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The Economics of Beer Processing

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1. Introduction

The brewing sector in the Czech Republic belongs to the most important agrarian business in the Czech Republic. Besides its long tradition (the first record of beer brewing in the Czech territory dates back to the year 993 and actually beer consumption per capita (158 litres per year) is the highest in Europe) it generates according to study of Ernst and Young (Leenen, 2010) nearly 7400 jobs directly in breweries and almost 12 300 jobs in the supplying sectors. Although this represents only minor part of all jobs in the Czech Republic, the industry represents an important factor in the local economic development, providing employment for relatively less skilled labour in the regions. Moreover in the hospitability sector approximately 32000 jobs can be attributed to the brewing sector while in retail around 2800 employees have jobs related to beer sales. These numbers also represent pretty benefits for the state budget from this sector. According to the Ernst and Young calculations (Leenen, 2010) the government revenues due to the production and sale of beer exceed actually to 676 million Euros, which create approximately 1,7 % of the state budget in 2010.

The number of industry breweries descends continuously from 72 industrial breweries in 1989 to 48 subjects in the Czech Republic in 2011. Contrariwise, the number of micro breweries concern 95 in the beginning of 2011 (Altova, 2011). This is the result of the progress from just one microbrewery to present number over the last 22 years. Despite the micro-brewing segment covers only approximately 0,5 % of total beer production in the Czech Republic, the growth of this segment is enormous. In 2006 the Czech Beer and Malt Association registered about 60 of them and it expects the number of these will exceed 100 in the end of 2011. Growth rate of this segment as well as the local character of this production is encouraging interest among researches and developing of economic analysis model for this segment is also a consequence of it.

2. Survey design

The survey involves the following structured sequence of steps. At the first stage brief overview of brewery industry is made. The method used is observation and description. At the second stage the research question is stated and null and alternative hypotheses are formulated. The method used is deduction. In addition the data sample and method of data collection is stated. At the third stage the theoretical framework is observed as the result of extensive theoretical literature review covering the state of the art of the business performance measurement system. Methods used are description, analysis and synthesis. At

the fourth stage the particular steps in research methodology are designed. The method used is analysis and synthesis. At the fifth stage the research findings are explored. The descriptive statistic method is used. The sixth stage involves hypothesis testing and the answering the research question. The ANOVA method is used. At the seventh stage the theoretical model is designed. The synthesis and description method are used. In fine, the discussion and tasks for future research are articulated using deduction.

2.1 Research question articulation

The primary objective of entrepreneurship is the growth of stockholder value in general. Value based management disposes of tools for value enhancement. The main task is the quantity and selection of suitable variable as a proxy for value growth. The research question concerning identification of the most considerable factors of Economic Value Added and the value drivers of particular segment of breweries in the Czech Republic. The research problem is the formulation of theoretical multifactor model for explanation the particular factors based on research findings. For the response on stated research question we articulate null hypothesis H_0 and alternative hypothesis H_1 for existence difference explanation.

H_1: There is no significant difference of factors in Economic Value Added decomposition.

H_1: There is distinguishable impact of factors in Economic Value Added decomposition.

If the particular factors impact the business performance balanced, the subsequent theoretical model will cover the same set of variables for each factor. If the particular factors impact the business performance differently, the subsequent theoretical model for explanation requires appropriate set of variables for each factor.

2.2 Data collection

Data surveyed on target population are from secondary likewise primary resources. Method used for data collection and data processing is Stratified Random Sampling. It is assumed that this data is gathered in an unbiased manner. For some forms of analysis that use inferential statistical tests the data must be collected randomly, data observations should be independent of each other and the variables should be normally distributed. Secondary statistical and economic data are assembled from annual censuses of state agencies – Ministry of Agriculture of the Czech Republic, Ministry of Industry and Trade of the Czech Republic, Czech Statistical Office, Institute of Brewing and Malting. In term of legal form target population includes legal person as well self-employed persons. Flow indicators cover the whole structure of breweries according to the number of employees. A nationwide observation is carried out for enterprises with more than 50 employees. A selective survey is carried out for enterprises with 20 – 49 employees, and enterprises with less than 19 employees are calculated. Primary sampling frame comes from Creditinfo – Albertina database and Trade Register of the Czech Republic. Sample of analysed breweries is chosed according to market concentration analysis. Supplemental economic and market information were observed from particular WebPages of sample population of breweries. The target population of an analyzed subjects is geographically limited NUTS0, NUTS1 the Czech Republic. Analyzed data for Economic Value Added decomposition concerning period since 2000 till 2009.

3. Theoretical framework

Shift from the financial perspective to the non-financial one within the performance management invoked genesis of different performance measurement systems. According to Neely (Neely, 2002) a Perfomance Management System (PMS) is a balanced and dynamic system that is able to support the decision-making process by gathering, elaborating and analysing information. The concept of PMS was developed in response criticisms that traditional performance models are focused on financial measures, are historically oriented and do not cover all of the business areas. According to many scholars a well designed PMS should by using different kinds of measures represent whole organization. The balance approach offers by tying together various measures a holistic organizational view.

Interest on performance measurement management has started to increase in the 80s of the last century. Since then numerous of PMS models were developed and consequently theoretical (and very little empirical) research on PMSs has been carried out. The literature surveys tried to sort the particular models according to different criterions, such as attitude to firm's strategy, focus on stakeholders, balance, dynamic adaptability, process orientation, casual relationships or simplicity (Garageno et al., 2005). According Toni & Tonchia (Toni & Tonchia, 2001) the main models of PMSs can be referred to following typologies: hierarchical/vertical (cost and non-cost performance measures on different levels of aggregation), balanced scorecard/tableaux de board (several separate performances are considered independently), internal and external performances.

As our research focuses on performance management in small and medium-sized enterprises only those reviews concerning SME were taken into account. Garengo et al. (Garengo et al., 2005) focused their review on eight PMS models developed after the mid-1980s. The models considered were six of the most popular generic models and two PMS models designed specifically for SMEs. They focused on following models. Performance Measurement Matrix (Keegan et al., 1989): According to Garengo et al. (Garengo et al., 2005) and Neely et al. (Neely et al., 2000) this model uses the matrix combining the non-cost and cost perspective with external and internal perspective. The model is balanced and simple, for which it is sometimes criticized. Performance Pyramid System (Lynch & Cross; 1991) is designed as a pyramid with several levels linking the firm's strategy, business units and operations. Results and Determinants Framework (Fitzgerald et. Al, 1991): This model focuses on searching the relationship between the entrepreneur's results expressed in terms of competitiveness or financial performance and determinants of these results such as quality, innovations and flexibility. Balanced Scorecard (Kaplan & Norton, 1996): 4-box approach to performance measurement. In addition to financial measures, managers are encouraged to look at measures drawn from three other perspectives of the business: learning and growth, internal business processes and customer. The model is balanced and belongs to the most popular models both in the literature and in practice. Integrated Performance Measurement System (Bititci et al., 1997), who defined it as the information system by which the company manages its performance in line with its corporate and functional strategies and objectives, it is based on four levels. According to Hudson et al. (2001) this model fails to provide a structured process that specifies objectives and timescales for development and implementation. Performance Prism (Neely et al. 2000): According to Garengo et al. (Garengo et al., 2005) this model is three-dimensional, in correspondence with its name a prism graphically represents the architecture of the model.

Organizational Performance Measurement (Chennell et al., 2000), which was designed exclusively for SMEs. Is based on three principles (alignment, process thinking, and practicability) and is balanced. Integrated Performance Measurement for Small Firms (Laitinen, 2002). Within the model the internal dimension monitoring production process and the external dimension monitoring the competitive position are causally likened.

Hudson et al. (Hudson et al., 2001) evaluated ten PMSs. In contrast to Garengo et al. (Garengo et al., 2005) they included 4 different PM approaches. In addition to Garengo's selection following models were considered: Integrated Dynamic PMS (Ghalayini et al., 1997) which focuses on ensuring fast and accurate feedback. Integrated PM framework (Medori & Steeple, 2000) which is criticized for being complicated to understand and use. Integrated Measurement Model (Oliver & Palmer, 1998) defines the dimensions of performance and offers a mechanism for designing the measures. And finally Consistent PM Systems (Flapper et al., 1996) which is being criticized for weak balanced approach for critical dimensions of performance.

The common conclusions of the latest reviews show that there is a difference between models for big companies and models for SMEs. According to Garengo et al. (Garengo et al., 2005) most of the SMEs models are characterized by increasing strategy alignment, while continuing to focus on the most critical aspect for SMEs, i.e. operational aspects. Further all models are balanced, which is particularly important and which makes these models different form the traditional financially oriented ones. Finally clarity and simplicity characterize the most recent models.

3.1 The basis of performance system in Czech conditions

For centuries, economists have reasoned that for a firm to create wealth it must earn more than its cost of debt and equity capital – this principle is in the microeconomic terminology titled 'creating the economic profit'. A good financial performance measure should ask how well the firm has generated operating profits, given the amount of capital invested to produce these profits. In recent years the Stern Stewart & Company has operationalized this concept under the label Economic Value Added. EVA is defined as a spread between the return on capital invested and the cost of capital invested. It describes the ability of the firm to create the economic profit. Contrary to the traditional performance metrics, EVA manages to reflect real costs of the firm because it takes note of the equity costs as well as the other costs of the firm. The EVA metric is based on a simple and straightforward notion, as described in the following equation:

$$EVA = NOPAT - Capital \cdot WACC \tag{1}$$

Where *NOPAT is* Net Operating Profit After Taxes, *Capital* is Capital Employed to generate Operating Profit, and *WACC* is Weighted Average Cost of Capital.

