of equity, which is required in sectors with different sensitivity to the economic cycle.
Methodology/methods: There are used and analyzed secondary data for periods from I. 2007 to II. 2011, gotten from materials published by the Czech Statistical Office and the Czech Ministry of Industry and Trade. The sector sensitivity is measured according to the correlation between gross domestic product (GDP), used for considering the economic cycle, and amount of sales reached on the sector, used for identifying the market life cycle. The structure of owner's risk rewards is calculated with the use of the constructional model by the Czech Ministry of Industry and Trade.
Scientific aim: There is selected one cyclical, one neutral and one anti-cyclical, ever with the extreme value of the coefficient of correlation. By each of these three sectors there is calculated the structure of cost of equity to know shares of partial owner's risk rewards.
Findings: Highest values of all risk rewards are reached in the anti-cyclical sector. On the contrary there is reached the lowest value of risk reward to the size of the company (r_{LA}) in the cyclical sector and of the risk reward to entrepreneurial risk (r_{POD}) in the neutral sector. The risk reward to financial stability ($r_{FINSTAB}$) and to financial structure ($r_{FINSTRU}$) were required in both sectors approximately on the same level.
Conclusions: From the findings there can be derived, that investments in companies acting in anti-cyclical sectors is the most risky. But there are some limits, that follow from used methods. There were used data, that are valid only for czech sectors and only for selected periods. And furthermore, there isn't considered the life cycle of companies, acting in selected sectors, and their market position, derived from corporate- and market life cycle.

Keywords: cyclical sectors, neutral sectors, anti-cyclical sectors, market life cycle, economic cycle, owner's risk rewards

JEL Classification: D40, E01, E32, G32, L11

Introduction and research objectives

National economy of every state goes through its economic cycle. According to Samuelson and Nordhaus (2007) is the economic cycle defined as a swing in total national output, income, and employment, which is usually lasting for a period of 2 to 10 years.

Most authors distinguish two basic phases of the economic cycle expansion and recession. Within recession there can be, according to Kučerová (2009), defined depression, which is a very considerable and long decline of economy performance and crisis, when this decline lasts more than 24 months and its quite considerable.

Besides the partial phases there exist two turning points of the economic cycle – peaks and troughs.

According to the length of a cycle there exist three types of economic cycles, as mentioned by Groligová and Mandelík (2004):

1) **Short term (= Kitchin) cycles**, lasting about 36–40 months, the cycle is connected with fluctuations in inventory and work in progress.
2) **Mid term (= Juglar) cycles**, lasting about 10–11 years (nowadays is the cycle shorter because of the technical progress), they are connected with investments especially in producing devices.
3) **Long term (= Kondratiev) cycles**, lasting about 50–60 years, they are connected with changes in producing technologies, with monetary phenomenons, or with political occurrences.

As written above, most authors use same names for partial phases of the economic cycle, but from one author to another, there are distinctions in reasons of the cycle. According to Holman (2010) the author's approaches can be divided into two groups – neo-classics and neo-keynesians. On Table 1 there are compared basic characteristics of these groups of authors.

Similarly to national economy, its partial sectors go through their market life cycle, too. But in this case, there aren't generally used terms of its partial phases, because there are more models of market life cycle. According to Lu and Wu (2000) the market life cycle includes phases of growth, maturity and decline. Liang, Czaplewski, Klein and Jiang (2009) distinguish phases of introduction, growth, maturity and decline, and with the same phases works the model by Digman (1995), mentioned in Wong and Maher (1997). And other authors, *e.g.* Owyang (1999) or Redondo, Juste and Palacios (2005) suggest models of market life cycle with partial phases, that aren't termed.

