

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

Department of Economics



Diploma thesis

Economic aspects of setting up a microbrewery

Roman Řezáč

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

Roman Řezáč

Economics and Management

Thesis title

Economic Aspects of Setting up a Microbrewery

Objectives of thesis

Partial goal of the thesis is to adequately analyse and characterise noticeable increase in the number of microbreweries built in Czech Republic, compare it with the similar trend in developed economies, the United States of America being an example, evaluate the outcomes and outline possible development. The main goal is, on the basis of real data, specification of initial investment in a microbrewery in Czech Republic, quantification of all necessary operating expenses, description of internal and external environment, risk assessment and performance metrics.

Methodology

Firstly, the thorough conceptualisation is done in order to determine underlying idea of the whole thesis and to formulate the hypotheses. The initial part is followed by collection of relevant information from literature, internet and consultation with the brewing experts. All the data gathered are critically processed, compared, analysed and synthesised. Despite the emphasis on quantitative methods, the qualitative are used as well and thus the knowledge is discussed both by deduction and induction.

The proposed extent of the thesis

70 pages

Keywords

beer, microbrewery, craft brewery, costing, budgeting, SWOT, PEST, financial analysis

Recommended information sources

- BAMFORTH, Charles. Beer: Tap into The Art and Science of Brewing. USA: Oxford University Press; 3rd edition, 2009. 272 p. ISBN 978-0195305425
- BRUNING, Ted. The Microbrewers Handbook. Paragraph Publishing; 3rd edition edition, 2011. 248 p. ISBN 978-0956268167
- BYGRAVE, William D., ZACHARAKIS, Andrew. Entrepreneurship. Wiley; 2nd edition, 2010. 632 p. ISBN 978-0470450376
- GITMAN, Lawrence J., ZUTTER, Chad J. Principles of Managerial Finance. USA: Prentice Hall; 13th, 2011. ISBN 978-0136119463
- HAMPSON, Tim. The Beer Book. DK Publishing, 2008. 352 p. ISBN 978-0756639822
- HELFERT, Erich A. Financial Analysis: Tools and Techniques: A Guide for Managers. USA: McGraw-Hill; 1st edition, 2001. 480 p. ISBN 0-07-137834-0
- HORNSEY, Ian S. A History of Beer and Brewing. Royal Society of Chemistry; 1st edition, 2004. 632 p. ISBN 978-0854046300
- CHLÁDEK, Ladislav. Pivovarnictví. Grada Publishing, a.s., 2007. 207 p. ISBN 978-80-247-1616-9
- JACSKON, Michael. Beer. Dorling Kindersley Publishers Ltd, 2007. 288 p. ISBN 978-1405320283
- KELLER, Gerald. Statistics for Management and Economics, Abbreviated Edition. Cengage Learning; 9th edition, 2011. 816 p. ISBN 978-1111527327
- MANKIW, Gregory N. Principles of Economics. Cengage Learning; 6th edition, 2011. 856 p. ISBN 978-1111869723
- MCCONNELL, Campbell, BRUE, Stanley, FLYNN, Sean. Microeconomics. McGraw-Hill/Irwin; 19th edition, 2011. 600 p. ISBN 978-0077337735
- NOVOTNÝ, Petr. Pivovary České republiky. Kartografie PRAHA, a. s.; 3rd edition, 2012. 119 p. ISBN 978-80-7393-212-1
- PROTZ, Roger. The Organic Beer Guide. Carlton Books Limited, 2002. 176 p. ISBN 1842225758
- ROBBINS, Stephen P., COULTER, Mary. Management. Prentice Hall; 11th edition, 2010. 672 p. ISBN 978-0132538947
- ROBINSON, Thomas R., GREUNING, Hennie van, HENRY, Elaine, BROIHAHN, Michael A. International Financial Statement Analysis. Hoboken, New Jersey: John Wiley & Sons; 1 edition, 2008. 864 p. ISBN 978-0-470-28766-8
- SAMUELS, Warren J., BIDDLE, Jeff E., DAVIS, John B. A Companion to the History of Economic Thought. Wiley-Blackwell, 2006. 736 p. ISBN 978-1405134590
- WINTER, Zikmund. Dějiny řemesel a obchodu v Čechách v 14. a v 15. století. Prague: Česká akademie císaře Františka Josefa pro vědy, slovesnost a umění, 1906. Available online: <http://kramerius.mlp.cz/kramerius/MShowMonograph.do?id=1034>
- WOODSKE, Dan. A Brewer's Guide to Opening a Nano Brewery: Your 10,000 Dollars Brewery Consultant for 15 Dollars, Vol. 1. CreateSpace Independent Publishing Platform, 2012. 108 p. ISBN 978-1470087968

Expected date of thesis defence

2015/16 WS – FEM

The Diploma Thesis Supervisor

Ing. Tomáš Maier, Ph.D.

Supervising department

Department of Economics

Electronic approval: 11. 3. 2014

prof. Ing. Miroslav Svatoš, CSc.

Head of department

Electronic approval: 11. 3. 2014

Ing. Martin Pelikán, Ph.D.

Dean

Prague on 08. 11. 2015

Statutory declaration

I declare I have worked on the diploma thesis individually and under the direction of my supervisor. All the resources are included in the list at the end of the thesis.

In Prague on

.....

Roman Řezáč

Acknowledgement

I would like to thank Ing. Tomáš Maier, Ph.D. for his professional supervision, valuable advice and helpful consultations during the work on this thesis.

Economic aspects of setting up a microbrewery

Ekonomické aspekty zakládání minipivovaru

Summary

The diploma thesis is concerned with the attributes of various microbrewery business models, e.g. brewpubs, community supported brewing, nanobreweries, contract brewing, packaging microbreweries etc. Especially, their advantages and disadvantages are elaborated. Further, the sources of barriers to entry into microbrewing subsector in Czech Republic are described, e.g. the economies of scale, product differentiation, capital requirements, access to distribution channels etc. Then, the SWOT analysis, PEST analysis and financial analysis of the microbrewing subsector in Czech Republic are performed. In total, 38 microbreweries' financial statements are utilised and financial benchmarks for brewpubs and packaging microbreweries are calculated. Subsequently, a sample financial plan for a packaging microbrewery is developed, including the start-up plan, pricing, sales forecast, pro-forma financial statements, break-even analysis and key business ratios, which are compared with the microbrewery financial benchmarks. The aim is to assess the profitability of setting up a microbrewery.

Keywords

beer, microbrewery, craft brewery, SWOT, PEST, financial analysis, financial plan

Souhrn

Diplomová práce se zabývá charakteristikou obchodních modelů používaných minipivovary, např. brewpuby, komunitou podporované pivovary, nanopivovary, smluvní vaření piva, balicí minipivovary atd. Zpracovány jsou obzvláště jejich výhody a nevýhody. Dále jsou popsány zdroje překážek vstupu do minipivovarského průmyslu v České Republice, např. výnosy z rozsahu, diferenciací výrobků, kapitálové požadavky, přístup k distribučním kanálům atd. Poté je vypracována SWOT analýza, PEST analýza a finanční analýza sektoru minipivovarů v České republice. Byly použity finanční výkazy celkem 38 minipivovarů a vypočteny finanční měřítka pro brewpuby a balicí minipivovary. Následně je vypracován finanční plán zaměřený na založení balicího minipivovaru včetně počáteční investice, cenové strategie, odhadu prodejů, předběžných finančních výkazů, analýzy bodu zvratu a klíčových poměrových ukazatelů, které jsou porovnány s minipivovarskými finančními měřítky. Cílem je zhodnocení ziskovosti založení minipivovaru.

Klíčová slova

pivo, minipivovar, řemeslný pivovar, SWOT, PEST, finanční analýza, finanční plán

Contents

1. Introduction	6
2. The goal and methodology	7
3. The nomenclature	8
3.1. Production factors perspective	14
4. Business models	18
4.1. Nanobrewery	18
4.2. Community supported brewing	22
4.3. Contract brewing	24
4.3.1. Advantages of contract brewing	28
4.3.2. Challenges of contract brewing	30
4.4. Brewery alternating proprietorships	32
4.5. Brewery incubator	34
4.6. Cooperative breweries	36
4.7. Brewpubs	36
4.7.1. Categorisation of brewpubs	44
4.7.2. Serving food	44
4.7.3. Business plan	47
4.7.4. Brewpub layout	48
4.7.5. Off-site sales	50
4.7.6. Ownership	53
4.7.7. Location	54
4.8. Brewpub chain	55
4.9. Fermentation pubs	56
4.10. Packaging brewery	57
4.10.1. Role of packaging	57
5. Barriers to entry	60
6. Analyses	69
6.1. SWOT analysis	69
6.2. PEST analysis	71
6.3. Financial analysis	72
7. Microbrewery financial plan	80
7.1. Key assumptions	80
7.2. Management	82
7.3. Start-up plan	83
7.4. Pricing	87

7.5. Market segmentation.....	87
7.6. Sales forecast.....	89
7.7. Break-even analysis.....	90
7.8. Projected profit & loss.....	93
7.9. Projected balance sheet.....	94
7.10. Projected cash-flow statement.....	95
7.11. Key business ratios.....	96
7.12. Risk assessment.....	98
8. Conclusion.....	99
9. List of resources.....	100
10. List of abbreviations.....	107
11. List of tables.....	108
12. List of charts.....	108
13. Appendix.....	109
13.1. List of appendices.....	109

1. Introduction

Currently, we are witnessing a growing number of microbreweries in the Czech Republic but also in other countries. The trend of setting up these small-scale brewing facilities, which many call "the boom of microbreweries," began in the western world in the second half of the twentieth century and gradually spread elsewhere, even into areas that are normally dedicated to other alcoholic beverages such as wine and spirits. Apart from the prefix "micro", another two adjectives are often used to describe these small companies, i.e. "craft" and "traditional", in order to differentiate their production from the beer brewed by big national and international brewing groups, which is considered inferior by many beer drinkers. For understanding such attitude, it is important to seek information in the history of brewing, especially the industrial revolution and subsequent consolidation of the breweries, and recent changes in consumption patterns. Many researchers believe the emergence of microbreweries is predominantly caused by changing demand, albeit other factors play their role as well, e.g. the tax reliefs.

When trying to define a "microbrewery", however, one may face some difficulties, stemming from the fact there is no universally applicable nomenclature and, therefore, what is considered a microbrewery in Czech Republic does not have to be necessarily considered a microbrewery elsewhere. It is also important to note that not all of the microbreweries can be characterised as "traditional" and "craft" and the same applies to bigger brewing facilities, which do not have to be always labelled as "producers of unified beer" because they can adhere to the traditional production processes and brew a very taste-differentiated beer as well.

Apart from the differences between large and smaller brewing facilities, there are also many differences between the microbreweries themselves. It is associated with the range of possible business models which are employed, e.g. the contract brewing, brewpub, packaging microbrewery etc. Of course, every microbrewery business model has its own advantages and disadvantages and all wannabe brewers should take them into consideration before developing a thorough business plan.

After preparing the pro-forma financial statements, which are part of every proper business plan, one should calculate the basic financial ratios and compare them with the industry or key competitors' financial indicators. Nevertheless, such benchmarks are not always available, e.g. for the microbrewing subsector, expensive or difficult to ascertain. Despite considerable amount of time needed for the calculation of benchmarks, it is often the last resort for an analyst who wants to compare and deduce some conclusions.

2. The goal and methodology

The underlying goal of the thesis is to develop a sample microbrewery financial plan, which includes all the necessary financial information for potential investors and possibly those interested in establishing a microbrewery in Czech Republic. In order to achieve the main goal, several partial goals were set. One of the partial goals is an analysis of the business models utilised by microbrewers, e.g. brewpubs, packaging microbreweries, packaging brewpubs etc., with the aim of understanding their advantages and disadvantages. The second partial goal is associated with the barriers to entry, e.g. the economies of scale, product differentiation and switching costs. The third partial goal is the analysis of microbrewing subsector in Czech Republic via SWOT, PEST and financial analyses. In reference to the last one, the main objective is to calculate the financial microbrewery benchmarks.

In order to reach the goals, I firstly collected appropriate literature, including books, magazines and essays related to economics of beer, demand for beer, production of beer, traditional production, brewing industry, opening and running a microbrewery, homebrewing, history of brewing etc. Apart from the literature, I also used various on-line articles, e.g. the articles provided by microbreweries' websites. I analysed the literature, compared it and synthesised the retrieved knowledge. When possible, I enriched the text with my empirical knowledge I gained via visiting the breweries in person and with information I obtained from discussions with brewmasters, beer geeks, owners and operators of hospitality and retail units (beer shops, beer bars, brewpubs etc.) and fellow homebrewers.

I gathered financial statements of a selected number of Czech microbreweries, copied the data into a spreadsheet and calculated liquidity, solvency, profitability and activity financial ratios. I used the basic statistical functions, i.e. arithmetic means, medians and standard deviations. As regards the financial plan, I followed the template provided by the Faculty of Management from the University of Primorska, Slovenia. I estimated the initial investment in a microbrewery, including the construction works necessary for the installation and subsequent operation of the brewing equipment. Then, I performed the break-even analysis, prepared the pro-forma financial statements, calculated the basic financial ratios and compared them to the subsector financial benchmarks. Also, I included the basic investment indicators, i.e. internal rate of return, discount rates (desired rate of return and weighted average cost of capital) and economic value added.

3. The nomenclature

According to Merriam-Webster (M-W) on-line dictionary, the term microbrewery is used to describe a small brewery that makes beer in small amounts. In the full M-W definition, however, the word “specialty” is added in front of the “beer”, referring to various beer styles, which are different from (e.g. in a supermarket) commonly available products. Also, the dictionary claims the first known use of the word is the year of 1982 but the term is, with the highest probability, older than that. ^[1] Various beer-related on-line articles cite the following sentence more or less in the same form:

„The term originated in the UK in the late 1970s to describe the new generation of small breweries that focused on producing traditional cask ale.“ ^{[2], [3], [4]}

No resources supporting the statement are included, although one of the possible original sources can be the Harish Maiya’s “The King of Good Times” (2011) or, which is a little bit worse alternative, the Wikipedia. ^[5] However, the statement may very well be the truth, taking into consideration the foundation of CAMRA (Campaign for Real Ale) in 1971, which promoted those “traditional cask ales” produced by small breweries. ^[6] The first one of those small breweries in the UK was the Traquair House Brewery rediscovered by Peter Maxwell Stuart in 1960 and revived in 1965, where only the original equipment was used and the beer fermented in traditional oak tuns. Later, when CAMRA was established, Peter was recognized as a true pioneer of microbrewing. ^[7] Other breweries followed the Traquair House Brewery’s path (reopening of a brewery in Selby, the former Middlebrough’s Brewery, in 1972; opening of a totally new brewing site, the Miner’s Arms, in Somerset in 1973 and establishing a microbrewery in Litchborough in 1974 by Bill Urquart in an outbuilding at his home) and today, nobody actually remembers, who was the first one to coin the term. ^{[8][9]} In Garret Oliver’s contribution on microbrewing to The Oxford Companion to Beer, one can ascertain that the word “microbrewery” emerged in the UK in 1970s to describe the “new wave brewers”, who brewed their “new” beers in a small building or a shed (maybe, the more appropriate term would be “revived” instead of “new”; the resurrection of extinct/dead beer styles is typical of microbrewing movement, e.g. the styles like porter, barleywine and berliner-weisse). ^{[10], [11]}

However, according to Charlie Papazian, the author of homebrewers’ scripture “The Complete Joy of Homebrewing” and one of the founders of the American Homebrewers Association, the term was coined in the early 1980s by Stuart Harris, a volunteer writing for Zymurgy magazine, a homebrewing magazine. Initially, Charlie Papazian defined microbrewery as a brewery not producing more than 5,000 barrels annually but later, the small brewers grew, and the threshold moved to 10,000 and then

to 15,000 barrels. In the 1987 issue of New Brewer magazine, for the first time, someone tried to provide a sophisticated classification of breweries by size ^[12]:

	Annual production
Microbrewery	No more than 15,000 barrels
Small brewery	15,000 - 100,000 barrels
Large brewery	100,000 - 1,000,000 barrels
Mega or giant brewery	More than 1,000,000 barrels

Table 1 Classification of breweries; source: The Craft Beer Revolution

Papazian not only classified the breweries by size, but also provided the new beer industry with terms like “craft brewery” and “brewpub” or “pub brewery”. Such terms helped enthusiastic microbrewers to differentiate their production from the mass-produced beer. Craft brewery and brewpubs were described as follows ^[12]:

Craft brewery - any brewery, where the manual arts and skills of a brewer are used to create its products.

&

Brewpub – A retail establishment, restaurant, bar, lounge, taproom, nightclub, or eatery that sells beer brewed on the same premises as the retail establishment. A brewpub is a type of microbrewery.

The terms coined above served as a base for wording and definitions proposed by the Brewers Association (BA), which was created in 2005 by merging Brewer’s Association of America and the Papazian’s Association of Brewers. ^[12] Later, the classification of breweries by size was slightly changed ^[13]:

	Annual production	Characteristic
Microbrewery	Up to 15,000 barrels	More than 75% of beer sold off-premises
Brewpub	Up to 15,000 barrels	More than 75% of beer sold on-premises
Regional brewery	15,000 - 6,000,000 barrels	-
Large brewery	More than 6,000,000 barrels	-

Table 2 Classification of breweries 2nd; Source: brewers Association

As we can see, the Brewers Association strictly differentiates between microbrewery and brewpub. Further, the term mega or giant brewery was replaced by

“large brewery” and the threshold moved from 1,000,000 barrels to 6,000,000 barrels. Actually, it initially moved from 1,000,000 barrels to 2,000,000 barrels and was not changed until December 20, 2010. ^[14] The former threshold was related to Alcohol and Tobacco Tax and Trade Bureau (TTB) excise tax differential for “small brewers”, which are defined (in the regulation) as not producing more than 2,000,000 barrels a year. ^[12] By changing the limits, the statistics provided on craft beer can continue to accurately mirror the development and growth of the industry. One of the main reasons of moving the threshold up to 6,000,000 barrels was, undoubtedly, unprecedented success of The Boston Beer Company, which became the first craft brewer to produce more than 2,000,000 barrels annually. ^[15]

Apart from the size, the term “craft” was further elaborated and three pillars of the definition were introduced ^[16]:

1. **Small.** According to this pillar, even a regional brewery can be considered a craft brewery because the term “small” has to be understood as relating to the overall size of the industry. Therefore, the limit of 6,000,000 barrels is supplemented with a relative figure of 3%, expressing the share in total U.S. annual sales and putting the barrel limit into context.
2. **Independent.** In order to become a member of BA, a brewer has to be independent, meaning that not more than 25% of a craft brewery is owned or controlled by another alcoholic beverage industry member, which is not itself a craft brewer.
3. **Traditional.** In my opinion, the most important pillar of the “craft” definition as it refers to the usage of raw materials. Without a doubt, the interpretation of “tradition” or “traditional” is not easy, depending on various factors, and even the BA definition is a little bit oxymoronic, considering its inclusion of “innovativeness” in the term “traditional”. Basically, a majority of beer produced by a craft brewery should be brewed either with traditional ingredients (as required, for example, by well-known Reinheitsgebot) or innovative ingredients and thus recognizing, actually, adjunct brewing as traditional. Nevertheless, the FMBs (flavoured malt beverages) don’t have the right to be treated as true beer.

Despite sophisticated BA classification and terminology, not everywhere is the term “craft” used to refer to microbreweries. According to Ted Bruning, the UK microbrewers rejected the term “craft brewers” because it is “too evocative of the kitchen sink”. Other terms like “New brewers” or “New wave brewers” weren’t suitable as well and, therefore, the brewers agreed on “local brewers” as it helps them to identify with

local food movement and provides reasoning for differentiation from the regionals and nationals. ^[8] The term “local“ is used in the UK, indeed, taking into consideration SIBA’s (Society of Independent Brewers) annual reports and their reference to Her Majesty’s Revenue & Customs (HRMC) classification of brewers ^[17]:

	Annual production
Micro	Up to 5,000 hectolitres
Local	5,000 - 30,000 hectolitres
Regional	30,000 - 200,000 hectolitres
National	More than 200,000 hectolitres

Table 3 Classification of breweries 3rd; Source: SIBA

To become a member of SIBA, a brewer’s production of beer should not exceed 200,000 hectolitres a year, which is in compliance with the European definition of “independent small brewery“ coined by the European Council in directive 92/83/EEC of 19 October 1992 on the harmonization of the structures of excise duties on alcohol and alcoholic beverages ^{[17][18]}:

„For the purposes of the reduced rates, the term “independent small brewery“ shall mean a brewery, which is legally and economically independent of any other brewery, which uses premises situated physically apart from those of any other brewery and does not operate under licence. However, where two or more small breweries cooperate, and their combined annual production does not exceed 200,000 hl, those breweries may be treated as a single independent small brewery.“ ^[18]

Also, some member states created several excise tax bands for independent small breweries to further differentiate in size, while complying with the regulation. In Czech Republic (CR), for example, the breweries not producing more than 10,000 hectolitres a year are eligible to the highest excise tax reduction. ^[19] Further, if a Czech brewery applies for a membership in the Bohemian-Moravian Association of Microbreweries, it has to comply with the above mentioned threshold as well. For that reason, one could conclude that the Czech definition of a microbrewery is “a brewery not producing more than 10,000 hl a year“, but it is not as simple as that. ^[20]

In the book “Restaurant Microbreweries in the Czech Republic“, it is stated that a typical annual production of a Czech microbrewery lies between 500 and 3000 hl, but still, a microbrewery is defined (in this book) as a facility with maximum per annum output of 10,000 hl. ^[21] Kateřina Pojmanová provides, in her diploma thesis “Restaurant

Microbreweries and Family Breweries in Czech Republic“, a table classifying breweries as follows ^[22]:

	Annual production
Microbrewery	Up to 10,000 hectolitres
Restaurant brewery	Up to 200,000 hectolitres
Regional brewery	Up to 500,000 hectolitres
Large brewery	More than 500,000 hectolitres

Table 4 Classification of breweries 4th; Source: Pojmanová Kateřina, Restaurant Microbreweries and Family Breweries in Czech Republic

As regards above mentioned terminology, it could have been inspired by Berry Verhoef’s book “Beer Encyclopaedia“ (I don’t refer to the actual thresholds), where the microbrewery is defined as a facility producing between 500 – 10,000 hl of beer a year. ^[23] The same classification is used in the study “Changes in the Czech Brewing Industry at the Turn of the Millennium“ written by Vratislav Kozák and Věra Kozáková. ^[24] However, the threshold for the restaurant brewery used in this classification is unnecessarily high. Another definition of a typical Czech microbrewery can be found in the article “Selected Aspects of the Microbreweries Boom“ written by Tomáš Maier. In his opinion, a microbrewery’s annual production doesn’t exceed 1,000 hectolitres. ^[25]

Instead of classifying breweries by absolute values, it would be more appropriate to take into account the size of domestic market and express the size in relative values, i.e. how it is done in the 1st pillar of BA craft brewery definition (maximum of 3% market share). Actually, in a paper “A Beer Market in Transition“, Janez Šušteršič and Snežana Šušteršič classified “small breweries“ as all beer producers with less than 1% market share. Complying with the definition of 1% market share, there were 42 small breweries in Slovenia in 2007 with average annual production of 204 hl. ^[26]

What is small in the U.S.A. does not have to be necessarily small in the Czech Republic and vice versa (the same applies, for example, to the CR and Slovenia comparison). Actually, if we follow the most common Czech microbrewery threshold of 10,000 hectolitres/year, such a brewery is relatively larger than its American counterpart:

Microbrewery	Market	Market share
Czech	18 million hectolitres	0.06%
American	200 million barrels	0.0075%

Table 5 Czech and American microbreweries' market share; Source: own work

By using the American relative values to calculate the Czech absolute values, one acquires outcomes that are surprisingly very close both to the size of a microbrewery recommended by Tomáš Maier and the size of a regional brewery presented by Kateřina Pojmanová:

Class	American relative value	Czech market	Recalculated absolute value
Microbrewery	0.0075%	18 million hectolitres	1,350 hectolitres
Regional	3.00%		540,000 hectolitres

Table 6 American brewery class market share applied to Czech market; Source: own work

Taking above mentioned into account, one has to conclude that classifying breweries by size varies from country to country and there is no final definition because beer markets differ in their sizes and characteristics as well. It can be summarised by following statement:

„What is small? That’s another question I am often asked. It depends on each country’s own circumstance. In the U.S., the largest craft brewer produces about 1.3 percent of all of the beer enjoyed in the country in a year.“ ^[27] Charlie Papazian

For that reason, the following table which categorizes breweries by their market share could be used as an alternative:

	Market share
Microbrewery	Up to 0.0075%
Small brewery	0.0075% - 1 %
Medium-sized brewery	1% - 3%
Large brewery	More than 3%

Table 7 Classification of breweries 5th; Source: own work

Deliberately, I excluded geographical expressions like local or regional because, in spite of the terms being entrenched (at least as regards the word “regional”), they are not always accurate, considering that microbreweries and small breweries do not have to be necessarily local and adhere to the “around the chimney” sales strategy, i.e. selling beer in the closest vicinity of its production. Actually, some of those breweries may be partially export oriented, which is the case of the brewery at St. Peter’s, indeed. Being situated in England and with 17,500 UK barrels annual production, St. Peter’s could be classified as a

small brewery (0.07% market share), however, 80% of the production is bottled and half of the bottled volume is exported. ^[28] In summary, it is more appropriate and cohesive to classify breweries in this way than mixing sizes and geographical terms in one place.

Further, the above proposed nomenclature is in compliance with European enterprise categories as defined in the Commission Recommendation 2003/361/EC of 6 May 2003 and as used by the Eurostat. ^{[29],[30]} The following table shows the classes of enterprises, which are distinguished on the basis of balance sheet bottom line, annual turnover or number of employees. Naturally, breweries can be classified according to such thresholds as well.

Enterprise category	Number of employees	Annual turnover	Annual balance sheet total
Micro enterprise	< 10	≤ 2€ million	≤ 2€ million
Small enterprise	< 50	≤ 10€ million	≤ 10€ million
Medium-sized enterprise	< 250	≤ 50€ million	≤ 43€ million
Large enterprise	≥ 250	> 50€ million	> 43€ million

Table 8 Classification of companies; Source: EUR-Lex, The New SME definition – [29], [30]

3.1. Production factors perspective

Even the economic theory can provide an insight into the classification of breweries, although more general than the tables above. All products, including beer, are made of a combination of three basic production factors: land, labour and capital. Usually, the land would be represented by material inputs (in spite of the material being considered, sometimes, as a secondary factor of production) and space/area, whereas the capital would incorporate the PP&E (property, plant & equipment) and intangible assets, e.g. ideas, know-how and technology. The basic material inputs for beer production are hops, malt, water and yeast. As regards the “beer capital”, it is represented, for example, by brewing equipment like beer kettles, fermentation and maturation tanks, yeast storage tanks, wort cooling units etc. Commonly, the economic term “labour” represents a purposive human activity, e.g. bottling, kegging and labelling (manual). In the following table, there are two basic production factors, land and capital, which are further divided into four subgroups. According to the characteristics of the subgroups, one can decide whether a brewery is rather micro (smaller), large (bigger), contemporary (includes innovation), traditional, craft or industrial:

Production factor	Subgroup	Characteristic	Brewery type
Capital	Property, plant and equipment	Used relatively less intensively	Craft
		Used relatively more intensively	Industrial
	Know-how, technology	Distant past & specific area related	Traditional
		Recent past, present & specific area related	Contemporary
Land	Space/area	Less space/area required	Micro
		More space/area required	Large
	Material inputs	Distant past & specific area related	Traditional
		Recent past, present & specific area related	Contemporary

Table 9 Brewery classification 7th; Source: own work

In the table above, the level of capital intensity is directly related to labour, i.e. if a production process is capital intensive, it is not labour intensive and vice versa. Therefore, I do not include the production factor “labour” in the table. In spite of the classification being (in many respects) too reductionist, I believe it helps to clarify the terminology.

A craft brewery is believed to be more labour intensive when compared to its industrial and relatively more capital intensive counterpart but it does not necessarily mean an industrial brewery is a large brewery. In fact, many of the “microbreweries” could be considered industrial breweries with the only difference being the size of their brewing equipment. The input of labour in the production process of beer is influenced, especially, by the level of automatization in a brewery, i.e. the differences like:

- Automatic vs. manual transport of the grist into the mash tun
- Automatic vs. manual control of the valves and claps
- Automatic vs. manual timing
- Automatic vs. manual bottling, kegging and labelling

However, the gap between “industrial” and “craft” is not as noticeable as in other industries, e.g. shoemaking, because the craft breweries are still relatively capital intensive, merely to a lesser extent than the “industrial ones”. Also, the quality of so called “craft beer” is not higher than the quality of beer produced by companies which use proportionately more capital to labour. Provided it is not done in a wrong way, manual timing, bottling, kegging and labelling does not have any effect on the quality of beer. Then, the only difference between craft and industrial may be the higher over-the-time variability in the batches of beer produced (the beer style, ingredients, production process etc. do not change), which stems from lower standardization and higher probability of “human error”, i.e. every batch of beer produced by a craft brewery can be potentially unique (either bad or good).

In case of know-how, I refer to the production process, particularly to the processes of mashing, i.e. decoction vs. infusion mashing, lautering, hopping and brewing. The processes, mash temperatures, brewing times etc. change over time and across countries. For example, the infusion mashing was traditionally preferred in the United Kingdom, whereas the decoction mashing became very popular in the area of present-day Germany. Nevertheless, what was a common practice in one time period, did not have to be a common practice in another one, albeit in the same space/area. The same applies to different space/areas in the same time period, like in the above UK and Germany example. For that reason, it is crucial to specify time and space in order to decide what is and what is not “traditional production process”. Also, the level of technology plays its role as well, taking into consideration the material the vessels were made of many centuries ago, i.e. wood. For example, the wooden “brew kettles” could not be directly heated by fire and, therefore, the liquid (wort) had to be heated by very hot stones (which, unlike the wood, could be easily heated by fire), which were dropped into the vessel. Further, the temperatures in lager cellars were kept low by storing natural ice there, at least until the discovery of more efficient refrigeration technology (Carl von Linde’s invention).

The annual production of a brewery is influenced by the capacity of its brew house (hot block) as well as by the capacity and number of its fermentation and maturation tanks (cold block). Of course, the higher the capacity and number of those vessels, the higher the requirements for space. *Ceteris paribus* (the same style of beer, technology and production process), a brewery with higher theoretical maximum production can be deemed bigger than a brewery with lower potential maximum output. In order to calculate the maximum potential output, however, one has to know the hot block and cold block capacity, which is a piece of information external analysts may find difficult to ascertain (many microbreweries keep it secret). Furthermore, higher production is reflected in higher requirements for storage space, space for administration activities, parking space etc. Therefore, even a simple physical size could be used for brewery classification, albeit some thresholds would have to be empirically determined.

Analogically to the know-how and technology, the raw materials used for beer production could be also considered either as traditional or non-traditional (contemporary and even innovative) but in this case, the question is not about “how” but about “what” or “what kind”. What kind of malt, hops, yeast or water is used for brewing a specific type of beer, e.g. two-row barley Pilsner malt, saaz hops, Czech lager yeast and soft water. In addition to the four basic ingredients, breweries may use adjuncts and malt substitutes like non-malted barley and other non-malted grains, sugar, starch syrup etc. Like the know-how and technology, also the inputs are related to a specific period of time and area, e.g. in the past, various herbs were used instead of hops and in the area of

contemporary Czech Republic, wheat malt used to be more popular than barley malt. Another example is the usage of corn in the New World or rice in Asian countries, which is absolutely understandable.

It is important to realise that smaller scale brewing facilities do not necessarily imply higher quality, tradition and craft. The relationship between these attributes could be summarised by the following equation:

micro ≠ craft ≠ traditional

4. Business models

4.1. Nanobrewery

“It just doesn’t make sense to me to begin business in handcuffs, however much you might enjoy the processes of brewing beer.” ^[31] Dick Cantwell

Again and analogically to the microbrewery definition, there is no precise and finite definition of a nanobrewery (aka nano-breweries, pico breweries or bucket breweries) and neither there is an official BA definition. Generally, they are referred to either as scaled-down microbreweries or, on the other hand, large-scale homebrewers - depending on the preferences and point of view. Nevertheless, there is one very general official definition provided by the Alcohol and Tobacco Tax and Trade Bureau ^[32]:

Nano brewery: A very small brewery operation.

As regards the size of a nanobrewery, it is not usually expressed on a per annum basis but rather on a per batch basis. The number of batches brewed per year may vary considerably and be even higher than the number of days in a year, meaning more than one batch brewed a day. Dan Woodske, the author of “A Brewer’s Guide To Opening a Nanobrewery“, considers a nanobrewery to be a brewing system with a capacity not exceeding 3 barrels. ^[33] The same threshold is used by Mike Hess Brewing from San Diego, which also uses the “range“ definition, putting a nanobrewery’s capacity somewhere between 10 and 75 gallons ^[34]. According to Dick Cantwell, the threshold for “extremely small-scale brewing“ facilities (nanobreweries) is 60 gallons. ^[31] Further, Bill and Christine Rittenour from the Morgantown Area Society of Homebrewers define a nanobrewery as a brewery that utilizes a system with less than 4 barrels capacity. ^[35] Erik Lars Myers from the Mystery Brewing considers as a maximum threshold for a nanobrewery to be 5 barrels. ^[36] As we can see, the definitions vary almost to the same extent as in the case of “microbreweries“.

Apart from the per batch thresholds, there are some examples of the per annum thresholds as well. For example, the New Hampshire law describes a nanobrewery as a business that manufactures beer or specialty beer, not exceeding 2,000 barrels annually. ^[37] Such a threshold is, however, very high and does not reflect the real average nanobrewery production. The New Brewer magazine provides, in my opinion, more suitable production threshold for a typical nanobrewery:

“Most of these small breweries make fewer than 100 barrels of beer annually. Most, in fact, make less than 50 barrels, with tiny brewhouses that amount to little more than ramped-up homebrewing systems.” ^[38]

In the Czech Republic, one “brewery engineering” company, PIVO Praha s.r.o. (s.r.o. = limited liability company), sets a threshold for a “pico brewery” between 100 and 500 hl of annual production. ^[39] Another Czech company, which produces, supplies and commissions complete brewery facilities, the Destila s.r.o., sets a threshold for a “microbrewery” to lie between 10,000 and 180,000 litres a year (cca 1534 barrels). ^[40] It is very important to note, however, that In the Czech Republic, the term “microbrewery” has a different meaning than in English speaking countries, referring to smaller microbreweries, also known as the nanobreweries. Further, the Czechs usually use the term “minibrewery” to refer to what is understood as a “microbrewery” in English speaking countries. The Destila offers two brewing facilities in the “microbrewery” category, from which the smaller one, i.e. the one with 10,000 - 60,000 litres annual production capacity, can be deemed a nanobrewery – at least as regards the lower band of the capacity range. Similarly to the problem of microbrewery definition, even the nanobreweries’ size could be expressed in relative figures because what is “nano” in Czech Republic doesn’t have to be “nano” elsewhere.

Regarding the “pico” prefix, it is under the “nano” prefix according to the SI (International System of Units) system of metric prefixes, indeed, but in my opinion, the term “pico brewery” is unnecessary because it could go simply forever, e.g. to “femto breweries”. It does not make any sense as there is no real purpose for those terms. For that reason, the “nanobrewery” is enough.

Actually, the nanobrewery could be labelled as a “halfway house” between homebrewing and a microbrewery as defined in the previous section, being a natural step in moving from the later stages of homebrewing to professional brewing. According to Michael Tonsmeire, there are four main stages of homebrewing ^[41]:

- 1) **Beginner** – “I hope it turns out well.”
- 2) **Advanced Beginner** – “I think I know what I am doing.”
- 3) **Advanced** – “I make excellent beer.”
- 4) **Expert** – “Why aren’t I brewing professionally?”

When a homebrewer brews beer others appreciate and when they even start to demand it, he or she may begin to think about commercialising their hobby. Complying with above listed stages of development, a nanobrewery can be, therefore, thought of as an expert homebrewer or a group of expert homebrewers, who turned their hobby into a business.

However, there is a big debate whether it is a sustainable and profitable business model, indeed. Taking into consideration the “Great Nanobrewery List” created by Hess

Brewing (in accordance with the 3 barrels threshold), there are more than 90 nanobreweries in operation in the United States, indicating such a strategy may be, in reality, viable. Also, according to Dan Woodske and his book, there is a way how to do it profitably if one is creative and hardworking enough. There are, undoubtedly, some advantages to opening a nanobrewery instead of moving directly to the microbrewery level:

- 1) Considerably lower initial investment costs**
- 2) No other employees are required**
- 3) Brewer doesn't have to quit his or her day job**
- 4) It is not that space-demanding**
- 5) Even more flexibility is allowed**
- 6) Less risky way of entering the market**

Not everybody has hundred thousands of dollars or millions of Czech crowns at his or her disposal and raising money for a start-up is very difficult and time consuming. For that reason, a nanobrewery may work as a cheaper and faster way of becoming a part of craft brewing industry. In such a case, it works like a stepping stone, a mere interim plan, on a way to proper production brewery or a brewpub. Also, all the necessary activities, including production, sales, accounting and administration, may be done by a single person, being a sort of "one man commercial brewery". Depending on the end goal (long-term, strategic goals), a brewer may even keep his or her day job, maintain the brewing system intentionally small and enjoy an extended and prestigious hobby of beer brewing at a larger scale than homebrewing. However, a mere production of excellent beer, which can be occasionally on tap in the closest bar (which is, undoubtedly, a very pleasant sight for a homebrewer), is not a viable business idea. But in spite of not being a viable business, which does not bring lots of money, the nanobrewers love their jobs because they are paid in other ways, e.g. job satisfaction and acknowledgment by the community.

Because of the size, the nanobreweries can fit almost to any room and, therefore, it is not as hard to find a suitable site as in case of larger-scale brewing, meaning that even one's backyard can serve as an appropriate space for doing the business. Owing to the low capacity, the nanobrewers can almost constantly change their supply of various beer styles and thus satisfy the constantly changing demand for variability and uniqueness.