The components of EVA are not directly obtainable from the financial statements, as EVA concept works with items referring entirely to operating activity. The EVA authors define operating activity as those operations that serve the basic entrepreneurial purpose. It is therefore necessary to convert the accounting data; under the Czech accounting rules, the "operating profit" and the corresponding capital include activities that are not directly aimed at fulfilling the basic entrepreneurial purpose - such as the investing of temporary

free operating financial asset into the securities or creating constructions in progress (neither contributes to current operating activities). On the other hand, other activities necessary for meeting the basic entrepreneurial purpose of the firm are not covered under the operating profit and capital. The most important ones include financial and operative leasing, as well as capitalization and amortization of certain marketing costs, research and development costs, unrecorded goodwill, etc.

Similar to many accounting innovations, the concept of EVA promises better performance measurements, incentive schemes and equity valuation. The concept behind EVA is quite simple – maximize the spread between the return on capital used to generate profits and the costs of using that capital. Through its adoption, corporate executives hope that EVA will lead to increased efficiency in the allocation of all assets and hence increased shareholder wealth. In fact, Stern Stewart & Company has advocated that EVA can be used instead of earnings or cash from operations as a measure of performance. They claim that: "Eva is almost 50 % better than its closest accounting-based competitor in explaining changes in shareholder wealth" (Stewart, 1994), or "Forget EPS, ROE and ROI. Eva is what drives stock prices" (Stewart, 1995).

Though from the theoretical point of view EVA is seen as a superior performance metric, the results of some empirical studies do not support this claim. Numerous researchers have looked into the effectiveness of EVA using the independent empirical evidences (for instance: Biddle, Bowen, Wallace (Biddle, Bowen, Wallace; 1997); Turvey, Lake, Duren, Sparling (Turvey, Lake, Duren, Sparling; 2000); Feltham, Issac, Mbagwu, Vaidyanathan (Feltham, Issac, Mbagwu, Vaidyanathan; 2004); Bacidore, Boquist, Milbourn, Thakor (Bacidore, Boquist, Milbourn, Thakor; 1997); Berenstein (Berenstein, 1998); Kramer, Pushner (Kramer, Pushner, 1997) and did not indicate the superiority of EVA among other financial measures. Nevertheless, among both the Czech academic researches and practical financial analysts the usage of EVA is still limited because of the low empirical evidence of the behaviour of EVA within the Czech economy. A critical point of this research in the conditions of Czech economy is a lack of data about publicly trading companies, which at the same time, serve as an exogenous criterion for assessing the quality of the examined measure in the mentioned studies.

One of the most often claimed characteristics of EVA is its capability to inform owners about the creation of shareholder value, which could be in general described by the performance of capital market. In 2010 was carried out a study focusing on the relationship between ability of Czech firms to create economic value and performance of Czech capital market (Chmelíková, 2010). The research question was, whether performance metric EVA describes creation of shareholder value of the firms in the Czech Republic. The answer was found in the relationship between EVA and behaviour of capital market. As the development of these two categories proceeded in the same way it could be concluded, that EVA metric, with respect to its theoretical background, can be used as measure of shareholder wealth creation of the Czech firms. The behaviour of capital market was described by the stock exchange index PX. The official index of Prague stock exchange is currently the index PX, which is being the successor of the oldest Prague index PX 50. The index's values are published daily, which is in contrast to the information about creation of economic value added by firms in Czech Republic that are shown on year basis. This invokes the need to characterize the performance of capital market on the annual basis by using simple arithmetic average of

daily index. Ministry of Industry and Trade of the Czech Republic monitors the creation of economic value added among the industry and construction firms in the Czech Republic. This analysis covers vast majority of all business in this sector (about 90%). Despite the number of business in this study is fluctuating in dependence on the number of currently operating firms, the trend of EVA development is well observable and enables the comparison with the development of capital market performance. The progress of these two categories indicated a general positive correspondence between the development of capital market performance and creation of economic value added among Czech firms. The regression results demonstrated high value of coefficient of determination R2, which gets to relatively high level of 0,83. This result is also supported by the research of the relationship between Economic Value Added, traditional performance measures (Return on Assets 'ROA' and Return on Equity 'ROE') and their ability to measure the creation of shareholder wealth of food-processing firms in the Czech Republic (Chmelíková, 2008). The intent of this research was fulfilled by providing a simple regression test of the hypothesis, that the EVA measure is more associated with improved shareholder wealth than traditional performance measures ROA and ROE. The results of regression analysis indicated in all cases a positive correspondence between EVA and financial performance metrics and show higher quality information content of EVA indicator in the relationship to the ability of shareholder wealth creation than traditional performance measures. This fact supports the tested hypothesis as well as the conclusions of corporate finance theory, that from the theoretical point of view EVA is seen as a superior performance metric. The results suggest that EVA should be considered when measuring performance of Czech-food processing firms and can become a basis of economic analysis in this sector.

When analyzing a firm current theory and praxis usually use three types of systems of measures: parallel systems, pyramidal systems and rating and bankruptcy indexes. Parallel systems concentrate measures into the groups according to the particular business areas. The advantage of this approach lies in the rich theoretical background and in the correspondence with functional structure of the firm. On the other hand the disadvantage is poor interconnection between particular groups of the system that leads to complicated interpretation of the results. Rating and bankruptcy indexes offer undemanding computative procedure unfortunately accompanied with rough information content of the results without identifying factors of the firm's efficiency. The advantage of pyramidal systems lies in the reflection of mutual interconnections between particular parts of the system with straightforward linking between the individual indicators and synthesis measure. On the other hand the pyramidal systems suffer from poor theoretical background and impose higher requirements on the analysts' qualification. The consequence is low popularity among financial analysts. Neumaierová (Neumaierová, 2008) claims, that current praxis prefers parallel evaluating systems. This is in contrast to the character of current situation, which is noted for high dynamical complexity due to the globalisation and rather than parallel systems of indicators requires the pyramidal ones. The keystone of pyramidal concepts is the involvement of interconnections between particular indicators, which makes these concepts the most compatible with the new environment. The basic principle of pyramidal system is decomposition of a top indicator with intention to identify the influence of its partial factors, when simultaneously the links between particular measures are represented by mathematical equations.

Enrichment of classical pyramidal system of any financial metric with the non-financial measures will offer a measurement system not dissimilar to the Balanced Scorecard. The Balanced Scorecard is a widely adopted performance management framework first described in the early 1990s through the work of Kaplan & Norton (Kaplan & Norton, 1992). Since then, the concept has become well known and its various forms widely adopted across the world. By combining financial and non-financial measures in a single report, the Balanced Scorecard aims to provide managers with richer and more relevant information about activities they are managing than is provided by financial measures alone. It is a performance management tool that enables a company to translate its strategy into a tangible set of performance measures. A Scorecard has to tell the story of a firm's strategy and the story is told by means of cause-and-effect model that links all the measures to the creating of shareholder value. The scorecard provides a view of a firm's overall performance by integrating financial measures with non-financial measures. This helps to manage the activities that stand beyond the control of financial measures in the framework of a holistic management system and overcomes the main disadvantage of pure financial analysis, which suffers form historic character of its information. The Balanced Scorecard contains a mix of leading and lagging indicators: Lag indicators represent the consequences of actions previously taken, while lead indicators are the measures that lead to the results achieved in the lagging indicators. Lagging indicators without performance drivers (usually described in non-financial terms) fail to inform managers of how to achieve the results. The authors of Balanced Scorecard Norton and Kaplan (Kaplan & Norton, 1992) claim that: "The balanced Scorecard retains traditional financial measures. But financial measures tell the story of past events, an adequate story for industrial age companies for which investments in long-term capabilities and customer relationships were not critical for success. These financial measures are inadequate, however, for guiding and evaluating the journey that information age companies must make to create future value through investment in customers, suppliers, employees, processes, technology, and innovation."

Balanced Scorecard is designed as a simple, 4-box approach to performance measurement. In addition to financial measures, managers are encouraged to look at measures drawn from three other perspectives of the business: Learning and Growth, Internal Business Processes and Customer. The power of the framework comes from a fact that it goes beyond an ad-hoc collection of financial and non-financial measures. Despite the apparent shortcomings of financial measures, a well-constructed Balanced Scorecard is not complete without them. Scorecard practitioners recognize this fact, and consider financial measures to represent the most important component of the Scorecard. Niven (Niven, 2006) claims, that "by using the Balanced Scorecard an organization has the opportunity to mitigate, if not eliminate entirely, many of the issues related to financial measures."

In building the scorecard, the process is just as important as the content. A scorecard devoid of process will be sterile and fail to mobilize both the executive team as well as the operational employees. To build a Balanced Scorecard for a specific company is a task for its whole executive team, since it is necessary to have specific information from all company's divisions. The choice of portfolio of non-financial measures depends on the character of a company. In order to be able to design a framework for economic analysis it is therefore necessary to specify at least the sector, or better a segment for future

application. For this purposes the segment of microbreweries form the brewing sector of the Czech Republic was chosen.

4. Research method

Descriptive statistics are used for basic features of the data in the study. One-way ANOVA is used for hypothesis tests[1]. MS Excel is the tool for computation. Observed variables are computed for industry average and the sample of breweries. The results are compared and statistically tested.

4.1 Market concentration

Herfindahl Index (*HHI*) is used for concentration ratio analysis. The *HHI* is calculated by summing the squares of the individual firms' shares, see equation (2). The firms with larger market shares have proportionately greater weight in the results (Horizontal Merger Guidelines [HMG], 2010), thereafter (HMG, 2005). Breweries included in *HHI* constitute sample for Economic Value Added Decomposition.

$$HHI = \sum_{i=1}^{N} s_i^2 \qquad (2)$$

where *HHI* is Herfindahl Index, s_i is the market share of the firm *i* in the particular market, and *N* is the number of firms.