Samuelson and Nordhaus (2007) mention, that the economic cycle causes the expansion, or the contraction in most sectors of the economy. But by some of these sectors, there is recorded the market life cycle, which copies the economic cycle, whilst other sectors have their market life cycle, which has an inverse course compared to the economic cycle. And furthermore, there are some sectors, that are independent, or almost independent, of the economic cycle. It follows, that there exist three types of sectors, according to their sensitivity to economic cycle, which is mentioned *e.g.* by Rejnuš (2010) or by Synek and Kislingerová (2010):

1) **Cyclical sectors** – they copies the economic cycle, which means, that in these sectors, there are generated high sales and profits during the phase of expansion of national economy, whilst during the recession, there are recorded losses. Typical characteristics is, that the consumption

Table 1. Basic distinctions in economic cycle approaches between neo-classics and neo-keynesians.

	Neo-classics	**Neo-keynesians**
Which shocks determinate economic cycle?	supply shocks	demand shocks
Are the cycles monetary or real?	real	monetary
Is the neutrality of money typical also for short-term?	yes	no
Do people make rational expectations?	yes	yes
Do markets permanently clean themselves also in short-term?	yes	no
Does the business cycle mean the fluctuation round the equilibrium or of the equilibrium itself?	fluctuation of the equilibrium itself	fluctuation round the equilibrium
Which character has the unemployment in recessions?	voluntary	involuntary
Should the government implement the anti-cyclical policy?	no	yes

Source: Holman (2010).

of goods and services produced in these sectors can be postponed to the future, because these goods and services are unnecessary, or even luxurious, and the demand for them is elastic. Cyclical sectors are *e.g.* construction or manufacturing of motor vehicles and other goods of longterm consumption.

2) **Neutral sectors** – they don't react on the economic cycle. In these sectors there are produced and saled necessary goods and services, which are characterized by a low elasticity of demand. Typical examples are food and drinks, medicaments, cigarettes, alcohol or newspapers and magazines.
3) **Anti-cyclical sectors** – their market life cycle has an inverse course in comparison with the economic cycle. So the best financial results are reached at the period of recession and vice versa. To these sectors belong, according to Kislingerová (2001), *e.g.* playing machines, betting offices or televisions, that serve as a substitute to unimplemented financially more demanding forms of spending free time. In accordance with microeconomics, the goods saled in these sectors are mostly Giffen goods. By researching the demand for these goods is recorded the Giffen's paradox, mentioned *e.g.* in Soukupová, Hořejší, Macáková and Soukup (2008), which means, that the demand for these goods is a growing function and this phenomenon is typical for goods satisfying basic needs of consumer, there aren't any substitutes available and the consumer spends a decisive amount of expenditures for them.

For shareholders and other investors, who have their ownership interest, there is necessary to know, whether the sector, on which the company is acting, belongs to cyclical, neutral or anti-cyclical sectors, because this fact has an significantly influence on the rate of risk, that the owners bear, and consequently on stock prices. The different rate of risk follows from the fact, that each economy has mostly a growing tendency and so there can be assumed, that the enterprise (and investment) is most risky in anti-cyclical sectors, less risky in neutral sectors and even less risky in cyclical sectors. There is generally known, that with growing rate of risk, there is required a higher return and this expected return is expressed in the form of cost of equity, which involve the so called riskless rate and risk rewards. The cost of equity can serve as a discount rate by calculating internal value of stock and thus it influences stock prices.

The main aim of this article is to find out differences in the structure of cost of equity reached on three selected sectors of Czech economy to know, which kinds of risks dominate in sectors with their different sensitivity to economic cycle. So there will be selected one cyclical, one neutral and one anti-cyclical sector. There will be compared percentual values of cost of equity and of partial risk rewards, which are involved in cost of equity, reached on these three different sectors. The riskless rate will be not researched, because it is the same for all sectors, regardless their sensitivity to economic cycle.

1. Methods

For measuring the economic performance and thus the economic cycle there is mostly used the gross domestic product (GDP), which is, according to Samuelson and Nordhaus (2007), the financial value of consumption (C), gross private domestic investment (I), government purchases (G) and net exports (X) produced within a nation during a given year. There is distinguished the nominal GDP, expressed in current prices, and the real GDP, which is calculated by using the fixed prices.