"There are no entrance exams for entrepreneurs" ^[42]

Sure enough, the above statement by Tom Potter is true, but starting a nanobrewery is not as risky as opening other larger-scale facilities because in case of a failure, it is at least a quicker and cheaper failure. For that reason, a nanobrewery can be

considered as a sort of entrance exam for expert homebrewers, which is costly, of course, but it won't ruin them as much as an unsuccessful microbrewery. Further, it can be a very good entrance strategy, which may help to establish a support of local community, step by step, and to build a strong brand, all of which will be very useful in later stages when growing bigger.

Nanobrewery doesn't have to be necessarily a start-up. Rather, it can be built by well-established microbreweries in order to follow the "failing quickly and cheaply" strategy. In such a case, a nanobrewery serves as an "experimentation" or "pilot" brewery for prototyping, i.e. testing new recipes and beer styles, gathering feedback from consumers in natural environment (tasting rooms, taprooms, nano brewpubs etc.), and evaluating and evolving the concept before introducing the final product to the larger market.

Apart from the advantages, there are some very important and crucial disadvantages to this business model:

- 1) It requires enormous amount of work**
- 2) Under-production**
- 3) Under-capitalisation**

Producing beer via homebrewing is costly and the reality is that nanobrewing is not that much cheaper either. Commercial brewing on such a small scale costs lots of time because it requires an operator of the facility to brew many batches a week. Evan Klein from the Barrier Brewing, for example, used to brew twelve times a week ^[12]. Sam Calagione, the founder of Dogfish Head Brewery, had to brew 3 batches a day (on a 10 gallon system) for five or six days a week in order to make enough money for his restaurant, a nano-brewpub. ^[43] Focusing only on the production phase means less devotion to other activities like selling, distribution, marketing communication etc. Under such conditions, if the goal of the brewery is to make money, it is almost impossible to keep one's day job. It ceases to be a simple hobby.

After all the time and effort put into running a business, the nanobrewer makes comparatively very little beer. Nanobreweries are simply too scale-inefficient and not even remotely approaching the minimal efficient scale of large breweries. From the economic standpoint, it makes more sense to run a brewery much bigger than a nano because, for example, the production of 20 barrels takes almost the same amount of time as production of 2 barrels. Also, when purchasing the inputs in small amount, one has to pay relatively more than would be the case of higher volume purchases. The same applies to the costs of brewing equipment, which gets proportionally more expensive as it gets

smaller (cost versus capacity problem), i.e. the initial investment may be lower in absolute terms but it is higher in relative terms.

Naturally, as regards the access to debt or equity financing, it is even more difficult for a nanobrewery than for microbreweries or small breweries. Under-production and labour-intensive nature of this kind of business may lead, in the end, to under-capitalisation, which, if not treated adequately, may lead to bankruptcy. It is very difficult to make money with such a small brewing system, especially for the “one man breweries“, where everything is done by one single person. In order to secure positive cash-flows, therefore, it is recommended to sell beer on-site and in smaller amounts, preferably per pint or per growler. When having a taproom or a tasting room with enough traffic, the higher per pint or per growler margins may make the venture profitable. ^[36]

Provided the overheads are kept low, e.g. paying no rent, and if a nanobrewer doesn't pay himself, the venture can be decently profitable, indeed, but the question remains whether it is sustainable over time. Some of the early pioneers of the American craft beer revolution started with this kind of mini-micro brewing systems but they, on the other hand, scaled it up as fast as possible because it was the only rational way to go. ^[31] Jack McAuliffe's New Albion, a barrel and a half brewing operation, wasn't that lucky, however, and was closed down due to under-production and under-capitalization. ^[12]

Being successful in this kind of business can lead to “nanobrewery vicious cycle“ because success leads to higher demand, which has to be met by brewing more beer, leading to even more working hours and thus higher losses. In the end, there are basically three options:

- 1) Fall victim to the vicious cycle, i.e. closing down**
- 2) Upsizing to the more efficient scale**
- 3) Contract brewing**

4.2. Community supported brewing

Adapting the principles of the Community Supported Agriculture (CSA), the Community Supported Brewery (CSB) receives money upfront from a limited number of subscribers in exchange for brewing beer for them on a regular basis for a limited period of time. The intervals and periods differ from one CSB to another but usually the beer is supplied every month either for one year or half a year. Also, some of the breweries may deliver the “subscribed beer“ directly to the members, whereas others require them to pick their subscription up at the brewery. In some cases, an off-brewery delivery site may

be agreed upon. In reference to packaging, the growlers are very popular and bottles by the same token. Apart from the pre-paid brew, the members enjoy other benefits like discounts for other beer and goods purchases and member-only events like beer education events, beer tasting nights, pairing beer with food events etc. ^{[44], [45], [46]}

Analogically to the CSA, it is important to secure sufficient variability of the products by brewing wide range of beer styles to keep the subscribers interested and satisfied with what they paid for in advance. Here lies the opportunity for extremely small breweries, i.e. nanobreweries, because they are the ones with the highest flexibility and therefore the highest potential of providing the highest beer variability. One example of successful utilization of this kind of business model is the Big Alice Brewing Company from Long Island. Kyle Hurst, the co-founder and head brewer of the nanobrewery, compares their brewery concept with CSA, when people often don't know what vegetables they are getting:

“Here, they don't know what beer they are getting because every time we brew, we're brewing a different beer.” ^[48]

As the principles of CSA can be implemented almost everywhere, e.g. community supported fisheries, community supported art, community supported publishing etc., there are many possibilities for cooperation. Taking into consideration growing appreciation of beer as an equivalent of wine suitable for food pairing, the CSBs may cooperate with CSA cheese producers or Community Supported Chocolate Companies and provide their members with already pre-paired bundles of gourmet experience.

The usually identified benefits for Community Supported Brewers are as follows ^[47]:

- 1) Secured income**
- 2) Higher margins**
- 3) Better responsiveness**

Truly, one of the biggest advantages is the secured flow of financial capital, thus avoiding the problem of nanobrewery undercapitalization. In this way, a brewer doesn't have to worry about raising funds and can devote more of his or her time to brewing beer, i.e. what he or she does the best. Further, like in the example above, some of the CSBs aren't limited by any boundaries and can experiment with various styles of beer, leading to self-actualization of the brewer and higher job satisfaction. As the number of members is known in advance, the problem of identification of “how much to brew” is avoided as well.

As one of the components of the supply chain is excluded, the CSBs can charge higher margins, which would be otherwise charged by the distributor. However, the cost reduction can only happen when members are required to pick up their subscriptions at the brewery, i.e. when it is not directly delivered to each individual member. In the latter case, it would be actually a self-distribution.

In spite of the relative freedom, the members' satisfaction is also very important. Therefore, not respecting their feedback and not listening to their needs is not a viable strategy at all. However, one of the advantages of CSB is very close relationship with the members, which allow the breweries to be more responsive to their demand, suggestions, complaints etc.

One possible risk for CSBs is that they are actually in short position, whereas the members are in long position, meaning that higher prices of inputs may lead to lower overall profits. From this point of view, it is a win-lose situation.

4.3. Contract brewing

“Paul and I knew that going down that path meant selling our souls with no hope of redemption; our brand would be forever sullied.” ^[49] Ken Grossman

Almost in any industry, it is not unexceptional that an organization is contracting out some of the business activities to another party. Such use of another entity's resources under contract is called outsourcing and one special form of this kind of business model is contract manufacturing, in which one company hires another to manufacture a specific product, which is subsequently marketed by the hiring company.

As regards the brewing industry, the hiring company is called a contract brewer. Such a brewery approaches another brewery about cooperation, asking it to produce and, usually, package its beer. Contract brewing is, in reality, an equivalent of contract manufacturing in brewing industry but even within this concept, there are many variations of it. In general, there are two main approaches to brewing under contract:

- 1) Passive contract brewing**
- 2) Active contract brewing**

There is, of course, a grey area between those two approaches but in the most extreme cases of the first arrangement, a contract brewer is actually a mere marketing unit, not involved in the production of beer at all and only focusing on distribution, selling, building a brand and other business functions. Actually, contracting and outsourcing of

goods in brewing industry, and in the manufacturing of food and beverages in general, is not a new phenomenon and has been around for quite a long period of time. Also, the concept is not only reserved for two breweries and for that reason, depending on the parties involved in the agreement, the basic forms of passive contract brewing can be further distinguished into:

- 1) Vertical passive contract brewing**
- 2) Horizontal passive contract brewing**

In the vertical contract brewing, a downstream entity, which can be a distributor, wholesaler or retailer, hires a brewery to design a specific kind of beer but the brand is developed and owned by the hiring entity, which is not associated with the brewing process at all. There is hardly any connection between the brand and the manufacturer. Predominantly, this is the case of private labelling (a.k.a own-label branding, store or dealer brands), when the retailer is engaged in building of its own brand in order to generate and cherish its customer base loyalty and to enhance the overall store image. Usually, the private brand goods are referred to as cheaper alternatives to conventionally marketed national-brand products but it doesn't have to be necessarily a case. Even the store-brands may be subdivided into three price categories ^[50]:

- 1) Budget store-brands (price-aggressive)**
- 2) Regular store-brands**
- 3) High-end store brands**

An example of the budget store-brand is a brand of beer produced by Slovenian macro-brewery Union (part of the Laško Group) for the chain of shops Mercator (part of Croatian group Agrokor). The name of the beer is simply "Light Beer" (Svetlo Pivo) and is substantially cheaper than other comparable products available in the retail chain in question. Another examples are bitters and lagers sold by Tesco and Sainsbury's within the group of products labelled as Tesco Value and Sainsbury's Basics, respectively. In essence, these brands are generic, indicating rather a product category than referring to actual manufacturer, whose identity is usually shrouded in mystery. These examples of beer are the cheapest of the cheap.

The regular store-brands of beer lie somewhere between the budget and high-end category, neither being that cheap nor overly expensive, and actually making an effort to dissociate from cheapness by using better-looking packaging and private labels. An example of such beer is Argus, which is brewed by Pivovary Lobkowicz Group for Lidl, a chain of discount stores. In the United Kingdom, products like Tesco Simply Golden Ale, Tesco Simply IPA and other "Tesco Simply" beers belong to the group. In the majority of

cases, there are big industrial breweries responsible for manufacturing of the two first categories of store-brands but not always, taking into consideration Costco Wholesale's Kirkland Signature private label. ^[51] According to Costco Connection magazine article "Raising a glass to Kirkland Signature craft beers", there are two craft breweries responsible for manufacturing of Kirkland Signature Hefeweizen, Kirkland Signature Amber Ale and other styles of beer, one being situated on the West Coast, the other one on the East Coast, but the names of the breweries are not explicitly mentioned either in the article or on the bottles. ^[52] In reality, the two brewers are Matt Brewing Company (East Coast) and Gordon Biersch Brewing Company (West Coast). ^[53] The family-owned Matt Brewing Company, one of the biggest craft brewing companies in the United States, is very famous for its beneficial role in the American craft beer revolution. ^{[12], [42]}

Regarding the third category of store-brand beer brands, there is an opportunity for craft brewers of all sizes to exploit such a relationship with downstream companies. Not only the biggest breweries have the right to contract-brew for wholesale and retail once the highest quality and uniqueness are required. Two examples of the quality-focused category of beer store-brands are Tesco Finest American Double IPA and Tesco Finest Traditional Porter. The American double IPA is brewed by a famous Scottish medium-sized craft brewery BrewDog, whereas the latter one is brewed by Harviestoun Brewery, a microbrewery, which is also situated in Scotland.

Another type of vertical passive contract-brewing are the true "virtual brewers", the mere marketing, selling or distributing units, either charging the hired brewery with a task of developing a new style of beer for them or simply buying an old recipe. Of course, the first case requires at least a certain level of involvement in the design of the final product but, nevertheless, these entities are neither associated nor related to the true brewing process at all. They are just brands with no brick-and-mortar brewing equipment or brewing knowledge behind them and, for that reason, the usually accepted term "contract brewer", which is used when referring to such entities, is not particularly correct because they are not real "brewers" per se.

One of the best examples of such a business model is the Schmalz Brewing Company, which was established in 1996 and functioned in this way until 2013, the year an actual brewhouse was built. ^[54] The owner of the company, Jeremy Cowan, provides the best possible summary of the concept:

"I tell Paul what I want, then we taste a lot of different beers together so I can say add a little of this, or a lot of that. Finally he takes my college English major explanations and turns them into a recipe." ^[55]

No wonder that lots of craft-beer enthusiasts, beergeeks, homebrewers and especially many owners of the real craft breweries look down on this business model because, according to them, it lacks authenticity and does not encompass the spirit of microbrewing revolution. Therefore, if a brand presents itself as being a brand of an actual brewery but it is not, it is considered as cheating and in such a situation, both consumers' and producers' contempt leads to the "contract brewing stigma". Truly, it is a problem of the craft-brewing philosophy, authenticity and transparency but the problem of authenticity is not, however, entirely limited to the craft segment of brewing industry since it is prevalent in the whole license brewing in general.

Then there is horizontal passive contract-brewing, which takes place when an actual brewery hires another brewery to brew beer for the first one. Recipe may or may not be provided. In the first instance, it can be referred to as license production, which is very common in the brewing industry, indeed. Again, the question of authenticity remains since it is not usually clear to what extent is the beer produced under licence similar to the original brand, because the geographical conditions differ together with the inputs, raw materials, capital, labour and knowledge. There are countless examples, both on the larger and smaller scale. As regards the larger, macro-brewery scale, brands like Heineken, Stella Artois, Budweiser (the American version), Asahi, Guinness, Staropramen and a myriad of other brands are all produced under licence in various parts of the world. From the smaller-scale point of view, the actual brewing background of the hiring party is crucial to distinguish it from the vertical contract brewing. Lots of the owners of contemporary well-functioning microbreweries and larger craft breweries began their careers as homebrewers, brewing their beer in garages, basements and kitchens, going through all the already mentioned development stages (four stages of homebrewing), continuously getting better and developing their techniques and recipes to the point of expertise their beer could be commercially successful on the market. Then, they could either utilize the nano-brewing business model and through unbelievable amount of time and hard work naturally (and as quickly as possible) grow to larger and more efficient scale. Another option was to hire a bigger brewery to produce their home-brew developed recipe. One such example is the famous Brooklyn Brewery whose president and cofounder, Steve Hindy, began brewing his own beer at home in 1984 before signing a contract with F.X. Matt Brewing Company.^[42] With a little exaggeration, those homebrewers could be deemed as very small breweries and, therefore, they deserve to belong to this group because there really is something solid behind the brand (even if it is very small brewing equipment) and the owners of the brand have at least a limited brewing knowledge (and lots of passion and enthusiasm).

As was already mentioned, there are many alternatives and shades between passive and active contract brewing and, for that reason, it is difficult to decide when it ceases to be passive and when it starts to be active. Normally, the active hiring brewers use the equipment owned by the hired brewery and actually brew their own beer by themselves or in cooperation with the head brewer, the only difference being the ownership. Good analogy to such a situation is when a guest prepares a meal using his or her host's kitchen equipment. Therefore, a proper terminology would be a "guest brewery" and "host brewery". Contrary to the passive contract brewing, the active "guest brewers" are really engaged in the brewing process and sometimes even supply specialty grains, yeast strains and hops for their brew (which, of course, can be a case of passive contract brewing as well).^[55] However, the extent to which is the work and effort of those guest brewers reflected in the final product is not always clear. It can be either fully or partially. Anyways, this kind of arrangement is not considered that offending among the craft beer consumers, beer geeks and brick-and-mortar craft brewery owners, leading to weakening of the "contract brewing stigma". Great example of active contract brewing is the story of Brian Buckowski and John Cochran from Terrapin Beer Company, who homebrewed before deciding to enter the craft beer business and because they failed to raise enough money to establish their own brewery, they embarked on brewing at someone else's equipment. As their product was successful, it didn't took long and they opened their own brewery in Athens, Georgia.^[56]

Sometimes, the active contract-brewers change their host brewery more than once and move from one facility to another, not being limited to one country and not even to one continent. There are many terms referring to such activity, probably the most well-known being the "gypsy brewing". Another terms are "flying brewers", "contract surfers", "nomadic breweries" etc. The flying brewery can consist of one person, being in a way "flying one-man brewery", or it may be a group. As is the case of other kinds of contract brewing, even the gypsy brewers sell their pieces of creation under one single brand. One of the best examples of this kind of business is the Danish Evil Twin Brewing, which was founded by Jeppe Jarnit-Bjergsø in 2010. According to Evil Twin press kit, Jeppe brews at 10 different breweries in 6 different countries around the world.^[57] In Czech Republic, some of the examples of gypsy brewing are Holy Farm Brewery, Nomád Brewery and Falkon Brewery.

4.3.1. Advantages of contract brewing

There are, of course, many valid reasons for utilization of the contract-brewing concept, both for the largest of the brewing companies and the smallest ones, nanobreweries. The usually identified advantages are^{[58], [59], [60]}.

- 1) Access to additional capacity**
- 2) Proving a product**
- 3) Access to know-how**
- 4) Benchmarking of operations**
- 5) Economies of scale**
- 6) Just-in-time beer**
- 7) Focus and specialization**
- 8) Geographical reach**

One of the most common reasons breweries are turning to contract brewing is that they lack necessary capacity to meet their customers' growing demand. It is mainly predominant in the craft brewing sector, where both well-established packaging microbreweries and brewpubs contract out because it would not be either financially feasible to upsize or "scaling up" is not simply realizable due to limited space in urban and even suburban areas. In the majority of cases, it is a win-win situation, beneficial both for the hiring brewery and the contractor because the equipment owned by bigger breweries is not affordable for smaller brewers and the bigger ones can, on the other hand, cleverly utilize their unused capacity. An agreement can be either temporary, lasting until a hiring brewery is able to collect enough funds to upsize its facility, or it may be a part of long-term thought-out strategy.

From a strategic point of view, being involved in longer-term partnership with the contractor can be very beneficial for a hiring brewery because it can indirectly transform part of its fixed costs into variable costs and thus more effectively cope with the demand changes. ^[60] Such situation could be called "just-in-time beer", freely upsizing and downsizing through contract brewing and partially transferring the risk of demand volatility to the hired brewery.

Further, by exploiting the economies of scale, the bigger brewers are better suited to cope with the changes in demand, having higher bargaining power with suppliers (and thus obtaining the inputs in a cheaper way) and generally being more efficient in production of beer. As already mentioned, especially the nanobreweries are disadvantaged when purchasing the inputs in small quantities. By contracting, the small breweries can exploit the competitive advantage of their bigger counterparts.

Apart from the economies of scale, the contract brewing may lead to exchange of experience, expertise and ideas between the two parties. Smaller breweries gain access to know-how, new technologies and effective and tried-and-tested business processes, whereas the bigger ones can be inspired by creativity and innovation of the smaller ones. The flow of information doesn't have to necessarily take place only between big and small

(information can be exchanged among breweries of all sizes), but in the end, by learning from each other, it is beneficial for both of them as well as for the final consumer.

By allowing the flow of information, the hiring brewery can compare its operations with operations of the contract brewer and thus getting access to useful benchmark. By analysing it thoroughly, it can identify the flaws in its own way of doing business and initiate necessary changes to become more effective and competitive.

Similarly to the model of nanobrewing, contract brewing may be a less risky way of entering the craft beer market and testing the product instead of immediately establishing a larger and more expensive brick-and-mortar facility. However, contracting out production of beer appears to be a better way of proving the market since one is not enslaved by his or her previously harmless hobby and can devote more time to other important activities including marketing, sales, bookkeeping etc.

As regards the vertical passive brewers, the reasons for contract brewing are absolutely obvious. These entities are not involved in the brewing process at all and, therefore, they can devote all their time to activities they do the best, whether it is marketing, selling or distribution. In other words, they can fully focus and specialize in activities other than production of beer.

Contract brewing can be used as a way of reaching and testing new markets for well-established breweries of all sizes. Instead of building a new facility in the place of interest, it is cheaper to find a brewery already being there and ask for help. Also, provided the market a brewery wants to enter is far away, e.g. in another country, contract brewing enables the hiring brewery to save the transportation costs. It is a common practice since it is more effective than direct export.

4.3.2. Challenges of contract brewing

Like always, no business model is perfect and contract brewing is no exception. Even in this case, there are some risks and limitations which have to be elaborated ^{[58], [59], [60]}.

- 1) Loss of control**
- 2) Lack of priority**
- 3) Client lock-in**
- 4) Abuse of information**
- 5) Communication costs**

There is a possibility of the hiring brewery to lose control over its recipe because not all breweries allow the tenant brewers to use their own hops, special grains and strains of yeast due to standardized production and internal directives. Also, it is a big difference to brew at extremely small scale, e.g. homebrewing and nanobrewing, and then taking the recipe to much larger scale. Therefore, the recipes may need some sort of rearrangement before moving to scaled up production, albeit all-malt recipes are relatively easy to scale up. At the large-batch level, the inputs are more efficiently processed than at the pilot-batch (homebrew, nanobrew) level and thus it is necessary to analyse the smaller-scale production and specify its efficiencies or inefficiencies. Mark Youngquist, co-founder of the Walnut Brewery from Colorado, provides a list of issues, which are important to discuss before scaling up the recipe ^[61]:

- 1) Types of malt used on the smaller scale**
- 2) Coarse grind extract of the types of malt used**
- 3) Pre-boil and post-boil volume of wort in the kettle**
- 4) Intended and starting gravities**
- 5) Types of hops used on the smaller scale**
- 6) Alpha acid levels of the hops used**
- 7) Addition and residence times of hops**

And still, despite all of the effort, the final product does not have to resemble the original beer, which used to be (or which is) produced in smaller batches. Sometimes, the difference between the small-batch and large-batch could be marginal and not identifiable by the end consumers, whereas on occasion, the deviation may represent a striking difference. The success really depends on the relationship and good relations with the host brewer and his willingness to meet the requirements of his or her clients. In order to secure consistent quality and authenticity of the original recipe, an intensive datastream of information has to be secured, samples taken, analysed and, if possible, the hiring brewery should engage in occasional brewing. Of course, depending on the level of involvement in the brewing process, the loss of control is either more important or not so important issue.

Many breweries that offer their excess capacity don't have only one client but rather a group of clients with varying requirements and needs. In case of one client's needs being more important, i.e. representing substantial amount of hired brewery's capacity, such a client (and more significant business partner) could be treated more favourably by the contract brewer to detriment of other and less important breweries. This could, under some circumstances, lengthen the "lead time" and subsequently cause cash-flow problems to the hiring brewery. ^[60]

Further, the bigger breweries may take advantage of their dominant position in the area, being the only brewery willing to meet all their clients' needs but, after signing the contract, continuously raising the prices and de facto exploiting their customers' lock-in position. In such a case, the advantages of economies of scale and associated cost savings aren't passed down to the hiring brewery and instead, it may be even more expensive than direct scaling-up.

The advantage of information flow and sharing of ideas, experience and know-how may be turned into a nightmare when the hired brewery doesn't respect intellectual property rights and abuse the information to imitate the product, i.e. stealing or slightly modifying the recipe, and then becoming a competitor of its former client. It is a theft, indeed, but larger breweries have better access to capital and can afford better legal services.

Especially when considering entrance to foreign market by using local brewery's capacity, communication costs may emerge in case of misunderstanding caused by intercultural differences or language barriers.

4.4. Brewery alternating proprietorships

In spite of some hiring breweries being active and actually involved in procurement of inputs and subsequent brewing of beer, i.e. active contract brewing, the product is still legally owned by the contract brewery until it is either taxed or removed from the facility, meaning that the hired brewery is de facto responsible for oversight over the operations like purchase of raw materials, beer production at all stages, obtaining certificates and label approvals, record keeping and, what is probably the most important, paying the taxes. In the United States, it is possible for an active hiring brewery to gain control over the brewery operations and thus become absolutely autonomous and independent from the hired brewer. It is done by "alternating the proprietorship", when the "host brewer" officially grants the "guest brewer" a right to use its premises and equipment. In such a case, the "guest brewer" officially becomes the true owner of the beer even before it leaves the site. ^[62]

However, the alternating proprietorship is not mere "officially approved" active contract brewing because there are some requirements which has to be met by both "host brewery" and "guest brewery" in order to enjoy the benefits of such arrangement. First of all, the situation is horizontal in nature since both parties have to be qualified as brewers, meaning that downstream entities and "virtual brewers" have little chance to

become tenant brewers. The TTB requires tenant brewers to own the ingredients, i.e. to be materially involved in the brewing process, to supervise brewery operations and, further, they must be involved in product development, either directly or by hiring a brewmaster, who will brew beer according to their formula. The formula doesn't have to be necessarily developed by the "guest brewery" itself but with the help of a brewery consultant or through cooperation with the host brewery. As regards the employees of the brewing facility, they can be hired by the tenant brewer on the basis of "brewing services agreement". For that reason, the staff of the host brewery do not change. Rather the management, production decisions and brands are those alternating. ^[62]

Before the production starts, the tenant breweries are allowed to purchase ingredients from the host brewery but after the production ends, the host brewer and guest brewers are forbidden to trade finished beer between each other (it would indicate contract brewing). In fact, it has to be always clear to whom does the ingredients and beer belong. From the beginning to the end, both host brewer's and other guest brewers' brewery operations have to be separated, i.e. not only after the product is finished but during all the stages of production, including brewing, fermentation and conditioning. In order to secure segregation of the operations, all the tenant brewers are responsible for separate record keeping as well as for regular submission of operational reports, claims and notices. Further, the tenant brewer himself or herself is responsible for obtaining necessary licenses and paying the taxes. ^[62]

Apart from the advantages similar to those of contract brewing, i.e. access to additional capacity or less expensive start-up option, the alternating proprietorship provides other benefits:

- 1) Possible tax benefit**
- 2) Common ownership**
- 3) Higher control**

Provided a brewer's production does not exceed 2,000,000 barrels a year, he or she is qualified for reduced tax on beer of 7\$ per barrel on the first 60,000 barrels, whereas the amount between 60,000 and 2,000,000 barrel threshold is taxed at the full rate of 18\$ a barrel. In case of contracting out production, the contract brewer is responsible for paying the taxes and once the threshold of 60,000 is exceeded, the higher tax burden is passed down to the hiring smaller brewer through higher fees paid. However, in case of alternating proprietorship, the brewers are treated as two independent and separate entities, both being responsible for segregated record keeping and tax payment of beer. Therefore, the smaller guest brewer is qualified for paying mere 7\$ a barrel for his or her first 60,000 barrels of production.

In case of contract brewing, the contractor's address has to be printed on the beer packaging, albeit the hiring brewery is allowed to market and sell the product under its own brand. Alternating proprietorship allows the guest brewer to label the beer with both its own name and address. In such a way, there is one single consistent label in spite of the beer being produced at multiple facilities. Further, the production may start at host's brewery and be finished at another host's brewery or brewery, which is actually owned by the guest brewer.

As was already mentioned, one of the disadvantages of contract brewing is lack of control over hiring brewery's formula due to various reasons. Under alternation, there is no such problem because the tenant brewery is actually required to have constant control over the product.

One disadvantage of alternating proprietorship is greater responsibility and higher administrative burden for the guest brewery. Also, the tax benefits don't have to be necessarily passed down because of higher price paid to the host brewery resulting from higher risk it is exposed to. The host brewery's risk lies in loss of control over the beer, which can cause trouble in case of the guest brewery not being punctual or, which is even worse, going bankrupt. In such a situation, the host brewery cannot do anything with beer which literally "got stuck" in its facility without TTB approval, leading to production delays and associated lost profits. ^[55]

4.5. Brewery incubator

Being faithful to the principles of business incubators, a brewery incubator provides new wannabe breweries with assistance and support in the form of various services, workshops, classes, coaching, provision of advice and expertise and by organizing events like tastings or "pairing dinners" and by providing access to the pilot facility, where the aspirant brewers can brew their beer, prove the market, develop a brand and build a customer base until they become profitable and successful enough to be capable of establishing their own brewery. ^{[63], [64]}

One example of such brewery incubator is The League of Extraordinary Brewers from Texas, which works as a cooperative with members paying annual fees and deciding by themselves who will become a new member and how to allocate the budget. By sharing the space and brewery equipment, the members can substantially reduce the costs of operating a brewery and risk of failure. Apart from the shared equipment, there is also a testing market, a taproom and various events, where beer is sold under aspirant

brewers' names. Nevertheless, it is important to note that the incubator does not guarantee success unless the brewers participate and exert on to achieve it. ^[64]

In addition to the cooperative brewing, there are some breweries which were deliberately established with the intention of providing their capacity to the growing craft beer industry. These organizations are not, however, simple contractors or alternating proprietors because they provide their clients with a variety of additional services like distribution, sales, marketing, logistics, legal services, consulting and development services etc. For that reason, they could be considered as a sort of "brewery incubators" or "craft beer incubators". Further, in order to differentiate themselves from simple contracting or alternation, they refer to the business model as "partner brewing". The examples of breweries utilising the model are Brew Hub, Florida, and Beltway Brewing Company from Virginia. ^{[65], [66], [67]}

4.6. Cooperative breweries

Both in the ancient times and at the present, the cooperatives are established, owned and operated by a group of people so as to provide them with services and benefits, which would be otherwise unattainable individually, a typical example being the housing cooperatives in the Czech Republic. It is an ancient concept, business structure and business model. According to the owners of a co-op, there are basically two types:

- 1) Producer owned co-ops**
- 2) Consumer owned co-ops**

The former one can be considered a "brewery incubator", whereas the latter one is based on an idea of a greater community establishing a brewery and subsequently buying its products. Typically, all members have voting rights (e.g. all of them electing together the managing body of a cooperative) but some of them may be more important than the others, depending on the amount of paid-in capital and involvement in the operations of the brewery, i.e. the employees of the cooperative. The employees, possibly a group of home-brewers, can actually represent the core of the structure - the founding fathers of the organization, who were successful in encouraging their surrounding community to become part of the business. ^[68]

For the "core", it is a very good way of financing, in principle similar to crowdfunding, but with the backers being directly involved and interested in the success of the business. In fact, the members can vote on other important issues, especially on

what kind of beer should be brewed and thus having higher control over their own consumption.

Of course, it is not as easy as it seems. Because of the enormous number of potential co-op members, it is a very time-consuming fund-raising process, which requires motivation as well as persistence. Also, the concept involves lots of people and not all of the members can be always satisfied, leading to possible misunderstanding and group tension.^[68]

4.7. Brewpubs

“Once upon a time almost all pubs brewed their own ale...”^[8] Ted Bruning

As was already mentioned, a brewpub (aka pub brewery) is a kind of microbrewery, which not only produces beer on the facility’s premises but it also sells and serves the beer on the same premises. It is not a new business model, indeed, if one takes into consideration the pre-concentration age of the brewing industry and other industries (the craft era), when it was absolutely common to produce and sell beer on-site. Really, some of the brewpubs are very old, an example being the Czech brewery “U Fleků” from Prague, whose history dates back to the year of 1499 and thus it can be considered the oldest brewery in Czech Republic (and in Central Europe), which has been producing beer without any interruptions since the end of 15th century (there are “older” breweries in the Czech Republic but their production was discontinued for a certain period of time until being revived later).^[69]

According to the Encyclopedia of Brewing, a typical brewpub brewhouse capacity is around 5-8 hl, whereas Sam Calagione asserts (in his book “Brewing Up a Business”) that an average brewpub system produces 10-barrel batches.^{[70], [43]} There are, however, some brewpubs with much bigger capacity. Usually, the brewpubs are distinguished from their relatives, the packaging breweries, which tend to be larger and, as the term suggests, package their beer and distribute it either by themselves or with the help of a specialized distributing company to various retail and hospitality locations. Of course, both concepts have some advantages and disadvantages but the first one is not as easy to manage and (therefore) not usually as common (in compliance with “Ratebeer.com” database) as the packaging breweries, albeit according to Brewers Association data, for example, the brewpub mortality rate is on average (1989-2013) merely 1 pp (percentage point) higher than that of microbreweries (packaging breweries)^{[71], [72], [73]} Nevertheless, there are

some undeniable benefits of running a brewpub when compared with running a small-scale packaging brewing facility:

- 1) **Higher margins**
- 2) **Additional revenue stream**
- 3) **Cash-flow constancy**
- 4) **Better supervision**
- 5) **Brand building**

In general, the on-premises value-related sales are relatively higher than the off-premises sales due to inclusion of “service” in the value added by the hospitality sector, i.e. the location, atmosphere, waiters’ or bartenders’ jobs etc. Also, the quality of draught beer is perceived as higher compared to packaged beer, regardless of the perception being justifiable or not. The following pie chart provides the evidence for the above discussed phenomenon by showing the value added to beer at different stages of the supply chain in the European Union:

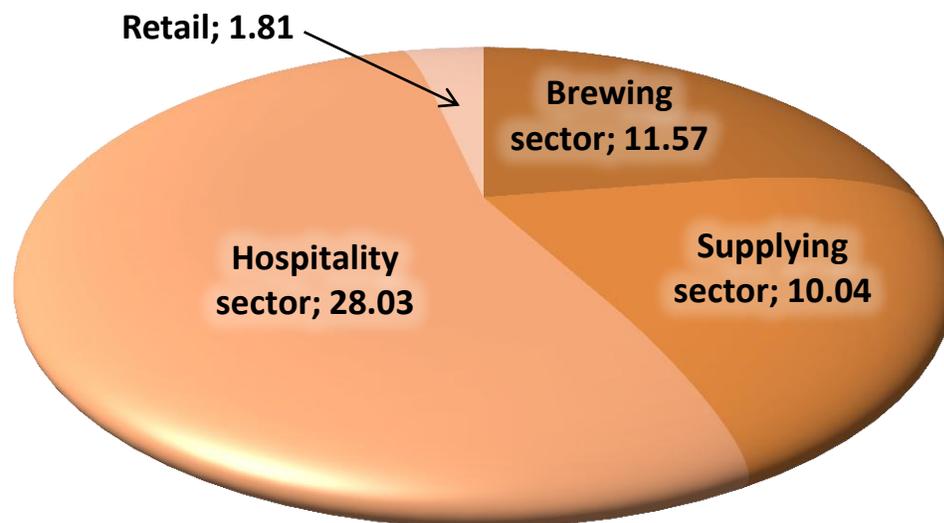


Figure 1 EU28 value added to beer in 2012 (in € billion); Source: Brewers of Europe

Apart from the value added, the beer consumption expressed in billions of Euro is relatively higher in on-trade than in off-trade provided we take into account the consumption expressed in volume, e.g. in millions of hectolitres like in the following chart:

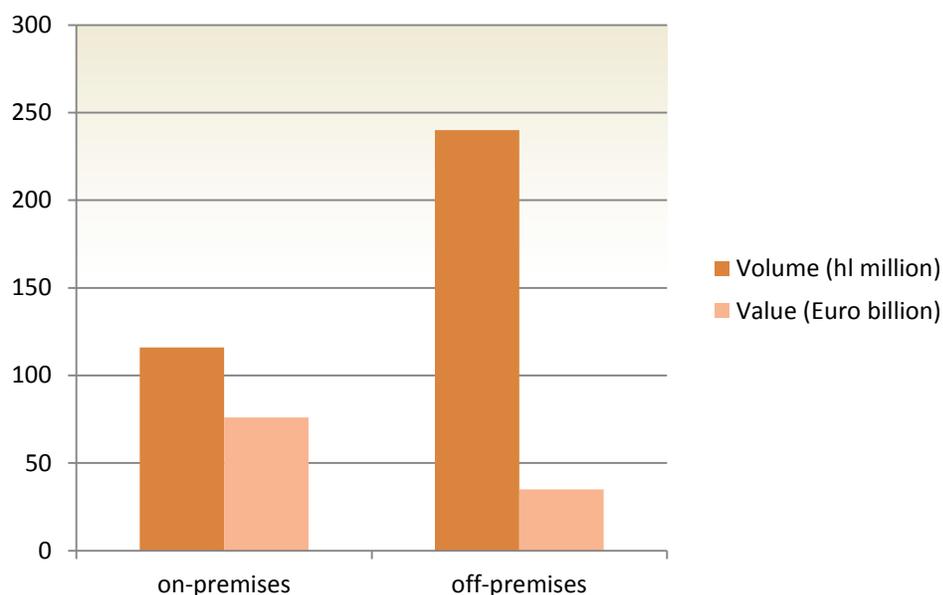


Figure 2 EU28 on-trade and off-trade beer consumption in 2012; Source: Brewers of Europe

Further, the mark-up in the brewpub hospitality subsector is even higher because this kind of facilities do not need any distribution, meaning that there are no beer transportation costs or distributors' fees, which would be otherwise absorbed and reflected in the price. As there is already built-in market on the site, the customers come directly to the source of beer production. Compared with the packaging breweries, it is also possible to establish a brewpub with smaller-scale equipment and some of the equipment don't have to be used at all, e.g. the bottling lines, leading to time, money and energy savings since the bottling lines and other packaging machinery tend to be the most maintenance-intensive items in a brewery, not even mentioning their acquisition price. Associated with the previous packaging-related benefits, a brewpub saves substantial amount of money only by not being in need of some types of packages, specifically the casks (firkins) and kegs, which are immensely expensive and which are, after the brewing equipment, the largest part of a start-up's capital expenditures (capex). Considering their (scrap, homebrew and other) value and difficulty of tracking, there is no wonder the kegs and casks are common victims to thefts or are simply lost. Keg or cask fleet maintenance is another money and time consuming activity. Additionally, a brewpub doesn't have to be concerned with the type, size and design of the packagings, e.g. bottles and cans, and doesn't have to pay any artists or design companies to develop various labels for those packages. The same applies to tap handles.

Undoubtedly, one of the biggest advantages of a brewpub is a potential of preparing, serving and selling food and thus getting access to additional source of income.

Other streams of revenue are represented by sales of beer substitutes, i.e. other beverages like wine, spirits, FMBs, malternatives, soft drinks etc., because not everyone is a beer drinker or alcohol drinker per se. Simply put, by offering a higher variety of drinks, a brewpub is able to satisfy demand of a larger group of customers, some of who wouldn't drink the beer anyway and who wouldn't be otherwise happy, recur to the premises or (and) spread positive information about the place among both the beer drinkers and non-beer drinkers (possible friends, colleagues or simple acquaintances of the true lovers of beer). Analogically to the paragraph above, also the beer substitutes are liable to higher margins compared to those typical for off-trade and, moreover, as regards wine and spirits, they are even higher than on-trade beer margins. Another advantages and disadvantages of selling food will be elaborated later in this chapter.