Markets are classified into three types (HMG, 2005):

- Highly competitive markets: *HHI* < 0,10,
- Unconcentrated markets: 0,10 < *HHI* < 0,15,
- Moderately concentrated markets: 0,15 < *HHI* < 0,25,
- Highly concentrated markets: 0,25 < *HHI.*

4.2 INFA rating model

Beverage industry in general and brewery sector in particular are analysed by INFA Rating Model (Neumaierova & Neumaier, 2002, 2005, 2005) with particular emphasis on annual EVA decomposition (MPO, 2010). The model of EVA decomposition encompasses financial and risk controlling and analysis. INFA rating model is compiled from three stages of business performance measurement. The first stage considering creation of productive powers (*EBIT/Assets*) allows analyzing the product with no taxation impact. The second stage covers analysis of redistribution of *EBIT* among government (tax), creditors (interest), and shareholders (net profit). At the third stage involves financial stability analysis via useful life of assets and liabilities ratio. Algorithm of model is based on interdependencies among balance sheet, income statement and cash flow indicators.

INFA Rating Model is based on further simplistic assumptions (MPO, 2010).

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[1] Fundamental statistics methods used in a standard way are not explained hereinafter.

- Financial interest is considered annually paid at the cost of debt,
- Market Value of debt is identified with the Book Value of interest-bearing debt,
- Independence of Weighted Average Cost of Capital on capital structure is assumed.
- Rate of EAT/EBT is used in the cost of capital instead of (1 – Tax) due to inclusion of the true impact of taxation.

4.3 Economic value added

Economic Value Added (EVA) modified by Neumaierova & Neumaier (Neumaierova & Neumaier, 2002, 2005, 2005) is primary in the form of shareholder claims articulation, see equation (3). The other explanations are not taken into account. According to methodology of Financial Analysis of Business the focus of EVA analysis is concerned on Value Spread (MPO, 2010). Value Spread $(ROE - r_e)$ is difference of real return on equity and expected return on the corresponding risk r_e i.e. alternative cost of equity. If the Value Spread is positive the business reached positive EVA and thus shareholder value increases.

$$EVA = \left(ROE - r_e \right) \cdot E \tag{3}$$

where EVA is Economics Value Added, ROE is Return on Equits, r_e is Cost of Equity, and E is Equity.

4.3.1 Return on equity

The priority in economic value creation is a shareholder's perspective. The keen on intrinsic value growth is a cornerstone of entrepreneurial activity and business strategy (Damodaran, 2001). ROE is the result of INFA Rating Model financial controlling.

$$ROE = \frac{EAT}{EBT} \cdot \frac{\dfrac{EBIT}{A} - \left(In \cdot \left(\dfrac{CE}{A} - \dfrac{E}{A} \right) \right)}{\dfrac{E}{A}} \tag{4}$$

where ROE is Return to Equity, EAT is Earning After Taxes, EBT is Earning Before Taxes, $EBIT$ is Earning Before Interest and Taxes, A are total Assets, In are Interests, E is Equity, CE is Capital Employed (Equity, Debt, Obligations).

4.3.2 Cost of equity

Principle of cost of Equity r_e by course of INFA Rating Model contravenes mostly applied classical Modigliani – Miller theorem of capital structure (Modigliani & Miller, 1958; Brealey & Myers, 2008). The model of risk controlling comes from econometrics studies of rating agencies risk assessment. Mostly used Capital Assets Pricing Model is not suitable for emerging economics. As well, estimation of beta coefficient of non listed companies makes the model too subjective.

The Risk Premium represents the alternative Cost of Equity r_e (5). It is Return on Equity achievable from investment to alternative risk opportunity for investment.

$$r_e = r_f + r_{FINSTRU} + r_{FINSTAB} + r_B + r_{LS} \qquad (5)$$

where r_f is Risk Free Rate, $r_{FINSTRU}$ is Financial Structure Risk Premium, $r_{FINSTAB}$ is Financial Stability Risk Premium, r_B Business Risk Premium, and r_{LS} Liquidity Risk Premium.

Risk Free Rate r_f is return on risk-free assets represented by annual yield on 10 years Czech government bond issued Czech National Bank.

Following risk premiums defined functions (6) in general shape. Because of lack of econometric studies suppose that from max certain level of indicators comprising the risk premium will be close to zero. Under these assumptions from min certain level the risk premium will converge to max value. The course of value of base indicator sets the interval of risk premium. Standard deviation measures the volatility of particular indicator in time series. Size of standard deviation indicates minimum value below which the risk premium cannot fall.

$$
\begin{aligned}
X \leq X_0 &\Rightarrow r_x = \max \\
X \geq X_1 &\Rightarrow r_x = \min \\
X \in (X_0, X_1) &\Rightarrow r_x = a(X_1 - x)^b
\end{aligned}
\qquad (6)
$$

where X is the value of particular indicators constituting risk premiums, X_0 is the threshold value of an indicator by which achievement and lower values the risk premium converge to max, X_1 is the threshold value of an indicator by which achievement and higher values the risk premium converge to min, max is maximum risk premium, min is minimum risk premium, r_x is risk premium, a is constant force for equality $m = a(X_1 - X_0)^b$, a is constant indicating the course of function r_x, ($B = 1$ indicates linear function).

Liquidity Risk Premium r_{LS} characterises company size according to total Equity.

Business Risk Premium r_B is an indicator of creation of productive powers (*EBIT/Assets*) (7).

$$
\begin{aligned}
Condition: \; & \frac{EBIT}{Assests} \geq \frac{Interst}{Debt + Obligation} \cdot \frac{Equity + Debt + Obligation}{Assest} \\[4pt]
Let\;say: \; & \frac{Interst}{Debt + Obligation} \cdot \frac{Equity + Debt + Obligation}{Assest} = X_1 \\[4pt]
If \; & \frac{EBIT}{Assests} < \frac{Interst}{Debt + Obligation} \cdot \frac{Equity + Debt + Obligation}{Assest} \Rightarrow r_B = 10\% \\[4pt]
If \; & \frac{EBIT}{Assests} > \frac{Interst}{Debt + Obligation} \cdot \frac{Equity + Debt + Obligation}{Assest} \Rightarrow r_B = \min\left(Sd\frac{EBIT}{Assest}\right) \\[6pt]
If \; 0 < & \frac{EBIT}{Assests} < \frac{Interst}{Debt + Obligation} \cdot \frac{Equity + Debt + Obligation}{Assest} \Rightarrow r_B = \frac{\left(X_1 - \dfrac{EBIT}{Assets}\right)^2}{10 \cdot X_1^2}
\end{aligned}
\qquad (7)
$$

Financial Stability Risk Premium $r_{FINSTAB}$ is an indicator of financial stability by Liquidity Ratio:

- If $L \leq X_1$ then $r_{FINSTAB} = 10$ %,
- If $L \geq X_2$ then $r_{FINSTAB} = 0$ %
- If $X_1 < L < X_2$ then $r_{FINSTAB} = ((X_2 - L)^2 / ((X_2 - X_1))*0,1$
- Market Value of debt is identified with the Book Value of interest-bearing debt,

$$\text{If} \quad \frac{\text{Current Assets}}{\text{Current Liabilities} + \text{Short - term} \cdots \text{Bank Loans}} \leq X_1 \Rightarrow r_{FINSTAB} = 10\%$$

$$\text{If} \quad \frac{\text{Current Assets}}{\text{Current Liabilities} + \text{Short - term} \cdots \text{Bank Loans}} \geq X_1 \Rightarrow r_{FINSTAB} = 0\%$$

$$\text{If} \quad 1 < \frac{\text{Current Assets}}{\text{Current Liabilities} + \text{Short - term} \cdots \text{Bank Loans}} \leq X_1 \Rightarrow r_{FINSTAB} = \frac{\left(X_1 - L\right)^2}{10 \cdot \left(X_1 - 1\right)^2}$$

Financial Structure Risk Premium $r_{FINSTRU}$ (7) is limited if $r_e = WACC$ than $r_{FINSTRU} = 0$ %. If $r_{FINSTRU} > 10$ % then $r_{FINSTRU}$ is limited to *10* %. The issue is in the case of extreme interest rate. Then interest rate shall be limited in the interval $0 \leq r_{FINSTRU} \leq 25$ %. Similarly tax burden is limited in the interval $0 \leq (EAT/EBT) \leq 100$ %. If the calculated value r_e is lower than *WACC* then $r_e = WACC$.

$$r_{FINSTRU} = r_e - WACC \qquad (8)$$

where $r_{FINSTRU}$ is Risk Premium for Financial Structure, r_e is Cost of Equity, and *WACC* is Weighted Average Cost of Capital.

Analysis of sector's alternative cost of capital is calculated as weighted average of alternative cost of capital of particular subjects. As a concrete weights are supposed individual equities. Assumed economic profits are numbered and divided by sector's aggregated equity.

4.3.3 Economic value added decomposition

Economic Value Added in the INFA Rating Model is the crucial indicator of business performance. The peak indicator is influenced by particular factors for its determining, see Fig.1. The changes of the peak indicator are decomposed and the degrees of impacts are determined. Economic Value Added as a peak indicator can be decomposed by additive and multiplicative relationship (Neumaierova & Neumaier, 2002, 2005, 2005). According to empirical results the Logarithm Method and Index Method are used for calculation of changes in the degree of influence.