Holman (2010) mentions three different methods, used for measuring GDP:

1) **Output approach** – there are add up values of goods and services, produced in the given period and there are considered only final products (added value).
2) **Expenditure approach** – it follows from the fact, that financial expenditure for the product is equal to its value and there are distinguished expenditures for consumption, investments, government expenditures and net exports.
3) **Income approach** – it is based on the fact, that every expenditure is somebody's revenue. Among incomes, there are considered wages and salaries, interests, rents, profits and depreciation. After calculating a sum of these kinds of income follows the subtraction of indirect taxes and depreciation.

In this article, there will be used the expenditure approach. The gross domestic product (GDP) will be calculated as follows:

1) + final consumption expenditure = households + + government + nonprofit institutions;
2) + gross capital formation = fixed capital + change in inventories + net acquisition of valuables;
3) + exports = goods + services;
4) – imports = – goods – services.

The market life cycle is mostly measured (= its phases are identified) by the amount of sales reached on the market. This quantity is used *e.g.* by Reiners

(2004) or Lu and Wu (2000). Some authors use in their models other indicators like cash flow, profit or number of companies on the market, but for researching sensitivity of sectors to economic cycle, there is most suitable to use the sales, because they are involved in GDP, which is calculated by using the expenditure approach. The sales, reached on the market consist of sales for goods, own products and services.

The sector sensitivity to the economic cycle will be measured by using the coefficient of correlation, calculated by MS Excel's function "CORREL", between GDP and sales reached on individual sectors (= markets).

The coefficient of correlation describes, according to Anderson, Sweeney and Williams (2011), linear types of dependences between two quantities. If the value of the coefficient of correlation is near to +1, the linear dependence is positive, the value near to –1 signalizes the negative linear dependence and in the case of approximately zero value, there is no linear dependence between two quantities. So the coefficient of correlation can reach the values from –1 to +1.

The economic application of this statistical tool was up to now mostly by decision-making of structure of the investment portfolio, which is mentioned *e.g.* by Nývltová and Marinič (2010).

The interval of values for the coefficient of correlation is bounded strictly and there is evident, that the partial intervals for cyclical and anti-cyclical sectors must differ just in the sign of values, not in their length, and furthermore, the interval for neutral sectors must oscillate around zero and its length must be the same as for both the other types of sectors. If the intervals were set in another way, then would have each type of sector another probability of its occurrence and there would be gotten distorted results.

So the partial intervals of values of the coefficient of correlation for cyclical, neutral and anti-cyclical sectors are set as follows:

1) Cyclical sectors: (0,3333; 1,0000⟩.
2) Neutral sectors: ⟨–0,3333; 0,3333⟩.
3) Anti-cyclical sectors: ⟨–1,0000; –0,3333).

The data about sales, reached on sectors, are gotten from analytical and statistical materials published by the Czech Ministry of Industry and Trade and to get the data about GDP, there are used materials by Czech Statistical Office. There are collected data for 18 quarters in total (from I. 2007 to II. 2011) and by each sector are put into correlation GDP and sales reached in these 18 periods. Consequently, there are selected three sectors, that reached extreme values of coefficient of correlation. That means, that there is selected one cyclical sector with the value of coefficient of correlation nearest to +1, one neutral sector with the value nearest to 0 and one anti-cylical sector with the value nearest to –1.

Up to now, there was implemented a similar research by Berman and Pfleeger (1997), whose aim was to find out, which sectors in USA are the most and which are the least sensitive to economic cycle. And the next difference, in comparison to this research, follows from the used quantities putting into correlation. There was considered gross domestic product (GDP) for measuring performance of national economy, but the market life cycle was identified according to other quantities, namely the employment and industry final demand. Basic results of these authors are recorded on Table 2.

There are more methods for calculating cost of equity, which are mentioned by Kislingerová (2001) or Režňáková (2005) like Gordon growth model, Capital assets pricing model, Arbitrage pricing theory, market model, constructional models, method based on the average return on equity on the market, method based on a risk reward to cost of debt.