“Although the brewery’s finances remained at a level where there were no finances to speak of for a couple of years, offsetting the losses at the brewery with the profits from the brewpub kept the situation from getting worse.” ^[43] Sam Calagione

By being an example of completely vertically integrated entity and from the downstream business' perspective (bar; restaurant), a fully on-trade devoted brewpub doesn't have to record almost any receivables (apart from some prepaid expenses and accrued incomes). In fact, the revenues from beer and potential food sales converge with the associated cash inflows to the extent they can be deemed identical. Contrary to the packaging breweries, which have to cope with several weeks window before getting paid, the brewpubs can exploit the advantage of built-in market and enjoy the stream of daily and constant cash-flow. Also, it is hardly a case for a packaging brewery to be open for seven days a week. Therefore, the cash-flow management is much easier in a brewpub, leading to lower exposure to risk and better access to supplier financing - if one takes into consideration that the small businesses' goal of achieving positive cash-flow is not that complicated for a pub brewery, there is no reason for excessive delays with paying back. Further, in a packaging brewery (like in any other business), it is crucial to make estimates and keep records of bad-debt allowances and be aware of the ratio between receivables and payables turnover. Such issues are not that important in a brewpub. Actually, the only examples of revenue and cash-flow disharmony I can think of are some larger group events like banquets, congress tourism meetings etc., which are (but don't have to be) invoiced and settled after the service has been provided. Mug or keg clubs membership fees paid backwards may serve as another example of potential brewpub's downstream accruals.

„I've long maintained that the fewer times beer is touched between production and serving, the better.” ^[31] Dick Cantwell

In a brewpub, the site managers (operators) have more control both over the beer quality and competition. Even today, the fact remains the wholesalers or retailers may not be as devoted to beer quality control, storage and handling as the brewers who actually made the product. Such attitude leads to many problems, including inadequate wholesaler storage temperatures, draught line infections, usage of unsuitable dispensing equipment and pushing gases, draught dilettantism and sanitizer residue in the glassware. At the end of the unforgiving process, the beer is flat, oxidized, over or under-carbonized and even undrinkable, leaving the customer dissatisfied and probably blaming not the outlet but the brewery itself. However, a brewpub has higher supervising power over such issues, e.g. the presentation of beer, its storage temperatures, thorough and regular cleaning, pairability of the food served, staff education etc. In Czech Republic, there is a saying: “Beer is brewed in a brewery but made in a pub“. Provided it is both brewed and “made“ on the same premises, it is a big advantage for the business, indeed. Under some circumstances like insufficient capacity (e.g. stemming from bad planning), batch spoilage, various accidents, broken equipment or when a brewpub starts its operation with unfinished beer (e.g. waiting in the maturation tanks), competitors’ golden liquid may be served for a short (or longer) period of time. Depending on various factors, the brewpub decides, in such a case, what beer will or won’t be on tap, de facto controlling the competition in its built-in market.

Because of the industrial revolution, the craft of beer brewing (and other artisanal activities) was disconnected from the individual consumers, moving to larger depersonalized facilities with higher internal economies of scale and thus becoming mere intangible brands, logos and trademarks promoted by the forces of commerce and marketing. As was already mentioned, the brewpub is an old and traditional business model, which is experiencing its glorious comeback at the moment, being one of the driving forces behind the craft beer movement. It enables both the producer and consumer to engage in more direct interaction, leading to closer relationship and higher potential of brand building and deeper customers’ loyalty. Also, the brewpubs appear more tangible and real. Due to lower levels of uncertainty avoidance compared to off-sales, which is caused by possible (beergeek) peer pressures (or through network effects; sense of belongingness effects) or higher overall producer-consumer interaction, it serves as a perfect place for inducing trial and de facto for pretesting various experimental batches, gaining feedback (either positive or negative), collecting new ideas and honing the product before moving to larger production. In this way, it can work as a pilot brewing system for a parent-brewery or packaging brewpub (as is the case of nanobreweries and nano-brewpubs). In general, the brewpub customers are more tolerant if some of the beer styles don’t exactly meet their expectations (educated staff or beer-loving peers can

explain the taste), meaning lower probability of customer loss and associated financial loss.

In spite of many advantages of this business model, there are some important challenges (when compared with packaging breweries) the potential investors and entrepreneurs should be aware of:

- 1) Changing consumption patterns**
- 2) Crucial role of location**
- 3) Different kind of business**

The on-trade/off-trade beer consumption ratio is not a constant figure and may change either in favour of the former or the latter, depending on the overall economic and demographic conditions of a specific area. For example, the beer consumers within the European Union tend to substitute the experience of drinking beer in restaurants, bars, pubs and other hospitality locations with drinking at home (e.g. in the USA, the craft/microbrew beers account for only 12% of away-from-home beer occasions).^[74] One of the reasons may be the aging European population, which is not as fond of going out with friends as the younger generation, albeit the growing influence of the internet and social networks may play its role even among the younger ones, whose needs for outside socializing are not as important as they used to be in the past. With the highest probability, it will be a combination of both. Also, it can be attributed to above demonstrated higher margins in the hospitality sector, pressuring the beer drinkers to consume at home because of considerable money savings. Taking into consideration the economic crisis and associated austerity measures, it really seems the demand for beer is more price-elastic and income-elastic in the hospitality sector. The following chart shows the declining nature of the on-site beer consumption as compared with the off-premises consumption:

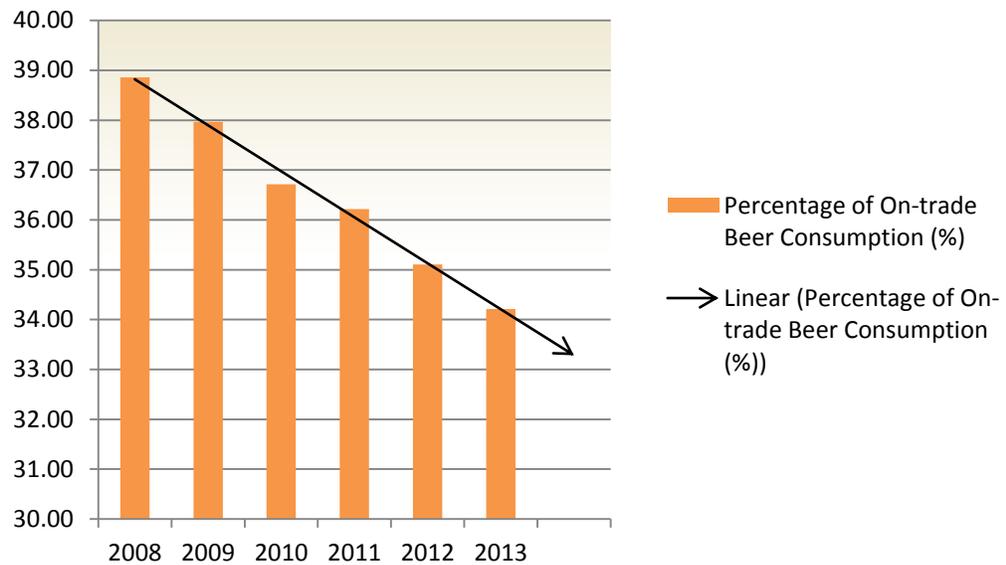


Figure 3 EU28 Percentage of on-trade beer in total consumption; Source: Brewers of Europe

Without a doubt, the location is important for every kind of business, e.g. packaging breweries, but to find a right place for a brewpub is one of the most difficult tasks the wannabe entrepreneurs face because it really is a question of survival, the difference between success and failure being as slight as operating on the wrong side of the road. By brewing the best beer in the world or by providing the best dining experience far and wide, one cannot be sure to break even if nobody knows about either the beer or service provided. Someone or something has to sell it. As regards the packaging breweries, the people, packages and shelf space are all responsible for sufficient sales, whereas for brewpubs, the location and the exterior constitute the most important sales force, being de facto a specific case of shelf space (location) and a package (exterior and interior) but on a larger scale. The people and the product, beer and food, are combined in one experience, which is “packaged” inside a building, a brewpub, situated in a particular area:

- 1) Rural area
- 2) Suburban area
- 3) Urban area

Rural areas are suitable for larger packaging breweries because they provide enough space for reasonably big construction and potential for future capacity scale-ups. Further, the real estate costs are lower, the suppliers may be closer and it is easier to dispose of spent grain. They are not, however, the best choice for a brewpub, taking into

consideration their remoteness and insufficient vehicle and foot traffic. Therefore, the suburban and especially the urban areas are the right places for opening a brewpub.

Compared with the urban areas, the suburban ones provide cheaper rents and higher tolerance for some kinds of negative externalities like noise, odours and fumes, although the latter ones are subject to personal taste and even appreciated. Of course, some of the sites are more expensive than the others, depending on the proximity to public transport and high traffic areas like shopping centres. Actually, the brewpubs themselves may become a part of the shopping mall and even an airport, exploiting the advantages of everyday influx of people. Apart from the high traffic places, there are also some abandoned industrial estates and brownfields with pre-developed infrastructure (which is tempting), but again, these remote areas are more suitable for packaging breweries than for service-oriented brewpubs.

The most attractive and fancy buildings are found in the urban areas - buildings with historical and architectural values, luring both locals and tourists to the place. More people means more business. No wonder the rents and real estate costs are the highest among the three area possibilities presented but with a functional concept, it can pay off. Nevertheless, there is a higher probability of people objecting to the idea of brewery construction in their neighbourhood, including some problems with the conservation authorities, and sometimes, it may be even impossible to build a brewery due to overly small premises and abnormal layout. Also, the future capacity expansion is often out of the question in highly urbanized and cramped environment.

"I was spending 80 percent of my time dealing with restaurant business, which hadn't been growing for a couple of years."^[75] Daniel Del Grande

When opening a brewpub, the chances are it will be a restaurant brewery and it is no secret that running a restaurant is absolutely different kind of business than running a "mere" brewery. One either has to like the restaurant business and possess all the necessary skills to manage the brewpub successfully or there has to be someone, probably a business partner or a hired manager, who will do the job. Even in the first case, however, it does not have to be the best alternative since restaurant is very time and energy consuming and may take the focus off other activities, especially the brewing, supplies, marketing, sales etc. Specifics of the restaurant operations include managing and training of additional (for the brewery) staff, i.e. servers, bartenders, kitchen staff, and maintenance of customer facilities, i.e. toilets, furniture, floors etc. Everything has to look clean and tidy. Furthermore, the rate of failure in hospitality sector is relatively high with as much as 80% of newly opened restaurants going bankrupt over a period of five years.^[43] Even the best beer cannot save the worst (or simply bad) restaurant.

4.7.1. Brewpub categorisation

In spite of being a subcategory themselves, the brewpubs can be further divided into groups in accordance with various aspects of the business model in question:

- 1) **Serving food**
 - a) Brew bars
 - b) Brew restaurants
- 2) **Business plan**
 - a) After-thought brewpub
 - b) Pre-thought brewpub
- 3) **Brewpub layout**
 - a) Open brewhouse
 - b) Closed brewhouse
 - c) Hidden brewhouse
- 4) **Off-site sales**
 - a) Packaging brewpub
 - b) On-trade devoted
- 5) **Ownership**
 - a) Freehold
 - b) Leasehold
- 6) **Location**
 - a) Airports
 - b) Train stations
 - c) Shopping malls
 - d) Hotels
 - e) etc.

4.7.2. Serving food

„Traditional beer is the new star with the international cuisines that we are all eating today. Real beer can do amazing things with food, and it goes places where wine cannot go.“^[76] Garrett Oliver

Overall, almost 80% of craft beer on-premises occasions involve some sort of food.^[74] Therefore and undoubtedly, the preparation and serving of food presents a big advantage for a brewpub, especially because of the following reasons:

- 1) **Additional stream of cash-flow**
- 2) **Pairing possibility**
- 3) **Beer sales booster**

4) Catering for other customers

As was already discussed, food can be a welcomed stream of constant cash-flow for a brewery but it is not the only advantage if we take into consideration that beer is a more complex drink than wine, offering an enormous range of flavours, aromas and colours, and can be paired with almost anything, even with the desserts, e.g. brownies with the Russian imperial stout or strong Baltic porter. Also, a food consuming customer is more likely to order another pint of beer and vice versa, leading to the beneficial cycle of boosting both the appetite and beer sales, not even mentioning that food is very attractive for some groups of customers, e.g. the families, and can induce more frequent brewpub visits.

Dealing with food is, on the other hand, big disadvantage when compared to “traditional” packaging breweries and it represents many problems which are basically common to all restaurants. With great food comes great responsibility:

- 1) Large amount of different ingredients**
- 2) Perishability of the ingredients**
- 3) Labour-intensive nature of the business**

Regardless the higher variety of inputs utilised in the craft brewing sector, there are basically four major ingredients used in a traditional beer production, whereas in a kitchen, the number goes to several hundreds of miscellaneous products. In such an environment, it is easy (especially for those with no restaurant experience) to constantly carry excess inventory, leading to lower “acid-test” liquidity ratio because of unnecessary tying up of the cash, associated cash-flow problems and increased waste, spoilage, overportioning and thefts.

Under the right conditions, non-milled malt and unpacked hops can be stored for months and even years. Such a long shelf life is not, however, possible in the restaurant business where most of the raw materials spoil within a week and some do not endure more than a day. Combined with the problems of excess inventory, the outcomes can be truly disastrous, possibly forcing the brewpub out of business. Therefore, the inventory control and thorough inventory management are more important than in a brewery. According to Jim Laube, the President of Center for Food Service Education in Houston, the typical inventory turnovers are 6-7 days for full-menu restaurant breweries and 3-5 days for limited-menu restaurant breweries. ^[77]

In spite of the beer production in microbreweries being more labour-intensive than in their much larger counterparts, it remains capital-intensive when compared with food preparation and serving. More people involved in the process means higher

probability of errors and difficulty with associated losses assessment. Some of the people-related losses are caused especially by: theft, overportioning, short weights, kickbacks, improper rotation, employee nibbling, breakage, unrecorded sales, cooking errors etc. Above all, the last aspect (cooking errors) is immensely important because customers are not as tolerant when food is mediocre as they are when their beer expectations are not met. Not many people are beer specialists but everybody is an expert when it comes to food.^[77]

Depending on the concept, a brewpub can be either more pub or a restaurant, which is reflected in the beer/food sales ratio. Basically, if there is no kitchen and no cooking (or preparation of food) takes place on the premises, a brewpub is a sort of brewery taproom, a brew bar, where some snacks like chips, peanuts or popcorn are served at the most, with the beer/food ratio being almost 100%. However, there are some options for a brew-bar to introduce more complex food to the site (and not necessarily on a regular basis):

- 1) Catering services, e.g. buffet**
- 2) Food delivery, e.g. pizzas, kebabs**
- 3) Pre-packaged food, e.g. some sandwiches**

However, in order to fully exploit the brewpub's potential and to gain access to additional stream of revenues, something more sophisticated should be prepared and served. When kitchen is involved and when it takes some effort (even limited) and time to make the food, a brewpub becomes a restaurant brewery (or brew restaurant). Taking into account the simplicity of the menu, a restaurant brewery can be further divided as follows:

- 1) Limited-menu restaurant brewery**
- 2) Full-menu restaurant brewery**

In the former one, very simple dishes like some sandwiches, paninis, hot dogs etc. are prepared and served on the premises. It is inexpensive and does not require complicated kitchen equipment. As was already mentioned, the restaurant business is a totally different kind of business when compared with beer brewing and therefore, the limited-menu brew-restaurant is a very good way to start when someone doesn't have any restaurant experience. But still, this kind of brewpub is closer to the brew bar concept because food serves merely as a complement to beer, which remains the core activity of the business with beer/food sales ratio not exceeding 50%.

The true full-menu restaurant breweries are the ones with the highest potential of achieving the advantages of additional revenue stream, moving to the beer/food ratio of

common restaurants, i.e. approximately five percent, but still emphasizing their on-premises brewed beer and thus selling more of it than a typical restaurant. With the beer/food ratio being as high as 15%, the process of beer brewing and selling ceases to be the core activity of the business, passing the throne to the kitchen and food sales. Also, there lies a high opportunity in development of an elaborated food menu, which allows beer and food to be perfectly matched, providing unforgettable pairing experience and leading to fair reputation and customer loyalty. ^[78]

4.7.3. Business plan

„If you have a limited budget, your number one priority is to find a restaurant that is just for lease.“ ^[79] Tom Hennessy

Not all of the brew bars and restaurant breweries started as a brewpub. In fact, there are two main kinds of brewpubs according to their origin:

- 1) **After-thought brewpub**
- 2) **Pre-thought brewpub**

An after-thought brewpub used to be either a simple restaurant or a packaging brewery before serving beer or/and food on the premises. If there is enough outside space, like in case of rural and suburban breweries, becoming a brewpub may be as easy as inviting a vendor to the parking place or buying a food wagon (food truck), which may be parked in the garden in front of the brewery for an unlimited period of time. Again and similarly to the limited-menu brew restaurants, simple food (fast food) can be served and no silverware involved. The same applies to the restaurants with sufficient outside space or unused outbuildings because they can either invite a brewer to move to the premises or they can buy their own brewery equipment, which does not have to be necessarily put in a “bricks & mortar” outbuilding but can be hidden in a wooden shed or a container.

In a more cramped environment, however, there are almost no other options than incorporating the kitchen equipment or brewing equipment in the building itself. Analogically to the problems of urban breweries, it may not be possible due to unsuitable properties of a particular building. If the brewing or kitchen equipment are incorporated despite all the challenges and warnings, the outcome may be inefficiently small, impractical and costly space, where it is a nightmare to work and perform the tasks correctly. In case of a brewery, it may lead to the “nano-brewing vicious cycle“. The truth remains that putting a brewery equipment inside a bad restaurant and vice versa won't save the business from going bankrupt, no matter how perfect the beer or food is (at least from the long-term perspective).

For the reasons presented above, it is a better alternative to establish a pre-thought brewpub, which is intentionally built as a combination of a restaurant/taproom and a brewery with all of the aspects of the business model already in mind and reflected in the business plan without the equipment being a mere attachment. The two components of the business model should work in a symbiosis, not only subsidising each other, and the pre-thought brewpub is a very good way how to achieve it, indeed.

From the brewpub's perspective, it is especially advantageous to buy or rent an existing restaurant and turn it into a restaurant brewery. One would object it is a kind of "after-thought brewpub" but not exactly because the whole concept is already built-in the business plan, which, in spite of being an example of "speculative non-fiction", is a condensed written "materialisation" of strategy, i.e. vision and less abstract mission, structure, organisational culture, marketing plan and entrepreneurial passion. According to Tom Hennessy, the owner of Colorado Boy Pub & Brewery, the following benefits stem from using an existing restaurant ^[79]:

- 1) Floor drains and floor sinks in place**
- 2) Restrooms that are likely handicap accessible**
- 3) Walk-in coolers**
- 4) Commercial kitchen space**
- 5) Air-conditioning and heating systems**
- 6) Commercial hot water heaters**
- 7) Grease traps plumbed in**
- 8) Adequate electrical amperage for your needs**
- 9) Parking**

One has to be careful, however, because there may be some reasons lying behind a restaurant being for sale or an owner being excessively willing to sell the premises under-priced. As was already emphasised, the location is one of the most important brewpub's features and a restaurant going bankrupt does not have to be necessarily an outcome of bad management.

4.7.4. Brewpub layout

"Essentially, the boutique brewery is a bar or beer café where the brewing equipment itself occupies centre stage, normally behind a huge sheet of glass." ^[8] Ted Bruning

If the interest of a brewpub is to create a connection and attract more customers, there is no better alternative than the open brewhouse layout. By incorporating the brewhouse into the restaurant/taproom area, one allows the customers to admire the

beauty of the brewing equipment, be in contact with the brewer, his or her assistants and basically become part of the brewing process itself, i.e. the exact opposite of what happened during the time of industrialisation and associated depersonalisation.

Nevertheless, there are some challenges of this kind of brewpub design. As was already mentioned, not everybody is fond of brewery-related noise and smell (it really is a subjective issue), meaning it can be annoying for some customers, e.g. families and older people, leading to possible demographic shift and shrinkage of the spectrum of potential guests.

Because of the overlapping areas of beer brewing and/or bar or sitting areas of the restaurant, some disputes between the employees may emerge, causing a possible job dissatisfaction and long-lasting grudge between the brewery staff and restaurant/taproom staff, which could further hinder both the brewery and restaurant operations. Unhappiness with the working environment and dissatisfaction can be passed down to customers, turning them into unhappy customers – a nightmare of every business.^[80]

Further, such a setup is predisposed for accidents (or at least there is a higher probability of accidents as compared with other setups), taking into consideration hot pipes, pipes with chemicals and high traffic environment full of people. Both customers and the staff can be badly injured, the examples of injuries varying from acid showers to serious burns. Some brewers wear gloves and goggles to protect themselves against such misfortunes but the customers cannot be forced to wear these protective tools (actually, they can but within a fortnight, there would be no one to wear it). Apart from the injuries, the material damage, e.g. to the wooden floors and wall art, can be very costly and it is more difficult to deal with the aftermath of the accident, not even mentioning the problems with day-to-day sanitisation.^[80]

As there may be problems with sanitisation and associated sterility of the facility, it can be difficult to keep the yeast healthy and happy. Yeast management is the most difficult part of the beer production process and it requires clean environment, which can be a challenge in an overcrowded bar or restaurant.

One way of overcoming the high traffic problem is to begin with “vampire brewing”, i.e. brewing early enough or at night. However, it can be inconvenient for brewery employees (especially if they belong to the “early bird” group of people with biorhythms different from those of “owls”), who can become tired and prone to make a mistake in the brewing process. Such batch inconsistencies may lead to unhappy customers.

The unhappy customers are the worst outcome of the business operations, indeed, because they spread the information among their friends and acquaintances, typically telling 8-10 other people about the negative experience. Therefore, there is not merely one dissatisfied guest but a group of lost customers because of the “unhappy customer multiplication effect“, albeit the progression doesn’t move ahead forever. Total loss associated with an unhappy customer consists of two parts ^[81]:

- 1) **Negative word gain**
- 2) **Positive word loss** – opportunity cost of not turning a customer into a happy customer, who would otherwise spread positive information

Taking all the above into consideration, the separated brewhouse looks like a better alternative for a brewpub. By closed brewhouse, I refer to a layout where the brewing technology is isolated but still visible, e.g. enclosed behind the glass, whereas the hidden brewhouse is present on the premises but not directly identifiable, except for the freshness and deliciousness of the beer served. If possible, the former option is better, combining the marketing power of an open brewhouse but at the same time avoiding some of its challenges. Actually, there is no point of not showing the brewhouse if it is situated on the premises but sometimes, it may be an issue, e.g. in case of after-thought brewpubs.

When distinguishing between the cold and hot block of a brewery, other possible brewpub layouts exist, e.g. open cold block and closed or hidden hot block. Provided they are visible, even the fermentation tanks, regardless of closed or open fermenters, and maturation tanks contribute to deeper customer experience.

4.7.5. Off-site sales

„Packaging and distribution can be a great business but it’s a very different model than that of brewpub, and that’s where our focus lies.“ ^[82] Paul Nashak

There are many reasons for a brewpub to go partially off-site and lots of them actually went, blurring the clear differences between a packaging brewery and a pub brewer. In spite of the challenges of off-premises sales, its benefits serve as a strong motivator for becoming a packaging brewpub. The two important advantages are:

- 1) **Additional source of revenue**
- 2) **Brand building**

In case of saturated local market, sufficiently high excess capacity and enough space for packaging equipment, a brewpub can enter other markets by going off-

premises, i.e. to start packaging part of its beer production, and thus sell more beer than would be otherwise possible. If there is not enough capacity or (and) space for the packaging machinery or capacity extension, either the contract brewing or alternating proprietorship could be a way of increasing the sales. The benefits and challenges of contracting and alternation have already been discussed but it is important to note that the production of beer doesn't have to necessarily move to another facility provided there is (again) space and a possibility of hiring a "mobile packager", who owns and operates the travelling machinery, especially the automatic bottling lines (e.g. Meheen) and possibly small compact canning machines (e.g. Cask Brewing Systems) because the keg fillers are relatively inexpensive and easy to operate. Also, seasonal waves of tourists coming to the brewpub's area present an opportunity of sales boost, which can be exploited with the help of packaging and supplying local retail and/or hospitality locations with pub brewery's beer.

Some of the beer styles are more suitable for packaging than the others; the styles like saison, tripel, other Belgian beer styles and high-gravity beers taste (and look) better in a glass bottle. Depending on the amount of these styles produced, a simple hand bottle filler may be sufficient to bottle the beer and offer it in limited quantities either on-premises or off-premises. Further, in order to please the needs of their customers, the brewpubs may provide them with kegs, lending them on deposit, one-way plastic (party) kegs – PETainers - or simple PET bottles, growlers or beer jugs filled with brewpub's beer for immediate consumption at home. Of course, such limited "packaging" activities are more about brand and loyalty building than about gaining access to another stream of cash flow.

Both bottle/can and draught sales (e.g. via attractive tap handles) can work as a powerful brand building tool allowing a brewpub to gain some regional recognition and lure interested customers in. On the other hand, the brewpub can support the off-premises sales, leading to beneficial symbiosis of the two selling strategies. Therefore, even the packaging breweries can better communicate their message when operating one or two brewpubs, bars or restaurants.

Because of the importance of functioning relationship with wholesalers and retailers in the packaging business, the brewpub's sitting and bar areas may serve as a promotional and representative hospitality resource, either persuading potential downstream partners to sign a contract or strengthening an already well-established relationship with them.

Many of the advantages of the brewpub business model are mirrored in the disadvantages of the packaging brewery model, e.g. lower margins, loss of control, need

for expensive packages and bottling/canning equipment etc. but there are some “packaging brewpub” specific challenges as well:

- 1) Loss of focus**
- 2) Decreased variability**
- 3) Ambiguity**
- 4) Competition**

Analogically to the “only brewing or restaurant brewpub” dilemma, even the off-site business can take the focus off the core activities, in this case selling beer on pub brewery’s built-in market, because packaging is time and energy consuming and it is more difficult to break even. The loss of focus can lead to decreased on-tap variability, with the off-site/on-site sales ratio moving in off-premises direction, tying up the production capacity previously reserved for on-site consumption. In spite of the variability reduction being compensated by introduction of guest beer, there is a certain possibility of customer loss. Therefore, the excess capacity emphasized in the beginning of this section is very important in order to prevent this situation from happening, other options being either contract brewing or alternating proprietorship.

By being a sort of hybrid between a brewpub and packaging brewery (in addition to being a combination of a restaurant/taproom and a brewery), some ambiguity problems may emerge, reflecting themselves in confusing accounting and employee friction. Because of the lower margins in the off-trade sector and difficulties with breaking even, higher volumes of production are necessary, forcing a brewmaster to order more of the inputs, subsequently causing problems with cash-flow and negatively influencing other parts of the business, i.e. the restaurant business. For that reason, the departments should be rigorously separated and a skilful accountant hired.

Entering the outside (from the brewpub’s point of view) on-trade market via draught sales (and possibly bottled/canned sales) may be difficult, taking into consideration the brewpub’s competition which is different from packaging brewery’s competition. An ordinary brewpub does not compete against other breweries but it rather competes against other restaurants, beer bars and brewpubs, which may not be willing to support competing brewpub’s on-trade efforts by carrying its beer. It is truly another disadvantage of being a hybrid.

Nonetheless, the packaging brewpubs are not the only hybrid organizations within the brewing industry, considering other organizational forms like mass beer producers and contract brewers. For example, even the large breweries can operate one or more brewpubs, even though these smaller-scale units cannot be considered independent

entities and craft brewers (complying with the three pillars of “craft”). Sometimes, it is important to strictly differentiate between various organizational forms, e.g. in case of empirical research. Glenn R. Carroll and Anand Swaminathan, for example, had to develop a hierarchical counting rule for hybrid organizations in order to perform their hypotheses testing and to avoid double counting^[83]:

mass producer → packaging microbrewery → brewpub → contract brewer

In this way, one doesn't have to know the exact off-site/on-site sales ratios in order to distinguish between brewpubs and packaging micros. If a brewpub engages in packaging, it is counted only as a packaging brewery.

4.7.6. Ownership

Undoubtedly, there are lots of benefits of “not-owning”. By not reflecting the usage of fixed assets in the asset section of the statement of financial position, a brewpub can artificially increase its relative profitability in the eyes of potential investors, successively increasing the chances of successful fund-raising. Also, it can avoid the problems of start-ups appearing less profitable than their older counterparts due to the lack of depreciation, which is usually done on the historical value basis. There is simply no requirement for SMEs to report in accordance with either IFRS (International Financial Reporting Standards) or GAAP (Generally Accepted Accounting Principles), the common financial languages in which the financial statements are presented, which is the case of larger and publicly traded companies, indeed.

As regards the role of assets in wealth generation, Chmelíková (2012) finds that especially the return on total invested capital (ROE) is crucial for Economic Value Added (EVA) within the brewing industry in Czech Republic.^[84] The ROE financial indicator is very important for (potential) investors because it measures the profitability in terms of what they have invested in the business. The higher the values of the ratio, the better. Complying with the DuPont Analysis, the ROE can be further subdivided into Return on Assets (ROA) and Assets/Equity ratio (financial leverage). Because of the latter one, the positive effect of not-owning, which is reflected in ROA, is not passed down to the ROE, i.e. the net income and shareholder's entity are the most important items (not the assets and the problem of owning them or not). Therefore, it really depends on what is perceived (or presented) as the most important financial indicator, then the industry, company's environment (both internal and external) and financial strategy are all relevant issues, e.g. lower levels of financial leverage in case of owing (borrowing) money to (from) financial intermediaries (companies are often committed not to breach some covenants which are based on accounting ratios).

Further, the freehold means absolute control over the assets, allowing the owner to perform all the necessary adjustments both to the buildings and land prior to (and after) opening the brewpub and without asking a “landlord” for permission every time a change is needed. By owning the site, one doesn’t have to worry about a landlord not renewing the lease contract due to more lucrative offers or because of not functioning lessee-lessor relationship. The fact remains, however, the conditions of the lease depends on each individual landlord and sometimes, he or she may not be opposed to adjustments at all. Actually, they can even share part of the costs, keeping in mind it is their property which is being improved. Nevertheless, it is still sensible to invest in the property provided there is long-term orientation of the business, i.e. not only being profitable in the short run but especially satisfying the customers’ needs and intention to survive in the long run, because in the end, the discounted cash outflows (lease payments) will always exceed the initial investment in the property.

4.7.7. Location

Regardless of the basic distinction of the possible brewpub locations, i.e. rural, suburban and urban, some of them are more attractive than the others, either being situated on frequent tourist trails or in densely populated areas with high vehicle and foot traffic. Especially the accommodation facilities in tourist areas are renowned for installing small-scale brewing equipment, hoping for increased attractiveness and better chances to succeed in uncompromising Darwinian economy. Not all of them are examples of after-thought brewpubs, however, with some projects being “hotel brewpubs” from the beginning, e.g. the MMX (2010) brewery from Czech Republic, which was built as a pub brewery combined with a hotel, catering for tourists going to visit the Karlštejn castle. Some of them are big wellness centres with saunas, swimming pools, bowling, beer spas etc. One big disadvantage of the “hotel brewpub” concept is its reliance on seasonal flow of tourists unless it is situated in year-long visited area.

Shopping malls, airports and main train stations are those areas with high year-long foot traffic, allowing a brewpub to fully exploit the potential of constant cash flow. But it may not last forever, taking into consideration the risks of “not-owning” a place, meaning the lease contract does not have to be prolonged. Then, the premises are easily taken over by another restaurant or shop, which offers better price, i.e. higher percentage of sales.

4.8. Brewpub chain

„Their tied estates, and the number of free houses they controlled through low-interest loans, surely meant that the upstarts would never gain more than a toehold in the retail trade and could never become a threat.“^[8] Ted Bruning

Apart from the packaging, contracting and alternating, there is another way of entering new markets, i.e. through opening additional brewpub or brewpubs elsewhere, possibly building a chain of multi-site facilities, a brewpub chain. The concept can be more centralised, however, resembling the old English tied-house system, whereby a central brewery, in this case a larger brewpub, supplies its beer to vertically controlled non-manufacturing pubs and restaurants. In England, the system was limited by the Beer Orders because it represented a market barrier for smaller manufacturers, whereas in the United States, the three-tier system (brewers are required to sell their beer to retailers indirectly through a group of wholesalers/distributors) basically prevented the large breweries from vertically integrating their retail partners, at least in some states, albeit not exactly facilitating the situation for smaller craft brewers either. The non-manufacturing locations are controlled by means of vertical restraints, which can be divided into two main groups^[84]:

- 1) **Price restrictions**
- 2) **Non-price restrictions**

As regards the former one, it is a classic example of price fixing, i.e. setting a minimal or/and maximal price the retailers are allowed to charge, bringing under control their margins and securing stream of revenues for the manufacturer. Complying with Margaret E. Slade's study, the latter one can be further subdivided into four categories^[84]:

- 1) **Exclusive dealing.** The retailer is allowed to sell brewery's products only.
- 2) **Exclusive territories.** Every geographic area is catered for by one retailer.
- 3) **Quantity forcing.** Retailers are forced to purchase minimal amount of beer.
- 4) **Tying.** Beer is not supplied unless another product is purchased as well.

There are some undeniable advantages of the centralisation, both for the large breweries and the smaller ones, which can be summarised as follows:

- 1) **Efficiency**
- 2) **Cost reduction**
- 3) **Power**
- 4) **Higher control**

Due to economies of scale, it is more efficient to centralise the production, brew beer in larger batches and purchase relatively cheaper ingredients in larger amount. Further, as was already discussed, the high traffic urban locations are very expensive (either to own or to rent), and by centralising the production, there is no need to have a space for the brewery equipment, meaning one doesn't have to invest in the technology and pay additional employees. Therefore, the cost reduction is two-fold. Without a doubt, the market power is another motivation, allowing the brewpub chain operator to take higher risks, not being afraid of going bankrupt if one of the new locations doesn't turn out to be profitable.

The last advantage is a little bit oxymoronic, being in fact a possible disadvantage. Because of the higher level of centralisation, it is easier to control over quality and consistency in the pubs, leading to standardization and unification of the beer. However, the standardization and uniformity of the products were the issues the craft beer movement fought against in the first place, trying not only to move back to the ancient times of traditional processes but also avoid the production of bland beers by being creative and unique (the 3rd pillar). For that reason, it is very important to find a balance between unification and creativity in the multi-site facility in order not to lose some of the customers. Also, in case of large brewpub chains with locations being situated far away from each other, it becomes very difficult to manage the business unless an operations manual is established, a written document distilling the substance from the organisational culture, philosophy, management style, quality control etc. Simply put, the invisible manifestation of the unification has to be present, whereas the solid one, i.e. the more direct environmental manifestation like colours, design, shapes, suits etc., is not so important and can be excluded, allowing each unit to develop its own unique concept.

4.9. Fermentation pubs

Taking advantage of the centralisation, the fermentation pubs present another interesting business model. In fact, they could be referred to as cold block pubs because no beer is brewed on the premises, although it is finished there. The wort is produced in one central brewhouse, shipped to various fermentation pubs, where the responsible people pitch the yeast and manage the fermentation process, and then it is served, cold-conditioned or matured in the tanks. Because of the cold block, however, the space benefits are not as high as in case of purely non-processing units in a centralised brewpub chain.^[85]

By separating the hot and cold process, one can possibly avoid some of the legal or customs-related obstacles because the wort is unfermented, i.e. it is a mere sugar liquid with “beer potential”, and thus it is not liable to duties, which would be otherwise the case of alcoholic drinks. Of course, the challenge is to keep the wort clean and unspoiled by the wild yeast. The risks can be mitigated by chilling the wort to very low temperatures and keep it cold until being ready for both transport by a suitable vehicle and on-premises fermentation. ^[85]

4.10. Packaging brewery

As the pros and cons of packaging were already elaborated in the previous part, i.e. comparing brewpubs with packaging breweries and “packaging brewpubs”, I focus on the role of packaging by slightly describing the most common beer packages.

4.10.1. Role of packaging

The most common packages used for beer’s preservation are glass bottles which were massively introduced at the beginning of 20th century. Actually, the introduction of cheap, pressurized and portable beer containers like glass bottles helped the beer to become widely distributed commodity and it facilitated trade in beer, indeed. Glass was strong and especially impermeable to liquids and gasses which enabled transport over longer distances because it helped to preserve one of the qualities of beer, i.e. its “brisk” caused by carbon dioxide. However, the biggest disadvantage of the glass bottle is its transparency which enables sunlight to affect the taste of beer, which becomes skunky due to various photochemical reactions. ^[10]

Plastic bottles for beverages were introduced in the 1970’s. Today, there are two main kinds of plastic bottles available:

- **PET** (polyethyleneterephtalate) and
- **PEN** (polyethylenaphtalate).