5. Results

In 2001 the Czech Republic ranked in the fifteenth position in the world beer production, see Fig. 2. It produced 18 mhl and it had 1,3 % of world and 3,8 %of European beer production. The biggest world beer producers were USA (231 mhl), China (215 mhl), Germany (109 mhl), Brazil (90 mhl) and Japan (71 mhl). According to Czech Association of Breweries and

Malt Plants the Czech breweries produced 17,881 mhl of beer, which means slight decrease on a year earlier (-0,25%). This change was caused by decline of 1,9 % in domestic consumption (by -309 thl to 16,026 mhl) and rise of 16,7 % in export (by 266 thl to 1,855 mhl). The average beer consumption per capita remained stable at the level of 160 ls. The decrease in the number of Czech breweries still continued. The number of 71 breweries in 1994 dropped to 54 in 2001. Shifting ownership from domestic to foreign one did influence neither the brand names nor the quality of the beer (Balsik, 2002).
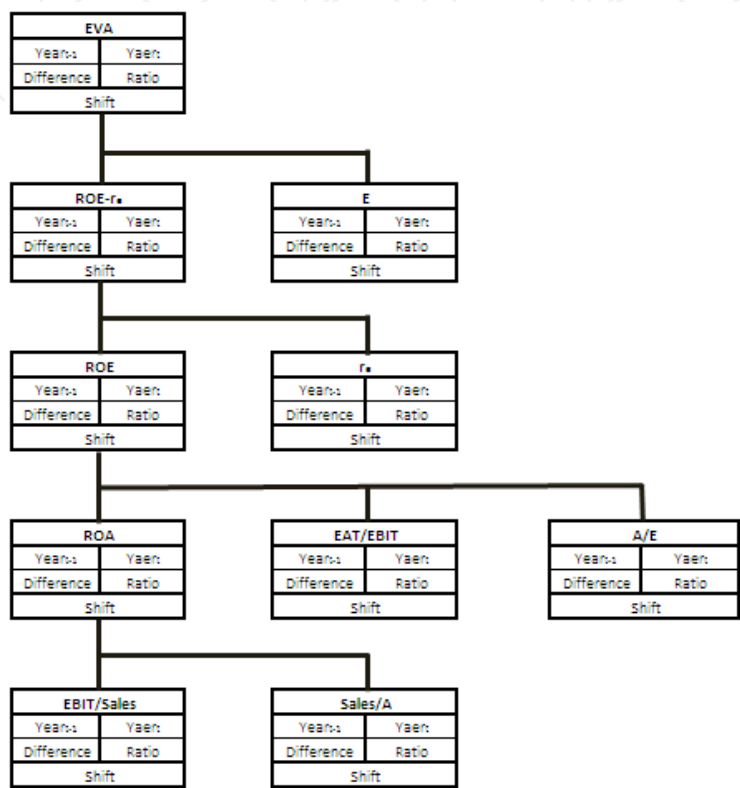

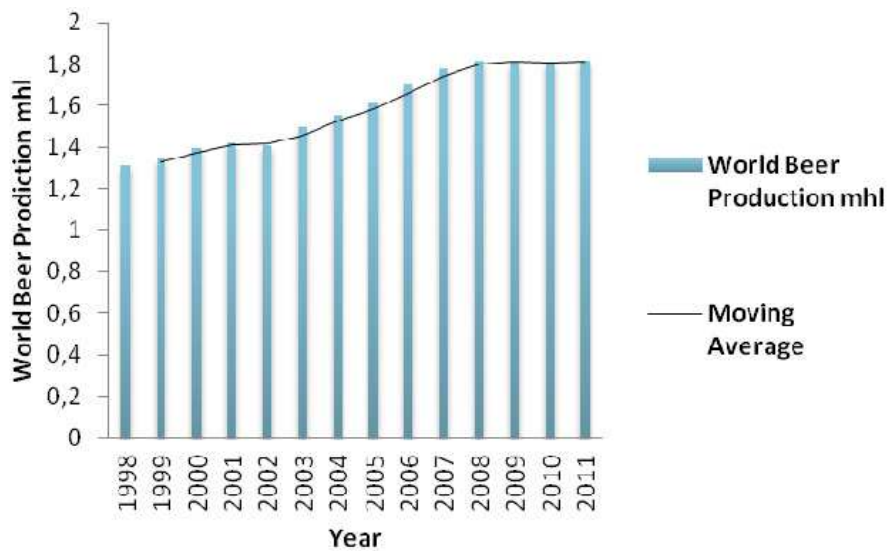Fig. 1. Economic Value Added Decomposition

Fig. 2. World Beer Production

In 2002 he Czech Republic ranked in the fifteenth position in the world beer production. It produced 18 mhl and it had 1,3 % of world and 3,7 % of European beer production. The biggest world beer producers still remained USA (231,5 mhl), China (231,2 mhl), Germany (109 mhl), Brazil (85 mhl) and Japan (70,5 mhl). According to Czech Association of Breweries and Malt Plants the Czech breweries produced 18,178 mhl of beer, which means slight increase on a year earlier (101,7 %). This change (+ 297 thl) was caused by the rise of 1,1 % in domestic consumption (by 176 thl to 16,202 mhl) and rise of 6,5 % in export (by 120 thl to 1,975 mhl). The average beer consumption per capita remained stable at the level of 160 ls. The demand was composed largely from draft beer (67,6 %) which was cheaper and better complied with Czech lifestyle than lager beer with slightly growing market share (28,4 %). The consumption share of special beers declined, so did the share of non-alcoholic beer which was in 2002 0,6 % of total beer consumption in CR (Braznovsky, 2003). In 2003 the Czech Republic ranked in the fifteenth position in the world beer production. It produced 18 mhl and it had 1,2 % of world and 3,4 % of European beer production. The ranking in the world beer producers changed and China with 245 mhl was on the top. Then USA (235 mhl), Germany (105 mhl), Brazil (86 mhl) and newly Russia (79,8 mhl), which reached the highest growth of beer volume production (annual rate of 8%). According to Czech Association of Breweries and Malt Plants the Czech breweries produced 18,548 mhl of beer, which means slight increase on a year earlier (2,1 %). This change was caused by increase of 1,9 % in domestic consumption (by 216 thl to 16,418 mhl) and rise of 7,8 % in export (by 155 thl to 2,130 mhl). The number of industry breweries continued in the fall (Breweries Svitavy and Litoměřice were closed), the concentration of the market kept going which led to beer unification. On the other hand the development of number of micro breweries was growing and their supply of specials was aimed on local markets. The share of lager beer grew slightly and leveled off at 28,4 %, draft beer had 67,6 % and non-alcoholic 0,6 % (Altova & Braznovsky, 2004). In 2004 the Czech Republic ranked in the seventeenth position in the world beer production. It produced 18,1 mhl and it had 1,2 % of world and 3,4 % of European beer production. The biggest world beer producers were China (277,5 mhl), USA (238,0 mhl), Germany (104,5 mhl), Brazil (90 mhl) and Russia (83 million mhl). According to Czech Association of Breweries and Malt Plants the Czech breweries produced 18,753 mhl of beer, which means slight increase on a year earlier (1,1 %). This change was caused by decrease in domestic consumption (by 303 thl to 16,115 mhl) and year-on-year rise of 7,8 % in export (by 508 thl to 2,638 mhl). The number of industry breweries remained stable at the level of 53 breweries. The demand was composed largely from draft beer (61,3 %) which was cheaper and better complied with Czech lifestyle than lager beer with slightly growing market share (34,4 %) (Altova, 2010). In 2005 the Czech Republic ranked in the sixteenth position in the world beer production. It produced 19,0 mhl and it had 1,2 % of world and 3,5 % of European beer production. The biggest world beer producers were China (308,0 mhl), USA (232,7 mhl), Germany (105,8 mhl) and Russia (88,4 mhl). According to Czech Association of Breweries and Malt Plants the production of Czech breweries breached the boundary of 19 mhl and reached the volume of 19,069 mhl of beer, which means a year-to year increase by 1,7 %. Whereas the production for domestic market decreased by 145 thl to 15,970 mhl the share of export on total volume of beer produced in The Czech Republic rose from 14 % in 2004 to 16,3 % in 2005. The number of industry breweries decreased slightly to 47 plants owned by 38 companies. The number of