Table 2. Sectors with the highest and the lowest sensitivity to economic cycle in USA.

Sectors of U.S. economy most correlated with economic cycle fluctuations	**Sectors of U.S. economy least correlated with economic cycle fluctuations**
Household furniture	Beverages
Miscellaneous plastics products, not elsewhere classified	Personal services, not elsewhere classified
Personnel supply services	Agricultural chemicals
Plumbing and nonelectric heating equipment	Accounting, auditing, and other services
Stone, clay, and miscellaneous minerál products	Educational services
Electric lighting and wiring equipment	Commercial sports
Metal coating, engraving, and allied services	Communications equipment
Concrete, gypsum, and plaster products, partitions and fixtures	Membership organizations
Cutlery, handtools, and hardware	Museum, botanical, zoological gardens

Source: Berman and Pfleeger (1997).

In general, cost of equity consists, according to Zemánková, Kruntorádová and Boušková (2010), of one part, that is equivalent to required reward to consumption delay (or loss caused by price growth) and of another part, which is a reward to beared risks.

The structure of cost of equity (and thus the structure of entrepreneurial risks) is possible to research only by using constructional models. In this research, there is used the constructional model, made in 1997 by Neumaierová and Neumaier, which is precisely described on the website by the Czech Ministry of Industry and Trade, in a methodical part of documents about financial analysis. Cost of equity, calculated by this way, includes five components:

1) **the so called riskless rate** (r_f), equal to interest rate of ten-year bonds of Czech Republic,
2) **the risk reward to size of the company** (r_{LA}), dependent on the amount of fund sources (equity, bank loans and bonds), that has the company available and this reward reaches its maximum by 100 millions CZK and its minimum by 3 billions CZK of fund sources,
3) **the risk reward to entrepreneurial risk**s (r_{POD}), dependent on creating earnings before interest and taxes (EBIT) with considering amount of assets,
4) **the risk reward to financial stability** ($r_{FINSTAB}$), dependent on liquidity of 3. level reached by the company, with considering liquidity of 2 and 1. level reached on the market,
5) **the risk reward to financial structure** ($r_{FINSTRU}$), as a difference between cost of equity (r_e) and weighted average cost of capital (WACC).

By calculation all the risk rewards for the whole market, there are at first calculated the values of these risk rewards for individual companies and then are they weighted by the amount of equity, that has each company available.

2. Research results (findings)

First of all, there was by each sector of czech economy find out its sensitivity to economic cycle. On Table 3, there are ordered these sectors according to the value of coefficient of correlation and furthermore, the sectors are divided into three groups, namely into cyclical, neutral and anti-cyclical sectors.

From the Table 3 follows, that the numbers of cyclical and neutral sectors are approximately the same, whilst only two sectors are anti-cyclical.

Among cyclical sectors, the highest sensitivity to the business cycle was recorded by sectors with construction activities, which is in accordance with most authors. But a surprising findings is, that manufacturing of food and beverages and related activities are cyclical sectors, too. The probable cause can be, that in the phase of recession of the economic cycle, there are bought and consumed cheaper food and beverages and there is less waste of them, than in the phase of expansion. To the cyclical sectors belong also quarrying and mining, manufacturing of computers and other electronic machines. The high sensitivity can be recorded also by some services like accommodation, consultancy or publishing activities, it follows, that these services are luxurious and not so necessary for common citizens.

Most of manufacturing sectors are neutral, which is valid also for the manufacturing of motor vehicles, whose coefficient of correlation is even negative. That is a very surprising findings, because up to now, there was, according to some authors, expected, that buying of motor vehicles can be postponed and some author reckon this sector as a cyclical.

Only two sectors of czech economy are anti-cyclical and both of them are manufacturing sectors. But in both cases, their value of coefficient of correlation is near to the minimal value from the interval for neutral sectors and so their market life cycle isn't quite inverse to business cycle.