Both of them have very good barrier properties but still, they don’t provide as long shelf life as ordinary glass bottles do because the oxygen (the greatest enemy of beer) is not only contained in the head space but also in the material itself. More expensive PEN bottles are, however, superior to PET bottles because they are more impermeable and can be used as returnable bottles. Compared to glass bottles, the plastic ones are much cheaper, lighter and less breakable, meaning they are suitable for outdoor occasions like

fishing, sunbathing on the beach, some sport venues etc. Nevertheless, the transparency of the material remains and they are less stable (easily toppled over) than glass bottles, possibly slowing down the bottling line. Another disadvantage of plastic bottles is their image of cheapness.^[10]

After the American prohibition, beer cans made of metal began to be produced at larger scale. Their advantage over glass bottles is similar to plastic bottles as the cans are much lighter than glass. Therefore, they are cheaper to transport and more suitable for outdoor activities. However, the cans stack better than both plastic and glass bottles and they are absolutely impermeable to liquids, gasses and even light. Since they are not transparent, they protect beer against light-struck and associated undesirable aftertaste or “tang”. Further, they provide more printable space when compared to bottles, leading to more artwork and information which in turn facilitates the formation of associations and the overall brand building. The disadvantage of cans is similar to plastic bottles because they are associated with cheaper (or lower quality) beer and they are not returnable (lots of consumers consider cans to be an inferior product). Provided a microbrewery utilizes a small and compact manual canning machine (Cask Brewing System’s manual two-head filler and single-head seamer), there is even a higher probability of contamination, considering the higher exposure of beer to oxygen due to the imperfections (labour intensiveness and slowness resulting in mere 12 cans/minute) of manual canning process. Therefore, the contract-canning (in bigger breweries or via the help of “moving packagers” – at least if they own the more expensive compact automatic fillers and seamers) may be a more practical way for a microbrewery willing to try the metal packages.^{[10], [86]}

There are even some less common beer packages like aluminium and ceramic bottles. As regards the former ones, their properties are very similar to cans but they are made from a single piece of metal, i.e. contrary to the ordinary cans, the aluminium bottles are seamless. Also, the aluminium bottles are stronger than glass bottles (their walls are much thicker than cans’ walls), they cool down faster and do not require purchase of a specialized bottling line because they are compatible with the conventional glass bottling lines. The ceramic bottles possess some unique qualities as well. They are absolutely impermeable to ultraviolet light and they serve as a better insulator than both metal and glass. However, these non-traditional packagings have something in common: they are very expensive (e.g. the aluminium bottle is much thicker than can but, on the other hand, it uses more aluminium). For that reason, they are more suitable for low-volume one-off batches of beer (at least from the microbrewery’s perspective because the big players are the ones to be famous for usage of aluminium bottles), and thus compensating the higher costs of packaging with higher margins.^[86]

Apart from the practical aspects of materials used, there are also communication issues because the materials possess some intrinsic values, which may explain why are some markets characterised by different packaging materials, e.g. tin has some emotional qualities in UK. As regards beer, the glass is still associated with higher quality and many people would not understand if high quality wine was kept, for example, in plastic bottles. It is believed that glass imparts superior taste and craftsmanship, e.g. in Bavaria, many people cannot imagine drinking beer from cans. Also, the glass is pure, not containing any chemicals and not interacting with the liquid inside. The traditional materials used in glass production are three (here, we can find a certain analogy with traditional beer and Reinheitsgebot): sand, limestone and soda ash. As the glass is almost endlessly recyclable, it is considered as the fourth traditional input. ^{[87], [50]}

5. Barriers to entry

„Once success becomes apparent, however, entry takes off.“ ^[88] Victor J. Tremblay,
Natsuko Iwasaki and Carol Horton Tremblay

Complying with Michael E. Porter’s Competitive Strategy and the idea of “extended rivalry“, the threat of new entrants into an industry is one of the most important determinants of the intensity of competition within that industry. The threat of new entrants depends on the barriers to entry which have seven main sources ^[89]:

- 1) Economies of Scale**
- 2) Product Differentiation**
- 3) Capital Requirements**
- 4) Switching Costs**
- 5) Access to Distribution Channels**
- 6) Government Policy & Authorities**
- 7) Scale-independent Cost Disadvantages**

As was already discussed, the economies of scale are important for microbreweries, i.e. the nanobreweries are excessively scale inefficient, but to a certain level because of the need for beneficial inefficiencies. Compared with the large generalists, the microbreweries are scale inefficient, although the “scale inefficiency“ is part of their identity, i.e. being small and thus avoiding the negative perception of mass production. For example, in the U.S.A., the big breweries attempted to enter the craft-beer segment with their own craft-like brands (aka phantom, stealth, microclone brands etc.), concealing their true identity and origin of the products, but they were mostly unsuccessful because of the craft beer consumers still preferring and supporting the organisational form of the smaller scale facilities. Analogically to the problem of contract brewing, the perception of identity and authenticity plays a key role in craft beer consumers’ purchasing decisions, at least in case of enthusiasts and loyalists. ^{[83], [84]} For that reason, the microbreweries are not only “scale inefficient“ but also “beneficially inefficient“ with the latter one offsetting the drawbacks of the former one. Therefore, the economies of scale are very important, of course, but do not represent a major barrier to entry into the microbrewing sector.

Not taking into account the loyal customers (loyalists), the craft beer consumers are generally very open to new brands, breweries and styles of beer, often exhibiting category loyalty instead of brand loyalty which is again associated with the differences between brand-differentiated unified (marketing, advertising, in many cases mass-produced) beer and taste-differentiated craft beer. The demand for diversity is no less

important, leading to low barriers to entry for new microbreweries, at least in case of focusing on a specific group of customers, i.e. focusing on the explorers and enthusiasts.

Stemming from the concept of beneficial inefficiencies, the capital costs of starting a microbrewery are relatively low, albeit not as low as in other sectors, e.g. the initial investment into a scale efficient microbrewery is substantially higher than costs of starting a homebrewing shop (provided no bricks and mortar are bought). Also, the brewing technology utilised by the microbreweries is usually very simple when compared with their larger counterparts, resembling the traditional technology of the past. Therefore, the capital requirements are not prohibitive.

The costs of switching between various brands, breweries and beer styles are close to zero within the group of well-established craft beer consumers. Some switching costs may appear in the beginning, when moving from the realm of unification and stereotype to the world of uniqueness and diversity, which is characterised not only by higher prices but also by unconventional tastes which may be difficult to appreciate and get accustomed to. For some very conservative beer consumers, the immovables, the craft-beer loyalists and less affluent people, the switching costs may be simply too high.

Whereas the brewpubs are safe, the packaging brewpubs and solely packaging microbreweries may face various difficulties in accessing some retail and hospitality locations, notably the conventional supermarket chains and pubs and restaurants tied to incumbents both from the microbrewing and mass-brewing sectors. As regards the micros, the ties may be based on long-term and trouble-free relationship with a restaurant/pub which takes care of the craft-beer loyalists, leaving not many options for a new microbrewer with a limited budget. In case of a pub/restaurant catering for the beer explorers and beer enthusiasts, their needs for style variability can be adequately satisfied by one innovative microbrewery as well, albeit the demand for brewery variability is unmet. On the other hand, the larger brewers resort to various trade promotions ^[50]:

- 1) **Off-invoice Allowances.** The retailers, pubs and restaurants get discounts after selling a certain amount of beer (the volume allowances) or the per unit prices are reduced.
- 2) **Advertising/performance Allowances.** The pubs, restaurants and retailers are monetarily motivated to promote and advertise brewery's brands. Money is provided when there is a certain proof of the advertising effort.
- 3) **Slotting Allowance.** Before allowing a new product on their shelves, many retailers require their up-stream partners to pay one-off fee to cover the costs of introducing the new product in their store.

- 4) **Buy-back Allowances.** These are not necessarily done only by the big brewers, i.e. it is also relevant for microbreweries pursuing the seasonal brands strategy. In case of not selling all of the seasonals (or new products) within a season (limited period of time), a brewery buys the unsold amount back.
- 5) **Dealer Contests.** A contest may be organised among the pubs in order to make them sell more beer. The winners of the contest are rewarded by various prizes, e.g. a new tap, furniture, free tickets, trips etc.
- 6) **Dealer Loaders.** Very common promotional materials which are offered to pubs, e.g. the glassware, coasters and even some equipment like refrigerators. The less expensive promotional materials are, of course, supplied by the micros as well.

Because of the above mentioned, lots of the hospitality locations and the majority of retail outlets represent forbidden zone for new microbreweries. It is possible to persuade some of the pub/restaurant owners but it requires lots of time, effort, luck, business contacts and possibly money for some kinds of trade promotions. Certainly, there are the beer bars with rotating handles and specialized beer shops but these businesses do not bring both new entrants and well-established microbreweries into safety. Without a doubt, a very effective and experienced sales force is needed in order to overcome this barrier.

Governments often limit or preclude the entry of new companies and entrepreneurs into an industry by extensive regulation or licensing requirements. In Czech republic, for example, the microbrewery keeper has to comply with the Act. No. 455/1991 Coll. the Licensing Act, in which the wannabe microbrewers need to prove their competence for the activity defined as “brewing and malting”. It is done by presenting an evidence of studying the activity in question or evidence of studying some related activities, e.g. biochemistry and fermentation, supplemented with a proof of one-year experience in the field defined as “brewing and malting”, albeit the college-educated entrepreneurs do not have to produce an evidence of one-year experience. Those without the appropriate education have basically two options of obtaining the license:

- 1) **Six years’ experience in brewing and malting**
- 2) **Trade operated by way of responsible representative**

As regards the second option, an entrepreneur appoints a trained brewmaster who is responsible for proper operation of the brewery and who is responsible for compliance with all relevant rules and regulation. The “proxy brewmaster” comments on and approves work and safety regulations within the facility, the quality assurance plan and beer recipes. His or her responsibility has its price, of course, but it doesn’t represent

major operational costs for a wannabe microbrewer. Further, after six years of experience, it is highly probable the license will be granted without the need for proxy brewmaster anymore.

Actually, apart from the changes in consumer preferences (already elaborated) and possible changes in technology (not so relevant for microbrewing sector), the changes in government policies can be considered as one of the key environmental changes responsible for niche creation, which is believed to be one of the explanations for the “microbrewery boom” (another explanation being the resource partitioning theory). For example, the legalization of homebrewing in USA in 1976, subsequent continual legalization of brewpubs and the introduction of substantial tax advantages for smaller brewers (granted in February 1977) served as powerful entry stimulators.^{[130], [84]} In EU, the excise duty rates can be reduced for the “independent small breweries”, i.e. the brewers with annual production not exceeding 200,000 hl, by no more than 50% (Council Directive 92/83/EEC of 19 October 1992). Such tax reduction may be very attractive for potential entrants, indeed.

In Czech Republic, an entrepreneur has to comply with a myriad of other legal requirements in addition to the Act. No. 455/1991 Coll. , the Licensing Act, in order to operate a microbrewery. Before establishing a brewery, it is absolutely necessary to contact local authorities and share a detailed description of business plan with them. One of the most important authorities is the building authority, which is authorised to change the official use of a building from “living” to “production”. Therefore, if a building (or a part of building) intended for operation of a new microbrewery has a different function than production, the building authority has to be requested to change it. Also, the building authority requires a written report containing an assessment of fire risk in a particular building/space. The assessment is done by local fire department (and not for free, of course).

Apart from the building authority, the municipal office is no less important because the members of the city council have to agree with the intention of operating a microbrewery in their town. Provided they agree with the idea, they put up their agreement on a notice board and provide the town’s inhabitants with time to express their opinion. If anyone of the citizens is against the business plan, an amendment procedure takes place and the dissatisfied individuals have to be persuaded to support the idea of establishing a microbrewery. Further, the department of the environment has to be assured a brewery does not adversely affect the surrounding environment. Hence, the department is interested in information on company’s waste management, the character of the waste materials, ownership of a sump, connection to the sewerage system etc.

Even a microbrewery can be (and is) controlled by the Czech Agriculture and Food Inspection Authority, which is authorised to penalize a company in case of violation of any hygiene-related legislation. Therefore (in order to avoid any penalties), a microbrewery has to meet some basic hygiene requirements. Among others, a company has to comply with following regulation:

- Regulation (EC) No 852/2004 on the hygiene of foodstuffs. It also provides hygiene requirements for the premises and equipment.
- Commission Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs
- Regulation (EC) No 178/2002 of the European Parliament and of the Council laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety
- Commission Regulation (EC) No 1881/2006 setting maximum levels for certain contaminants in foodstuffs
- Regulation (EC) No 1333/2008 of the European Parliament and of the Council on food additives
- Regulation (EC) No 1334/2008 of the European Parliament and of the Council on flavourings and certain food ingredients with flavourings properties for use in and on foods

Then, it is also important to meet the requirements for “beer“ as it is defined in the Czech National Regulation No 335/1997 Coll. (discussed in the part on traditional production). Provided beer is sold in packages (bottles, kegs etc.), the labelling requirements and requirements for materials suitable for contact with food become relevant, i.e. the following directives and regulations:

- Directive 2000/13/EC of the European Parliament and of the Council on the approximation of the laws of the Member States relating to the labelling, presentation and advertising of foodstuffs. The directive was incorporated into Czech National Regulation No 110/1997 Coll. on foodstuffs and tobacco products.
- Czech National Regulation No 477/1997 Coll. on packaging and Regulation No 38/2001 Coll. on hygienic requirements for products designed for contact with foodstuffs

Also, a microbrewery should not exceed local noise limits. For that reason, it is necessary to prepare a study of noise of the operations to prevent any hearing impairments of the workers and possible disturbances of company’s neighbours. As

regards brewing water, it should meet the parameters of drinking water (as defined in the decree No 252/2004 Coll.) and a simple water chemistry analysis has to be performed. Last but not least, the General Customs Directorate has to be contacted because of the excise duties.

Nevertheless, there are yet other factors influencing the barriers to entry, not necessarily stemming from the size and economies of scale but rather from the scale-independent cost advantages of the well-established breweries. According to Porter, these cost advantages have following sources ^[131]:

- 1) Proprietary product technology.**
- 2) Favourable access to raw materials.**
- 3) Favourable locations.**
- 4) Government subsidies.**
- 5) Learning or experience curve.**

The availability of know-how of beer brewing and various beer recipes is very high, with some microbreweries and craft brewers even publishing or sharing the composition of their brews to allow enthusiastic homebrewers to try to imitate their favourite brewery's products at home. Provided all the necessary rules are adhered to, brewing is not a very complicated process and the technology is not that complicated either (returning to traditional and simple brewing), even in case of some innovation, e.g. the continual hopping for more balanced beers (Sir Hops Alot; 60 Minute IPA, 90 Minute IPA), it really is not considered a rocket science. ^[43] Without a doubt, the most difficult part of the beer production process is the fermentation part and yeast management, especially when fermenting high gravity beer, and it requires some experience. But again, it is not a proprietary knowledge. Regarding very large breweries and their possibly patented methods of unified beer production, they are not relevant for the microbrewing and craft beer sector. On the contrary, they wish to be disassociated from the big ones and their practices.

The upstream vertical integration is very common in the brewing industry with many breweries owning their own malt plants and even hop-fields, bringing them control and independence. They cannot be deemed the only and exclusive sources of raw materials, however, with a myriad of other malt-houses and hop gardens catering for even the smallest of the small. Some possible disadvantages may lie in the fact that the hop and malt supplies are often forward contracted, hindering the new entrants' access to raw materials. Theoretically, in case of a brewery owning a hop-field with a unique species of aroma/flavour hops, which was developed or bred exclusively for the brewery and is not available anywhere else, e.g. at that time the Japanese Sorachi Ace (this variety was

named after its developers, Sorachi Subprefecture, who crossbred Czech Saaz with Brewer's gold for Sapporo Breweries in the late 1970s), the favourable and exclusive access to raw materials is created, indeed. ^{[90], [91]} The same applies to potential new varieties of grains.

Attractive and profitable locations constitute precious merchandise, most importantly in the hospitality sector. If not fast enough, even the new microbreweries may face hard times when looking for appropriate locations and sometimes, it can be even impossible because of the market saturation in some geographical areas. Therefore, the pioneers and early followers are in a better position when compared with the latecomers, enjoying the benefits of the first-mover geographic advantage and creating barriers to entry for wannabe brewpubs, packaging brewpubs and geographically focused microbreweries.

In the EU, the new business projects with some intended social benefits, especially in economically poor regions with high unemployment, are those supported by subsidies from various funds, e.g. the European Agricultural Fund for Rural Development (Vesnický pivovar Ohrada – Czech microbrewery) or European Social Fund (1. Selský pivovár – another Czech microbrewery). For that reason, the preferential subsidies may handicap some of the new entrants, whereas some of them are privileged. Even the well-established breweries, both large and small, may receive subsidies, some of them legitimately, some of them less legitimately, e.g. the export subsidies for oligopolist brewing companies with power, influence and connections. Also, the older companies might have gained more experience with receiving subsidies, their relationship with important officials can become partially informal or they can be simply the first ones to exploit the opportunity of time-limited subsidy programmes.

In many industries, the unit costs decline with the accumulated experience, often following the pattern of S-shaped curve, also known as the experience or learning curve. Complying with the S-curve pattern, the rate of learning is very slow in the beginning, then it starts to continuously rise and is followed by rapid progress until it reaches the saturation zone. It can be applied to production, marketing, distribution and spread of new ideas (then in medicine, ecology, chemistry etc.). The fundamental condition of the companies' accumulated experience becoming a barrier to entry, however, is its proprietary and exclusivity, i.e. not being available to competitors and possible entrants through copying, hiring competitor's workers, purchasing the same (similar) or up-to-date equipment and acquiring know-how from industry consultants, experts and other companies. ^[131] Rather than proprietary experience, the microbrewing and craft beer sub-sectors are characterised by shared experience, solidarity and by combined forces in

fighting against the big players of the brewing industry. Unfortunately, some of the pioneers of the microbrewing revolution went bankrupt, while the followers adopted their ideas, learned from their mistakes and built (albeit with no less hard work) successful breweries.

As was already mentioned, the experience curve can be used to demonstrate the spread of new ideas and innovation, e.g. the ideas of setting up and operating a microbrewery, with the revolution leaders trailing slowly and with great effort the path for their successors and imitators, leading to more successful companies, higher customers' awareness, higher demand, even more new businesses established in order to satisfy the demand and to rapid industrial growth until it gradually slows down and reaches its maximum in the zone of market saturation. In this case, the curve is called a "diffusion curve", which is mathematically described by sigmoid or logistic functions. The rate of new entrants is also consistent with the contagion, feedback and organizational ecology theories, which claim the entrance into new industry is very limited in the beginning but when the risk-taking pioneers become successful, the secondary entrants appear, although with a lag due to hindered identifiability of the "success" in the early stages. ^[88] In the chart below, the "curve fitting" process provided relatively good fit to the growth of microbreweries in the Czech Republic:

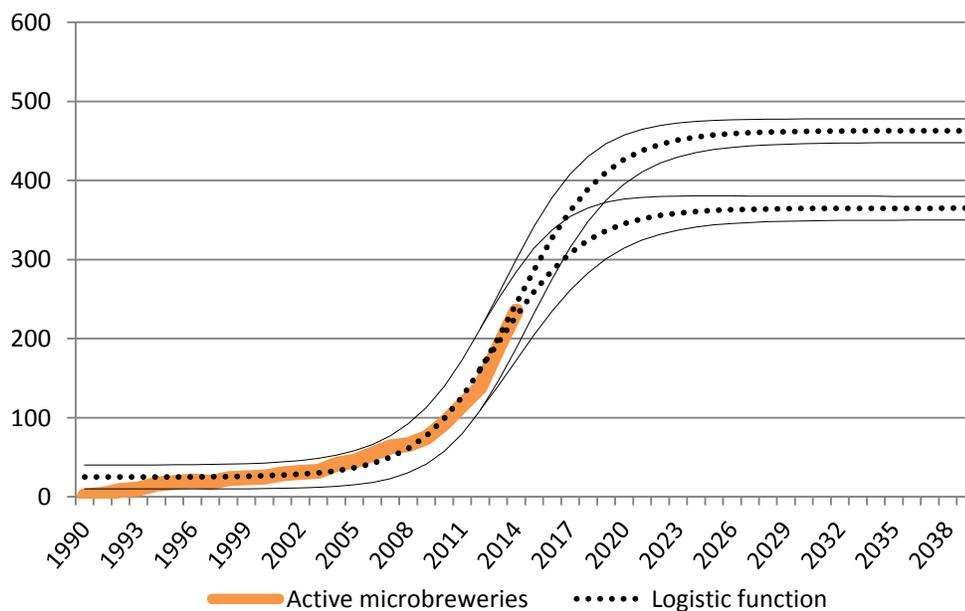


Figure 4 Growing number of microbreweries in Czech Republic; Source: own processing, Pivovary.info

As we can see in the chart, the development of the number of active microbreweries follows the first half of the two logistic functions (at least from the year 1993), albeit with a certain level of volatility. The diffusion curves may provide some insight into the foreseeable development but they can be hardly considered reliable predictors of the future, taking into account, for example, the over-exuberance and associated shakeout in the US craft beer industry in the late nineties. Therefore, there is merely a certain probability and in this case, it is highly probable that the number of microbreweries will find its plateau either in the 300-400 region or 400-500 region, i.e. the number of microbreweries will continue to rise for a certain period of time, further increasing the competition and barriers to entry.

6. Analyses

6.1. SWOT analysis

In cooperation with one small packaging brewery from Czech Republic, I conducted a SWOT (strengths, weaknesses, opportunities, threats) analysis, elaborating some of the differences between the breweries' attributes and specifics of the microbrewing (smaller scale brewing) per se. Some of the differences were already discussed in the previous part. For example, some of the advantages of nanobrewing (when compared to microbrewing) can be applied to the issue of microbrewing as well, e.g. higher flexibility, whereas some may be perceived as a threat to well-established microbrewery, e.g. lower barriers to entry.

SWOT	
<p>Strengths:</p> <ul style="list-style-type: none"> • Traditional beer • Regionality • Freshness • Higher flexibility • Quality • Credibility • Excellent brewmaster 	<p>Opportunities:</p> <ul style="list-style-type: none"> • Own malt-house • Own hop garden • Reasonable expansion • Higher market share • Food pairing potential
<p>Weaknesses:</p> <ul style="list-style-type: none"> • Lower diversification of risk • Economies of scale • Hindered access to capital • Higher economic vulnerability • Possible inconsistency of outputs • Crucial role of sensory analysis 	<p>Threats:</p> <ul style="list-style-type: none"> • Threat of new entrants • High level of competition • Big brewers' economic power • Big brewers' retaliation • Economic policies • Inputs' weather dependency • Seasonality of consumption • Fading away of fashion effects • Insufficient supply of brewmasters

Table 10 SWOT analysis; Source: own processing

The tradition (traditional inputs and production processes) is very important issue in the brewing industry, at least in some areas and countries. The Czech Republic is one of those countries. Provided the consumers know about the traditional production and raw

materials, they deem it a positive sign which affects their purchasing decisions to a large extent. The concepts of regionality (neolocalism), freshness and higher flexibility were sufficiently (in my opinion) elaborated in the previous sections. As regards the quality and related credibility (preserving standard quality), the smaller-scale brewing facilities depend substantially on sensory analysis, which is usually done by the brewmaster. Therefore, an excellent brewmaster with adequate sensory training is a very valuable asset for a company since he/she serves as a guarantee of quality. Also, even the microbreweries and small breweries may develop a complex quality assurance plan which can become one of their core competencies.

By contrast to the microbreweries and smaller breweries, the big brewing companies can afford investments in top-notch laboratories, expensive equipment and professional chemists. For that reason, it is easier for them to secure standard quality of their products. Smaller breweries, therefore, may suffer some inconsistencies in their outputs, which, on the other hand, does not have to be necessarily treated as a weakness because some of the consumers may welcome the vertical variability in beer production (one style of beer changing over time). Further, the big brewing companies often consist of more than one brewery and beer brand, catering for a larger group of consumers and geographical markets and thus diversifying the risk of failure.

One of the ways of reducing the power of hops and malt suppliers (one of the vertical Porter's powers) is to move or integrate upstream. Own grain field, malt-house and hop garden can become a very welcomed cushion against periods of shortages and volatile prices. However, establishing or acquiring those businesses is a very costly venture, not affordable for smaller breweries. Therefore, there is always an option for a microbrewery to become bigger (and thus more scale efficient), seek for higher market share, gain some capital and invest it, e.g. in a hop garden (like in case of Sierra Nevada brewery). Because of the higher flexibility of smaller breweries, they can begin a cooperation with some well-known and fancy restaurants, offering them a beer style or a set of beer styles which will match perfectly with restaurants' menus.

Because of relatively low barriers to entry, the rivalry in the microbrewing subsector may continue to rise, leading to harsher competition not only for customers but also for the limited number of experienced brewmasters. Also, the economic policies may change, e.g. the reduced excise for smaller breweries, the prices of inputs rise, the winter be too cold (and consumption of beer lower) and the big breweries may start to fight back for the lost market share, e.g. by limiting smaller breweries' access to raw materials (e.g. via strategic inventories) or by embarking on a marketing campaign aiming to discredit their smaller competitors (e.g. the fake microbrewery "Patron" marketing campaign by

Plzeňský Prazdroj, a.s.). In the end, the fashion effects (like every fashion), may fade away and a substantial part of susceptible consumers may return to mass-produced beer.

6.2. PEST analysis

In this section, I provide some information about the political, economic, social and technological environment in Czech Republic, which may be relevant for establishing and operating a microbrewery or small brewery.

Regarding the political factors, it is especially important to note relatively high level of corruption in Czech Republic. According to Transparency international and its “Corruption perception index“, the Czech Republic scores mere 51 out of 100 with 100 being the highest score, i.e. “very clean“ (e.g. in Denmark).^[92] For every wannabe entrepreneur, such a situation represents possible obstacles in form of unfair negotiation with the authorities. However, the country is politically stable and the probability of returning back to the planned economy is very low (in spite of the communist party still being represented in the parliament), allowing the business to flourish. Actually, the “2014 Ease of doing business index“ is not bad, indeed: 44th place out of 189 with “1th“ being the best.^[92] Further, the international relations with the main importers of Czech beer are at a good level and neither the tariffs nor quotas are to be imposed in the near future (as the majority of the biggest importers are also members of the European Union; Germany, Slovakia, United Kingdom, Poland etc.).^[93] As regards the fiscal policy, the level of interventionism is slightly lower in Czech Republic, taking into consideration the corporate income tax of 19% (2015) is below both the Europe average (20.24% in 2015) and EU average (22.15% in 2015).^[94] Nevertheless, the tax compliance in Czechia is still relatively difficult and expensive because the time of tax compliance is the second largest within EU & EFTA, i.e. 413 hours in Czech Republic compared with EU & EFTA average of mere 176 hours.^[95]

At the moment, the Czech Republic is a developed country with very high HDI (human development index), low unemployment rate (7.9%; 2014 annual average), inflation rate (0.4%; 2014 annual average) and interest rate (0.27%; 2014 PRIBOR 1M annual average). Real GDP growth rate was 2% in 2014 and the purchasing power is increasing.^{[96], [97]} For that reason, the breweries can cater for high-end of the beer market and charge higher prices for some kinds of beer (e.g. microbreweries like Matuška and even medium sized-breweries like “Tradiční pivovar v Rakovníku“ and its fresh hopped and dried hopped lager). Such economic conditions are especially important for many smaller breweries and microbreweries which are focused on production of relatively more

expensive beer (the reasons for the beer being more expensive are explained in the previous sections). Nowadays, it is not uncommon for the retailers to charge more than 100 CZK for a bottle of beer (decades ago, an unthinkable situation in Czech Republic).

With reference to social environment, the age distribution and education trends are particularly important for a craft brewery because, as the research suggests, the craft beer is preferred by younger people (25-35) and by people with higher education levels (university degrees). According to IQ research, an average IQ in CR is 98, which entails 9th place out of 43 (together with, for example, Australia and Denmark), and 20 % of the 25-64 year-olds attained tertiary education level (2013 estimate).^{[98],[99]} Further, almost 16% of the population belongs to the 25-35 group (15.8%; 2014).^[96] For that reason, there is a numerous group of potential customers who may appreciate the “craft” attribute of beer. However, the uncertainty avoidance index (developed by Geert Hofstede) is relatively high in Czech Republic, which may prevent smaller breweries from being innovative (e.g. using non-traditional raw materials) and introducing new beer styles.^[100]

Because of the limited capital of smaller breweries, they cannot afford to market their products through conventional communication channels. For that reason, the internet and social media become very important. In Czech Republic, the penetration (% of total population with internet) is 77.5% (2014) and in absolute values there are more than 8.3 million internet users (2014), which is the 48th highest in the world.^[101] As regards the brewing technology, the equipment used by craft and traditional breweries is similar to that of the past, whereas the contemporary industrial breweries utilise the modern technology and are characterised by high level of automatization. Some of the beer consumers consider “craft” and “traditional” to be an added value and, therefore, the craft and traditional breweries do not have to pay much attention to the latest advances in beer-related technology (e.g. faster fermentation and bottling/canning lines).

6.3. Financial analysis

When composing a business plan, one should prepare the key pro-forma financial statements and calculate the basic financial indicators. However, the sole financial ratios are useless unless compared over time or with a certain benchmark, either an industrial or key competitor (competitors) one. Also, the pro-forma financial statements represent a mere projection of planned future operations and thus the simple horizontal analysis (over time; trend) of pro-forma financial indicators cannot be treated as sufficient for drawing any conclusions. Therefore, the industrial and/or competition benchmarks are especially useful in the process of business planning. A problem appears if there are no

benchmarks available for the sector (or subsector), which is the case of microbrewery subsector in CR, indeed.

Usually, the industrial financial indicators are sorted in line with some of the industry classifications, e.g. NAICS (North American Industry Classification System), NACE (Statistical Classification of Economic Activities in the European Community) etc. For example, the Troy's Almanac of Business and Industrial Financial Ratios is based on NAICS, whereas the financial ratios provided by BACH database (Bank for Accounts of Companies Harmonized) comply with the NACE classification. The Czech benchmarking diagnostic system of financial indicators "INFA" is based on CZ-NACE, a Czech version of the NACE. Both in the CZ-NACE and NACE, the brewing industry is classified as C11.0.5 – Manufacture of beer. Nevertheless, neither the BACH nor INFA provide information exclusively for C11.0.5. Instead, the BACH calculates ratios only for the code C11, "manufacture of beverages", which comprises of the following subcodes ^[102]:

- C11.0.1 – Distilling, rectifying and blending of spirits
- C11.0.2 – Manufacture of wine from grape
- C11.0.3 – Manufacture of cider and other fruit wines
- C11.0.4 – Manufacture of other non-distilled fermented beverages
- C11.0.5 – Manufacture of beer
- C11.0.6 – Manufacture of malt
- C11.0.7 – Manufacture of soft drinks; production of mineral waters and other bottled waters

As we can see, there are many different kinds of businesses included in the C11 code. Such aggregated data prevents an analyst from performing more precise comparison of the indicators. As regards the INFA benchmarking system, it is even less detailed than BACH because it provides benchmarks solely for the most aggregated code: C - the manufacturing. In the American Almanac, however, there are business and industrial ratios for the brewing industry (code 312120), which is further divided into "companies with net income" (profitable) and "companies with and without net income" (both profitable and non-profitable). Also, the breweries are categorised according to their annual balance sheet total (total assets). If we take into consideration one of the possible classifications of the breweries, i.e. the European Commission one, there are two size groups in the Almanac of particular importance for the microbrewing subsector:

1. 0 – 500,000 \$
2. 500,000 – 1,000,000 \$

When converted to euros (e.g. using the long term 1999-2015 average = 1.2202), it is evident the size groups are far below the EC 2€ million threshold for micro enterprises. ^[103] Therefore, the breweries within those two groups could be considered microbreweries, especially those from the first size group. The 2009 edition of the Almanac included 340 companies in the first group, with and without net profit, and 58 companies in the second group, also with and without net profit. The business ratios were calculated for the accounting period 7/05 - 6/06. Nevertheless, the subset “companies with net income” reveals there were no profitable companies in the first group and only 58 profitable in the second group, possibly signifying the effects of MES (minimum efficient scale). There are, among others, the following financial ratios:

	Profitable & non-profitable		Profitable
	0 - 500	500 - 1000	500 - 1000
Total assets in 1000 USD	0 - 500	500 - 1000	500 - 1000
Number of breweries	340	58	58
Current ratio	1.3	1.9	1.9
Quick ratio	0.3	1.8	1.8
Total debt ratio	0.30	0.52	0.52
Net profit margin	-	1.5%	1.5%
Return on assets	-	1.7%	1.7%
Return on equity	-	3.5%	3.5%
Inventory turnover	1.5	-	-
Days of inventory on hand	243	-	-
Receivables turnover	40.3	1.8	1.8
Average collection period	9	203	203
Total assets turnover	1.5	1	1

Table 11 Selected financial indicators for the microbrewery sector in USA; Source: Almanac of Business and Industrial Financial Ratios

But still, some analysts would be more interested in the European benchmarks instead of the American ones. Hence I decided to calculate some selected financial ratios for the microbrewing subsector in Czech Republic.

Firstly, I created a list of all owners of the microbreweries whose financial statements were available in the on-line public register (at Justice.cz) and whose recent annual production did not exceed 10,000 hectolitres, i.e. the microbrewery threshold set by the Bohemian-Moravian Association of Microbreweries. In order to create the initial list, I used internet sources (pivovary.info, pivni.info and ceskepivo-ceskezlato.cz), visited

the microbreweries in person or directly called the breweries and asked for information on annual production.

Then, I excluded those not fully focused on brewing business and/or restaurant business because some of the companies do business in other areas, e.g. massage & recondition services, operation of slot machines, building industry etc., and would otherwise distort the data. Afterwards, I divided the microbreweries into two groups: packaging breweries and brewpubs. If I wasn't sure about the microbrewery type, I checked all possible on-line sources, visited a microbrewery in person or called the breweries directly. Also, I excluded those financial statements not providing enough information and/or statements not reflecting operations (production; selling of goods and services), i.e. usually the new microbreweries' year of foundation. In the end, I collected almost 200 financial statements for the period from 2002 to 2014, transcribed them into a spreadsheet and calculated following financial ratios:

- **Current ratio** = current assets/current liabilities
- **Quick ratio** = (cash & cash equivalents + net short-term receivables)/current liabilities
- **Cash ratio** = cash & cash equivalents/current liabilities
- **Total debt ratio** = total liabilities/total assets
- **Equity ratio** = equity/total assets
- **Coverage ratio** = EBIT/interest payments; EBIT = earnings before interest & taxes
- **Relative profit or loss** = profit or loss/total assets
- **Operating profit margin** = (operating income/revenues)*100
- **Net profit margin** = (net income/revenues)*100
- **Return on assets** = (net income/average total assets)*100
- **Return on equity** = (net income/average total equity)*100
- **Inventory turnover** = revenues/average inventory
- **Days of inventory on hand** = 365/inventory turnover
- **Receivables turnover** = revenues/average receivables
- **Average collection period** = 365/receivables turnover
- **Fixed assets turnover** = revenues/fixed assets
- **Total assets turnover** = revenues/total assets

With reference to the liquidity ratios (current, quick and cash ratios) I did not include the deferrals into the numerator because their transformation into cash & cash equivalents would be problematic (because, unlike usual receivables, they do not represent claim on money). However, the inclusive total debt ratio incorporates all liabilities, i.e. even the deferrals. An average balance sheet item (total assets, total equity,

inventory and receivables) is, in this case, a simple arithmetic mean of the current period balance sheet item and the previous period balance sheet item. The “return on equity” ratio is calculated only with positive values, i.e. only positive equity and net income, because “return on negative equity” does not indicate anything except for negativeness of the equity, which can be better seen in both total debt and equity ratios. Further, the activity ratios’ (inventory turnover, days of inventory on hand, receivables turnover, average collection period, fixed assets turnover and total assets turnover) numerator, the revenues, consists merely of the “operating revenues”, i.e. the effect of financial revenues and extraordinary revenues is eliminated; only the core business is included.

When compared with the formulas in the Almanac, the formulas I use are almost the same except for the denominator of the liquidity ratios because many of the Czech statements of financial position are presented in a simplified form, i.e. not distinguishing between short-term and long-term bank loans.

In the appendix AP1, financial benchmarks, we can see a list of variables (a legend) and 18 tables. The first half of the tables shows financial ratios for both profitable and non-profitable companies, while the second half contains benchmarks only for profitable companies. A profitable company is defined as a company whose average net income (over time) is positive. Additionally, the organisations are classified according to type of a brewery:

- 1. Brewpubs**
- 2. Packaging breweries**
- 3. Both brewpubs and packaging breweries**

Each group is further divided into three size categories according to breweries’ annual production in hectolitres:

- 1. 0 – 1,350 hl**
- 2. 1,350 – 10,000 hl**
- 3. 0 – 10,000 hl**

The threshold of 1350 hl is in compliance with the classification of breweries by market share and represents a stricter approach to the definition of a microbrewery, whereas the 10000 threshold is used by the Bohemian-Moravian Association of Microbreweries.

In the first column of each table is a total number of companies whose financial statements were used to calculate the benchmark (n_c). It is followed by a total number of one kind of ratios, e.g. all current ratios of all companies (n_{rc}). For each company, I

calculated an average financial ratio (ar) and a median financial ratio (mr), which should mitigate the volatility of the data over time. The table shows, however, only the final benchmarks, i.e. the arithmetic mean of average financial ratios (\bar{ar}), arithmetic mean of medians of financial ratios (\overline{mr}), median of medians of financial ratios (\widetilde{mr}) and median of average financial ratios (\widetilde{ar}).

The average of standard deviations of a specific ratio ($\bar{\sigma}_r$; one company over time) and the standard deviations of average ratios and median ratios (σ_{ar} and σ_{mr} ; among all companies) serve as indicators of the data's variability (financial data often contain extreme values). In case of at least one of the standard deviations being higher than 1, it is highly advisable to focus on median values instead on average values, i.e. the median of medians of ratios (\widetilde{mr}) and the median of averages of ratios (\widetilde{ar}). The extreme values are given in the last four columns of each table (\min_{rc} , \min_{ar} , \max_{rc} , \max_{ar}).

In total, there are 16 packaging breweries and 22 brewpubs in the sample. At first sight, it is evident (from the relative profit/loss indicators in the first half; tables 1 - 9) that both business models are on average non-profitable. With the only exception (median of median ratios for packaging breweries in the first size category), the microbreweries are "on median" in red numbers as well. Actually, the last table reveals that only 50% of all companies achieved, at least once, positive net profit over the course of their lifetime. The remaining 50% always ended the accounting period with negative bottom line. Financial statements of only 20 companies provided 64 net profit margin ratios, which represents 45% of the potential 142. Provided those 20 companies were always profitable, they would contribute with 108 net profit margin ratios (not in the table), i.e. 76% of the potential 142. It indicates that the loss-making half of the breweries consists of relatively young companies ($34/19 = 1.8$ years), whereas the second half, i.e. those achieving net profit at least once, consists of older companies ($108/19 = 5.7$ years). Further, if the second half contributed with mere 20 net profit margins (all of them being profitable only once), it would represent 14% of the potential 142. Then, the older microbreweries are 31 pp (percentage points) above the minimum (45% - 14%) and 31 pp below the potential maximum (76% - 45%). Therefore, we can conclude that the older microbreweries give only average performance and the new breweries are not profitable at all.