microbreweries was still growing to the number of 30. The Czech beer market offered in 2005 more than 470 beer types. Despite the majority of them was produced by the Czech traditional way of beer production (Pilsner), there could be found also around 80 marks of special beers. Their specialty is based on a different way of fermentation, different yeasts and special flavor reached from herbals, fruit, honey etc. The number of industrial breweries (54) remained on the same level as in 2004. In comparison to previous year there is visible drop of 58,8 % in production of small breweries (in category up to 20 thousands hl) and growth of 1,1 % in the category 200 – 300 thl (Altova, 2010). In 2006 the Czech Republic ranked in the seventeenth position in the world beer production. It produced 19,2 mhl and it had 1,2 % of world and 3,5 % of European beer production. The biggest world beer producers were China (320 mhl), USA (223 mhl), Germany (105 mhl), and Russia (93 mhl). The Czech brewing segment continued in growing and it produced the highest volume of beer than ever before. According to Czech Association of Breweries and Malt Plants the Czech breweries produced 17,787 mhl of beer, what improved previous best record from 1992. The number of industrial breweries remained at the same amount, only the number of microbreweries grew and reached almost the level of 60. There has been a marked improvement in the production of non-alcoholic beer which was brewed by 19 breweries. The total volume of non-alcoholic beer reached 328 thousands hl what is 1,65 % of total beer production in the Czech Republic. These numbers indicates dramatic growth of 37 % in comparison to previous year (Altova, 2010). In 2007 the Czech Republic ranked in the seventeenth position in the world beer production. It produced 20 mhl and it had 1,1 % of world and 3,4 % of European beer production. The biggest world beer producers were China (370 mhl), USA (232,8 mhl), Russia (109,8 mhl) and Germany (106 mhl). The Czech brewing segment continued in growing and exceeded the previous year's record. According to Czech Association of Breweries and Malt Plants the Czech breweries produced 19,897 mhl of beer, what meant the growth by 100 thousands hl. on a year earlier, see Fig. 3. Regarding the concentration of the market it kept going which led to beer unification. 86 % of total volume of beer production was brewed in 7 biggest breweries. The total volume of non-alcoholic beer reached 497 thousands hl what is 2,5 % of total beer production in the Czech Republic. These numbers again indicates dramatic growth of 51,6 % in non-alcoholic beer production on a year earlier (Altova, 2010).
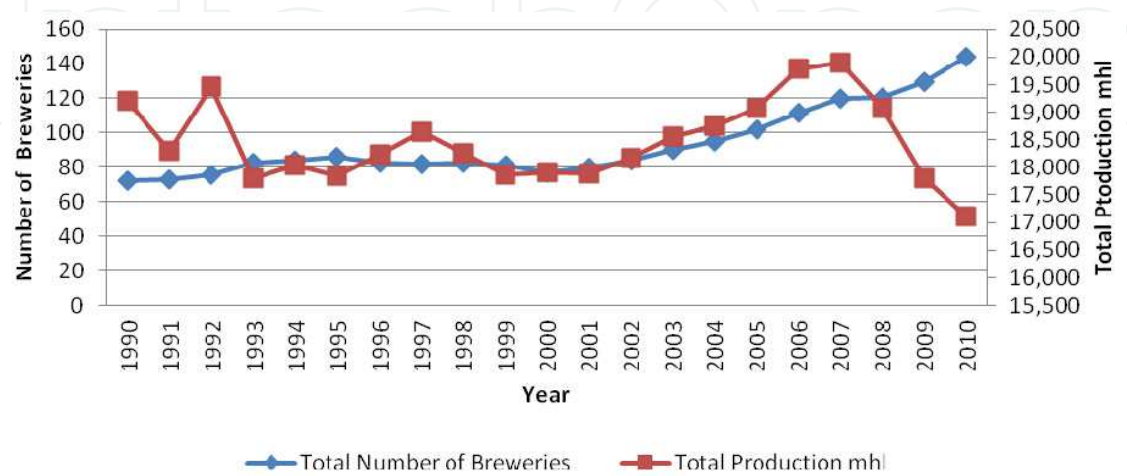

Fig. 3. Beer Production in the Czech Republic

In 2008 the Czech Republic ranked in the eighteenth position in the world beer production. It produced 20 mhl and it had 1,1 % of world and 3,3 % of European beer production. The biggest world beer producers were China (395 mhl), USA (236 mhl), Russia (119 mhl) and Germany (101 mhl). The growth of Czech brewing segment leveled off in 2008 at the volume of 19,806 mhl of beer. The volume of exported beer hectols exceeded in 2008 the bounder of 3 million. Regarding the concentration of the market it kept going, because 91,6 % of total beer production was produced in 10 breweries. In 2008 the flavored beers were on increase (by 38.8% to 6,8 thl) so did the specials with upper brewer's yeast which rose by 34,4 %. The non-alcoholic beers slowed down their expansion and grew by 16,4 % compared to last year's growth rate of 51,6 %. Czech breweries produced in 2008 578,9 thl (Altova, 2010). In 2009 was the total world beer production 1 802,7 mhl (99,3 % of the previous year's volume) and it recorded first downturn since 1999. In 2009 The Czech Republic ranked in the sixteenth position in the world beer production. It produced 20 mhl and it had 1,1 % of world and 3,5 % of European beer production. The biggest world beer producers were China (418,5 mhl), USA (234,1 mhl), Russia (110 mhl) and Brazil (107,3 mhl). Breweries associated with Czech Association of Breweries and Malt Plants produced in 2009 18,598 million hl of beer which means decrease by 5,9 % compared to previous year. This drop was caused mainly by the declining demand for draft beer of which production fell by 10,3 %. On the other hand the lager beer was on slight increase (5 %). The production of non-alcoholic beer declined for the first time during last decade by 1 % in comparison to 2008. The total decline in demand for beer can perhaps be explained by the fact that there was a drop in the number of tourists who visited Czech Republic in 2009 (Altova, 2010). World beer production decreased in 2009 for the first time since 1999. Moderate growth of 0,2% was recognised in 2010. The total world beer production was 1 811,4 mil. hl in 2010. In the terms of beer production the Czech Republic ranks the 17th from monitored countries by Hopsteiner. In the light of total yield Czech Republic covers 1,1 % of world beer production and 3,7 % of production in Europe. Czech beer production fell by 7,9 % following the decrease of tourism and consumption tax increase in 2010. The downturned was mostly caused by the industrial breweries' production gap. Light beer production slumped furthest by 13%. Traditional variety of the Czech brewing industry lay in the wide variety and uniqueness of the product range. Notwithstanding, production goes down but the number of brands increases. The diversification of production plays crucial role in customers' satisfaction. According to preliminary searching of Czech Association of Breweries and Malt Plants (August 2011) production turn into mild grow in 2011 (Altova, 2011).

5.1 Market structure of producers

A trend in brewery industry in the Czech Republic shows Fig. 4. Although the brewery industry's characteristics commemorate mature industry the number of microbreweries is constantly decreasing. A similar evolution was observed in USA (Carroll & Wade, 1991; Carroll & Swaminathan, 1992).

Fig. 5 comprises trend in concentration of production toward the segment of largest producers. The crucial role is played by breweries with annual production higher than 1000 khl. During the analysed period 2001 - 2008 the share of total production increased from 54% to 85%. Otherwise the largest decline experienced the breweries with production 500 – 1000 khl from 17% to 5%. The smallest drop experienced the breweries with production less than 120 khl 9% to 7%.
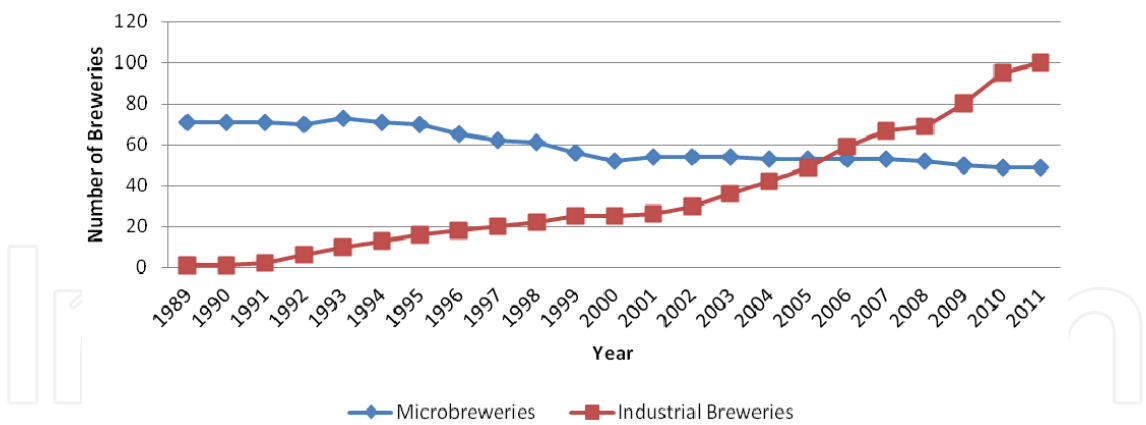
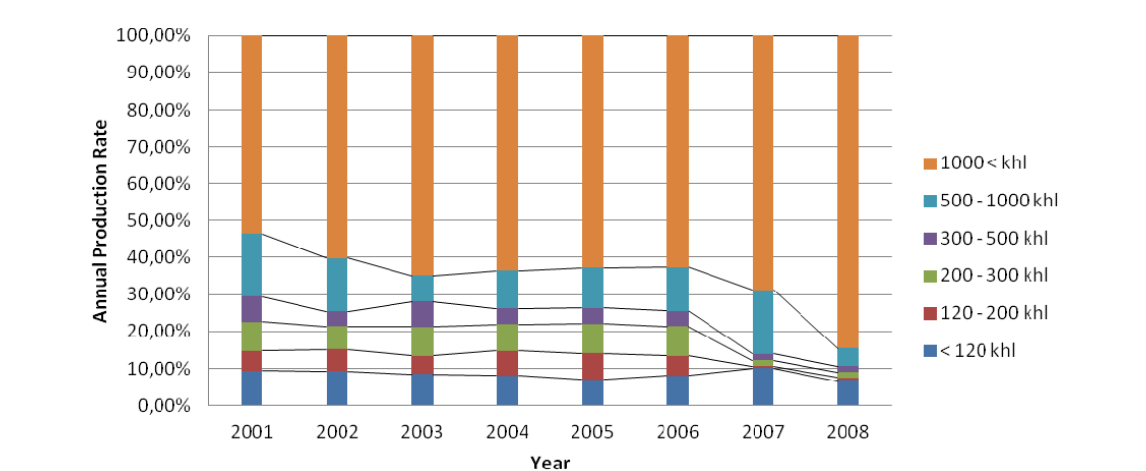Fig. 4. Trends in the Number of Breweries in the Czech Republic