Compared to the research by Berman and Pfleeger (1997) there were recorded many differences. According to this research is manufacturing of beverages a cyclical sector, but Berman and Pfleeger (1997) mention, that it is one of sectors least correlated with economic cycle, so it is a neutral sector. Vice versa, manufacturing of furniture is, according to Berman and Pfleeger (1997), one of the most sensitive sectors, but this research showed, that it belongs to neutral sectors. But there was found out also one consensus, that sectors producing chemicals are less sensitive to business cycle.

Then, there were selected three sectors with extreme values of the coefficient of correlation, namely civil engineering as a cyclical sector, other manufacturing as a neutral sector and manufacture of textiles as an anti-cyclical sector. On Table 4, there are recorded percentual changes of sales, reached on these sectors and percentual changes of GDP. Changes of sales or GDP, in all researched periods are related ever to the previous period. In the first period (I. 2007) there isn't possible to calculate the change of sales, because there aren't published amount of sales reached on individual sectors in IV. 2006.

By comparing the changes of GDP and changes in sales reached by the cyclical sector, it can be concluded, that these changes have, in almost all cases,

Table 3. Coefficient of correlation reached on sectors of the czech economy, with considering their sensitivity to the economic cycle.

Kind of sector	Sector and its code according to CZ-NACE	Coefficient of correlation
cyclical	Civil engineering (42)	0,8627
	Specialised construction activities (43)	0,7690
	Other mining and quarrying (08)	0,7094
	Manufacture of food products (10)	0,6739
	Food and beverage service activities(56)	0,6583
	Warehousing and support activities for transportation (52)	0,6464
	Computer programming, consultancy and related activites (62)	0,5719
	Manufacture of computer, electronic and optical products (26)	0,5642
	Accommodation (55)	0,5546
	Wholesale trade, except of motor vehicles and motorcycles (46)	0,4497
	Construction of buildings (41)	0,4378
	Publishing activities (58)	0,4202
	Manufacture of beverages (11)	0,4095
	Repair and installation of machinery and equipment (33)	0,3903
	Manufacture of coke and refined petroleum products (19)	0,3799
	Mining of coal and lignite (05)	0,3781
	Telecommunications (61)	0,3534
neutral	Printing and reproduction of recorded media (18)	0,3319
	Land transport and transport via pipelines (49)	0,2920
	Retail trade, except of motor vehicles and motorcycles (47)	0,2625
	Manufacture of other transport equipment (30)	0,2372
	Manufacture of other non-metallic mineral products (23)	0,2256
	Manufacture of fabricated metal products, except machinery and equipment (25)	0,1757
	Manufacture of machinery and equipment n. e. c. (28)	0,1633
	Wholesale and detail trade and repair of motor (45)	0,1382
	Manufacture of electrical equipment (27)	0,1309
	Manufacture of basic metals, fabricated metal products; foundry industry(24)	0,1165
	Manufacture of furniture (31)	0,0978
	Manufacture of chemicals and chemical products (20)	0,0751
	Other manufacturing (32)	0,0133
	Manufacture of basic pharmaceutical products and pharmaceutical preparations (21)	–0,1113
	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials (16)	–0,1452
	Manufacture of rubber and plastic products (22)	–0,1564
	Manufacture of motor vehicles (except motorcycles), trailers and semi-trailers (29)	–0,1950
anti-cyclical	Manufacture of paper and paper products (17)	–0,3598
	Manufacture of textiles (13)	–0,3685

Source: own research.

the same direction (either ++ or —). Furthermore, the change of sales reached on the cyclical sector is more considerable than the change of GDP.

Between the changes of sales reached on the neutral sectors and changes of GDP, there wasn't found out any link, so the changes have in some periods the same direction, whilst in other periods they have an inverse direction.