Also, all of the companies are highly indebted and have, on average, negative equity. Only the medians reveal slightly positive equity ratios but the median debt ratios remain high (0.98 and 0.99). Contrary to the Czech indebtedness, the American total debt was much lower (0.3 for the first size category and 0.5 for the second size category). The negative values of equity are caused, of course, by the accumulation of loss over years but also by insufficient equity financing, both in the beginning and in the later stages of

companies' lives. I believe such situation is not, from a long-term perspective, manageable and some of the companies will go bankrupt unless being subsidised or becoming significantly profitable. As regards the profitable breweries, the table reveals that 74% of total assets is financed by liabilities and the remaining 26% by equity, which is a much better situation than almost 100% indebtedness of the first group of corporations. In spite of the profitable breweries experiencing occasional losses and even negative equity, the values were never as extreme as in all companies' case, i.e. the minimal equity ratio of -1.06 vs. -15.51. Surprisingly, the coverage ratios for the two basic groups are almost the same and sufficiently high, indicating no problems in meeting the interest expenses. At least in profitable years.

When the microbreweries manage to be profitable, both the operating and net profit margins are comparatively high. The American net profit margin was only 1.5%, while the Czech average is 7.9%. Czech average ROA (return on assets) and median ROE (return on equity) are also much bigger, i.e. 10.5% vs. 1.5% (ROA) and 16% vs. 3.5% (ROE). If we focus only on profitable Czech companies (5 packaging breweries and 5 brewpubs; 26% of all companies), the difference between Czech and American ROE (26.06%) is "on median" even more evident.

Because of relatively high standard deviations in the liquidity group of ratios, it is better to use medians instead of means. The American breweries from the first size group have a little bit higher current ratio but much lower quick (acid-test) ratio than the Czech ones, which implies more important role of inventories in the structure of American microbreweries' current assets. When comparing profitable companies with the first group of profitable and non-profitable organisations, it is evident that both have positive working capital but the profitable companies tend to be more secured against financial fluctuations because their current and quick ratios are higher.

Analogically to the liquidity ratios, even the activity group contains significantly variable data and, therefore, the usage of medians is recommended instead. As we can see in tables 9 and 18, the profitable breweries are considerably faster in collecting cash from customers and they also attain higher levels of inventory turnover, which indicates better cash flow and/or inventory management. Truly, such abilities may be one of the determinants of success of those profitable breweries.

Except for very short average collection period of American breweries from the first size group (9 days), the average collection period and time of inventory on hand are substantially longer than that of Czech companies. Undoubtedly, waiting more than 200 days for the bills to be settled is unnecessarily long. Concerning the days of inventory on hand, the 243 days may not be, in the end, an indicator of bad planning if we consider

bulk purchases discounts and possible needs for strategic inventories. Moreover, it is important to note that the American microbreweries utilise their total asset base more efficiently than the Czech ones, i.e. total assets turnover of 1 (and 1.5) vs. 0.87.

In addition to national differences and differences between profitable and non-profitable companies, even the two basic microbrewery business models, i.e. brewpubs and packaging breweries, have their unique financial characteristics. For example, the mean liquidity ratios as well as the median liquidity ratios assign higher liquidity to packaging breweries, both in the non-profitable and profitable groups. It can be associated with one of the advantages of the brewpub business model, i.e. constant and daily cash-flows stemming from the restaurant (bar; pub) part of the business. Therefore, the brewpubs don't have to be as afraid of depleting their cash reserves as packaging breweries, which must rely on receivables and thus be well prepared for possible periods without any cash inflows. Nevertheless, the brewpubs do have receivables and those items actually represent substantial part of their current assets base, especially if a brewpub is a hybrid between packaging brewery and a brewpub, i.e. the packaging brewpub. For that reason, the differences between brewpubs' quick and cash ratios are at the same level as the differences between a packaging brewery's quick and cash ratios because some of the brewpubs in the sample are "packaging brewpubs". As regards the collection periods, they are very similar, 23 days for a packaging brewery and 23 days (median of medians) or 31 days (median of averages) for a brewpub. The same applies to "days of inventory on hand", which is around 30 days for both business models. Although brewpubs are not always profitable, the ROA and ROE indicate the business model is slightly more profitable than packaging breweries, albeit the relative profit or loss, operating margins and net profit margins do not provide conclusive information (net profit margins are almost the same, 7.93% vs. 7.87%). According to the indicators, the brewpubs utilise their asset base more efficiently than "packagers" (higher total assets turnover) and are better suited to service their debt without any trouble due to higher interest coverage ratios.

7. Microbrewery financial plan

7.1. Key assumptions

The “Shouting Village” packaging microbrewery will produce two flagship beer styles: American India Pale Ale (AIPA) and American Amber Ale (AAA). The first style will accentuate the character of hops, whereas the second one will be rather focused on the aroma of malt. Both beer styles will be of highest quality, medium to full-bodied, fresh and brewed with no adjuncts and additives, utilising both the traditional methods of production and some contemporary techniques.

The legal status of the company will be a limited liability company, which is referred to as “společnost s ručením omezeným” in Czech Republic (s.r.o.). It can be established either by a single person or a group of people, who are legally required to invest a minimal amount of money in the company, which is (in 2015) 1 Czech crown (CZK). For example, 1 CZK was 0.03644 € on 1st June 2015, i.e. it is a mere symbolic amount of money, the lowest limit, which is (or should be) usually exceeded because 1 CZK equity simply does not make much sense in this case (a microbrewery) because if it did, it would mean the assets (equipment, materials etc.) are solely financed by credit. Furthermore, the liability is not as limited as it used to be in the past and the owners can, in case of bankruptcy, lose all of their property.

Regarding the ownership structure of the company, it will be proportionately distributed among the founding members. In spite of the legal number of members being limitless, the membership of the “Shouting Village s.r.o.” will be conditioned by minimal investment. In this way, only those interested in being engaged in the decision making process (via general meetings) will be included. Also, the bureaucracy is lower and flexibility higher in companies with not so many members. The memorandum contains an article, which permits existence of only one manager of the company, the founding father and creator of the original idea, and it states that within the period of three years, the general meeting cannot vote for change of the manager. Therefore, the manager doesn't have to be afraid of being relegated and can rather focus on making the venture successful (in spite of potentially not very promising beginning).

After asking several business credit specialists, I concluded that it would be possible to find a financial institution willing to provide the microbrewery with a loan with 10 years maturity, at least 7% p.a. and instalments being paid annually. In both scenarios, i.e. the capacity of fermenters utilised at maximum vs. only one third of their capacity, the brewery will have enough cash to cover the first annual instalment. Actually, even higher interest rate would be financially maintainable. Another reason for the financial

institutions being more willing to finance the brewing equipment is its mobility and the fact it is not going to be firmly connected to the production hall. Hence, it will be faster and easier to liquidate the equipment and settle the liabilities in case of bankruptcy. Another key assumption, which is related to the debt financing, is the financial institution will finance 100% of the brewing equipment. Such situation is, however, overly optimistic because the financial institutions rarely finance 100%. Considering the total CAPEX (brewing equipment, brewing environment and cooling equipment), the financial institution will finance 89%. Nevertheless, in case of bankruptcy, the LLC's liabilities are settled with all the assets, not only the fixed assets and, under positive development (optimistic scenario), the value of current assets and deferrals should persuade the financial institution to accept the terms (in the first year, the deferrals and current assets will represent 52% of the total assets). In the conservative scenario, the losses will lead to two years of negative equity but the brewery will be able to pay the instalments anyway. In this case, the first year deferrals and current assets will represent 28% of the total assets. Provided the equipment is sold at lower price than is the carrying amount, the current assets and deferrals should compensate for the difference. In such situation, of course, the current liabilities would not be settled. Also, I intend to follow the optimistic scenario, brew more batches of beer and thus either achieve profit or at least substantially lower loss than the one presented in the conservative scenario. Therefore, it is highly probable the situation will not be that serious and brewery will be able to service both its long-term debt and current liabilities. The loan schedule can be seen in the appendix AP5. As regards the tax depreciation, the brewing equipment will be included in the "second depreciative group" and linear depreciation will be used. For tax purposes, therefore, the brewing equipment will be depreciated for 5 years with lower coefficient in the first year (0.11) and higher coefficient in the last four years (0.223). For the accounting purposes, however, I decided to depreciate the equipment for 10 years because it will lead to more precise record of utilisation of the equipment, albeit 10 years is still relatively low, taking into consideration that breweries use their equipment for decades. The difference between tax and accounting depreciation will lead to deferred income tax. The depreciation plan is in the appendix AP6.

The Shouting Village, s.r.o., is going to be a VAT payer, which will have indisputable advantages, at least after it starts producing beer because in the beginning, there will be a huge VAT receivable (in YEAR 0). The VAT payables will provide the company with additional and interest-free financing. Further, the intention is to buy ingredients from and sell beer to other VAT payers, who will undoubtedly appreciate the possibility of buying beer without inputs' VAT being included in the final price. The VAT non-payers will appreciate cheaper products as well.

7.2. Management

In the company, there will be just one general manager, who will be responsible for the start-up plan, brewing, selling and delivering beer, marketing and accounting. Except for some helpers, it will be a one-man brewery. Of course, the strategy and marketing will be discussed with all members interested in this topic but in a company as small as this one, the budget for marketing will be very limited. Rather, the brewery will rely on social media and word of mouth. In reference to accountancy, the company does not need to be assisted with any external accountants because the general manager possesses necessary knowledge to compile basic financial statements (balance sheet & profit/loss statement) and identify company's tax responsibilities. In the periods between brewing beer, it will be sold and delivered to chosen retail and hospitality units in Czech Republic.

Some non-qualified labour force will be needed, however. The general manager's helpers will assist him in brewing beer and they will clean and sanitize both the brewing equipment and brewing environment under his supervision (at least in the beginning). Only one helper will be needed at the time of brewing beer but in total, more may come to the brewery and take turns. The intention is to hire locals, e.g. students, unemployed, retired etc. In the following table, we can see the estimated required man hours for one 500 l batch of beer:

Man hours needed per one 500 l batch of beer		
	AIPA	AAA
Milling	0.7	0.63
Brewing	14	14
Fermentation	1.2	1.2
Cold crashing	1	1
Kegging	1.6	1.6
Bottling	4.5	4.5
Labelling	0.9	0.9
Sanitation and cleaning	1.5	1.5
Total hours needed	25.4	25.33

Table 12 Man hours needed per one 500 l batch of beer; Source: own processing

Because the AAA won't require as much malt as the AIPA, the milling will be slightly shorter. Otherwise, the requirements for both styles are the same. Of course, brewing and bottling activities will be the most labour intensive. In the next table, we can see the costs of labour in production:

Labour costs in production of one 500 l batch of beer		
Estimated amount of work		
- Qualified	9.2	hours
- Non-qualified (helper)	15.5	hours
Qualified workers	1	person
Non-qualified workers	1	person
	AIPA	AAA
Estimated costs - qualified	1 840.00 CZK	1 840.00 CZK
Estimated costs - non-qualified		
- Milling	56.00 CZK	50.40 CZK
- Brewing	560.00 CZK	560.00 CZK
- Sanitation and cleaning	120.00 CZK	120.00 CZK
- Kegging	128.00 CZK	128.00 CZK
- Bottling	360.00 CZK	360.00 CZK
- Labelling	72.00 CZK	72.00 CZK
Total	3 136.00 CZK	3 130.40 CZK

Table 13 Labour costs in production of one 500 l batch of beer; Source: own processing

In total, there will be 6 batches of AAA and 6 batches of AIPA produced each month. Therefore, the monthly labour costs in production will be 37600 CZK. Apart from these labour costs, I will be “paid” symbolic 1000 CZK for driving and 1000 CZK for accounting. Then, the total estimated monthly gross labour costs are: 39600 CZK.

Although the marketing activities won’t require substantial investments, I do not underestimate the role of proper marketing communication. The truth is the marketing represents one of manager’s weaknesses due to lack of sufficient practice and expertise in this field. Therefore, I will seek an assistance in marketing among many acquaintances (and friends), who work as marketing specialists, asking them for their expert opinions and suggestions (e.g. regarding SEO – search engine optimization). If they are interested in help, fresh beer, brewery tours and POS materials (T-shirt, coasters, posters etc.) will be offered in return.

7.3. Start-up plan

The start-up expenses consist of two groups: “brewing environment” and “equipment” (cooling and brewing). As we can see in the tables in appendix AP2, the capital expenditures, the brewing environment is further divided into following groups:

- Water supply
- Sewerage
- Electricity
- Tiling
- Ventilation

Although the production hall is equipped with the basic industrial sockets, access to water supply, drainage and ordinary tiles, it is not satisfactory enough for operating a brewery. For that reason, it has to be modified to a certain extent. Firstly, it is especially important to secure sufficient and fast water supply for the brewhouse. Because of the need for thorough cleaning and sanitation, a rustproof washbowl will be installed in the hall. The washbowl will be used for washing hands and for cleaning of smaller equipment, e.g. flasks and beakers.

In order to allow for smooth outflow of water and other fluids, the floor area will have to be supplemented with appropriate industrial drains and box inlet. In addition to the basic sewerage system, a rustproof sink will be placed near the washbowl. It will be used either for the smaller equipment to dry out or for the disposal of various kinds of liquids, e.g. possibly failed batches of beer.

All of the equipment, i.e. the cooling and brewing one, will use great amount of electricity. Therefore, a sufficient number of 400V industrial wall plugs will have to be installed and further supplemented with adequate amount of circuit breakers and RCDs (residual current devices). In this way, a safe and continuous supply of electricity will be secured.

Easily sanitizable and durable industrial tiles are one of the most important prerequisites for operating a brewery. The ordinary floor ceramic tiles will be replaced with industrial basalt tiles, which will be hard enough to support the weight of the brewing equipment, both empty and filled with liquids (beer, water, sanitizing agents), and will not crack. The wall will be panelled up to 150 cm with the tiles made of the same material (basalt), albeit with a slightly different surface. However, not all of the former ceramic tiles will be replaced. Only the area necessary for operating the brewery, which will be 70 m², will be retiled. The area of the floor space, corresponding to the configuration of a microbrewery, will be separated from the remaining floor area by a small wall (a relatively isolated “brewing island“ will be created) and will be slightly sloped towards the drains and box inlet. The minimal slope of the floor will be set at 2%.

During the fermentation process, large amounts of carbon dioxide will be produced by the yeast. In order to prevent any accidents, the gas (which can be toxic) has

to be exhausted from the room. An industrial ventilator, situated in the proximity of the fermentation tanks and placed slightly above the floor, will be sufficient. It will be connected to the ventilation pipes, which will conduct the gas away to the roof.

The reconstruction works (or adjustments) will be relatively simple (nothing new will be build, no building permits required) and will include activities like cutting out the space for pipes (ventilation, water, sewerage pipes) and cables, fitting the pipes and cables in the space cut out, connecting and installing the washbowl, sink, ventilator, circuit breakers and RCDs, tiling, assembling, painting and covering all the holes with appropriate material, e.g. building plaster, concrete, mortar etc. On average, the work will represent 35% of the total reconstruction expenses with “water supply“ having the highest proportion (53%) and “sewerage“ having the lowest proportion (only 20%; the industrial drains and box inlets are very expensive). In the majority of cases, the delivery service is marginal and sometimes even “free of charge“, e.g. in case of concrete (the price of the delivery service varies, of course, from supplier to supplier). Because of the limited scope of the reconstruction works, it should be finished within 6 months before installing the equipment and starting the operations.

With reference to the equipment, it is divided into “cooling“ and “brewing equipment“. The latter one, however, not only covers the hot block of the brewery but also the cold block, i.e. all the equipment directly involved in production of beer. The cooling equipment includes the cooling room, which is sufficiently big for temporary storage of finished beer (both in kegs and bottles) and brewer’s yeast. Another part of the cooling equipment is the chest freezer, which will be used for storing hops. As regards the brewing equipment, the items are recorded in the table “brewing equipment“ in appendix AP2. The following table shows the total estimated CAPEX (capital expenditures) without VAT, the VAT and CAPEX with VAT. The VAT is 21%.

	Preliminary	VAT	Total CAPEX
Brewing environment	417 900 CZK	87 759 CZK	505 659 CZK
Cooling equipment	145 700 CZK	30 597 CZK	176 297 CZK
Brewing equipment	4 371 310 CZK	917 975 CZK	5 289 285 CZK
ESTIMATED CAPEX TOTAL	4 934 910 CZK	1 036 331 CZK	5 971 241 CZK

Table 14 Estimated CAPEX; Source: own processing

In the following table, we can see the financing requirements for CAPEX including VAT. The brewing equipment will be completely financed by a 10-year bank loan, 7% p.a., and the rest, i.e. the brewing environment and cooling equipment, will be equity-financed.

Initial investment	CAPEX	Rounded up	Financing
Brewing environment	505 659 CZK	505 660 CZK	Equity
Cooling equipment	176 297 CZK	176 300 CZK	Equity
Brewing equipment	5 289 285 CZK	5 289 290 CZK	Bank loan
TOTAL	5 971 241 CZK	6 080 750 CZK	

Table 15 Financing of CAPEX; Source: own processing

Also, the minimal inventories and cash will be needed in the beginning in order to secure smooth operations for at least half a year because the first cash inflow is expected to be at the end of second month after the start of production, i.e. the first cash inflow should be at end of February. The cash receipt can be seen in a simple chart in appendix AP3, the operations plan (receiving cash). It is important to emphasise that “the cash should be received” because there may be (and usually are) some delays in settling the bills. Therefore, six months will be sufficient to collect enough cash to cover both the fixed and variable costs in the second half of the year. These items, i.e. inventories and cash, are recorded in the “opening balance” which can be found in appendix AP10, the initial investment. In the opening balance, we can see that the part of fixed assets (cooling equipment), inventories, part of the VAT receivables, cash and cash equivalents and deferred expenses are reflected in the share capital. Hence, the total amount the limited liability company members will have to invest in the venture is almost 3.1 million CZK, covering predominantly the current assets needed for future operations.

A cooling van will be needed for distribution of finished beer, collecting the empty kegs and delivering the liquid yeast. Instead of investing in a new cooling van, it will be leased. The operating leasing will have undoubted advantages because all of the necessary costs and obligations related to operating a vehicle will be managed by the leasing company, e.g. the following activities:

- All of the repairs, both within and after the guarantee period
- Replacement of the engine oil
- Replacement and storage of the winter and summer tires
- Complete insurance (car/automobile and legal insurance)
- Assistance services
- Insurance of all of the peripheral glass of the vehicle
- Providing a new vehicle in case of accident
- Managing the insurance events
- Registering and deregistering the vehicle
- Paying the radio license fee
- Paying the road taxes

7.4. Pricing

Some of the breweries prefer to price their beer under the industry average in order to gain market share, whereas others choose prices which are above the industry average because they want to associate their beer with premium products. The Shouting Village will belong to the latter group, taking into consideration its target group of consumers and nature of production, which will be more costly than that of larger breweries (more expensive inputs, scale inefficiency etc.)

After asking several owners and operators of both retail and hospitality units and after considering the cash inflow necessary to make the venture adequately profitable, I decided to price the two styles of beer as follows:

- 1) One 30 l keg for 1700 CZK including VAT; 1405 CZK without VAT
- 2) One 750 ml bottle for 100 CZK including VAT; 83 CZK without VAT

The owners and operators of the restaurants and pubs I asked expressed an interest in buying and selling my beer but it is quite possible the others will require, for the first time, either a discount or they won't be willing to sell the beer unless being provided free of charge. For that reason, I will try to maintain relatively high level of cash in the beginning of operations because of these "contingent" trade promotion expenses.

7.5. Market segmentation and needs of respective segments

With regard to potential customers of Shouting Village microbrewery, they can be divided into several geographical segments and two basic customer segments, retail and hospitality units. The geographic focus on the local market will be limited, albeit not considered unimportant because some of the inhabitants will become eager supporters of the microbrewery and loyal consumers of its products. The local market consists of the town of Řevnice and neighbouring cities: Lety, Dobřichovice, Karlík, Zadní Třebaň, Hlásná Třebaň, Liteň, Svinaře, Řitka, Mníšek pod Brdy and other towns and villages located near the Berounka river and situated in the "Český Kras" protected area. In these cities, the most important group of customers will consist of hospitality units, i.e. restaurants and pubs. Another group of customers will be the retail units, especially the healthy food shops, beer shops and potentially some independent supermarkets willing to stock our products. The long-term goal is to be on regular tap in at least one of the pubs or/and restaurants and permanently on shelf in the retail units situated in the area. They will represent the core of microbrewery's "local market". The estimated population of "local market" is 60000 inhabitants. However, the kegs and bottles of beer will be sold to other

hospitality and retail units in the whole region of Prague-west and Beroun. Therefore, the size of the “broader local market“ (regional) will be a set of percentages of the whole population of these two regions. As regards the percentages, they are determined by the age, income and education criteria because, according to the research, the majority of microbrewed production is consumed by less conservative younger people, people with higher income and those with higher level of education (tertiary). The combined population of the two regions is around 223500 inhabitants, out of which 17.8% belong to the group of people whose average annual net money income is higher than 188000 CZK (the highest third), i.e. almost 40000 individuals. As regards the age, almost 16% belong to the 25-35 age group, i.e. roughly 35300. Taking into account the national statistics, we can conclude that almost 20% of the 25-64 age group are people with higher level of education, i.e. around 25000. ^[104]

Apart from the “regional market“, the microbrewery will also cater for the needs of inhabitants from other parts of Czech Republic, especially those living in the following cities: Prague, Plzeň, České Budějovice, Karlovy Vary, Ústí nad Labem, Jablonec n. Nisou, Pardubice, Jihlava, Brno and Olomouc. Of course, the smaller towns and villages in the proximity of those cities will not be ignored as well. Similarly to the local market, the customers will be the restaurants, pubs, healthy food shops and beer shops, albeit in this case, the more upscale hospitality units will be preferred, especially in Prague. The total population of the cities and their neighbours is more than 2.5 million people. If we apply the same percentages as in the first case, there is approximately 450 thousand people with “higher income“, approximately 400 thousand inhabitants belong to the younger 25-35 age group and around 287700 of the individuals from the 25-64 group attained higher level of education (tertiary). It is important to note, however, the above figures serve only as estimates and do not represent the real situation. For example, there will be certainly more than 450 thousand people earning higher income because of the capital, Prague, but the estimates are sufficient enough for the demonstration of the number of potential consumers of the beer offered. ^[104]

Some of the more affluent people need to show their social status. Such need (snobbish need) can be satisfied by purchasing more expensive goods (cars, clothes etc.). The microbrewery’s beer will belong to the high-end group of products and thus may meet the snobbish needs. As regards the highly educated people, they are the ones who seek information and who can understand and appreciate it. In this case, the information is related to beer, brewing process, microbreweries’ background, raw materials, brewing history etc. Undoubtedly, I will provide these individuals with sufficient amount of information (more in the “strategy“ part). The last group of consumers, the younger ones, are those who seek new, trendy, bold, unique and are not afraid of trying new products

(they are less conservative). I believe that various beer styles, especially the top-fermented ones, meet such criteria.

Further, the consumers of the Shouting Village microbrewery's beer will be divided into three main groups: triers, beer lovers and regulars. The first group consists of people, who enjoy trying new products, in this case beer and beer styles. Also, they could be referred to as "beer explorers". Once the two flagship beer styles are established, the future one-offs and seasonals will be very attractive for this group of consumers. Analogically to the triers, the beer lovers (aka beer enthusiasts) are also keen on tasting new beer styles and beer produced by different breweries but they can become regulars. They are interested in the production process, brewing history, ingredients etc. and some of them may be even homebrewers. They are the ones truly appreciating the "craft" and "tradition" because they consider beer to be more than a simple product. Regarding the last group, the regulars (or loyals) consist of people loyal to the brand, brewery or both. The reasons for loyalty may stem from neo-localism or assurance the beer is really produced traditionally and with human hands, i.e. more labour was involved in its production. Other reasons involve uniqueness, price and taste of a product.

7.6. Sales forecast

As regards projected sales, the breakdown can be seen in appendix AP4, the sales forecast. The breakdown is provided for local, regional and national market and for two basic categories of products, i.e. kegs and bottles. In general, the proportion of kegs and bottles will be as follows:

- 60% of beer sold in KEGs
- 40% of beer sold in bottles

Because of both AAA and AIPA being priced the same, there is no need for listing them separately. In the "market analysis", I divided the three markets into three categories according to age, income and education. However, not all of the individuals from these three groups are beer drinkers. Therefore, in order to estimate the market share, I used the latest statistics on annual per capita beer consumption and its proportion in total per capita alcohol consumption (wine, beer and spirits). I focused on the higher income group of individuals. Then, the market share is expressed as a percentage of expected Shouting Village's beer consumption in the estimated total amount of beer consumed by: "beer drinkers with higher income".

Also, I provide the forecast for two possible scenarios. In the first one, the capacity of fermenters will be utilised at 100% from the beginning, whereas in the second one, it will be more difficult to sell the beer and the fermenters' capacity will be utilised only partially, 1/3 in the first year, 2/3 in the second year and 3/3 in the third year, i.e. 100%. Only the projected sales are provided in the appendix AP4. The costing is elaborated in "financial plan".

In the tables, we can see that the national market will be more important than the remaining two markets, representing almost 93.5% of the total sales. Such forecasts comply with microbrewery's strategy to focus on bigger cities in Czech Republic, i.e. selling beer in a hierarchical manner instead of focusing its sales "around the chimney". Further, the tables reveal very low market share, which is caused by the fact the per capita beer consumption is not divided into consumption of mass-produced beer and microbrew (craft; traditional) beer. Of course, if the latter one was included, the market share would be higher. However, the microbreweries not only compete with each other but they fight for consumers of big breweries' beer as well.

7.7. Break-even analysis

Before calculating the variable costs, fixed costs and break-even points, I collected all the necessary input data, i.e. the prices of raw materials, transport of raw materials, gas, energy, sanitation, leasing and waste packaging. In the appendix AP7, there are several tables containing the input data without VAT (which is added later). As regards sanitation agents, carbon dioxide and waste packaging, the transport is not included because my future suppliers do not charge it provided the goods is purchased in bulk (which will be) and if the purchaser's destination is not far away (which will not be). In case of self-delivering the sanitation agents and CO₂, the price of transport would be included in the price of transport of liquid yeast because the Research Institute of Brewing and Malting does not deliver the liquid yeast and expects its customers to come and take the fermenting wort away. Therefore, there would be enough space for the sanitation agents and carbon dioxide in the cooling van, albeit they wouldn't be purchased in bulks and would be delivered more often.

After collecting all the data, I calculated the production costs, variable costs and fixed costs, which can be seen in the appendix AP8. I calculated the production costs for three possible batch sizes: 300 l, 400 l and 500 l. In the appendix AP8, I include only the 500 l batch production costs because the brewery will produce only the most economical 500 l batches but still, the other size versions work as a very good comparison and

demonstration of their inefficiency. Firstly, I determined the consumption of raw materials per 5 hl, 4 hl and 3 hl batches of both AAA and AIPA. The truth is that each batch size is slightly different and requires specific proportions of malt, hops and mashing and sparging water. Also, the estimated SRM is not exactly the same either:

- 300 l batch SRM: AIPA = 8; AAA = 15
- 400 l batch SRM: AIPA = 7.8; AAA = 14.7
- 500 l batch SRM: AIPA = 7.7; AAA = 14.9

Of course, such differences are marginal and in general, both the 300 l and 400 l batches of beer would be almost the same as 500 l batch of beer. Even the 500 l batches will slightly differ over time (which is absolutely acceptable at the microbrewing level). After the raw materials requirements, I used the brewing equipment parameters to estimate the equipment-related consumption, i.e. the energy consumption in kWh, sanitizing agents consumption in litres and kilograms (grams), CO₂ consumption in grams and water usage in litres. The labour costs requirements in production were already elaborated in the previous part: management. In the end, I calculated the estimated total production costs per one batch of beer, including all the production-related costs, i.e. costs of raw materials, equipment-related costs, packaging, depreciation of brewing equipment, leasing of the production hall, deferrals (brewing environment) and costs of labour in production. In order to show per bottle and per keg production costs, I further divided the total per batch costs, separating both the pre-bottling and pre-kegging production costs and bottling and kegging-specific costs.

In the first year (YEAR 1) fixed costs, I included the depreciation and electricity consumption of the cooling units (chest freezer; cooling box), lighting electricity consumption, ventilation electricity consumption and other production-unrelated electricity consumption (notebook, recharging smartphones' batteries etc.), gas heating (very important for wintertime top fermentation), production-unrelated water consumption, detergents (SAVO; washing liquids) for regular cleaning of not necessarily production-related areas and equipment, diesel oil (fuel for the cooling van – not directly attributable to unit of production), vignette, deferrals (brewing environment), leasing (of cooling van, production hall and storage space), interest, salaries ("symbolic" for driving and accounting), health insurance, social insurance, marketing and responsible representative. As regards the diesel oil for the cooling van, it is estimated for delivery of twelve 500 l batches of beer (for the 400 l and 300 l batch sizes, it is proportionally lowered). The problem with the diesel oil costs is they do not necessarily increase with increased production. For that reason, I can only estimate certain "jump" increases in this category of costs, classifying them as "semi-fixed costs".

Contrary to the per-bottle and per-keg production costs, the variable costs do not include the production-related depreciation, deferrals and leasing. Nevertheless, the excise duties, social insurance and health insurance are added. It is important to note, however, that the variable costs in beer production are quite specific. For example, if a brewery breaks even at five hundred 0.75 l bottles of beer “x” and its brewhouse and fermenter maximum capacity is 300 l, it is not economical to produce only the remaining one hundred bottles. Ceteris paribus (e.g. the same expected diesel oil expenses), the break-even point of 500 bottles rather determines the number of break-even batches, which is 2 in this case. From the economic perspective, producing only 75 litres of beer “x” with 300 l brewhouse is not rational. In the appendix AP8, we can see the effect of economies of scale in production, i.e. the variable costs for 300 l, 400 l and 500 l batches of both AAA and AIPA with 500 l brewhouse and 500 l fermenter. Although the differences between bottles are relatively small, the differences between kegs are evident. Therefore, the big breweries’ brewhouses and fermenter capacity allow them to reach enormous economies of scale (in production, marketing etc.). In the following table, we can see monthly break-even points for 400 l batches:

Monthly break-even points - 400 l batches			
	Bottles	KEGs	TOTAL in litres
AIPA	1276	48	2397
AAA	1276	48	2397
TOTAL	2552	96	4794

Table 16 Monthly break-even points for 400 l batches of beer; Source: own processing

The above table reveals that, ceteris paribus, at least twelve 400 l batches of beer need to be brewed per month in order to break even ($4794/400 = 11.985$). Of course, the necessary number of KEGs and bottles will be slightly lower if we take into consideration proportionately lower requirements for diesel oil. However, it won’t decrease the break-even batches below 12. In the next table, we can see the monthly break-even points for 5 hl batches of beer:

Monthly break-even points - 500 l batches			
	Bottles	KEGs	TOTAL in litres
AIPA	1160	44	2190
AAA	1160	44	2190
TOTAL	2320	88	4380

Table 17 Monthly break-even points for 500 l batches of beer; Source: own processing

Ceteris paribus, at least nine 5 hl batches of beer need to be brewed monthly to break even ($4380/500 = 8.76$). Analogically to the 400 l batch break-even points, even in this case the adjustment of semi-fixed fuel costs does not lead to substantial decrement of loss. Provided eight 500 l batches are brewed a month, the lower costs of diesel oil lead to decrease of -10516 CZK loss by mere 4810 CZK. Therefore, the adjustment does not reduce the break-even batches.

7.8. Projected profit and loss

In the appendix AP9, there are two pro-forma profit/loss statements. One is for the optimistic scenario, whereas the other one reflects lower production in the first and second year, i.e. more conservative scenario. Complying with the outcome of break-even analysis, neither 4 batches brewed monthly (YEAR 1) nor 8 batches brewed per month (YEAR 2) enable the Shouting Village microbrewery to break even. Moreover, part of the relatively higher non-profitability of the first year is carried to the second year and part of the relatively lower non-profitability of the second year is carried to the third year. It is clearly evident the expenses are recorded according to their nature, not function. Therefore, it is impossible to deduce margin from the “nature” statement of income. The item “beer produced, not sold” refers to beer which is going to be produced in the second half of the final month of the accounting period (December) and which will be sold next year, i.e. it will become the item “previous year beer sold” in the next year profit & loss statement. Provided there is no loss, the deferred tax is created in order to mitigate the inconsistency between tax and accounting depreciation.

The importance of sufficient fermenting space is unambiguous. For example, if only four fermenters were purchased and 8 batches of beer produced monthly (instead of twelve batches with six fermenters), the first year profit (EBT) would decrease by 96%. In this case, the 8 batches would “break even” (would be slightly profitable), however, because of both lower depreciation and reduced diesel oil expenses. As was already mentioned, the liquid yeast will be used instead of less expensive dried yeast because I believe it will help in creation of more differentiated microbrew beer. Provided dried yeast is used instead of liquid yeast and I am able to regenerate both at least twice, the first year profit (EBT) will increase by 64%.

As regards EVA (economic value added), it can be seen in the table below:

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
EVA 1	592 899 CZK	617 137 CZK	576 008 CZK	530 441 CZK	480 645 CZK
EVA 2	-	223 602 CZK	707 446 CZK	758 257 CZK	723 851 CZK

Table 18 Economic value added; Source: own processing

The EVA 1 represents the optimistic scenario, whereas the second EVA was calculated for the conservative one. Except for the first year in the loss-making scenario, the company will create value for its owners. The higher EVA of the conservative scenario is caused by lower WACC (weighted average cost of capital). Higher WACC of the optimistic scenario can be decreased by share capital and/or accumulated profit reduction (which will be, of course, much higher in the optimistic scenario).

7.9. Projected balance sheet

Analogically to the projected statements of income, even the pro-forma statement of financial position is provided for the “optimistic scenario” and “conservative scenario”. The two versions can be found in the appendix AP10. It is important to note, however, that by “conservative scenario” I do not mean unexpected circumstances. Rather, it could be considered as expected difficulties in the beginning of operations because, based on the data provided by publicly available financial statements, the majority of microbreweries are not profitable in their first year (and often years) of operations. Merely a handful of these businesses are capable of being profitable in the first year. Therefore, there is a big difference in share capital of the two scenarios. Because of expected lower production, there is no need for extensive inventories and cash, which is reflected in lower share capital.

The equipment-related VAT overpayment is used to decrease relatively “more expensive” equity financing. Of course, such cash inflow could be used in other ways, e.g. decreasing total debt, purchasing securities, CAPEX, strategic inventories etc. I decided to decrease more expensive equity financing and utilise the effect of higher financial leverage. As regards securities, the aim of the brewery is brewing beer, not investing in shares, bonds etc. In the future, I expect some CAPEX but in the first years of operations, it will be better to focus on achieving 100% utilisation of the brewery’s capacity (conservative scenario), selling beer and creating a firm base of loyal customers. In the more difficult initial stage of microbrewery’s life, I believe it will be better to keep current assets in the most liquid form instead of keeping them in a form of extensive strategic inventories.

In the conservative balance sheet, we can see the first two years losses can lead to negative equity. In the third year of operations, however, a sufficiently high net income can reverse the trend and decrease the proportion of total debt (liabilities) below 100%.

By the end of fifth year, then, a microbrewery can generate enough cash for another major cash-out or additional CAPEX, i.e. some additional fermenters. Also, there is an “income tax” liability in the loss making years, representing the employees’ income tax. On the contrary to the conservative one, the optimistic balance sheet doesn’t show any accumulated losses except for the first year, which is caused by the non-depreciating equipment being written off in the YEAR 0 (it can be seen in the opening balance sheet in AP10).

7.10. Projected cash-flow statement

The “optimistic” cash-flow statement in appendix AP11 displays a relatively steady expected net inflow of cash. Actually, the only variable item is the payment of income tax, which differs due to the decreasing financial expenses, the inconsistency between tax and accounting depreciation and is influenced, to a large extent, by advance tax payments. The “conservative” cash flow statement reveals substantial cash outflow in the first year of operations, which is caused by insufficient cash inflow from operating activities and great cash outflow from financing activities. The important cash outflow from financing activities is related to my decision to use the VAT overpayment to decrease relatively more expensive equity financing. In spite of the cash flow being negative in the first two years, the company will have enough liquidity to settle all potential current liabilities.

I do not plan any CAPEX in the first years of operations (year 1 – year 4) but for both the optimistic and conservative scenarios I provide a version of cash-flow statement with a limited investing activity in the fifth year, i.e. buying just one additional fermenter, and its influence on the stream of cash flows. The additional fermenter will allow Shouting Village to brew 16 batches of AAA and AIPA per month. Below, we can see the IRRs (internal rate of returns; for equity financing) for all four scenarios:

- | | |
|-----------------------------------|--------------|
| 1. Optimistic, no CAPEX: | IRR = 15.82% |
| 2. Optimistic, CAPEX: | IRR = 21.7% |
| 3. Conservative, no CAPEX: | IRR = 8.72% |
| 4. Conservative, CAPEX: | IRR = 16.15% |

Taking into consideration the interest rate of 7% p.a., the IRRs show the equity financing will be truly more expensive. Provided the desired rate of return is 12%, the company will achieve positive NPV (net present value) except for the conservative (loss-making) scenario without any future CAPEX. In case of using WACC (weighted average cost of capital; tax shield included) to discount future cash flows, the NPV will be even higher. The WACC for the optimistic scenario is 7%, whereas for the conservative one is 5%. As we can see, the effect of additional fermenter on the stream of cash flow is considerable,

increasing the IRRs by several percentage points. Therefore, I will accentuate the need for CAPEX (and not only one fermenter) in the later years of operations (year 5 and onwards).