Fig. 5. Brewery Industry Concentration in the Czech Republic

Fig. 6 covers trend in market concentration measured by Herfindahl Index (HHI). Index is calculated on two levels. The first level covers the largest breweries with annual production higher than 500 khl and the second wider level covers the producers with annual production higher than 120 khl. The annual production of breweries included in the HHI captures decreasing concentration toward the largest producers.
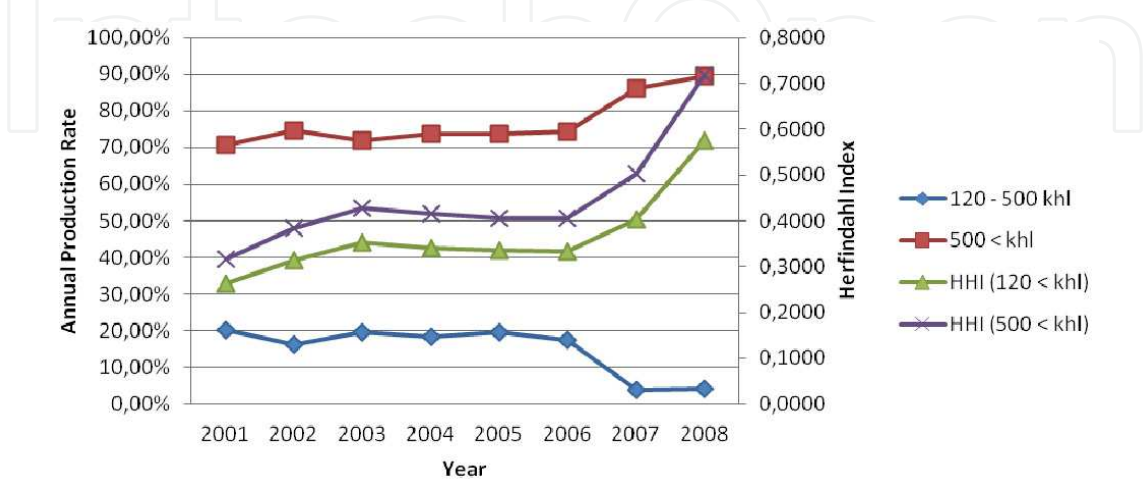

Fig. 6. Trend of HHI by the Size of Brewery in the Czech Republic

The distribution of annual production segmented by the size of the breweries covers Fig. 7. The trends of smallest and the largest producers are modelled by the appropriate functions. Trend of breweries with annual production 120 – 200 khl is modelled by the second-degree polynomial function. Trend of breweries with annual production more than 1000 khl is modelled by exponential function.
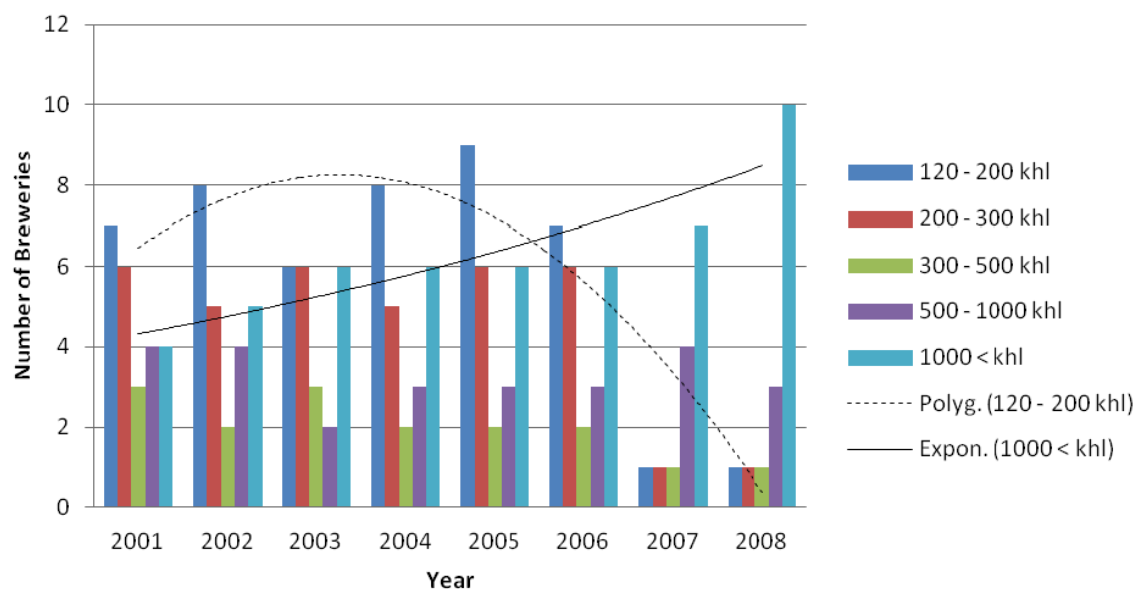

Fig. 7. Annual Production by the Size of Brewery in the Czech Republic

5.2 Economic value added decomposition

Economic Value Added is computed for beverage industry at the fist level and decomposition of changes of particular factors is carried out, see Table 1. The factors with the higher impact on peak variable differ. Factor with the highest frequency at the first level of decomposition is ROE-re.

Variables	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
EVA	232,09%	-45,30%	207,91%	723,09%	-18,65%	250,07%	-24,23%	-29,62%	-55,61%	-158,80%
E	-14,58%	13,88%	106,41%	-49,19%	8,58%	20,42%	4,89%	8,14%	10,39%	0,74%
ROE-re	229,46%	59,28%	204,51%	772,08%	-27,18%	229,65%	-24,39%	-37,76%	-66,00%	-159,54%
ROE	149,09%	-9,22%	71,56%	845,07%	-7,72%	126,18%	-20,05%	-4,32%	-58,18%	-31,53%
re	80,36%	68,50%	132,95%	-72,99%	-19,45%	103,47%	-4,34%	-33,45%	-7,82%	-128,01%
ROA	-26,84%	-5,89%	45,62%	558,10%	-6,60%	131,27%	-16,61%	-1,48%	-56,80%	-54,88%
EAT/EBIT	167,30%	-23,84%	70,99%	120,26%	22,61%	35,50%	4,17%	0,00%	6,87%	0,47%
A/E	8,63%	20,51%	-45,05%	166,70%	-23,74%	-40,59%	-7,62%	-2,84%	-8,25%	22,88%
EBIT/Sales	-26,76%	6,83%	60,08%	296,70%	-13,85%	119,79%	-22,39%	5,75%	-35,52%	-52,33%
Sales/A	-0,08%	-12,72%	-14,46%	261,40%	7,24%	11,48%	5,78%	-7,23%	-21,28%	-2,56%

Table 1. Industry Economic Value Added Decomposition

Descriptive statistics of particular factors of Economic Value Added of beverage sector shows Table 2.

Variable	EVA	E	ROE-re	ROE	re	ROA	EAT/EBIT	A/E	EBIT/Sales	Sales/A
Mean	1,0809561	0,1096818	1,1801132	1,060886	0,1192271	0,5658918	0,4043402	0,0906541	0,3383093	0,2275825
St. Error of the Mean	0,8150073	0,1230822	0,8433651	0,8497107	0,2611943	0,5831726	0,1930699	0,1896227	0,333387	0,2671901
Median	-0,2143662	0,0836167	0,1744268	-0,0601924	-0,0607929	-0,0624599	0,1473995	-0,0522999	-0,0404546	-0,0131765
Modus	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
Standard Deviation	2,5772794	0,38922	2,6669545	2,6870211	0,825969	1,8441536	0,6105405	0,5996397	1,0542624	0,8449294
Variance	6,6423689	0,1514922	7,1126461	7,2200823	0,6822247	3,4009026	0,3727597	0,3595677	1,1114691	0,7139056
Kurtosis	3,1332525	4,8397562	3,9405335	8,2231798	-0,7858908	7,6866278	0,7804933	6,3559884	4,3846358	9,5880005
Skewness	1,6582335	1,4945915	1,7989465	2,7934284	-0,1100759	2,7026855	1,2770505	2,3149773	2,049831	3,0725106
Difference Min-Max	8,8188763	1,5560068	9,3161726	9,0324608	2,6095707	6,1490056	1,9114327	2,117505	3,4902693	2,8268245
Min	-1,5879785	-0,4919113	-1,5953717	-0,581785	-1,2800608	-0,5679921	-0,2383978	-0,4504672	-0,5232674	-0,212813
Max	7,2308977	1,0640955	7,7208009	8,4506759	1,3295099	5,5810135	1,6730349	1,6670378	2,9670019	2,6140116
Sum	10,809561	1,0968181	11,801132	10,60886	1,1922714	5,6589176	4,0434018	0,9065409	3,3830925	2,275825
Number	10	10	10	10	10	10	10	10	10	10
Confidence Level	1,8436746	0,2784312	1,9078243	1,9221791	0,5908626	1,319228	0,4367544	0,4289564	0,7541739	0,6044261

Table 2. Industry Descriptive Statistics

Economic Value Added of sample of producers includes Fig. 8. The sample of producers concerns largest and most influential producers in the Czech Republic covered by Herfindahl index, see Fig. 6. Elements of the sample are denoted Brew.1 – Brew. 5. Factor with the highest frequency at the first level of decomposition for particular breweries are E, A/E, EBIT/Sales, E, and Sales/A.
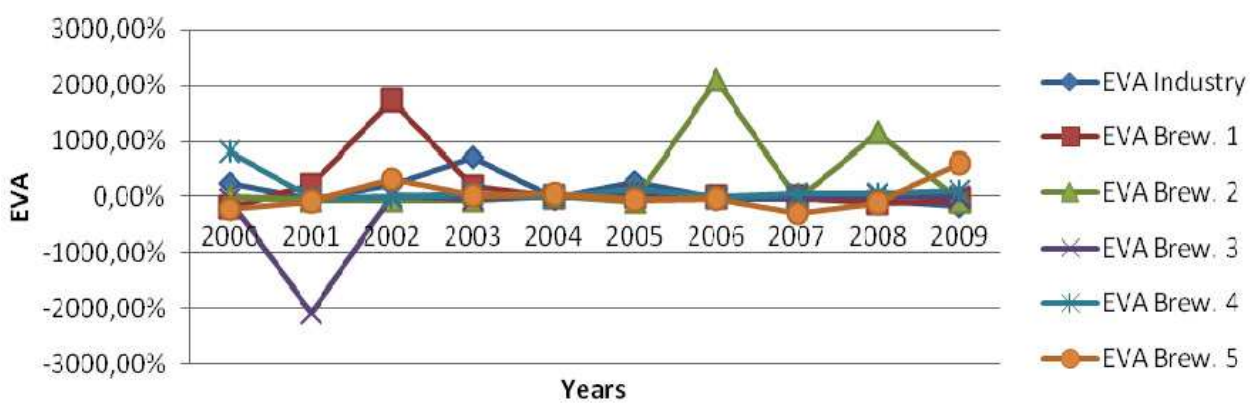

Fig. 8. Economic Value Added of Sample of Breweries

5.3 Hypothesis tests

Economic Value Added for particular breweries is decomposed and the results are used for verification of hypothesis and research question solution. The basic statistics of Economic Value Added decomposition for industry with comparison with particular breweries comprises Table 3.