The changes of sales reached in the anti-cyclical sector have mostly an inverse direction, than the changes of GDP (either +– or –+). But there is in most period recorded an considerable change of GDP and simultaneously a mild change of sales reached on the anti-cyclical sector and vice versa, so it follows, that this sector is anti-cyclical, but its market life cycle doesn't have a quite inverse course in

Table 4. Changes of GDP and sales (in %) in periods from I. 2007 to II. 2011.

Period	Δ sales in cyclical sector	Δ sales in neutral sector	Δ sales in anti-cyclical sector	Δ GDP
I. 2007	–	–	–	–
II. 2007	+111,95	+6,03	+1,12	+7,41
III. 2007	+8,89	–35,20	–15,89	+3,22
IV. 2007	+14,29	+16,96	–4,87	+4,60
I. 2008	–58,47	+13,69	+12,07	–9,11
II. 2008	+97,18	+5,55	–1,74	+9,21
III. 2008	+23,17	–1,05	–13,45	+2,70
IV. 2008	+3,10	+7,73	–13,94	–0,62
I. 2009	–54,36	–22,46	+6,30	–10,36
II. 2009	+99,23	+4,96	–0,31	+4,98
III. 2009	+13,48	–6,81	–9,46	+0,74
IV. 2009	+7,32	–0,69	–0,86	+4,15
I. 2010	–62,14	+11,79	+6,36	–10,79
II. 2010	+116,57	+9,39	+19,06	+9,58
III. 2010	+18,93	–7,81	–9,84	+0,26
IV. 2010	–6,45	+12,60	–1,79	+2,85
I. 2011	–65,16	–9,25	+11,88	–9,68
II. 2011	+108,64	+2,30	+10,65	+8,53

Source: own research.

Table 5. Minimal, average and maximal values of cost of equity (in %) and its components (in %), reached on selected sectors during periods from I. 2007 to II. 2011.

Cost of equity and its components		Cyclical sector	Neutral sector	Anti-cyclical sector
r_{LA}	minimum	0,84	1,33	1,84
	average	1,24	1,93	2,00
	maximum	1,57	2,59	2,15
r_{POD}	minimum	2,52	2,78	3,74
	average	3,58	3,10	4,46
	maximum	6,49	3,51	5,20
$r_{FINSTAB}$	minimum	0,36	0,47	0,83
	average	1,41	1,23	2,43
	maximum	3,34	2,38	3,58
$r_{FINSTRU}$	minimum	0,49	0,54	0,36
	average	1,19	1,26	2,76
	maximum	2,30	2,21	4,35
r_e	minimum	9,81	9,50	13,68
	average	11,69	11,79	15,91
	maximum	14,60	14,05	17,77

Source: own research.

comparison to business cycle, because the value of the coefficient of correlation is very distant from –1.

And finally, there were found out values of cost of equity and the components (except the riskless rate) reached by these three selected sectors. On Table 5, there are compared minimal, average and maximal values of these researched quantities, reached from I. 2007 to II. 2011, between the cyclical, neutral and anti-cyclical sector.

The risk reward to size of the company (r_{LA}) reached the highest average value in the anti-cyclical sector. Furthermore, in the anti-cyclical sector, there was recorded the lowest spread between the minimal and maximal value of this risk reward. In the neutral sector was the average value of risk reward to size of the company mildly lower, but there was the highest spread between its maximal and minimal value (more than 1%). And in the case of the cyclical sector, the average value of r_{LA} was considerable lower than in both other sectors and the spread between maximal and minimal value was lower than in the neutral sector, but higher than in the anti-cyclical sector.

The risk reward to entrepreneurial risk (r_{POD}), which was the greatest part of alternate cost of equity (r_e) in all three sectors reached its highest average value in the anti-cyclical sector and its lowest average value was reached in the neutral sector. The highest spread between the minimal and maximal value (almost 4%) was recorded in the cyclical sector.

The highest average value of the risk reward to financial stability ($r_{FINSTAB}$) was required in the anti--cylical sector, whilst in both other sectors was its average value more than 1% lower. Spreads between its minimal and maximal value were in the cyclical and anti-cyclical sector approximately the same, whilst in the neutral sector was this spread about 1% lower.