7.11. Key business ratios

Based on the pro-forma financial statements, i.e. the balance sheet and profit & loss statement, I calculated the basic financial ratios (liquidity, solvency, profitability and activity ones). Analogically to the sales forecast, the set of financial indicators is provided for both the optimistic (12 batches a month) scenario and the conservative one (4 batches, 8 batches and 12 batches a month). In the formulas combining “flow” profit & loss data and “stative” balance sheet data, I used a simple mean of the balance sheet items. Therefore, some of the ratios are missing in the first year. The formulas I used are included in the appendix AP1.

In the appendix AP12, we can see the indicators for the “optimistic scenario”. If the ratios are compared to the subsector benchmarks (packaging brewery; first size category; medians), which can be found in the appendix AP1, one has to immediately conclude the Shouting Village’s are relatively high, which is a situation stemming from various factors. Firstly, the optimistic scenario does not lead to any losses and thus only cash is accumulated. Secondly, there is no substantial reduction in equity (except for the first year) and no CAPEX occur. Unnecessarily high liquidity can be easily decreased by harvesting the accumulated profit or by CAPEX. As was already demonstrated, the purchase of additional fermenters has considerably positive influence on future cash inflows. Therefore, the accumulated cash will be used both for investing activities and for equity reduction (dividing the profits among owners). Contrary to the optimistic one, the liquidity ratios for the conservative scenario are substantially lower, which is attributable to two-year losses. Nevertheless, when compared with the benchmarks, the liquidity remains relatively high. In this case, the liquidity will be decreased preferably by CAPEX because even after five years of operations, there will be no accumulated profits (due to the losses). Possibly, the share capital could be slightly reduced as well. My long-term goal will be to keep current liquidity below 2.

In reference to solvency ratios, the optimistic scenario will lead to lower total indebtedness than is subindustry’s median (profitable & non-profitable companies) and average (only profitable companies). The conservative total debt ratios will be substantially higher, in the first two years even higher than one (due to negative equity), but at the end of fifth year, it will be close to subindustry average (profitable companies; 0.82 vs. 0.78). If the total debt ratio decreases under 0.5, I will try to seek additional debt

financing or reduce the equity. My long-term goal is to keep the total debt ratio above 0.5 and below 0.8. One of possible weaknesses will be relatively lower coverage ratio, at least in the first five years, because the subindustry average is higher (medians; 4.35 and 7.03). Nevertheless, both the optimistic and conservative scenario coverage ratios are close to the lower one of the medians in YEAR 5 (3.85) and in the following years, they will be even higher.

As we can see in the tables (AP12), the average optimistic relative profit will be close to the subindustry average (only the profitable companies; 6.1% vs. 5.4%). However, both the operating profit margin (average 18%) and net profit margin (average 10%) will be significantly higher than that of profitable packaging breweries (first size category; 5.75% and 4.05%). The ROA (return on assets) will be slightly higher (averages; 6.4% vs. 5.8%) and the ROE (return on equity) will be lower (averages; 17.6% vs. 22.3%). Lower ROE is related to high accumulated profits, which will be decreased in the following years and thus increase the ROE. Contrary to the optimistic scenario, the conservative relative profit will be lower (due to lower balance sum). At the end of five-year period, the operating profit margin and net profit margin will be the same as the optimistic ones. Because of relatively lower balance sum and equity (due to losses), both the conservative ROA (average 10%) and ROE will be higher (average 88%). Very high ROE will decrease after YEAR 5 because the business is expected to become profitable.

According to the indicators, the days of inventory on hand will be 113 days, which is a very good approximation because I intend to buy hops yearly and malt every fourth month. Bulk purchases of these raw materials will lead to lower costs of delivery and it will decrease the effect of volatile prices on company's business. In the subindustry, the median inventory turnover is considerably higher (profitable & non-profitable companies; only profitable ones) but it does not reveal anything about how efficient breweries are. Every company is unique and follows different inventory strategy. Actually, the profitable packaging breweries (first size category) have lower inventory turnover than the group of both profitable and non-profitable ones. In the tables, we can see the average collection period should be 39 days but I know the payment term agreed with my customers will be 30 days at maximum. I will strictly require the compliance with the maturity date and cooperate only with those customers who are able to meet the deadlines. If we take into consideration the benchmarks, the median subindustry receivables turnovers are much higher, leading to mere nine days (profitable companies) and eleven days (the combined group) needed for transforming the receivables into cash. My long-term goal will be to achieve maximum average collection period of 20 days. The expected payment term towards my suppliers will be 30 days. Therefore, the average collection period should be shorter than the average payment period, while the collection period will remain higher

than the subindustry benchmark and thus be more attractive for some customers. The efficiency of using fixed assets in generating sales is almost the same as both combined group's and profitable breweries' medians (fixed assets turnover; 1.76 vs 1.77 and 1.85, respectively). However, the median "optimistic" total assets turnover (0.63) is lower than the microbreweries' medians (1.01; 1.19). It is associated with higher levels of liquidity ratios. After CAPEX and equity reductions, the indicator will become higher. The median conservative total assets turnover (0.95) is closer to subindustry's values (partially due to two-year negative cash-flows).

7.12. Risk assessment

Apart from the optimistic and more conservative scenarios, there is also the pessimistic one. In spite of me making an effort, there is a possibility I will not be able to sell all the beer I brew. Then, I will be forced to reduce the number of batches below the break-even points, which will lead to substantial losses and negative equity. If I am not able to persuade the hospitality and retail units to try my products out, I will hire additional employees, who will be solely focused on selling beer to potential customers. Before they start working, I will thoroughly train them and teach them about the traditional brewing process, ingredients, beer styles, beer history etc. Then, they will be ready to represent the Shouting Village and its products. Of course, more employees (I expect 1-2 salesmen) will increase the labour expenses and decrease the profit. But still, it is better to achieve lower profit than no profit at all. The same applies to the marketing expenses, which may increase as well. Other risks are related to increase of prices of raw materials and higher taxes. Provided I am forced to increase the prices of my products, I will slightly modify the recipe, i.e. I will decrease the amount of hops and malt used. For example, the IBU of AIPA will be decreased from 68 to 58 and the ABV will decrease from 6.5 to 6. The recipe will be modified but it will always comply with the BJCP style criteria. If the situation is very serious, I will be willing to substitute the liquid yeast with less expensive dried yeast. Also, I will be more than willing to reduce my salary so as to prevent the company from going bankrupt. Insufficient liquidity will be remedied through additional equity and debt financing. I will try to raise as much money as possible, asking friends, family, financial institutions and angel investors.

8. Conclusion

In addition to brewery categorization by absolute values, i.e. annual production in hectolitres, turnover, total balance sum and number of employees, the relative values can be used as well, i.e. the market share. In this way, one can partially mitigate the effects of different market sizes in different countries. Regarding the microbrewery business models, the most popular ones are contract brewing, brewpubs and packaging breweries. However, there are some less common business models as well, e.g. the CSB (community supported brewing) and fermentation pubs. All of them have their advantages and disadvantages, e.g. through contract brewing, a brewery can easily gain access to additional capacity but at the same time, it loses absolute control over the production process.

Complying with the results of financial analysis, one has to conclude the majority of analysed microbreweries in Czech Republic (38) are not profitable. Actually, only 26% of the companies can be considered profitable (average positive net income). The profitable microbreweries tend to achieve higher receivables and inventory turnovers and their liquidity is higher. The average Czech microbrewery's net profit margin is 7.9%, average return on assets (ROA) is 10.5% and median return on equity (ROE) is 16%. The packaging breweries tend to have higher liquidity, whereas the brewpub model appears to be relatively more profitable (at least according to ROA and ROE).

In the sample microbrewery financial plan, I calculated the initial capital expenditures and prepared the basic pro-forma financial statements. The break-even analysis revealed I need to brew at least nine 5 hl batches of top fermented beer a month in order to break even. Therefore, the annual production of 480 hectolitres would not be enough to make the venture profitable. Provided the production will gradually increase, the first years will not be profitable and the internal rate of return (IRR) will rapidly decrease. However, if the capacity of the cold block (fermenting capacity) is extended, the IRR significantly increases and leads to positive net present value even for the less optimistic scenario. I used either the weighted average cost of capital (5% and 7%) or desired level of return (12%) to discount the stream of cash inflows.

9. List of resources

- [1] Merriam-Webster Online Dictionary. 2015. 'Microbrewery'. <http://www.merriam-webster.com/dictionary/microbrewery>
- [2] Beerfest-sg.com,. 2015. 'History of microbrewery'. <http://beerfest-sg.com/en/interesting/history-of-microbrewery>
- [3] Slightlyfoxedbrewery.co.uk,. 2015. 'Slightly Foxed Brewing Company'. <http://www.slightlyfoxedbrewery.co.uk/>
- [4] Oddfellows Times,. 2015. 'What's a brewing? - Oddfellows Times by the Oddfellows'. <http://www.oddfellowstimes.com/culture/whats-abrewing.aspx>
- [5] Maiya, H. 2011. *The King of Good Times* (pp. 59-60). CreateSpace Independent Publishing Platform.
- [6] Camra.org.uk,. 2015. 'What is CAMRA - CAMRA'. <http://www.camra.org.uk/what-is-camra>
- [7] Traquair.co.uk,. 2015. 'Traquair House Brewery | Traquair House, Innerleithen, Scottish Borders, Scotland'. <http://www.traquair.co.uk/traquair-house-brewery>.
- [8] Bruning, Ted. 2011. *The Microbrewers' Handbook*. 3rd ed. Norwich: Paragraph Publishing.
- [9] Hornsey, Ian S. 2003. *A History Of Beer And Brewing*. Cambridge: Royal Society of Chemistry.
- [10] Oliver, Garrett. 2012. *The Oxford Companion To Beer*. New York: Oxford University Press.
- [11] *Brew Dogs - Season 2, Episode 9: New Orleans*. 2015. Video. USA: Esquire Network, A Division of NBCUniversal.
- [12] Hindy, Steve. 2014. *The Craft Beer Revolution*. New York: Palgrave Macmillan.
- [13] Brewers Association,. 2015. 'Craft Beer Industry Market Segments'. <http://www.brewersassociation.org/statistics/market-segments/>.
- [14] Brewers Association,. 2014. 'Brewers Association Board Meeting Produces Strategic Changes - Brewers Association'. <http://www.brewersassociation.org/press-releases/brewers-association-board-meeting-produces-strategic-changes/>.
- [15] BUSINESS WIRE. 2011. 'Brewers Association Announces Revised Craft Brewer Definition | Business Wire'. *Businesswire.Com*.

<http://www.businesswire.com/news/home/20110103005869/en/Brewers-Association-Announces-Revised-Craft-Brewer-Definition#.VSz9ZvmsXCM>.

[16] Brewers Association,. 2015. 'Craft Brewer'.

<http://www.brewersassociation.org/statistics/craft-brewer-defined/>.

[17] *SIBA Beer Report 2014*. 2015. Ebook. 1st ed. Society of Independent Brewers.

<http://www.siba.co.uk/forms/BeerReport2014.pdf>.

[18] Eur-lex.europa.eu,. 2015. 'Council Directive 92/83/EEC of 19 October 1992 on the harmonization of the structures of excise duties on alcohol and alcoholic beverages'. http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.1992.316.01.0021.01.ENG.

[19] *Excise Duty Tables*. 2015. Ebook. 1st ed. Brussels – Belgium. European Commission.

http://ec.europa.eu/taxation_customs/resources/documents/taxation/excise_duties/alcoholic_beverages/rates/excise_duties-part_i_alcohol_en.pdf.

[20] Minipivo.cz,. 2015. 'Stanovy - Svaz – Minipivovary, Pivovary' (Statutes of the Bohemian-Moravian Association of Microbreweries). <http://www.minipivo.cz/www/cz/stanovy/>.

[21] Čapková, Veronika, Petr Janík, and Václav Potěšil. 1999. *Restaurant Microbreweries In The Czech Republic*. Prague: Výzkumný ústav pivovarský a sladařský, a.s. (Research Institute of Brewing and Malting).

[22] Pojmanová, Kateřina. 2009. 'Restaurační Minipivovary A Rodinné Pivovary V Podmínkách České Republiky' (Restaurant Microbreweries and Family Breweries in Czech Republic). Undergraduate, University of Economics, Prague.

[23] Verhoef, Berry. 1998. *Beer Encyclopaedia*. Lisse, Netherlands: Rebo Productions.

[24] Kozák, Vratislav, and Věra Kozáková. 2013. *Změny v Českém Pivovarství Na Přelomu Tisíciletí (Changes in the Czech Brewing Industry at the Turn of the Millennium)*. Zlín: Radim Bačuvčík - VeRBuM.

[25] Maier, Tomáš. 2013. 'Selected Aspects of The Microbreweries Boom'. *Agris On-Line Papers In Economics And Informatics V* (Number 4).

http://ageconsearch.umn.edu/bitstream/162254/2/agris_on-line_2013_4_maier.pdf.

[26] Šušteršič, Janez, and Snežana Šušteršič. 2009. *A Beer Market In Transition*. Ebook. 1st ed.

<http://www.beeronomics.org/papers/5A%20Sustersic.pdf>.

[27] Papazian, Charlie. 2015. 'The Expanding World of Small And Independent'. *The New Brewer* 32 (1): 7-8.

- [28] Stpetersbrewery.co.uk,. 2015. 'Brewery | St. Peter's Brewery'.
<http://www.stpetersbrewery.co.uk/brewery/>.
- [29] Eur-lex.europa.eu,. 2015. 'Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises'. <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32003H0361>.
- [30] *The New SME Definition: User guide and model declaration*. 2015. Ebook. 1st ed. European Commission.
http://ec.europa.eu/enterprise/policies/sme/files/sme_definition/sme_user_guide_en.pdf.
- [31] Cantwell, Dick. 2013. *The Brewers Association's Guide to Starting Your Own Brewery*. 2nd ed. Boulder: Brewers Publications.
- [32] Ttb.gov,. 2015. 'TTB Glossary'. Accessed March 5.
http://www.ttb.gov/forms_tutorials/glossary/glossary.html
- [33] Woodske, Dan. 2012. *A Brewers Guide to Opening a Nano Brewery*. CreateSpace Independent Publishing Platform.
- [34] Thefoodsection.com,. 2015. 'The Food Section - Food News, Recipes, And More'.
<http://www.thefoodsection.com/foodsection/2010/02/nanobrewery.html>.
- [35] Rittenour, Bill, and Christine Rittenour. 2013. *Adventures In Opening A Commercial Nano-Brewery*. Ebook. 1st ed. https://mashvv.files.wordpress.com/2013/03/mash_seminar_3-17-13_handout_1.pdf.
- [36] Lars Myers, Erik. 2013. *Relax And Start A Brewery*. Ebook. 1st ed.
- [37] Gencourt.state.nh.us,. 2015. 'Section 178:12-A Nano Brewery License.'. <http://www.gencourt.state.nh.us/rsa/html/xiii/178/178-12-a.htm>.
- [38] Moen, Alan. 2010. 'Small Wonders: The Wave of Nanobreweries'. *The New Brewer* 27 (1).
- [39] Pivopraha.cz,. 2015. 'Pikopivovary | Pivo Praha - Pivovarský Dům, Pivovarský Klub'.
<http://www.pivopraha.cz/pikopivovary/>.
- [40] Destila.eu,. 2015. 'Microbreweries | DESTILA S. R. O.'. <http://www.destila.eu/microbreweries-with-the-capacity-of-10000-to-180000-liters-of-beer-a-year>.
- [41] Themadfermentationist.com,. 2013. 'The Four Stages of Homebrewing | The Mad Fermentationist - Homebrewing Blog'. <http://www.themadfermentationist.com/2013/04/the-four-stages-of-homebrewing.html>.

- [42] Hindy, Steve, and Tom Potter. 2005. *Beer School*. Hoboken, N.J.: Wiley.
- [43] Calagione, Sam. 2005. *Brewing Up a Business*. Hoboken, N.J.: John Wiley.
- [44] Begylebrewing.com,. 2015. '» CSB Begyle Brewing'.
<http://www.begylebrewing.com/home/csb/>.
- [45] Burlington Beer Company,. 2015. 'Beer Club Membership Information - Burlington Beer Company'. <http://www.burlingtonbeercompany.com/csb-information/?age-verified=3ed1c5a5a1>.
- [46] Houseofbrewsmadison.com,. 2015. 'House of Brews :: CSB Info'.
<http://houseofbrewsmadison.com/csb-info/>.
- [47] Bigalicebrewing.com,. 2015. 'Big Alice Brewing'. <http://www.bigalicebrewing.com/index.htm>.
- [48] Bashford, Jade, and Kathleen Cross & col. 2013. *European Handbook On Community Supported Agriculture*. Ebook. 1st ed. Community Supported Agriculture for Europe project.
http://urgenci.net/wp-content/uploads/2015/03/CSA4EUrope_Handbook.pdf.
- [49] Grossman, Ken. 2013. *Beyond The Pale*. Hoboken: John Wiley & Sons, Inc.
- [50] Pelsmacker, Patrick de, Maggie Geuens, and Joeri van den Bergh. 2010. 4th ed. *Marketing Communications*. New York: Financial Times/Prentice Hall.
- [51] Costco.com,. 2015. 'Kirkland Signature™'. <http://www.costco.com/kirkland-signature.html>.
- [52] Volchok, Pat. 2010. 'Raising A Glass To Kirkland Signature Craft Beers'. *The Costco Connection*.
<http://www.costcoconnection.com/connection/201009#pg1>.
- [53] My Money Blog,. 2010. 'Which Brewer Makes Costco Beer?'.
<http://www.mymoneyblog.com/which-brewer-makes-costco-beer.html>.
- [54] Shmaltzbrewing.com,. 2015. 'HE'brew the Chosen Beer'.
<http://www.shmaltzbrewing.com/HEBREW/cliftonpark.html>.
- [55] Curtin, Jack. 2012. 'The Road Now Taken: Contract Brewing'. *The New Brewer*.
- [56] Cochran, John. 2010. '4 Steps To Opening Your Own Craft Brewery (Or the History of Terrapin Beer)'. *Craftbeer.Com*. <http://www.craftbeer.com/featured-brewery/terrapin-beer-co>.
- [57] Jarnit-Bjergsø, Jeppe. 2015. *Evil Twin Brewing*. PDF. 1st ed.
https://dl.dropboxusercontent.com/s/x5kjm8pv3unefck/Evil_Twin_Press.zip?dl=1&token_hash=A AE24X3xfep_tEi88CNP2PJY15pfkZtX9ooiLBO37Xcq8A.

- [58] Rolstadås, A, Bjørnar Henriksen, and David O'Sullivan. 2012. *Manufacturing Outsourcing*. London: Springer.
- [59] *The Vital Role Of Contract Manufacturing In Supply Chain Management And Optimization*. 2008. Ebook. 1st ed. MK Precision.
- [60] Nordigården, Daniel. 2007. 'Outsourcing In The Wood Product Manufacturing Sector: A Combined Customer And Supplier Perspective'. Postgraduate (Doctoral Dissertation), Linköping University.
- [61] Youngquist, Mark. 2000. 'Q&A from a Corporate Brewmaster: Location and Converting Homebrew Recipes'. *The New Brewer*.
- [62] Ttb.gov,. 2005. 'Alternating Proprietors At Brewery Premises'. http://www.ttb.gov/industry_circulars/archives/2005/05-02.html.
- [63] Lesáková, Ľubica. 2012. 'The Role of Business Incubators in Supporting the SME Start-Up'. *Acta Polytechnica Hungarica* 9 (3).
- [64] Breweryincubator.com,. 2014. 'Home | The Brewery Incubator'. <http://breweryincubator.com/home/>.
- [65] Beltwaybrewco.com,. 2015. 'Beltway Brewing Company – Partner Brewery, Contract Brewery And Private Label Beers'. <http://www.beltwaybrewco.com/>.
- [66] Brew Hub,. 2015. 'Brew Hub FAQ'S'. <http://brewhub.com/faqs/>.
- [67] Hieronymus, Stan. 2014. 'Contract Brewing: The Next Generation'. *The New Brewer*.
- [68] Lincoln, Anda. 2011. 'Co-op Breweries'. *The New Brewer*.
- [69] PIVOVAR A RESTAURACE U FLEKŮ s.r.o.,. 2013. 'Historie U Fleků'. <http://ufleku.cz/onas/historie-u-fleku/>.
- [70] Boulton, Chris. 2013. *Encyclopaedia Of Brewing*. Hoboken: John Wiley & Sons.
- [71] Edgar, David. 2000. 'Craft Brewing Gets Back On Track'. *The New Brewer*.
- [72] Scheppach, Turczyn. 2004. 'Imports and Large Breweries: Sales Go Soggy in 2003'. *The New Brewer*
- [73] Gatza, Paul & Watson, Bart. 2014. 'Onward and Upward for Craft Breweries'. *The New Brewer*

- [74] Henkes, David. 2008. 'Capturing Craft Beer Opportunities On-Premises'. *The New Brewer*
- [75] Kitsock, Greg. 2003. 'Brewpubs: Evolving to Meet the Challenge'. *The New Brewer*
- [76] Oliver, Garrett. 2003. *The Brewmaster's Table*. New York: Ecco.
- [77] Laube, Jim. 2000. 'Why Many Brew Pubs Lose Money Dealing With Food'. *The New Brewer*
- [78] Smith, Scott. 2001. 'Selling House-brewed Beer in a Restaurant: Scott Smith on Brewpub Management'. *The New Brewer*
- [79] Hennessy, Tom. 2012. *Brewery Operations Manual*. Ridgway: Tom Hennessy
- [80] Osborne, Derek M. 2000. 'The Brewpub Brewer'. *The New Brewer*
- [81] Marvin, Bill. 2000. 'What is a Guest Worth?'. *The New Brewer*
- [82] Curtin, Jack. 2012. 'Packaging Options for Brewpubs and Small Breweries'. *The New Brewer*
- [83] Carroll, Glenn R., and Anand Swaminathan. 2000. 'Why the Microbrewery Movement? Organizational Dynamics Of Resource Partitioning In The U.S. Brewing Industry'. *American Journal Of Sociology* 106 (3): 715-762. doi:10.1086/318962.
- [84] Swinnen, Johan F. M. 2011. *The Economics of Beer*. Oxford: Oxford University Press.
- [85] Kitsock, Greg. 2004. 'Tied-houses return...with a twist'. *The New Brewer*
- [86] Kitsock, Greg. 2003. 'Packaging in the 21st Century: What the Well-Dressed Beer is Wearing'. *The New Brewer*
- [87] Curtin, Jack. 2012. 'Packaging Options for Brewpubs and Small Breweries'. *The New Brewer*
- [88] Tremblay, Victor J., Natsuko Iwasaki, and Carol Horton Tremblay. 2005. 'The Dynamics Of Industry Concentration For U.S. Micro And Macro Brewers'. *Review of Industrial Organization* 26 (3)
- [89] Porter, Michael E. 1980. *Competitive Strategy*. New York: Free Press.
- [90] Hopunion.com,. 2015. 'Sorachi Ace ~ Hopunion'. <http://hopunion.com/sorachi/>.
- [91] Brewery, Brooklyn. 2015. 'Brooklyn Sorachi Ace : Brooklyn Brewery'. *The Brooklyn Brewery*. <http://brooklynbrewery.com/brooklyn-beers/big-bottles/sorachi-ace>.

- [92] Transparency International. 2015. 'How Corrupt Is Your Country?'. *Transparency.Org*. <http://www.transparency.org/cpi2014/infographic/regional/european-union-and-western-europe>.
- [93] Data.worldbank.org,. 2015. 'Ease Of Doing Business Index (1 = Most Business-Friendly Regulations) | Data | Table'. <http://data.worldbank.org/indicator/IC.BUS.EASE.XQ>.
- [94] Šámal, František, and Dušan Falge. 2015. *Zpráva O Stavu Českého Pivovarství A Sladařství Za Rok 2014*. PDF. Czech Beer and Malt Association. http://www.ceske-pivo.cz/sites/default/files/dokumenty_tz/2015_zprava_hospodarske_vysledky_oboru_za_2014_final_20150410.pdf.
- [95] Home.kpmg.com,. 2015. 'Corporate Tax Rates Table | KPMG | GLOBAL'. <https://home.kpmg.com/xx/en/home/services/tax/tax-tools-and-resources/tax-rates-online/corporate-tax-rates-table.html>.
- [96] Czso.cz,. 2015. 'Demografická Ročenka České Republiky - 2014 | ČSÚ'. <https://www.czso.cz/csu/czso/demograficka-rocenka-ceske-republiky-2014>.
- [97] Cnb.cz,. 2015. 'Sazby PRIBOR - Měsíční A Roční Průměry - Česká Národní Banka'. https://www.cnb.cz/cs/financni_trhy/penezni_trh/pribor/prumerne.jsp?year=2014&show=Spustit+sestavu.
- [98] Iq-research.org,. 2015. <https://iq-research.org/en/page/average-iq-by-country>.
- [99] Data.oecd.org,. 2015. 'Education Attainment - Adult Education Level - OECD Data'. <https://data.oecd.org/eduatt/adult-education-level.htm>.
- [100] Geert-hofstede.com,. 2015. 'Czech Republic - Geert Hofstede'. <http://geert-hofstede.com/czech-republic.html>.
- [101] Internetlivestats.com,. 2015. 'Internet Users by Country (2014) - Internet Live Stats'. <http://www.internetlivestats.com/internet-users-by-country/>.
- [102] Ec.europa.eu,. 2015. 'EUROPA - Competition - List of NACE Codes'. http://ec.europa.eu/competition/mergers/cases/index/nace_all.html.
- [103] Bank, European. 2015. 'Euro Exchange Rates USD'. *Ecb.Europa.Eu*. <https://www.ecb.europa.eu/stats/exchange/eurofxref/html/eurofxref-graph-usd.en.html>.
- [104] Czso.cz,. 2015. 'Počet Obyvatel V Obcích - K 1.1.2015 | ČSÚ'. <https://www.czso.cz/csu/czso/pocet-obyvatel-v-obcich-k-112015>.

10. List of abbreviations

AAA	American amber ale
ABV	Alcohol by volume
AIPA	American India pale ale
BA	Brewers Association
CAMRA	Campaign for Real Ale
CAPEX	Capital expenditures
CR	Czech Republic
CSA	Community supported agriculture
CSB	Community supported brewing
EBT	Earnings before taxes
EFTA	European Free Trade Area
EVA	Economic value added
FG	Final gravity
FMB	Flavoured malt beverages
HRMC	Her Majesty's Revenue and Customs
IBU	International bittering units
IPA	India pale ale
IRR	Internal rate of return
NPV	Net present value
OG	Original gravity
PEST	Political, economic, social and technological environment
POS	Point of sale
PP	Percentage point
RCD	Residual current device
ROA	Return on assets
ROE	Return on equity
SG	Specific gravity
SIBA	Society of Independent Brewers
SME	Small and medium-sized enterprises
SRM	Standard reference method
SWOT	Strengths, weaknesses, opportunities and threats
TTB	Alcohol and Tobacco Tax and Trade Bureau
WACC	Weighted average cost of capital

11. List of tables

Table 1 Classification of breweries; source: The Craft Beer Revolution	9
Table 2 Classification of breweries 2 nd ; Source: brewers Association.....	9
Table 3 Classification of breweries 3 rd ; Source: SIBA	11
Table 4 Classification of breweries 4 th ; Source: Pojmanová Kateřina, Restaurant Microbreweries and Family Breweries in Czech Republic	12
Table 5 Czech and American microbreweries' market share; Source: own work.....	13
Table 6 American brewery class market share applied to Czech market; Source: own work.....	13
Table 7 Classification of breweries 5 th ; Source: own work	13
Table 8 Classification of companies; Source: EUR-Lex, The New SME definition – [29], [30]	14
Table 9 Brewery classification 7 th ; Source: own work	15
Table 10 SWOT analysis; Source: own processing	69
Table 11 Selected financial indicators for the microbrewery sector in USA; Source: Almanac of Business and Industrial Financial Ratios.....	74
Table 12 Man hours needed per one 500 l batch of beer; Source: own processing.....	82
Table 13 Labour costs in production of one 500 l batch of beer; Source: own processing	83
Table 14 Estimated CAPEX; Source: own processing	85
Table 15 Financing of CAPEX; Source: own processing.....	86
Table 16 Monthly break-even points for 400 l batches of beer; Source: own processing	92
Table 17 Monthly break-even points for 500 l batches of beer; Source: own processing	92
Table 18 Economic value added; Source: own processing	94

12. List of charts

Figure 1 EU28 value added to beer in 2012 (in € billion); Source: Brewers of Europe	37
Figure 2 EU28 on-trade and off-trade beer consumption in 2012; Source: Brewers of Europe.....	38
Figure 3 EU28 Percentage of on-trade beer in total consumption; Source: Brewers of Europe ...	42
Figure 4 Growing number of microbreweries in Czech Republic; Source: own processing, Pivovary.info.....	67

13. Appendix

13.1. List of appendices

AP1 Microbrewery financial benchmarks	110
AP2 Estimated CAPEX	130
AP3 The first expected cash inflow	133
AP4 Sales forecast	134
AP5 Loan schedule	136
AP6 Depreciation plan	136
AP7 Input data	138
AP8 Costs	140
AP9 Income statement	145
AP10 Balance sheet	147
AP11 Cash-flow statement	151
AP12 Financial ratios	155

AP1 Microbrewery financial benchmarks

Calculated financial ratios

Current ratio = current assets/current liabilities

Quick ratio = (cash & cash equivalents + net short-term receivables)/current liabilities

Cash ratio = cash & cash equivalents/current liabilities

Total debt ratio = total liabilities/total assets

Equity ratio = equity/total assets

Coverage ratio = EBIT/interest payments; EBIT = earnings before interest & taxes

Relative profit or loss = profit or loss/total assets

Operating profit margin = (operating income/revenues)*100

Net profit margin = (net income/revenues)*100

Return on assets = (net income/average total assets)*100

Return on equity = (net income/average total equity)*100

Inventory turnover = revenues/average inventory

Days of inventory on hand = 365/inventory turnover

Receivables turnover = revenues/average receivables

Average collection period = 365/receivables turnover

Fixed assets turnover = revenues/fixed assets

Total assets turnover = revenues/total assets

Symbols

r	A financial ratio of a company.
ar	An average financial ratio of a company.
mr	A median of financial ratios of a company.
n_{rc}	Number of financial ratios of all companies.
n_{ar}	Number of average financial ratios.
n_{mr}	Number of medians of financial ratios.
n_c	Number of companies whose financial statements were used for computation of \bar{ar} and \overline{mr} and \tilde{ar} and \widetilde{mr} . Generally: $n_c = n_{mr} = n_{ar}$
σ_{mr}	Standard deviation of medians of financial ratios.
σ_{ar}	Standard deviation of average financial ratios.
σ_r	Standard deviation of financial ratios of a company.
$\bar{\sigma}_r$	Average standard deviation of financial ratios of a company.
\bar{ar}	Arithmetic mean of average financial ratios.
\overline{mr}	Arithmetic mean of medians of financial ratios.
\widetilde{mr}	Median of medians of financial ratios.
\tilde{ar}	Median of average financial ratios.
min_{rc}	Minimum value of financial ratios of all companies.
min_{ar}	Minimum value of average financial ratios.
max_{rc}	Maximum value of financial ratios of all companies.
max_{ar}	Maximum value of average financial ratios.

Microbrewery benchmarks 1

Profitable & non-profitable companies

Microbrewery type: Brewpub
 Production range: 0 – 1350 hl / year
 Number of companies: 12
 Average production: 663 hl / year
 Median production: 700 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	12	47	0.82	1.19	1.06	1.26	1.07	0.83	0.82	3.66	11.46	0.29	0.15
Quick ratio	12	47	0.63	1.03	0.92	0.97	0.75	0.56	0.56	3.16	10.15	0.18	0.10
Cash ratio	12	47	0.39	0.60	0.48	0.47	0.34	0.17	0.25	2.00	4.99	0.02	0.01
Total debt ratio	12	47	0.71	0.72	0.18	1.08	1.08	0.94	0.98	3.12	3.18	0.40	0.13
The equity ratio	12	47	0.71	0.72	0.18	-0.08	-0.08	0.06	0.02	0.60	0.68	-2.12	-2.18
Coverage ratio	2	4	13.01	13.01	1.65	10.72	10.72	10.72	10.72	19.91	21.20	1.52	1.49
Relative profit/loss	12	48	0.37	0.36	0.17	-22.75%	-23.38%	-6.86%	-8.30%	17.64%	35.82%	-98.18%	-143.54%
Operating profit margin	5	19	0.06	0.06	0.06	6.83%	6.93%	5.63%	4.49%	17.76%	31.43%	2.31%	0.51%
Net profit margin	5	18	0.07	0.07	0.06	6.17%	6.07%	4.18%	4.20%	17.69%	31.71%	1.69%	0.23%
Return on assets	5	15	0.13	0.13	0.09	12.26%	11.86%	4.93%	6.86%	26.59%	42.75%	0.44%	0.09%
Return on equity	5	14	2.93	2.92	0.10	155.43%	153.88%	17.74%	20.15%	676.80%	676.80%	0.70%	0.17%
Inventory turnover	11	33	15.17	14.70	2.58	19.35	19.47	12.55	12.55	50.04	55.46	5.93	2.76
Days of inventory on hand	11	33	17.25	17.09	4.19	29.15	29.12	29.07	29.07	61.56	61.56	7.38	3.00
Receivables turnover	12	37	12.08	15.20	19.05	20.40	16.58	11.66	19.37	43.34	128.47	2.91	2.34
Average collection period	12	37	44.62	41.79	24.28	51.52	47.08	33.98	38.73	130.48	157.82	11.08	2.84
Fixed assets turnover	11	36	6.36	6.91	0.91	4.95	4.72	1.26	1.26	19.32	25.55	0.18	0.01
Total assets turnover	12	37	2.30	2.27	0.28	2.18	2.18	1.13	1.16	6.46	6.94	0.14	0.03

Microbrewery benchmarks 2

Profitable & non-profitable companies

Microbrewery type: Brewpub
Production range: 1350 – 10000 hl / year
Number of companies: 10
Average production: 3350 hl / year
Median production: 1750 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	10	51	0.91	0.93	0.43	0.90	0.92	0.68	0.68	3.17	4.89	0.15	0.07
Quick ratio	10	51	0.80	0.83	0.38	0.70	0.70	0.46	0.44	2.75	4.33	0.09	0.05
Cash ratio	10	51	0.68	0.71	0.28	0.40	0.37	0.12	0.15	2.39	3.74	0.05	-0.12
Total debt ratio	10	51	0.86	0.92	0.46	1.29	1.23	1.06	1.06	2.76	4.03	0.24	0.19
The equity ratio	10	51	0.86	0.92	0.46	-0.29	-0.23	-0.06	-0.06	0.76	0.81	-1.76	-3.03
Coverage ratio	3	9	8.29	3.00	20.65	17.96	13.31	15.51	19.04	20.27	51.05	14.56	1.45
Relative profit/loss	10	50	0.38	0.35	0.21	-21.38%	-23.37%	-1.74%	-1.84%	6.44%	24.99%	-92.01%	-115.88%
Operating profit margin	5	26	0.11	0.11	0.11	11.79%	11.67%	6.52%	6.52%	27.27%	51.85%	1.96%	0.21%
Net profit margin	5	24	0.10	0.09	0.10	9.69%	9.52%	5.90%	5.90%	24.86%	47.41%	1.36%	0.12%
Return on assets	5	22	0.12	0.11	0.05	11.69%	11.11%	8.07%	8.24%	29.53%	30.28%	0.57%	0.57%
Return on equity	4	17	0.52	0.77	1.68	75.59%	42.71%	25.74%	69.58%	161.56%	942.86%	1.66%	1.42%
Inventory turnover	9	44	51.65	51.67	8.95	31.58	31.71	9.74	9.74	165.30	187.10	1.25	1.25
Days of inventory on hand	9	44	89.92	89.76	4.70	60.75	60.09	37.46	37.46	292.30	292.30	2.25	1.95
Receivables turnover	9	44	21.14	21.19	7.71	24.98	23.51	18.46	20.67	71.44	71.44	1.92	1.92
Average collection period	9	44	58.82	59.41	11.98	43.11	42.63	19.78	21.51	190.22	190.22	5.11	5.11
Fixed assets turnover	9	44	10.50	10.58	2.28	10.14	10.02	10.08	10.08	28.60	32.01	0.05	0.05
Total assets turnover	9	44	2.09	2.10	0.40	2.32	2.30	2.14	2.14	5.45	5.92	0.05	0.05

Microbrewery benchmarks 3

Profitable & non-profitable companies

Microbrewery type: Brewpub
Production range: 0 – 10000 hl / year
Number of companies: 22
Average production: 1885 hl / year
Median production: 1000 hl /year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	22	98	0.84	1.07	0.80	1.10	1.00	0.83	0.82	3.66	11.46	0.15	0.07
Quick ratio	22	98	0.69	0.93	0.71	0.85	0.73	0.56	0.56	3.16	10.15	0.09	0.05
Cash ratio	22	98	0.52	0.64	0.41	0.44	0.35	0.15	0.21	2.39	4.99	0.02	-0.12
Total debt ratio	22	98	0.77	0.80	0.28	1.18	1.15	0.98	0.99	3.12	4.03	0.24	0.13
The equity ratio	22	98	0.77	0.80	0.28	-0.18	-0.15	0.02	0.01	0.76	0.81	-2.12	-3.03
Coverage ratio	5	13	8.87	7.91	11.15	15.06	12.27	15.51	19.04	20.27	51.05	1.52	1.45
Relative profit/loss	22	98	0.37	0.35	0.19	-22.12%	-23.38%	-5.47%	-6.05%	17.64%	35.82%	-98.18%	-143.54%
Operating profit margin	10	45	0.09	0.09	0.08	9.31%	9.30%	6.08%	5.50%	27.27%	51.85%	1.96%	0.21%
Net profit margin	10	42	0.08	0.08	0.08	7.93%	7.79%	4.81%	4.82%	24.86%	47.41%	1.36%	0.12%
Return on assets	10	37	0.12	0.11	0.08	11.98%	11.48%	6.50%	7.55%	29.53%	42.75%	0.44%	0.09%
Return on equity	9	31	2.18	2.16	0.73	119.95%	104.47%	19.14%	21.47%	676.80%	942.86%	0.70%	0.17%
Inventory turnover	20	77	35.82	35.73	5.23	24.85	24.98	11.72	11.81	165.30	187.10	1.25	1.25
Days of inventory on hand	20	77	61.73	61.70	4.41	43.37	43.06	31.30	31.76	292.30	292.30	2.25	1.95
Receivables turnover	21	81	16.48	17.67	14.69	22.36	19.55	16.44	20.67	71.44	128.47	1.92	1.92
Average collection period	21	81	49.84	48.90	19.55	47.92	45.17	22.20	30.72	190.22	190.22	5.11	2.84
Fixed assets turnover	20	80	8.66	8.90	1.44	7.29	7.10	1.84	1.77	28.60	32.01	0.05	0.01
Total assets turnover	21	81	2.16	2.14	0.33	2.24	2.23	1.39	1.44	6.46	6.94	0.05	0.03