Variables	Number	Sum	Mean	Variance
E Industry	10	1,096818096	0,10968181	0,151492231
E Brew. 1	10	11,71851773	1,171851773	10,54940141
E Brew. 2	10	12,50923797	1,250923797	9,107712839
E Brew. 3	10	-1,72798544	-0,172798544	0,481647761
E Brew. 4	10	6,916121354	0,691612135	1,564326416
E Brew. 5	10	9,921791203	0,99217912	5,894173
ROE-re Industry	10	11,8011317	1,18011317	7,112646076

Variables	Number	Sum	Mean	Variance
ROE-re Brew. 1	10	17,36378991	1,736378991	16,82857339
ROE-re Brew. 2	10	16,96957401	1,696957401	33,64941223
ROE-re Brew. 3	10	-18,6715505	-1,867155049	34,6138331
ROE-re Brew. 4	10	5,219831167	0,521983117	1,815547907
ROE-re Brew. 5	10	-8,02440309	-0,802440309	1,767543233
ROE Industry	10	10,60886029	1,060886029	7,220082313
ROE Brew. 1	10	15,19148314	1,519148314	14,21660606
ROE Brew. 2	10	1,926673091	0,192667309	0,756573518
ROE Brew. 3	10	-3,58545302	-0,358545302	1,214694686
ROE Brew. 4	10	5,464278608	0,546427861	1,804975771
ROE Brew. 5	10	-5,04353231	-0,504353231	1,693920646
re-re Industry	10	1,192271407	0,119227141	0,682224716
re Brew. 1	10	2,172306773	0,217230677	0,131062824
re Brew. 2	10	15,04290092	1,504290092	27,6222958
re Brew. 3	10	-15,0860975	-1,508609747	23,78197355
re Brew. 4	10	-0,24444744	-0,024444744	0,046228373
re Brew. 5	10	-2,98087078	-0,298087078	0,317321175
ROA-re Industry	10	5,658917576	0,565891758	3,400902569
ROA Brew. 1	10	13,36015824	1,336015824	12,72644729
ROA Brew. 2	10	-3,75063497	-0,375063497	1,436081246
ROA Brew. 3	10	-1,54108809	-0,154108809	0,371752623
ROA Brew. 4	10	6,605010194	0,660501019	2,259412793
ROA Brew. 5	10	0,841447855	0,084144786	2,194263131
EAT/EBIT Industry	10	4,043401764	0,404340176	0,372759683
EAT/EBIT Brew. 1	10	4,820393498	0,48203935	6,689907692
EAT/EBIT Brew. 2	10	1,571714428	0,157171443	0,119035818
EAT/EBI Brew. 3	10	-0,49597947	-0,049597947	0,049059267
EAT/EBIT Brew. 4	10	-0,20560792	-0,020560792	0,046590406
EAT/EBIT Brew. 5	10	-4,49029674	-0,449029674	0,709908584
A/E Industry	10	0,90654095	0,090654095	0,35956773
A/E Brew. 1	10	-2,9890686	-0,29890686	0,164112557
A/E Brew. 2	10	3,999529685	0,399952968	1,233232462
A/E Brew. 3	10	-1,25528772	-0,125528772	0,196760829
A/E Brew. 4	10	-0,93512366	-0,093512366	0,201868969
A/E Brew. 5	10	2,869958567	0,286995857	0,37470278
EBIT/Sales Industry	10	3,383092548	0,338309255	1,111469108
EBIT/Sales Brew. 1	10	14,80786278	1,480786278	14,70071229
EBIT/Sales Brew. 2	10	-0,93491412	-0,093491412	0,79979165
EBIT/Sales Brew. 3	10	0,495979469	0,049597947	0,049059267
EBIT/Sales Brew. 4	10	7,568201524	0,756820152	2,966541797
EBIT/Sales Brew. 5	10	-9,72405782	-0,972405782	4,821239837
Sales/A Industry	10	2,275825028	0,227582503	0,713905641
Sales/A Brew. 1	10	-1,44770454	-0,144770454	1,012756171
Sales/A Brew. 2	10	-6,00207537	-0,600207537	1,274417975
Sales/A Brew. 3	10	-2,40451342	-0,240451342	0,576558256
Sales/A Brew. 4	10	-0,96319133	-0,096319133	0,137428159
Sales/A Brew. 5	10	10,95205008	1,095205008	10,29613015

Table 3. Sample of Breweries Economic Value Added Statistics

Table 4. covers the results of ANOVA analysis. The variances of all set of factors of Economic Value Added decomposition are observed to recognise the factors with the highest influence for additional model constitution. Statistical significance P Value at the 5% for all variables falls to reject the null hypothesis.

E	Sum of Squares	Difference	Mean Square	F Value	P Value	F Stat
Model	17,17768339	5	3,4355367	0,7428521	0,5948124	2,3860699
Error	249,7387829	54	4,6247923			
Corrected Total	266,9164663	59				
ROE-re	**Sum of Squares**	**Difference**	**Mean Square**	**F Value**	**P Value**	**F Stat**
Model	106,7659603	5	21,353192	1,3375344	0,2625777	2,3860699
Error	862,0880034	54	15,964593			
Corrected Total	968,8539638	59				
ROE	**Sum of Squares**	**Difference**	**Mean Square**	**F Value**	**P Value**	**F Stat**
Model	31,46410009	5	6,29282	1,4032455	0,237851	2,3860699
Error	242,161677	54	4,4844755			
Corrected Total	273,625777	59				
re	**Sum of Squares**	**Difference**	**Mean Square**	**F Value**	**P Value**	**F Stat**
Model	46,89634399	5	9,3792688	1,070263	0,387112	2,3860699
Error	473,2299579	54	8,7635177			
Corrected Total	520,1263019	59				
ROA	**Sum of Squares**	**Difference**	**Mean Square**	**F Value**	**P Value**	**F Stat**
Model	19,6571875	5	3,9314375	1,0535876	0,3962382	2,3860699
Error	201,4997369	54	3,7314766			
Corrected Total	221,1569244	59				
EAT/EBIT	**Sum of Squares**	**Difference**	**Mean Square**	**F Value**	**P Value**	**F Stat**
Model	5,792401116	5	1,1584802	0,8702459	0,5072074	2,3860699
Error	71,88535304	54	1,3312102			
Corrected Total	77,67775416	59				
A/E	**Sum of Squares**	**Difference**	**Mean Square**	**F Value**	**P Value**	**F Stat**
Model	3,531577302	5	0,7063155	1,674894	0,1564189	2,3860699
Error	22,77220794	54	0,4217076			
Corrected Total	26,30378524	59				
EBIT/Sales	**Sum of Squares**	**Difference**	**Mean Square**	**F Value**	**P Value**	**F Stat**
Model	34,31330929	5	6,8626619	1,6841705	0,1541596	2,3860699
Error	220,0393255	54	4,0748023			
Corrected Total	254,3526348	59				
Sales/A	**Sum of Squares**	**Difference**	**Mean Square**	**F Value**	**P Value**	**F Stat**
Model	16,89886297	5	3,3797726	1,4473165	0,2224493	2,3860699
Error	126,1007671	54	2,3351994			
Corrected Total	142,9996301	59				

Table 4. ANOVA of Sample of Breweries

F Value is less than F stat for all variables. According to testing we fall to reject the null hypothesis H_0. We suppose data are not sufficiently persuasive for us to prefer the alternative hypothesis H_1 over the null hypothesis. Stated research question allows according to F Values at Table 4. statistical differences considered to be statistically significant enough for the design the model for explanation of particular factors. The

statistical characteristics are so balanced and the draft of additional model concerns the whole field of value creation.

5.4 Economic value added with respect to soft skills value drivers

Despite the apparent shortcomings of financial measures, it is not possible to construct the economic analysis without them. These even represent the most important component of it. The results of above analysis identified performance measure Economic Value Added as basis for economic analysis of the firms form beverage sector in the Czech Republic. Most of analytical models are focused on the big businesses. We focus on sector of microbreweries hereinafter as the most dynamics segment in beverage industry in the Czech Republic, see Fig. 3. When designing the decomposition of EVA it is suitable to rewrite the equations (1) and (2) the following way:

$$EVA = \frac{NOPAT}{Sales} \cdot \frac{Sales}{Capital} - \frac{WACC}{Capital} \tag{9}$$

Where *NOPAT is* Net Operating Profit After Taxes, *Capital* is Capital Employed to Generate Operating Profit, and *WACC* is Weighted Average Cost of Capital.