The risk reward to financial structure ($r_{FINSTRU}$) reached its highest average value in the anti-cyclical sector and furthermore, in this sector was recorded the highest spread between the minimal and maximal value (about 4%), whilst in both other sectors were the average values and the spreads approximately the same (almost 2%).

And finally the alternate cost of equity (r_e) which is the sum of previous risk rewards and the risless rate (r_f) reached the highest minimal, average and maximal value in the anti-cyclical sector and all these three values were about 4% higher than in both other sectors.

3. Discussion

The main findings of this research is, that the highest alternate cost of equity (r_e) was required in the anti-cyclical sector, because all of the partial risk rewards reached the highest average value in this sector. It follows, that investing in shares of companies, that are acting on anti-cyclical sectors, is most risky, because the rate of risks, that are considered by shareholders (and other owners), are expressed in the form of individual risk rewards, which are involved in the cost of equity. On the contrary, investing in shares of companies from the cyclical and neutral sector is connected with a considerably lower level of risks and the risk, which is expressed in the form of cost of equity, is in both sectors approximately the same.

But these findings have some limitations. For all selected periods, there were considered only average data about alternate cost of equity and individual risk rewards, which were reached on whole markets (sectors), but there wasn't consiered data about companies acting on these markets and therefore, there was considered neither the life cycle of the companies, nor their position, that holds the company on the market, where this market position can be, according to Reiners (2004), derived from the combination of phases of corporate- and market life cycle.

That will be the main objective for future researches.

And finally, there is necessary to mention, that the used methods are connected with some limits, too. The coefficient of correlation as a statistical tool, is suitable for identifying the sector sensitivity to economic cycle, but there are used data of both researched quantities (sales and GDP) only for selected 18 periods, because there are published data about sales reached on markets for individual quarters since I. 2007. Till 2006 were the data published only for whole years, and furthermore, there was used another classification of sectors of czech economy (not CZ-NACE but OKEČ). So it could be possible to get other results, if there were used data for other 18 periods, or for a longer time horizon.

Conclusions

The main aim of this article is to find out relations between the sector sensitivity to the economic cycle and the cost of equity including its individual risk rewards, that are required in the sector.

To determine, how sensitive is the sector, there were put into correlation sales, reached in the sector and gross domestic product, calculated by using the expenditure approach. The interval of values, which can reach the coefficient of correlation, was divided into three thirds to determine cyclical, neutral and anti-cyclical sectors. The coefficient of correlation was calculated for all sectors of the czech economy and consequently, there were selected three sectors with extreme values of the coefficient of correlation, that means, that there was selected one cyclical sector with the value nearest to +1, one neutral sector with the value nearest to 0 and one anti-cyclical sector with the value nearest to –1. By these three sectors, there were found out minimal, average and maximal values of cost of equity and its components (except the riskless rate, because it is the same for all sector, regardless their sensitivity to the economic cycle).

To calculate cost of equity, there was selected the methodics by the Czech Ministry of Industry and Trade, because this way of quantification allows to find out the structure of cost of equity, and thus the structure of entrepreneurial risks, because the risks, that are considered by investors, are expressed in form of individual risk rewards.

The research showed, that the numbers of cyclical and neutral sectors are approximately the same, whilst only two sectors of czech economy are anti-cyclical. There was selected civil engineering as a cyclical sector, other manufacturing as a neutral sector and manufacture of textiles as an anti-cyclical sector. There was found out, that the highest cost of equity are required in companies, acting in anti-cyclical sector, and furthermore, all of four individual risk rewards are the highest in the anti-cyclical sector. It follows, that investments in shares of companies, acting in the anti-cyclical sector are most risky.

The main limitation of this research and its findings is, that there wasn't considered life cycle of companies, which are acting on selected markets (sectors) and there wasn't also considered the market position of these companies, which is derived from the combination of phases of corporate- and market life cycle.

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