Microbrewery benchmarks 4

Profitable & non-profitable companies

Microbrewery type: Packaging brewery
 Production range: 0 – 1350 hl / year
 Number of companies: 8
 Average production: 694 hl / year
 Median production: 750 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	8	27	2.59	3.35	2.31	2.58	2.25	1.25	1.34	10.01	23.97	0.06	0.06
Quick ratio	8	27	2.01	3.00	2.10	1.92	1.52	0.93	0.97	9.16	22.81	0.06	0.06
Cash ratio	8	27	1.82	2.57	2.08	1.63	1.31	0.64	0.78	7.81	21.87	0.06	0.05
Total debt ratio	8	27	5.49	5.49	0.22	2.96	2.95	0.98	0.98	16.51	16.51	0.61	0.37
The equity ratio	8	27	5.49	5.49	0.22	-1.96	-1.95	0.02	0.02	0.39	0.63	-15.51	-15.51
Coverage ratio	2	8	0.96	2.81	6.30	7.03	4.35	4.35	7.03	9.01	26.64	5.04	2.05
Relative profit/loss	8	26	2.08	2.08	0.15	-74.19%	-73.68%	2.12%	-1.76%	8.13%	39.42%	-587.80%	-587.80%
Operating profit margin	5	17	0.05	0.08	0.11	9.06%	7.23%	5.83%	5.83%	22.23%	55.51%	2.46%	0.81%
Net profit margin	4	16	0.05	0.09	0.10	8.27%	6.19%	5.81%	5.26%	20.94%	53.06%	1.64%	0.30%
Return on assets	4	14	0.14	0.12	0.08	11.39%	10.73%	5.59%	7.43%	28.17%	33.90%	2.53%	0.61%
Return on equity	3	11	0.16	0.10	0.26	22.27%	17.35%	10.71%	27.39%	28.72%	69.96%	10.71%	2.83%
Inventory turnover	7	21	7.45	7.86	5.12	13.28	12.55	12.17	12.17	26.36	45.79	4.65	4.65
Days of inventory on hand	7	21	23.51	23.20	12.92	40.08	39.88	29.99	29.99	78.49	78.57	13.88	7.97
Receivables turnover	7	21	21.68	20.71	7.96	33.88	32.66	34.03	35.31	66.43	66.43	5.88	1.56
Average collection period	7	21	46.52	46.55	40.48	30.95	30.86	10.72	10.65	134.53	233.24	5.49	5.49
Fixed assets turnover	7	20	1.36	9.81	13.95	5.97	1.84	1.77	1.93	27.68	108.89	0.16	0.10
Total assets turnover	8	22	5.65	5.60	0.76	3.13	2.98	1.01	1.26	16.88	16.88	0.14	0.08

Microbrewery benchmarks 5

Profitable & non-profitable companies

Microbrewery type: Packaging brewery
Production range: 1350 – 10000 hl / year
Number of companies: 8
Average production: 3250 hl / year
Median production: 2500 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\tilde{mr}	\tilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	8	18	12.47	12.29	5.98	7.79	7.83	1.99	2.05	36.44	50.42	0.37	0.37
Quick ratio	8	18	12.43	12.25	5.65	7.33	7.39	1.70	1.73	36.07	49.80	0.29	0.29
Cash ratio	8	18	3.59	3.57	2.35	2.33	2.24	1.17	1.27	10.98	16.66	0.10	0.10
Total debt ratio	8	18	0.41	0.41	0.15	0.84	0.85	0.90	0.91	1.31	1.44	0.03	0.02
The equity ratio	8	18	0.41	0.41	0.15	0.16	0.15	0.10	0.09	0.97	0.98	-0.31	-0.44
Coverage ratio	2	3	1.87	1.87	6.52	6.54	6.54	6.54	6.54	7.86	12.47	5.22	3.25
Relative profit/loss	8	18	0.12	0.12	0.10	-7.66%	-8.37%	-6.13%	-4.70%	2.03%	13.68%	-34.19%	-44.05%
Operating profit margin	5	6	0.28	0.28	0.10	18.29%	18.29%	7.14%	7.14%	67.34%	67.34%	0.24%	0.24%
Net profit margin	5	6	0.08	0.08	0.10	7.54%	7.54%	5.48%	5.48%	19.74%	19.74%	0.16%	0.16%
Return on assets	5	6	0.06	0.06	0.04	6.66%	6.66%	5.05%	5.05%	14.42%	14.42%	0.24%	0.24%
Return on equity	4	5	0.12	0.12	0.25	11.18%	11.18%	9.20%	9.20%	26.06%	43.74%	0.25%	0.25%
Inventory turnover	8	12	42.78	42.82	10.84	31.68	31.77	13.26	12.93	118.30	137.05	1.98	1.98
Days of inventory on hand	8	12	61.25	60.99	6.00	51.46	50.80	27.57	30.23	184.22	184.22	3.16	2.66
Receivables turnover	6	10	7.28	6.89	6.67	11.16	9.70	7.99	10.68	20.36	33.31	1.08	0.93
Average collection period	6	10	128.19	128.01	41.85	93.19	90.30	45.68	45.68	345.98	393.90	1.00	10.96
Fixed assets turnover	8	12	76.90	76.92	0.29	39.60	39.63	0.96	0.83	206.54	206.54	0.14	0.14
Total assets turnover	8	12	4.73	4.73	0.17	2.08	2.09	0.44	0.44	13.77	13.77	0.10	0.10

Microbrewery benchmarks 6

Profitable & non-profitable companies

Microbrewery type: Packaging brewery
Production range: 0 – 10000 hl / year
Number of companies: 16
Average production: 1972 hl / year
Median production: 1250 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	16	45	9.17	9.11	4.15	5.18	5.04	1.73	1.73	36.44	50.42	0.06	0.06
Quick ratio	16	45	9.12	9.06	3.88	4.62	4.45	1.37	1.37	36.07	49.80	0.06	0.06
Cash ratio	16	45	2.79	3.02	2.22	1.98	1.78	1.04	1.08	10.98	21.87	0.06	0.05
Total debt ratio	16	45	3.91	3.91	0.18	1.90	1.90	0.96	0.96	16.51	16.51	0.03	0.02
The equity ratio	16	45	3.91	3.91	0.18	-0.90	-0.90	0.04	0.04	0.97	0.98	-15.51	-15.51
Coverage ratio	4	11	1.75	1.97	6.37	6.78	5.45	5.12	6.54	9.01	26.64	5.04	2.05
Relative profit/loss	16	44	1.46	1.46	0.12	-40.92%	-41.02%	-2.48%	-4.70%	8.13%	39.42%	-587.80%	-587.80%
Operating profit margin	10	23	0.20	0.20	0.11	13.68%	12.76%	6.49%	6.49%	67.34%	67.34%	0.24%	0.24%
Net profit margin	9	22	0.07	0.08	0.10	7.87%	6.94%	5.48%	5.48%	20.94%	53.06%	0.16%	0.16%
Return on assets	9	20	0.10	0.09	0.07	8.76%	8.47%	5.05%	5.10%	28.17%	33.90%	0.24%	0.24%
Return on equity	7	16	0.13	0.12	0.26	15.93%	13.82%	10.71%	14.16%	28.72%	69.96%	0.25%	0.25%
Inventory turnover	15	33	32.21	32.15	7.57	23.10	22.80	13.11	12.44	118.30	137.05	1.98	1.98
Days of inventory on hand	15	33	46.31	46.10	9.96	46.15	45.70	27.84	29.99	184.22	184.22	3.16	2.66
Receivables turnover	13	31	19.97	19.32	7.41	23.39	22.06	16.33	18.81	66.43	66.43	1.08	0.93
Average collection period	13	31	94.24	94.62	41.17	59.67	58.29	22.58	22.58	345.98	393.90	1.00	5.49
Fixed assets turnover	15	32	57.78	57.46	8.10	23.91	22.00	1.25	1.25	206.54	206.54	0.14	0.10
Total assets turnover	16	34	5.06	5.04	0.51	2.60	2.53	0.71	0.68	16.88	16.88	0.10	0.08

Microbrewery benchmarks 7

Profitable & non-profitable companies

Microbrewery type: Brewpubs and packaging breweries
Production range: 0 – 1350 hl / year
Number of companies: 20
Average production: 676 hl / year
Median production: 725 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	20	74	1.79	2.32	1.53	1.79	1.54	0.91	0.91	10.01	23.97	0.06	0.06
Quick ratio	20	74	1.37	2.04	1.36	1.35	1.06	0.61	0.61	9.16	22.81	0.06	0.06
Cash ratio	20	74	1.24	1.73	1.08	0.93	0.73	0.32	0.35	7.81	21.87	0.02	0.01
Total debt ratio	20	74	3.50	3.50	0.19	1.84	1.83	0.94	0.98	16.51	16.51	0.40	0.13
The equity ratio	20	74	3.50	3.50	0.19	-0.84	-0.83	0.06	0.02	0.60	0.68	-15.51	-15.51
Coverage ratio	4	12	8.38	7.97	3.98	8.87	7.54	4.35	7.03	19.91	26.64	1.52	1.49
Relative profit/loss	20	74	1.32	1.32	0.16	-43.32%	-43.50%	-5.47%	-7.13%	17.64%	39.42%	-587.80%	-587.80%
Operating profit margin	10	36	0.06	0.07	0.08	7.95%	7.08%	5.73%	5.16%	22.23%	55.51%	2.31%	0.51%
Net profit margin	9	34	0.06	0.07	0.07	7.10%	6.12%	4.18%	4.20%	20.94%	53.06%	1.64%	0.23%
Return on assets	9	29	0.13	0.11	0.08	11.88%	11.36%	4.93%	6.86%	28.17%	42.75%	0.44%	0.09%
Return on equity	8	25	2.33	2.32	0.16	105.50%	102.68%	15.11%	23.77%	676.80%	676.80%	0.70%	0.17%
Inventory turnover	18	54	12.93	12.58	3.50	16.99	16.78	12.36	12.36	50.04	55.46	4.65	2.76
Days of inventory on hand	18	54	19.98	19.79	7.37	33.40	33.31	29.53	29.53	78.49	78.57	7.38	3.00
Receivables turnover	19	58	17.59	18.14	15.35	25.37	22.51	20.81	26.71	66.43	128.47	2.91	1.56
Average collection period	19	58	44.75	43.52	29.68	43.94	41.10	17.54	30.85	134.53	233.24	5.49	2.84
Fixed assets turnover	18	56	5.15	7.89	5.26	5.35	3.60	1.54	1.62	27.68	108.89	0.16	0.01
Total assets turnover	20	59	3.87	3.84	0.44	2.56	2.50	1.01	1.26	16.88	16.88	0.14	0.03

Microbrewery benchmarks 8

Profitable & non-profitable companies

Microbrewery type: Brewpubs and packaging breweries
Production range: 1350 - 10000 hl / year
Number of companies: 18
Average production: 3306 hl / year
Median production: 2000 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	18	69	8.77	8.66	2.99	3.96	3.99	1.37	1.25	36.44	50.42	0.15	0.07
Quick ratio	18	69	8.70	8.58	3.01	3.64	3.67	0.98	0.89	36.07	49.80	0.09	0.05
Cash ratio	18	69	2.54	2.55	1.32	1.26	1.20	0.32	0.37	10.98	16.66	0.05	-0.12
Total debt ratio	18	69	0.71	0.75	0.30	1.09	1.06	1.01	1.01	2.76	4.03	0.03	0.02
The equity ratio	18	69	0.71	0.75	0.30	-0.09	-0.06	-0.01	-0.01	0.97	0.98	-1.76	-3.03
Coverage ratio	5	12	7.00	6.67	15.94	13.39	10.60	7.86	14.56	20.27	51.05	5.22	1.45
Relative profit/loss	18	68	0.30	0.28	0.16	-15.28%	-16.70%	-3.54%	-3.64%	6.44%	24.99%	-92.01%	-115.88%
Operating profit margin	10	32	0.20	0.20	0.11	15.04%	14.98%	6.83%	6.83%	67.34%	67.34%	0.24%	0.21%
Net profit margin	10	30	0.08	0.08	0.10	8.62%	8.53%	5.69%	5.69%	24.86%	47.41%	0.16%	0.12%
Return on assets	10	28	0.09	0.09	0.05	9.18%	8.89%	6.56%	6.85%	29.53%	30.28%	0.24%	0.24%
Return on equity	8	22	0.38	0.61	1.20	43.38%	26.94%	16.65%	17.82%	161.56%	942.86%	0.25%	0.25%
Inventory turnover	17	56	46.20	46.23	9.66	31.63	31.73	13.11	12.44	165.30	187.10	1.25	1.25
Days of inventory on hand	17	56	75.55	75.36	5.19	56.38	55.72	27.84	33.15	292.30	292.30	2.25	1.95
Receivables turnover	15	54	17.98	17.96	7.32	19.45	17.99	16.33	16.44	71.44	71.44	1.08	0.93
Average collection period	15	54	91.82	92.27	25.26	63.14	61.70	22.58	22.58	345.98	393.90	1.00	5.11
Fixed assets turnover	17	56	53.61	53.61	1.53	24.01	23.95	1.19	0.94	206.54	206.54	0.05	0.05
Total assets turnover	17	56	3.46	3.46	0.31	2.21	2.20	0.58	0.59	13.77	13.77	0.05	0.05

Microbrewery benchmarks 9

Profitable & non-profitable companies

Microbrewery type: Brewpubs and packaging breweries
Production range: 0 – 10000 hl / year
Number of companies: 38
Average production: 1921 hl / year
Median production: 1000 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	38	143	6.21	6.20	2.19	2.82	2.70	1.07	1.17	36.44	50.42	0.06	0.06
Quick ratio	38	143	6.12	6.11	2.07	2.44	2.30	0.80	0.79	36.07	49.80	0.06	0.05
Cash ratio	38	143	1.96	2.13	1.18	1.09	0.95	0.32	0.36	10.98	21.87	0.02	-0.12
Total debt ratio	38	143	2.59	2.59	0.24	1.48	1.47	0.98	0.99	16.51	16.51	0.03	0.02
The equity ratio	38	143	2.59	2.59	0.24	-0.48	-0.47	0.02	0.01	0.97	0.98	-15.51	-15.51
Coverage ratio	9	24	7.31	7.19	9.10	11.38	9.24	5.22	9.01	20.27	51.05	1.52	1.45
Relative profit/loss	38	142	0.97	0.97	0.16	-30.04%	-30.81%	-4.11%	-4.70%	17.64%	39.42%	-587.80%	-587.80%
Operating profit margin	20	68	0.15	0.15	0.09	11.49%	11.03%	6.17%	6.17%	67.34%	67.34%	0.24%	0.21%
Net profit margin	19	64	0.07	0.08	0.08	7.90%	7.39%	5.44%	5.44%	24.86%	53.06%	0.16%	0.12%
Return on assets	19	57	0.11	0.10	0.07	10.46%	10.06%	5.05%	6.86%	29.53%	42.75%	0.24%	0.09%
Return on equity	16	47	1.66	1.67	0.55	74.44%	64.81%	15.95%	20.81%	676.80%	942.86%	0.25%	0.17%
Inventory turnover	35	110	33.85	33.76	6.09	24.10	24.04	12.55	12.44	165.30	187.10	1.25	1.25
Days of inventory on hand	35	110	54.90	54.81	6.45	44.56	44.19	29.07	29.99	292.30	292.30	2.25	1.95
Receivables turnover	34	112	17.64	18.03	12.14	22.76	20.51	16.39	19.58	71.44	128.47	1.08	0.93
Average collection period	34	112	69.11	68.84	27.79	52.41	50.19	22.39	26.65	345.98	393.90	1.00	2.84
Fixed assets turnover	35	112	38.37	38.38	3.77	14.41	13.49	1.26	1.26	206.54	206.54	0.05	0.01
Total assets turnover	37	115	3.64	3.63	0.39	2.40	2.36	0.81	0.87	16.88	16.88	0.05	0.03

Microbrewery benchmarks 10

Profitable companies

Microbrewery type: Brewpub
 Production range: 0 – 1350 hl / year
 Number of companies: 2
 Average production: 925 hl / year
 Median production: 925 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	2	13	0.69	0.56	0.39	1.13	1.15	1.15	1.13	1.53	1.94	0.74	0.40
Quick ratio	2	13	0.48	0.48	0.36	0.85	0.84	0.84	0.85	1.19	1.69	0.52	0.22
Cash ratio	2	13	0.14	0.12	0.22	0.35	0.27	0.27	0.35	0.44	0.92	0.27	0.05
Total debt ratio	2	13	0.08	0.04	0.11	0.62	0.65	0.65	0.62	0.65	0.85	0.59	0.38
The equity ratio	2	13	0.08	0.04	0.11	0.38	0.35	0.35	0.38	0.41	0.62	0.35	0.15
Coverage ratio	0	0	-	-	-	-	-	-	-	-	-	-	-
Relative profit/loss	2	13	0.17	0.09	0.14	11.32%	15.46%	15.46%	11.32%	17.64%	31.30%	5.01%	-15.60%
Operating profit margin	2	11	0.03	0.02	0.02	3.40%	3.63%	3.63%	3.40%	4.49%	7.22%	2.31%	0.51%
Net profit margin	2	11	0.02	0.02	0.01	3.01%	2.73%	2.73%	3.01%	4.20%	6.15%	1.81%	0.32%
Return on assets	2	9	0.15	0.14	0.06	16.73%	15.76%	15.76%	16.73%	26.59%	29.05%	6.86%	0.93%
Return on equity	2	9	0.35	0.29	0.14	40.96%	37.12%	37.12%	40.96%	61.77%	70.90%	20.15%	3.38%
Inventory turnover	2	11	16.94	16.33	4.70	38.49	39.74	39.74	38.49	50.04	55.46	26.95	21.65
Days of inventory on hand	2	11	4.31	4.47	1.32	10.54	10.10	10.10	10.54	13.70	16.86	7.38	6.58
Receivables turnover	2	11	3.61	4.77	17.39	30.08	25.10	25.10	30.08	33.45	73.39	26.71	13.25
Average collection period	2	11	2.39	0.38	8.09	15.84	14.89	14.89	15.84	16.10	27.54	15.57	4.97
Fixed assets turnover	2	11	8.08	10.02	3.18	12.23	10.88	10.88	12.23	19.32	25.55	5.15	3.40
Total assets turnover	2	11	2.60	2.33	0.69	4.81	4.85	4.85	4.81	6.46	6.94	3.16	2.26

Microbrewery benchmarks 11

Profitable companies

Microbrewery type: Brewpub
Production range: 1350 – 10000 hl / year
Number of companies: 3
Average production: 1667 hl / year
Median production: 1500 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	3	31	1.46	1.53	0.50	1.51	1.50	1.31	1.21	3.17	4.89	0.15	0.07
Quick ratio	3	31	1.30	1.38	0.41	1.20	1.17	0.78	0.74	2.75	4.33	0.12	0.06
Cash ratio	3	31	1.22	1.29	0.37	0.91	0.87	0.29	0.29	2.39	3.74	0.05	-0.12
Total debt ratio	3	31	0.46	0.45	0.21	0.76	0.71	0.78	0.90	1.12	2.06	0.26	0.19
The equity ratio	3	31	0.46	0.45	0.21	0.24	0.29	0.22	0.10	0.74	0.81	-0.12	-1.06
Coverage ratio	2	8	8.04	3.16	20.65	16.80	9.83	9.83	16.80	19.04	51.05	14.56	1.45
Relative profit/loss	3	30	0.02	0.02	0.08	4.34%	4.79%	5.76%	3.37%	6.44%	24.99%	3.21%	-11.93%
Operating profit margin	3	23	0.10	0.10	0.04	8.39%	8.19%	3.08%	3.87%	19.35%	25.19%	1.96%	0.21%
Net profit margin	3	21	0.06	0.06	0.02	5.89%	5.61%	3.39%	3.85%	12.47%	15.46%	1.36%	0.12%
Return on assets	3	20	0.06	0.05	0.05	9.46%	8.49%	8.07%	8.24%	14.68%	30.28%	5.45%	0.59%
Return on equity	3	16	0.53	0.72	1.68	100.24%	56.39%	32.34%	117.69%	161.56%	942.86%	21.47%	1.42%
Inventory turnover	3	28	9.89	10.12	3.81	29.26	29.63	33.25	33.20	36.81	42.93	17.77	12.68
Days of inventory on hand	3	28	5.46	6.02	2.07	14.08	13.53	10.98	11.30	20.99	28.79	9.96	8.50
Receivables turnover	3	28	14.38	14.47	10.78	26.83	22.42	18.46	20.67	43.36	62.52	16.46	7.37
Average collection period	3	28	12.81	11.03	8.88	20.33	21.42	19.78	21.51	30.72	49.51	8.77	5.84
Fixed assets turnover	3	28	8.03	8.42	3.11	10.32	9.93	14.34	13.92	16.33	32.01	0.70	0.35
Total assets turnover	3	28	1.87	1.90	0.43	2.76	2.70	3.37	3.55	4.14	5.01	0.59	0.33

Microbrewery benchmarks 12

Profitable companies

Microbrewery type: Brewpub
 Production range: 0 – 10000 hl / year
 Number of companies: 5
 Average production: 1370 hl / year
 Median production: 1500 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	5	44	1.11	1.14	0.45	1.36	1.36	1.31	1.21	3.17	4.89	0.15	0.07
Quick ratio	5	44	0.96	1.02	0.39	1.06	1.04	0.78	0.74	2.75	4.33	0.12	0.06
Cash ratio	5	44	0.93	0.96	0.31	0.69	0.63	0.29	0.29	2.39	3.74	0.05	-0.12
Total debt ratio	5	44	0.33	0.32	0.17	0.71	0.69	0.70	0.65	1.12	2.06	0.26	0.19
The equity ratio	5	44	0.33	0.32	0.17	0.29	0.31	0.30	0.35	0.74	0.81	-0.12	-1.06
Coverage ratio	2	8	8.04	3.16	20.65	16.80	9.83	9.83	16.80	19.04	51.05	14.56	1.45
Relative profit/loss	5	43	0.10	0.06	0.11	7.13%	9.06%	5.76%	5.01%	17.64%	31.30%	3.21%	-15.60%
Operating profit margin	5	34	0.08	0.07	0.03	6.39%	6.37%	3.08%	3.87%	19.35%	25.19%	1.96%	0.21%
Net profit margin	5	32	0.05	0.04	0.02	4.74%	4.46%	3.39%	3.85%	12.47%	15.46%	1.36%	0.12%
Return on assets	5	29	0.10	0.09	0.06	12.37%	11.40%	8.07%	8.24%	26.59%	30.28%	5.45%	0.59%
Return on equity	5	25	0.43	0.62	0.91	76.53%	48.68%	32.34%	61.77%	161.56%	942.86%	20.15%	1.42%
Inventory turnover	5	39	12.30	11.97	4.17	32.95	33.67	33.25	33.20	50.04	55.46	17.77	12.68
Days of inventory on hand	5	39	4.80	5.18	1.77	12.67	12.16	10.98	11.30	20.99	28.79	7.38	6.58
Receivables turnover	5	39	10.43	10.66	13.42	28.13	23.49	22.55	26.71	43.36	73.39	16.46	7.37
Average collection period	5	39	9.81	8.18	8.56	18.53	18.81	16.58	16.10	30.72	49.51	8.77	4.97
Fixed assets turnover	5	39	6.99	7.85	3.14	11.08	10.31	14.34	13.92	19.32	32.01	0.70	0.35
Total assets turnover	5	39	2.20	2.10	0.54	3.58	3.56	3.37	3.55	6.46	6.94	0.59	0.33

Microbrewery benchmarks 13

Profitable companies

Microbrewery type: Packaging brewery
Production range: 0 – 1350 hl / year
Number of companies: 4
Average production: 838 hl / year
Median production: 825 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	4	15	1.79	1.77	1.35	2.21	2.18	1.60	1.69	4.70	4.70	0.79	0.22
Quick ratio	4	15	0.73	0.66	0.96	1.19	1.13	1.11	1.15	1.89	3.04	0.58	0.11
Cash ratio	4	15	0.74	0.66	0.90	1.03	0.96	0.94	1.08	1.64	2.95	0.31	0.07
Total debt ratio	4	15	0.12	0.12	0.13	0.77	0.78	0.81	0.79	0.89	0.98	0.61	0.37
The equity ratio	4	15	0.12	0.12	0.13	0.23	0.22	0.19	0.21	0.39	0.63	0.11	0.02
Coverage ratio	2	8	0.96	2.81	6.30	7.03	4.35	4.35	7.03	9.01	26.64	5.04	2.05
Relative profit/loss	4	14	0.03	0.02	0.10	5.38%	4.23%	4.08%	5.43%	8.13%	19.38%	2.53%	-6.39%
Operating profit margin	3	12	0.06	0.05	0.05	5.75%	5.92%	3.23%	3.23%	11.56%	20.83%	2.46%	0.81%
Net profit margin	3	12	0.04	0.03	0.03	4.05%	4.13%	2.87%	2.87%	7.64%	13.48%	1.64%	0.30%
Return on assets	3	11	0.04	0.04	0.08	5.80%	3.96%	2.53%	5.10%	9.76%	25.08%	2.53%	0.61%
Return on equity	3	11	0.16	0.10	0.26	22.27%	17.35%	10.71%	27.39%	28.72%	69.96%	10.71%	2.83%
Inventory turnover	4	12	9.66	9.46	2.18	13.52	13.37	11.17	11.54	26.36	27.97	4.65	4.65
Days of inventory on hand	4	12	28.43	28.34	6.32	40.77	40.97	35.81	35.35	78.49	78.49	13.88	13.05
Receivables turnover	4	12	20.06	19.60	3.92	43.89	43.40	43.17	43.81	66.43	66.43	21.52	20.63
Average collection period	4	12	5.37	5.13	1.52	10.03	10.18	8.85	8.81	17.01	17.69	5.49	5.49
Fixed assets turnover	4	12	0.96	2.28	4.63	3.36	2.13	1.85	2.88	6.37	23.22	1.30	0.89
Total assets turnover	4	12	0.63	0.69	0.83	1.55	1.39	1.19	1.45	2.42	3.71	0.88	0.68

Microbrewery benchmarks 14

Profitable companies

Microbrewery type: Packaging brewery
Production range: 1350 – 10000 hl / year
Number of companies: 1
Average production: 3000 hl / year
Median production: 3000 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\tilde{mr}	\tilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	1	3	-	-	8.12	13.19	14.94	14.94	13.19	13.19	20.29	13.19	4.34
Quick ratio	1	3	-	-	7.52	12.31	14.15	14.15	12.31	12.31	18.73	12.31	4.03
Cash ratio	1	3	-	-	2.03	2.26	2.30	2.30	2.26	2.26	4.27	2.26	0.21
Total debt ratio	1	3	-	-	0.05	0.80	0.78	0.78	0.80	0.80	0.85	0.80	0.76
The equity ratio	1	3	-	-	0.05	0.20	0.22	0.22	0.20	0.20	0.24	0.20	0.15
Coverage ratio	1	2	-	-	6.52	7.86	7.86	7.86	7.86	7.86	12.47	7.86	3.25
Relative profit/loss	1	3	-	-	0.06	2.03%	1.95%	1.95%	2.03%	2.03%	7.91%	2.03%	-3.75%
Operating profit margin	1	2	-	-	0.10	13.32%	13.32%	13.32%	13.32%	13.32%	20.22%	13.32%	6.41%
Net profit margin	1	2	-	-	0.10	10.58%	10.58%	10.58%	10.58%	10.58%	17.61%	10.58%	3.54%
Return on assets	1	2	-	-	0.04	5.05%	5.05%	5.05%	5.05%	5.05%	8.16%	5.05%	1.94%
Return on equity	1	2	-	-	0.25	26.06%	26.06%	26.06%	26.06%	26.06%	43.74%	26.06%	8.37%
Inventory turnover	1	2	-	-	1.14	13.42	13.42	13.42	13.42	13.42	14.23	13.42	12.61
Days of inventory on hand	1	2	-	-	2.33	27.30	27.30	27.30	27.30	27.30	28.94	27.30	25.65
Receivables turnover	1	2	-	-	0.21	1.08	1.08	1.08	1.08	1.08	1.22	1.08	0.93
Average collection period	1	2	-	-	67.76	345.98	345.98	345.98	345.98	345.98	393.90	345.98	298.07
Fixed assets turnover	1	2	-	-	0.14	1.25	1.25	1.25	1.25	1.25	1.35	1.25	1.16
Total assets turnover	1	2	-	-	0.06	0.50	0.50	0.50	0.50	0.50	0.55	0.50	0.46

Microbrewery benchmarks 15

Profitable companies

Microbrewery type: Packaging brewery
 Production range: 0 – 10000 hl / year
 Number of companies: 5
 Average production: 1270 hl / year
 Median production: 850 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	5	18	5.91	5.14	3.05	4.41	4.73	2.23	2.23	13.19	20.29	0.79	0.22
Quick ratio	5	18	5.86	5.00	2.60	3.42	3.74	1.61	1.61	12.31	18.73	0.58	0.11
Cash ratio	5	18	0.88	0.79	1.18	1.28	1.23	1.56	1.56	2.26	4.27	0.31	0.07
Total debt ratio	5	18	0.11	0.10	0.11	0.78	0.78	0.78	0.80	0.89	0.98	0.61	0.37
The equity ratio	5	18	0.11	0.10	0.11	0.22	0.22	0.22	0.20	0.39	0.63	0.11	0.02
Coverage ratio	3	10	2.13	2.04	6.37	7.30	5.52	5.03	7.86	9.01	26.64	5.04	2.05
Relative profit/loss	5	17	0.02	0.02	0.09	4.71%	3.77%	2.53%	5.22%	8.13%	19.38%	2.03%	-6.39%
Operating profit margin	4	14	0.06	0.06	0.07	7.64%	7.77%	8.17%	7.39%	13.32%	20.83%	2.46%	0.81%
Net profit margin	4	14	0.05	0.04	0.06	5.68%	5.74%	5.81%	5.26%	10.58%	17.61%	1.64%	0.30%
Return on assets	4	13	0.03	0.03	0.07	5.61%	4.23%	3.79%	5.07%	9.76%	25.08%	2.53%	0.61%
Return on equity	4	13	0.14	0.08	0.26	23.22%	19.53%	18.39%	26.72%	28.72%	69.96%	10.71%	2.83%
Inventory turnover	5	14	8.36	8.19	1.84	13.50	13.38	13.42	13.42	26.36	27.97	4.65	4.65
Days of inventory on hand	5	14	25.37	25.27	4.99	38.08	38.24	27.30	27.30	78.49	78.49	13.88	13.05
Receivables turnover	5	14	25.69	25.59	2.68	35.33	34.93	34.03	35.31	66.43	66.43	1.08	0.93
Average collection period	5	14	150.25	150.31	23.60	77.22	77.34	10.72	10.65	345.98	393.90	5.49	5.49
Fixed assets turnover	5	14	0.92	2.19	3.13	2.94	1.95	1.77	1.93	6.37	23.22	1.25	0.89
Total assets turnover	5	14	0.67	0.76	0.58	1.34	1.21	1.14	1.14	2.42	3.71	0.50	0.46

Microbrewery benchmarks 16

Profitable companies

Microbrewery type: Brewpubs and packaging breweries
Production range: 0 – 1350 hl / year
Number of companies: 6
Average production: 867 hl / year
Median production: 850 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	6	28	1.52	1.50	0.97	1.85	1.84	1.30	1.33	4.70	4.70	0.74	0.22
Quick ratio	6	28	0.62	0.58	0.72	1.08	1.04	0.90	0.94	1.89	3.04	0.52	0.11
Cash ratio	6	28	0.68	0.62	0.63	0.81	0.73	0.35	0.53	1.64	2.95	0.27	0.05
Total debt ratio	6	28	0.13	0.12	0.12	0.72	0.74	0.73	0.71	0.89	0.98	0.59	0.37
The equity ratio	6	28	0.13	0.12	0.12	0.28	0.26	0.27	0.29	0.41	0.63	0.11	0.02
Coverage ratio	2	8	0.96	2.81	6.30	7.03	4.35	4.35	7.03	9.01	26.64	5.04	2.05
Relative profit/loss	6	27	0.10	0.05	0.12	7.36%	7.97%	4.56%	5.43%	17.64%	31.30%	2.53%	-15.60%
Operating profit margin	5	23	0.05	0.04	0.04	4.81%	5.00%	3.23%	3.23%	11.56%	20.83%	2.31%	0.51%
Net profit margin	5	23	0.03	0.02	0.02	3.63%	3.57%	2.87%	2.87%	7.64%	13.48%	1.64%	0.30%
Return on assets	5	20	0.10	0.10	0.07	10.17%	8.68%	4.93%	6.86%	26.59%	29.05%	2.53%	0.61%
Return on equity	5	20	0.23	0.19	0.20	29.75%	25.26%	12.48%	27.39%	61.77%	70.90%	10.71%	2.83%
Inventory turnover	6	23	17.28	16.53	3.44	21.84	22.16	20.49	20.42	50.04	55.46	4.65	4.65
Days of inventory on hand	6	23	27.25	27.01	3.82	30.70	30.68	19.50	19.55	78.49	78.49	7.38	6.58
Receivables turnover	6	23	18.26	16.91	10.65	39.29	37.30	30.84	34.38	66.43	73.39	21.52	13.25
Average collection period	6	23	4.94	4.98	4.81	11.97	11.75	11.96	13.11	17.01	27.54	5.49	4.97
Fixed assets turnover	6	23	5.84	6.65	3.91	6.32	5.05	2.72	4.49	19.32	25.55	1.30	0.89
Total assets turnover	6	23	2.19	2.05	0.76	2.64	2.55	1.77	2.09	6.46	6.94	0.88	0.68

Microbrewery benchmarks 17

Profitable companies

Microbrewery type: Brewpubs and packaging breweries
Production range: 1350 - 10000 hl / year
Number of companies: 4
Average production: 2000 hl / year
Median production: 1750 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\widetilde{mr}	\widetilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	4	34	6.82	5.97	2.40	4.43	4.86	2.18	2.19	13.19	20.29	0.15	0.07
Quick ratio	4	34	6.58	5.66	2.19	3.98	4.42	1.70	1.74	12.31	18.73	0.12	0.06
Cash ratio	4	34	1.23	1.25	0.78	1.25	1.23	1.28	1.27	2.39	4.27	0.05	-0.12
Total debt ratio	4	34	0.38	0.36	0.17	0.77	0.73	0.78	0.85	1.12	2.06	0.26	0.19
The equity ratio	4	34	0.38	0.36	0.17	0.23	0.27	0.22	0.15	0.74	0.81	-0.12	-1.06
Coverage ratio	3	10	5.80	5.63	15.94	13.82	9.17	7.86	14.56	19.04	51.05	7.86	1.45
Relative profit/loss	4	33	0.02	0.02	0.08	3.76%	4.08%	3.90%	3.29%	6.44%	24.99%	2.03%	-11.93%
Operating profit margin	4	25	0.09	0.08	0.05	9.62%	9.47%	8.20%	8.59%	19.35%	25.19%	1.96%	0.21%
Net profit margin	4	23	0.06	0.05	0.04	7.06%	6.85%	6.98%	7.21%	12.47%	17.61%	1.36%	0.12%
Return on assets	4	22	0.05	0.04	0.05	8.35%	7.63%	6.56%	6.85%	14.68%	30.28%	5.05%	0.59%
Return on equity	4	18	0.46	0.69	1.20	81.69%	48.81%	29.20%	71.87%	161.56%	942.86%	21.47%	1.42%
Inventory turnover	4	30	11.44	11.45	3.14	25.30	25.58	25.84	25.49	36.81	42.93	13.42	12.61
Days of inventory on hand	4	30	8.20	8.24	2.13	17.39	16.97	15.39	16.15	27.30	28.94	9.96	8.50
Receivables turnover	4	30	15.86	17.48	8.14	20.39	17.08	14.45	18.57	43.36	62.52	1.08	0.93
Average collection period	4	30	162.62	163.07	23.60	101.74	102.56	27.38	26.11	345.98	393.90	8.77	5.84
Fixed assets turnover	4	30	7.86	8.23	2.37	8.05	7.76	7.80	7.59	16.33	32.01	0.70	0.35
Total assets turnover	4	30	1.88	1.92	0.34	2.20	2.15	1.97	2.07	4.14	5.01	0.50	0.33

Microbrewery benchmarks 18

Profitable companies

Microbrewery type: Brewpubs and packaging breweries
Production range: 0 – 10000 hl / year
Number of companies: 10
Average production: 1320 hl / year
Median production: 1000 hl / year