This alternative expression of EVA measure determines three basic branches of its decomposition. The managers can use three ways how to drive the value of the firm:

- Through increasing the profit margin (NOPAT/SALES),
- Through increasing the turnover of total assets (SALES/CAPITAL),
- Through decreasing the riskiness of the firm (WACC/CAPITAL).

These free common financial measures represent in the framework of economic analysis the group of lag indicators that are the consequences of actions previously taken. But the managers are also interested in the question what are the lead indicators, what are the measures that lead to the results achieved in the lagging indicators? The framework of economic analysis should therefore contain a mix of leading and lagging indicators. Lagging indicators without performance drivers fail to inform of how to achieve the results. Conversely, leading indicators may signal improvements, but on their own they do not inform whether these improvements are improving the shareholder wealth.

Further EVA decomposition should therefore include also the lead measures, of which usage challenges leaving the financial perspective. Before incorporating the non-financial measures, one should first more specify the character of microbrewing segment in the Czech Republic. For the microbreweries according to Maier (Maier, 2009) are typical following characteristics: shipping does not exceed 5 000 hl/year, they have not a distribution network of its own, most of production is usually consumed in its own facility-restaurant, they do not export, the owner is usually a natural person or smaller legal entity, owner's relationship to the given sector is not only economic but also emotional. The quality of beer is believed to be the highest among other national brands and this fact is also connected with relatively higher selling price. This knowledge enables to design a framework of economic analysis suitable for business operating in this

segment. According to stated research question and research problem we submit o multifactor model, see Fig. 9.
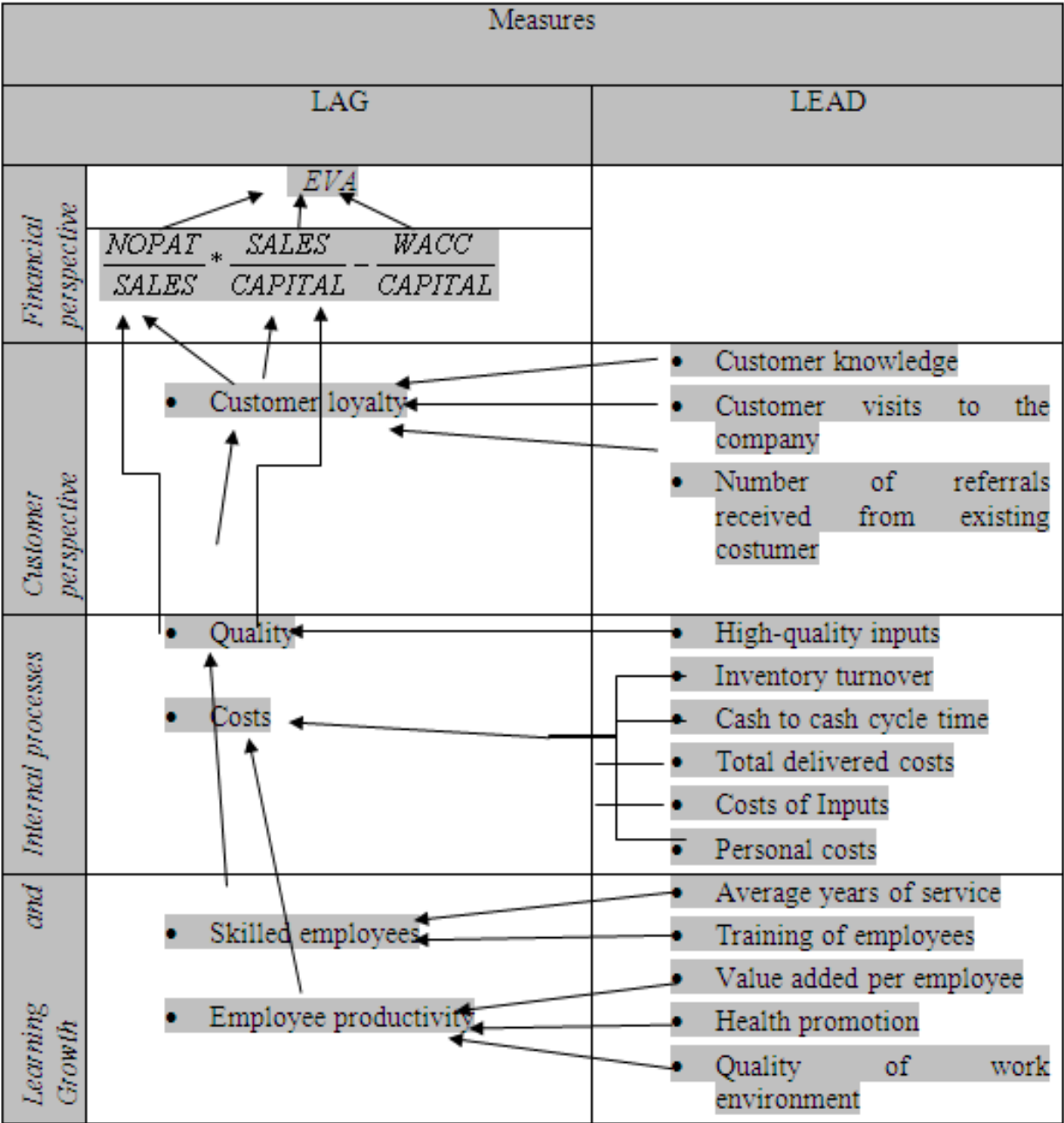
Measures		
	LAG	**LEAD**
Financial perspective	EVA $$\frac{NOPAT}{SALES} * \frac{SALES}{CAPITAL} - \frac{WACC}{CAPITAL}$$	
Customer perspective	• Customer loyalty	• Customer knowledge • Customer visits to the company • Number of referrals received from existing costumer
Internal processes	• Quality • Costs	• High-quality inputs • Inventory turnover • Cash to cash cycle time • Total delivered costs • Costs of Inputs • Personal costs
and Learning Growth	• Skilled employees • Employee productivity	• Average years of service • Training of employees • Value added per employee • Health promotion • Quality of work environment

Fig. 9. Dynamics Soft Skills Model

According to both scholars and practitioners balanced top down approach is important for the successful managing of the firm, small firms are not excluded. Garengo et al. (Garengo et al., 2005) showed that even though the literature highlights the importance of using Performance Measurement System in small companies, very few firms carry out performance management. They see basically two main obstacles to introducing Performance Measurement in small firms – the lack of financial and human resources and the perception of Performance Measurement Systems as bureaucratic system that cause

rigidity. As these obstacles were kept on mind when designing Performance Measurement System suitable for small breweries, the clarity and simplicity characterize this model. The framework of economic analysis built on the basis of Balanced Scorecard with the main performance indicator Economic Value Added represents from this view suitable tool for managing of Czech firms. No one pretends this is generally applicable for all microbreweries in the Czech Republic, nevertheless this procedure can be instrumental when building economic analysis framework in any microbrewery. Since this model was built solely on theoretical basis the next step in this research project is its empirical verification. This is also in accordance with the literature which claims that there is a significant gap between theory and practice. On one hand many PM models have been proposed but on the other hand very little empirical research has been carried out. In order better to understand the process performance measurement further empirical studies on this field are necessary. In spite of increasing interest on performance measurement systems during last 30 years, there is not visible any significant deviation from widely used financial measures in Czech business environment. These are generally criticized on account of several reasons: lag information content, bad fitting with information age competition and difficult communication to employees. Shift from the financial perspective to the non-financial one within the performance management invoked genesis of different performance measurement systems. The aim of this paper was therefore to establish the status of current knowledge in the area of performance measurement systems for small and medium enterprise. This theoretical phase of the research was based on the study of up-to-date reviews and it focused on the description of the most recent performance measurement systems. Further after considering Czech business specifics suitable base for performance measurement system was chosen and the framework of whole performance measurement system not dissimilar to Balanced Scorecard was designed. After considering the circumstances of the microbrewing segment in the Czech Republic this article resulted in designing an example system suitable for usage among Czech microbreweries. Since this model was built solely on theoretical basis the next step in this research project is its empirical verification. This is also in accordance with the literature which claims that there is a significant gap between theory and practice. On one hand many Performance Measurement models have been proposed but on the other hand very little empirical research has been carried out. In order better to understand the process performance measurement further empirical studies on this field are necessary.

6. Conclusion

The economics of beer processing covers the production part of the supply chain of beverage industry. The most considerable characteristics and industry movement observed in this chapter allows application, analysis and in addition development of modern economic theories and dynamic models. The primary objective of entrepreneurship is the growth of stockholder value. Value Based Management disposes of tools for value enhancement. The main task of the research was the quantity and selection of suitable variable as a proxy for value growth. The research question concerning identification of the most considerable factors of Economic Value Added and

the value drivers of particular segment of breweries in the Czech Republic. The research problem was the formulation of theoretical multifactor model for explanation the particular factors based on research findings. For the response on stated research question we articulate null hypothesis H_0 and alternative hypothesis H_1. According to testing we fell to reject the null hypothesis H_0. Stated research question allows according Table 4. statistical differences considered to be statistically significant enough for the design the model for explanation of particular factors. The statistical characteristics are so balanced and the draft of additional model concerns the whole field of value creation. According to stated research question and research problem we submit o multifactor model based on Balanced Scorecard, Economic Value Added decomposition as a tool for Performance Management System including soft factors, see Fig. 9. The tasks for future research are induced from research findings. The challenge in the field of market structure is fulfilled by EVA decomposition for the whole target population with the emphasis on microbreweries and compares the brewery industry with comparable EU countries. The challenge in the field of researches on analytical tools is verification of the drafted model on empirical data and taxonomy of this model for the particular size of the breweries.

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8. References

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