Financial ratio	n_c	n_{rc}	σ_{mr}	σ_{ar}	$\bar{\sigma}_r$	\bar{ar}	\bar{mr}	\tilde{mr}	\tilde{ar}	\max_{ar}	\max_{rc}	\min_{ar}	\min_{rc}
Current ratio	10	62	4.39	3.86	1.61	2.88	3.05	1.47	1.37	13.19	20.29	0.15	0.07
Quick ratio	10	62	4.20	3.62	1.37	2.24	2.39	0.98	0.96	12.31	18.73	0.12	0.06
Cash ratio	10	62	0.91	0.89	0.70	0.98	0.93	0.35	0.53	2.39	4.27	0.05	-0.12
Total debt ratio	10	62	0.24	0.23	0.14	0.74	0.73	0.77	0.78	1.12	2.06	0.26	0.19
The equity ratio	10	62	0.24	0.23	0.14	0.26	0.27	0.23	0.22	0.74	0.81	-0.12	-1.06
Coverage ratio	5	18	4.90	5.62	12.08	11.10	7.24	5.03	9.01	19.04	51.05	5.04	1.45
Relative profit/loss	10	60	0.08	0.05	0.10	5.92%	6.42%	4.56%	5.12%	17.64%	31.30%	2.03%	-15.60%
Operating profit margin	9	48	0.07	0.06	0.04	6.95%	6.99%	3.23%	3.87%	19.35%	25.19%	1.96%	0.21%
Net profit margin	9	46	0.05	0.04	0.03	5.16%	5.03%	3.39%	3.85%	12.47%	17.61%	1.36%	0.12%
Return on assets	9	42	0.08	0.07	0.06	9.36%	8.21%	5.05%	6.86%	26.59%	30.28%	2.53%	0.59%
Return on equity	9	38	0.35	0.52	0.63	52.83%	35.73%	26.06%	27.39%	161.56%	942.86%	10.71%	1.42%
Inventory turnover	10	53	14.59	14.10	3.29	23.23	23.53	22.47	22.06	50.04	55.46	4.65	4.65
Days of inventory on hand	10	53	22.03	21.80	2.98	25.37	25.20	16.79	17.44	78.49	78.49	7.38	6.58
Receivables turnover	10	53	19.44	18.87	9.39	31.73	29.21	25.10	30.08	66.43	73.39	1.08	0.93
Average collection period	10	53	105.01	105.01	14.20	47.88	48.08	14.89	15.84	345.98	393.90	5.49	4.97
Fixed assets turnover	10	53	6.44	6.92	3.14	7.01	6.13	2.72	4.49	19.32	32.01	0.70	0.35
Total assets turnover	10	53	1.97	1.90	0.55	2.46	2.39	1.77	2.09	6.46	6.94	0.50	0.33

AP2 Estimated CAPEX

Brewing environment

Water supply			
	Preliminary Price	VAT	Total Price
PPR Pipes	3 500 CZK	735 CZK	4 235 CZK
PPR reducers	600 CZK	126 CZK	726 CZK
Angle valves	500 CZK	105 CZK	605 CZK
Water tap	250 CZK	53 CZK	303 CZK
Fixtures	800 CZK	168 CZK	968 CZK
Washbowl	6 500 CZK	1 365 CZK	7 865 CZK
Building plaster	500 CZK	105 CZK	605 CZK
Delivery service	850 CZK	179 CZK	1 029 CZK
Work	15 000 CZK	3 150 CZK	18 150 CZK
TOTAL	28 500 CZK	5 985 CZK	34 485 CZK

Sewerage			
	Preliminary Price	VAT	Total Price
HT pipes	3 500 CZK	735 CZK	4 235 CZK
Box inlet	9 200 CZK	1 932 CZK	11 132 CZK
Industrial drains	28 000 CZK	5 880 CZK	33 880 CZK
Cover gratings	15 000 CZK	3 150 CZK	18 150 CZK
Sink	7 000 CZK	1 470 CZK	8 470 CZK
Concrete	5 000 CZK	1 050 CZK	6 050 CZK
Building plaster	200 CZK	42 CZK	242 CZK
Mortar	200 CZK	42 CZK	242 CZK
Delivery service	500 CZK	105 CZK	605 CZK
Work	17 000 CZK	3 570 CZK	20 570 CZK
TOTAL	85 600 CZK	17 976 CZK	103 576 CZK

Elektricity			
	Preliminary Price	VAT	Total Price
CYKY cables	4 500 CZK	945 CZK	5 445 CZK
Wall plugs	5 000 CZK	1 050 CZK	6 050 CZK
Distribution board	8 500 CZK	1 785 CZK	10 285 CZK
Circuit breakers	2 000 CZK	420 CZK	2 420 CZK
Residual current devices (RCDs)	6 500 CZK	1 365 CZK	7 865 CZK
Building plaster	500 CZK	105 CZK	605 CZK
Delivery service	500 CZK	105 CZK	605 CZK
Work	12 000 CZK	2 520 CZK	14 520 CZK
TOTAL	39 500 CZK	8 295 CZK	47 795 CZK

Tiling			
	Preliminary Price	VAT	Total Price
Basalt industrial tiles	52 000 CZK	10 920 CZK	62 920 CZK
Floor self levelling compound	5 800 CZK	1 218 CZK	7 018 CZK
Wall levelling compound	2 000 CZK	420 CZK	2 420 CZK
Primer	1 200 CZK	252 CZK	1 452 CZK
Tile adhesive	6 200 CZK	1 302 CZK	7 502 CZK
Grout	30 000 CZK	6 300 CZK	36 300 CZK
Concrete	48 000 CZK	10 080 CZK	58 080 CZK
Delivery service	5 000 CZK	1 050 CZK	6 050 CZK
Work	97 000 CZK	20 370 CZK	117 370 CZK
TOTAL	247 200 CZK	51 912 CZK	299 112 CZK

Ventilation			
	Preliminary Price	VAT	Total Price
Industrial ventilator	3 500 CZK	735 CZK	4 235 CZK
Ventilation pipes	2 800 CZK	588 CZK	3 388 CZK
Roof head	1 500 CZK	315 CZK	1 815 CZK
Fixtures	3 000 CZK	630 CZK	3 630 CZK
Mortar	500 CZK	105 CZK	605 CZK
Delivery service	500 CZK	105 CZK	605 CZK
Work	5 300 CZK	1 113 CZK	6 413 CZK
TOTAL	17 100 CZK	3 591 CZK	20 691 CZK

Equipment

Cooling equipment			
	Preliminary Price	VAT	Total Price
Cooling unit	40 000 CZK	8 400 CZK	48 400 CZK
Cooling room	72 200 CZK	15 162 CZK	87 362 CZK
Chest freezer	14 000 CZK	2 940 CZK	16 940 CZK
Shelves	17 000 CZK	3 570 CZK	20 570 CZK
Delivery service	500 CZK	105 CZK	605 CZK
Work	2 000 CZK	420 CZK	2 420 CZK
TOTAL	145 700 CZK	30 597 CZK	176 297 CZK

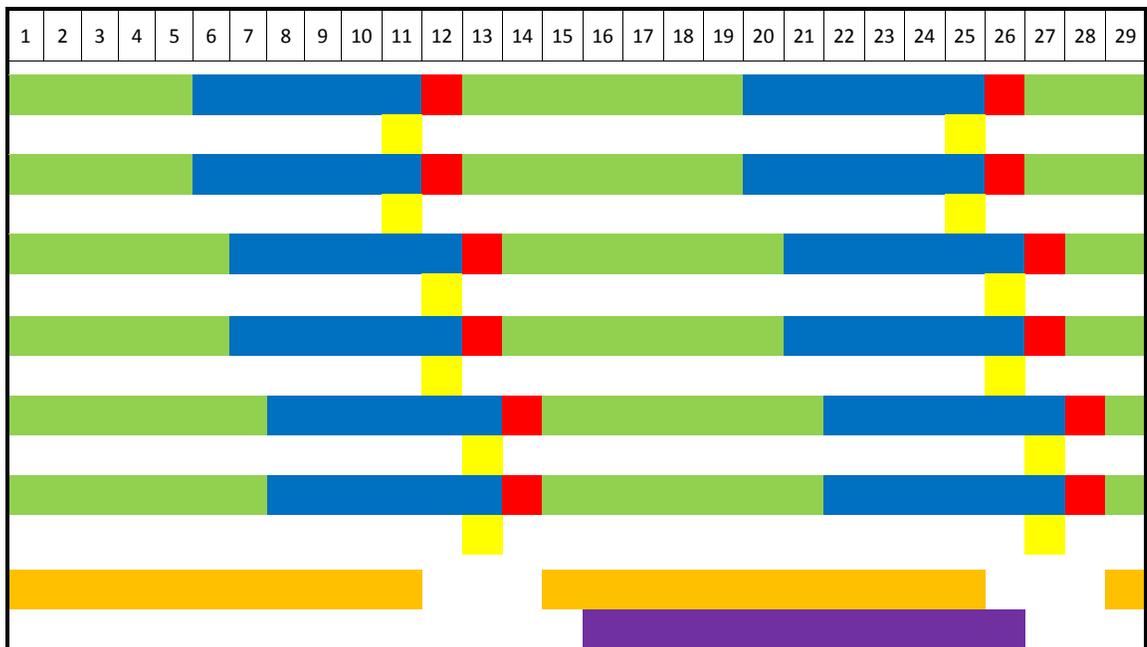
Brewing equipment			
	Preliminary Price	VAT	Total Price
500 l Brewhouse - manual control	1 381 000 CZK	290 010 CZK	1 671 010 CZK
Fermentation and maturation units	1 360 000 CZK	285 600 CZK	1 645 600 CZK
Water management units	381 510 CZK	80 117 CZK	461 627 CZK
Steam generator	160 000 CZK	33 600 CZK	193 600 CZK
Accessories and tools	110 000 CZK	23 100 CZK	133 100 CZK
Air compressor	74 000 CZK	15 540 CZK	89 540 CZK
Malt mill	70 000 CZK	14 700 CZK	84 700 CZK
Connection material	55 000 CZK	11 550 CZK	66 550 CZK
Brewhouse vapor condenser	70 000 CZK	14 700 CZK	84 700 CZK
Activated carbon filter	15 500 CZK	3 255 CZK	18 755 CZK
Yeast storage tanks	70 000 CZK	14 700 CZK	84 700 CZK
Mobile pump	24 000 CZK	5 040 CZK	29 040 CZK
Platform trolleys	10 000 CZK	2 100 CZK	12 100 CZK
CIP station	109 000 CZK	22 890 CZK	131 890 CZK
Keg washer and filler	111 000 CZK	23 310 CZK	134 310 CZK
Manual bottle filler	60 000 CZK	12 600 CZK	72 600 CZK
Manual bottle washer	55 000 CZK	11 550 CZK	66 550 CZK
European beer kegs	252 300 CZK	52 983 CZK	305 283 CZK
Transport of equipment	3 000 CZK	630 CZK	3 630 CZK
TOTAL	4 371 310 CZK	917 975 CZK	5 289 285 CZK

AP3 The first expected cash inflow

Legend

	Brewing
	Fermenting
	Cold crashing
	Packaging
	Selling, distribution
	Receiving cash

Month 2; February



AP4 Sales forecast

Optimistic scenario

Local market projections

	Production year				
	Year 1	Year 2	Year 3	Year 4	Year 5
No. of bottles sold	423	423	423	423	423
No. of kegs sold	54	54	54	54	54
Total revenue	110 437 CZK	110 437 CZK	110 437 CZK	110 437 CZK	110 437 CZK
Liters total	1929	1929	1929	1929	1929
Market share	0,24%	0,24%	0,24%	0,24%	0,24%

Regional market projections

	Production year				
	Year 1	Year 2	Year 3	Year 4	Year 5
No. of bottles sold	1364	1364	1364	1364	1364
No. of kegs sold	86	86	86	86	86
Total revenue	234 193 CZK	234 193 CZK	234 193 CZK	234 193 CZK	234 193 CZK
Liters total	3617	3617	3617	3617	3617
Market share	0,16%	0,16%	0,16%	0,16%	0,16%

National market projections

	Production year				
	Year 1	Year 2	Year 3	Year 4	Year 5
No. of bottles sold	36613	36613	36613	36613	36613
No. of kegs sold	1300	1300	1300	1300	1300
Total revenue	4 852 064 CZK	4 852 064 CZK	4 852 064 CZK	4 852 064 CZK	4 852 064 CZK
Liters total	66455	66455	66455	66455	66455
Market share	0,20%	0,20%	0,20%	0,20%	0,20%

Conservative scenario

Local market projections

	Production year				
	Year 1	Year 2	Year 3	Year 4	Year 5
No. of bottles sold	141	282	423	423	423
No. of kegs sold	33	43	54	54	54
Total revenue	57 418 CZK	83 928 CZK	110 437 CZK	110 437 CZK	110 437 CZK
Liters total	1083	1506	1929	1929	1929
Market share	0,13%	0,19%	0,24%	0,24%	0,24%

Regional market projections

	Production year				
	Year 1	Year 2	Year 3	Year 4	Year 5
No. of bottles sold	455	909	1364	1364	1364
No. of kegs sold	29	58	86	86	86
Total revenue	78 064 CZK	156 129 CZK	234 193 CZK	234 193 CZK	234 193 CZK
Liters total	1206	2411	3617	3617	3617
Market share	0,05%	0,11%	0,16%	0,16%	0,16%

National market projections

	Production year				
	Year 1	Year 2	Year 3	Year 4	Year 5
No. of bottles sold	12204	24409	36613	36613	36613
No. of kegs sold	419	859	1300	1300	1300
Total revenue	1 596 749 CZK	3 224 406 CZK	4 852 064 CZK	4 852 064 CZK	4 852 064 CZK
Liters total	21712	44083	66455	66455	66455
Market share	0,06%	0,13%	0,20%	0,20%	0,20%

AP5 Loan schedule

Year	Payment Date	Beginning Balance	Payment	Principal	Interest	Ending Balance
1	31.1.YEAR1	5 289 290 CZK	753 076 CZK	382 826 CZK	370 250 CZK	4 906 464 CZK
2	31.1.YEAR2	4 906 464 CZK	753 076 CZK	409 623 CZK	343 453 CZK	4 496 841 CZK
3	31.1.YEAR3	4 496 841 CZK	753 076 CZK	438 297 CZK	314 779 CZK	4 058 544 CZK
4	31.1.YEAR4	4 058 544 CZK	753 076 CZK	468 978 CZK	284 098 CZK	3 589 566 CZK
5	31.1.YEAR5	3 589 566 CZK	753 076 CZK	501 806 CZK	251 270 CZK	3 087 760 CZK
6	31.1.YEAR6	3 087 760 CZK	753 076 CZK	536 933 CZK	216 143 CZK	2 550 827 CZK
7	31.1.YEAR7	2 550 827 CZK	753 076 CZK	574 518 CZK	178 558 CZK	1 976 309 CZK
8	31.1.YEAR8	1 976 309 CZK	753 076 CZK	614 734 CZK	138 342 CZK	1 361 575 CZK
9	31.1.YEAR9	1 361 575 CZK	753 076 CZK	657 766 CZK	95 310 CZK	703 809 CZK
10	31.1.YEAR10	703 809 CZK	753 076 CZK	703 809 CZK	49 267 CZK	0 CZK

AP6 Depreciation plan

	Preliminary	VAT	Total CAPEX
Brewing environment	417 900 CZK	87 759 CZK	505 659 CZK
Cooling equipment	145 700 CZK	30 597 CZK	176 297 CZK
Brewing equipment	4 371 310 CZK	917 975 CZK	5 289 285 CZK
ESTIMATED CAPEX TOTAL	4 934 910 CZK	1 036 331 CZK	5 971 241 CZK

	Preliminary	VAT	Total
Depreciated brewing equipment	4 211 698 CZK	884 480 CZK	5 096 290 CZK
Non-depreciated brewing equipment	159 612 CZK	33 495 CZK	192 995 CZK

Tax depreciation

Brewing equipment		
Acquisition cost:		4 211 698 CZK
Year	Coefficient	Linear depreciation
1	0,110	463 287 CZK
2	0,223	937 103 CZK
3	0,223	937 103 CZK
4	0,223	937 103 CZK
5	0,223	937 103 CZK
Total	1,00	4 211 698 CZK

Cooling equipment		
Acquisition cost:		145 700 CZK
Year	Coefficient	Linear depreciation
1	0,110	16 027 CZK
2	0,223	32 418 CZK
3	0,223	32 418 CZK
4	0,223	32 418 CZK
5	0,223	32 418 CZK
Total	1,00	145 700 CZK

Accounting depreciation

Brewing equipment		
Acquisition cost:		4 211 698 CZK
Year	Coefficient	Linear depreciation
1	0,100	421 170 CZK
2	0,100	421 170 CZK
3	0,100	421 170 CZK
4	0,100	421 170 CZK
5	0,100	421 170 CZK
6	0,100	421 170 CZK
7	0,100	421 170 CZK
8	0,100	421 170 CZK
9	0,100	421 170 CZK
10	0,100	421 170 CZK
Total	1,00	4 211 698 CZK

Cooling units		
Acquisition cost:		145 700 CZK
Year	Coefficient	Linear depreciation
1	0,100	14 570 CZK
2	0,100	14 570 CZK
3	0,100	14 570 CZK
4	0,100	14 570 CZK
5	0,100	14 570 CZK
6	0,100	14 570 CZK
7	0,100	14 570 CZK
8	0,100	14 570 CZK
9	0,100	14 570 CZK
10	0,100	14 570 CZK
Total	1,00	145 700 CZK

AP7 Input data

Prices without VAT

Prices of raw materials				
		Price	Unit	
Malt	Pale ale malt	14 500 CZK	1 t	
	Caraaroma caramel malt	19 500 CZK	1 t	
	Transport of malt		2 500 CZK	1t
			4 400 CZK	2t
			5 100 CZK	3t
			6 200 CZK	4t
			7 300 CZK	5t
Hops	Willamette	660 CZK	1 kg	
	Citra	1 090 CZK	1 kg	
	Transport of hops (300-400 kg)	10 CZK	1 kg	
Yeast	California and British ale yeast	1 930 CZK	5l	
		2 940 CZK	10l	
		3 950 CZK	15l	
		4 960 CZK	20l	
		248 CZK	1 l	
	Dried yeast Safale US-05	1 050 CZK	500 g	

	Transport of yeast (up to 50 km)	20 CZK	1 l
Water	Water rate	38 CZK	1000 l
		0.038 CZK	1 l
	Sewerage	0.028 CZK	1 l
	Carbon filtration	0.55 CZK	1 l

Gases		
	Price	Unit
Carbon dioxide	580 CZK	10 kg
	780 CZK	15 kg
	1 050 CZK	20 kg
	1 670 CZK	30 kg

Prices of energy		
	Price	Unit
Electricity	4,2 CZK	1 kWh
Gas - for heating	35 000 CZK	1 year
Diesel oil	32 CZK	1 l

Sanitation		
	Price	Unit
Detergents (SAVO; washing liquid)	25 CZK	1 l
Nitric acid (HNO₃)	112 CZK	1 l
Sodium hydroxide (NaOH)	55 CZK	1 kg
SPC (Sodium percarbonate)	50 CZK	1 kg
TAED (Tetra Acetyl Ethylene Diamine)	50 CZK	200 g

Salaries		
	Price	Unit
Non-qualified labour	80 CZK	1 h
Qualified labour	200 CZK	1 h
Responsible representative reward	5 000 CZK	1 month

Leasing		
	Price	Unit
Cooling van, consumption 10l/100 km	13 000 CZK	1 month
Production hall	9 500 CZK	1 month
Storage space	7 500 CZK	1 month

Waste packaging		
	Price	Unit
Swing-top glass bottle, brown, 0.75 l	15 CZK	1 piece
Wire bail, suitable for non-pasteurized beer	7 CZK	1 piece
Labels (outsourced)	2 CZK	1 piece

AP8 Costs

Consumption of raw materials per one 5 hl batch		
	AIPA	AAA
Estimated OG	1.065	1.058
- cca in Plato °P	16	14
Estimated FG	1.015	1.016
Target ABV	6.5	5.5
Target IBU	68	32
Target SRM	7.7	14.9
Pre-boil wort	580 l	580
Malt		
- Pale ale malt	114 kg	96 kg
- Caramel malt	3 kg	11.5 kg
Hops		
- Citra	2.55 kg	0
- Willamette	0	3 kg
Yeast	30 l	30 l
Water		
- Mashing	330	302 l
- Sparging	380	395 l

Equipment-related consumption per 5 hl batch of beer			
	Machine parameters	Anticipated usage per batch	Anticipated consumption per batch
Brewhouse 500 l	30 kWh	4 hrs	120 kWh
Water management units			
- Cooling	1.2 kWh	12 hrs	14.4 kWh
- Heating	6 kWh	6 hrs	36 kWh
CCT 500 l	0.5 kWh	230 hrs	115kWh
Malt mill	2.2 kWh	0.5 hr	1.1 kWh
Steam generator	18 kWh	0.5 hr	9 kWh
- Water consumption	20 l/batch	1 batch	20 l
Air compressor	1.5 kWh	5 hrs	7.5 kWh
Vapor condenser	0.4 kWh	4 hrs	1.6 kWh
Mobile pump	0.75 kWh	1 hr	0.75 kWh
CIP station 2 x 50 l	4.2 kWh	1 hr	4.2 kWh
- Sanitizing agent 1; NaOH	400 g/batch	1 batch	400 g
- Sanitizing agent 2; HNO ₃	1 l/batch	1 batch	1 l
- Water for dilution	20 l/batch	1 batch	20 l
- Water for rinsing	50 l/batch	1 batch	50 l
Keg washer and filler			
- Pump	0.75 kWh	1.6 hrs	1.2 kWh
- Heating	1.5 kWh	1.6 hrs	2.4 kWh
- CO ₂	120 g/KEG	10 kegs	1200 g
- Sanitizing agents; NaOH	500 g/KEG	10 kegs	5 kg
- Water for dilution	12 l/KEG	10 kegs	120 l
- Water for rinsing	12 l/KEG	10 kegs	120 l
Manual bottle filler			
- CO ₂	3 g/bottle	267 bottles	800 g
Manual bottle washer			
- Sanitizer 3; TAED	0.035 g/bottle	267 bottles	9 g
- Sanitizer 4; SPC	0.6 g/bottle	267 bottles	160 g
- Water for dilution	0.2 l/bottle	267 bottles	53 l
- Water for rinsing	0.2 l/bottle	267 bottles	53 l

Production costs per one 5 hl batch of beer		
	AIPA	AAA
Costs of raw materials		
- Malt	1 892,85 CZK	1 782,88 CZK
- Hops	2 805 CZK	2 010 CZK
- Yeast	2 680 CZK	2 680 CZK
- Water	419 CZK	413 CZK
Brewing equipment-related costs	1 875 CZK	1 875 CZK
Packaging - bottles	6 400 CZK	6 400 CZK
Depreciation of brewing equipment	2 925 CZK	2 925 CZK
Leasing of production hall	792 CZK	792 CZK
Deferrals - brewing environment	290 CZK	290 CZK
Costs of labour in production	3 136 CZK	3 130 CZK
TOTAL	23 215 CZK	22 298 CZK

Production costs per one bottle of beer; 5 hl batch		
	AIPA	AAA
Production costs before bottling	15 487 CZK	14 570 CZK
- One liter of beer	31 CZK	29.1 CZK
- 0.75 liter; one bottle	23 CZK	22 CZK
Bottling equipment-related costs	62 CZK	62 CZK
- per one bottle	0.23 CZK	0.23 CZK
Packaging - one bottle	24 CZK	24 CZK
Depreciation of bottling equipment	80 CZK	80 CZK
- per one bottle	0.30 CZK	0.30 CZK
Labour costs - bottling	432 CZK	432 CZK
- per one bottle	2 CZK	2 CZK
TOTAL per one bottle	49 CZK	48 CZK

Production costs per one keg of beer; 5 hl batch		
	AIPA	AAA
Production costs before kegging	15 487 CZK	14 570 CZK
- One liter of beer	31 CZK	29.1 CZK
- 30 liters, one keg	929 CZK	874 CZK
Kegging equipment-related costs	373 CZK	373 CZK
- per one keg	37.32 CZK	37 CZK
Depreciation of kegging equipment	252.46 CZK	252 CZK
- per one keg	25.25 CZK	25.25 CZK
Labour costs - kegging	128 CZK	128 CZK
- per one keg	12.80 CZK	12.80 CZK
TOTAL per one keg	1 005 CZK	950 CZK

Variable costs - 300 l batch		
	Bottle	KEG
AIPA	50 CZK	1020 CZK
AAA	48 CZK	944 CZK

Variable costs - 400 l batch		
	Bottle	KEG
AIPA	47 CZK	912 CZK
AAA	45 CZK	835 CZK

Variable costs - 500 l batch		
	Bottle	KEG
AIPA	45 CZK	836 CZK
AAA	44 CZK	771 CZK

Fixed costs		
	Monthly	Yearly
Depreciation	36 312 CZK	435 740 CZK
Elektricity	3 000 CZK	36 000 CZK
Heating	2 917 CZK	35 000 CZK
Water	167 CZK	2 000 CZK
Detergents	50 CZK	600 CZK
Diesel oil	14 432 CZK	173 184 CZK
Vignette	125 CZK	1 500 CZK
Deferrals	3 483 CZK	41 790 CZK
Leasing		
- Cooling van	13 000 CZK	156 000 CZK
- Production hall	9 500 CZK	114 000 CZK
- Storage space	7 500 CZK	90 000 CZK
Interest	30 854 CZK	370 250 CZK
Salaries		
- Driver	1 000 CZK	12 000 CZK
- Accountant	1 000 CZK	12 000 CZK
Marketing	2 083 CZK	25 000 CZK
Responsible representative	5 000 CZK	60 000 CZK
TOTAL	130 422 CZK	1 564 464 CZK

Excise duty		
	Bottle	KEG
AIPA	1.92 CZK	76.80 CZK
AAA	1.68 CZK	67.20 CZK

Prices		
	Bottle	KEG
AIPA	100 CZK	1 700 CZK
AAA	100 CZK	1 700 CZK

Prices without VAT		
	Bottle	KEG
AIPA	83 CZK	1 405 CZK
AAA	83 CZK	1 405 CZK

AP9 Income statement

Pro-forma income statement; optimistic

Currency units: CZK

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
INCOME TOTAL	5116703	5333232	5333232	5333232	5333232
Revenues	4980165	5196694	5196694	5196694	5196694
Beer produced, not sold	136538	136538	136538	136538	136538
EXPENSES TOTAL	4599372	4709112	4680439	4649758	4616929
Last year beer sold	0	136538	136538	136538	136538
Material	2229003	2229003	2229003	2229003	2229003
Energy	266547	266547	266547	266547	266547
Services	486790	486790	486790	486790	486790
Labour	475181	475181	475181	475181	475181
Social and health insurance	161561	161561	161561	161561	161561
Taxes and charges	174300	174300	174300	174300	174300
Depreciation	435740	435740	435740	435740	435740
Financial expenses	370250	343453	314779	284098	251270
PROFIT BEFORE TAXATION	517330	624120	652793	683474	716302
PROFIT TAX	90014	17164	22612	28442	34679
Deferred tax	8279	101418	101418	101418	101418
NET PROFIT	419038	505537	528762	553614	580205

Pro-forma income statement; conservative

Currency units: CZK

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
INCOME TOTAL	1705568	3483312	5188879	5333232	5333232
Revenues	1660055	3392287	5052342	5196694	5196694
Beer produced, not sold	45513	91025	136538	136538	136538
EXPENSES TOTAL	2466487	3551644	4634926	4649758	4616929
Last year beer sold	0	45513	91025	136538	136538
Material	743401	1486202	2229003	2229003	2229003
Energy	137518	202033	266547	266547	266547
Services	486790	486790	486790	486790	486790
Labour	174394	324787	475181	475181	475181
Social and health insurance	59294	110428	161561	161561	161561
Taxes and charges	59100	116700	174300	174300	174300
Depreciation	435740	435740	435740	435740	435740
Financial expenses	370250	343453	314779	284098	251270
PROFIT BEFORE TAXATION	-760919	-68333	553953	683474	716302
PROFIT TAX			3833	28442	34679
Deferred tax			101418	101418	101418
NET PROFIT	-760919	-68333	448702	553614	580205

AP10 Balance sheet

Opening balance; optimistic

Currency units: CZK

Date: 1.1.YEAR0

ASSETS	8368810
NON-CURRENT ASSETS	4357398
Tangible fixed assets	
- Equipment	4357398
CURRENT ASSETS	3593512
VAT	1158167
Inventories	684425
Cash and cash equivalents	1750920
DEFERRALS	417900
Deferred expenses	417900
EQUITY AND LIABILITIES	8368810
EQUITY	2893664
Share capital	3073276
P&L	-179612
LIABILITIES	5475146
LONG-TERM FINANCIAL LIABILITIES	5289290
loans and credits gained	5289290
SHORT-TERM LIABILITIES	185856
Suppliers	185856

Pro-forma balance sheet; optimistic

Currency units: CZK

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
ASSETS	8166731	8255208	8481680	8671385	8855107
NON-CURRENT ASSETS	3921659	3485919	3050179	2614439	2178699
Tangible fixed assets	3921659	3485919	3050179	2614439	2178699
- Equipment	3921659	3485919	3050179	2614439	2178699
CURRENT ASSETS	3868963	4434969	5138971	5806205	6467458
Inventories	820963	820963	820963	820963	820963
- Material	684425	684425	684425	684425	684425
- Products	136538	136538	136538	136538	136538
Short-term receivables	568249	568249	568249	568249	568249
- VAT	44249	44249	44249	44249	44249
- Customers	524000	524000	524000	524000	524000
Cash and cash equivalents	2479750	3045757	3749759	4416993	5078246
DEFERRALS	376110	334320	292530	250740	208950
- Deferred expenses	376110	334320	292530	250740	208950
LIABILITIES AND EQUITY	8166731	8255208	8481680	8671385	8855107
EQUITY	2112702	2618239	3147001	3700615	4280820
Share capital	1873276	1873276	1873276	1873276	1873276
Transferred profit/loss from previous year	-179612	239426	744963	1273725	1827339
Non-allocated profit/loss from current year	419038	505537	528762	553614	580205
LIABILITIES	6054029	5636969	5334679	4970769	4574287
LONG-TERM LIABILITIES	4906464	4496841	4058544	3589566	3087760
Credits and loans gained	4906464	4496841	4058544	3589566	3087760
SHORT-TERM LIABILITIES	1139286	1030431	1065019	1068669	1072575
- Income tax	161291	52436	87024	90674	94579
- Social and health insurance institutions	117831	117831	117831	117831	117831
- Liabilities to suppliers	802061	802061	802061	802061	802061
- Excise	28800	28800	28800	28800	28800
- Employees	29303	29303	29303	29303	29303
DEFERRALS	8279	109698	211116	312534	413953
- Deferred tax	8279	109698	211116	312534	413953

Opening balance; conservative

Currency units: CZK

Date: 1.1.2015

ASSETS	7120828
NON-CURRENT ASSETS	4357398
Tangible fixed assets	
- Equipment	4357398
CURRENT ASSETS	2345530
VAT	1079743
Inventories	228142
Cash and cash equivalents	1037645
DEFERRALS	417900
Deferred expenses	417900
EQUITY AND LIABILITIES	7120828
EQUITY	1769586
Share capital	1949198
P&L	-179612
LIABILITIES	5351242
LONG-TERM FINANCIAL LIABILITIES	5289290
loans and credits gained	5289290
SHORT-TERM LIABILITIES	61952
Suppliers	61952

Pro-forma balance sheet; conservative

Currency units: CZK

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
ASSETS	5011476	4909983	5402103	5611234	5787445
NON-CURRENT (FIXED) ASSETS	3921659	3485919	3050179	2614439	2178699
Tangible fixed assets	3921659	3485919	3050179	2614439	2178699
- Equipment	3921659	3485919	3050179	2614439	2178699
CURRENT ASSETS	713707	1089745	2059395	2746055	3399796
Inventories	273654	547309	820963	820963	820963
- Material	228142	456284	684425	684425	684425
- Products	45513	91025	136538	136538	136538
Short-term receivables	195161	381705	568249	568249	568249
- VAT	20495	32372	44249	44249	44249
- Customers	174667	349333	524000	524000	524000
Cash and cash equivalents	244891	160731	670182	1356842	2010583
DEFERRALS	376110	334320	292530	250740	208950
- Deferred expenses	376110	334320	292530	250740	208950
LIABILITIES AND EQUITY	5011476	4909983	5402103	5611234	5787445
EQUITY	-191333	-259666	189036	742650	1322855
Share capital	749198	749198	749198	749198	749198
Transferred profit/loss from previous year	-179612	-940531	-1008864	-560162	-6548
Non-allocated profit/loss from current year	-760919	-68333	448702	553614	580205
LIABILITIES	5202808	5169649	5213067	4868584	4464590
LONG-TERM LIABILITIES	4906464	4496841	4058544	3589566	3087760
Credits and loans gained	4906464	4496841	4058544	3589566	3087760
SHORT-TERM OPERATING LIABILITIES	296344	672808	1053105	1076181	1072575
- Income tax	26159	48718	75110	98186	94579
- Social and health insurance institutions	-17523	50154	117831	117831	117831
- Liabilities to suppliers	267354	534707	802061	802061	802061
- Excise	9600	19200	28800	28800	28800
- Employees	10754	20029	29303	29303	29303
DEFERRALS	0	0	101418	202837	304255
- Deferred tax	0	0	101418	202837	304255

Cash flow statement; optimistic

Currency units: CZK

AP11 Cash-flow statement

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
OPERATING ACTIVITIES										
Cash inflow:	6660167	6332249	6332249	6332249	6332249	6332249	6332249	6332249	6332249	6332249
Cash received from customers	5502000	6288000	6288000	6288000	6288000	6288000	6288000	6288000	6288000	6288000
VAT overpayment	1158167	44249	44249	44249	44249	44249	44249	44249	44249	44249
Cash outflow:	3978260	5013167	4875172	4911939	4917921	4924321	5073156	5039917	5047758	5056148
Material and energy consumption	2812947	3429151	3429151	3429151	3429151	3429151	3429151	3429151	3429151	3429151
Marketing	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000
VAT payments	577983	623454	623454	623454	623454	623454	623454	623454	623454	623454
Labour	322331	351634	351634	351634	351634	351634	351634	351634	351634	351634
Excise duty	144000	172800	172800	172800	172800	172800	172800	172800	172800	172800
Social & health institutions	96000	213831	213831	213831	213831	213831	213831	213831	213831	213831
Income tax	0	197296	59302	96069	102050	108451	257286	224046	231887	240277
Net cash provided	2681906	1319083	1457077	1420310	1414329	1407928	1259093	1292333	1284492	1276102
FINANCING ACTIVITIES										
Cash outflow:	753076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Repayment of long-term loans	753076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Share capital reduction	1200000									
Net cash used	1953076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Net increase in cash	728831	566007	704002	667235	661253	654852	506018	539257	531416	523026

Cash flow statement; CAPEX, optimistic

Currency units: CZK

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
OPERATING ACTIVITIES										
Cash inflow:	6660166	6332249	6332249	6332249	6332249	7999449	8440127	8440127	8440127	8440127
Cash received from customers	5502000	6288000	6288000	6288000	6288000	7860000	8384000	8384000	8384000	8384000
VAT overpayment	1158166	44249	44249	44249	44249	139449	56127	56127	56127	56127
Cash outflow:	3978260	5013167	4875172	4911939	5013121	6039239	6482765	6365136	6381636	6390026
Material and energy consumption	2812947	3429151	3429151	3429151	3429151	4150889	4150889	4150889	4150889	4150889
Marketing	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000
VAT payments	577983	623454	623454	623454	718654	847743	862911	862911	862911	862911
Labour	322331	351634	351634	351634	351634	462925	462925	462925	462925	462925
Excise duty	144000	172800	172800	172800	172800	230400	230400	230400	230400	230400
Social & health institutions	96000	213831	213831	213831	213831	213831	281508	281508	281508	281508
Income tax	0	197296	59302	96069	102051	108451	469131	351502	368002	376392
Net cash provided	2681906	1319083	1457077	1420310	1319128	1960210	1957361	2074991	2058490	2050100
INVESTING ACTIVITIES										
Cash outflow:					453333					
Purchase of equipment					453333					
Net cash used					453333					
FINANCING ACTIVITIES										
Cash outflow:	753076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Repayment of long-term loans	753076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Share capital reduction	1200000									
Net cash used	1953076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Net increase in cash	728831	566007	704002	667235	112720	1207134	1204285	1321915	1305414	1297025

Cash flow statement; conservative

Currency units: CZK

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
OPERATING ACTIVITIES										
Cash inflow:	2913743	3731627	5752171	6332249	6332249	6332249	6332249	6332249	6332249	6332249
Cash received from customers	1834000	3711132	5719799	6288000	6288000	6288000	6288000	6288000	6288000	6288000
VAT overpayment	1079743	20495	32372	44249	44249	44249	44249	44249	44249	44249
Cash outflow:	1753421	3062712	4489644	4892513	4925433	4924321	5073156	5039917	5047758	5056148
Material and energy consumption	1336743	2218294	3161798	3429151	3429151	3429151	3429151	3429151	3429151	3429151
Marketing	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000
VAT payments	129381	368839	593140	623454	623454	623454	623454	623454	623454	623454
Labour	118297	240343	351634	351634	351634	351634	351634	351634	351634	351634
Excise duty	48000	105600	163200	172800	172800	172800	172800	172800	172800	172800
Social & health institutions	96000	78477	146154	213831	213831	213831	213831	213831	213831	213831
Income tax	0	26159	48718	76643	109562	108451	257286	224046	231887	240277
Net cash provided	1160322	668915	1262528	1439736	1406817	1407928	1259093	1292333	1284492	1276102
FINANCING ACTIVITIES										
Cash outflow:	753076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Repayment of long-term loans	753076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Share capital reduction	1200000									
Net cash used	1953076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Net increase in cash	-792754	-84160	509452	686660	653741	654852	506018	539257	531416	523026

Cash flow statement; CAPEX, conservative

Currency units: CZK

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
OPERATING ACTIVITIES										
Cash inflow:	2913743	3731627	5752171	6332249	6332249	7999449	8440127	8440127	8440127	8440127
Cash received from customers	1834000	3711132	5719799	6288000	6288000	7860000	8384000	8384000	8384000	8384000
VAT overpayment	1079743	20495	32372	44249	44249	139449	56127	56127	56127	56127
Cash outflow:	1753421	3062712	4489644	4892513	4926966	6039239	6482765	6365136	6381636	6390026
Material and energy consumption	1336743	2218294	3161798	3429151	3429151	4150889	4150889	4150889	4150889	4150889
Marketing	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000
VAT payments	129381	368839	593140	623454	718654	847743	862911	862911	862911	862911
Labour	118297	240343	351634	351634	351634	462925	462925	462925	462925	462925
Excise duty	48000	105600	163200	172800	172800	230400	230400	230400	230400	230400
Social & health institutions	96000	78477	146154	213831	213831	213831	281508	281508	281508	281508
Income tax	0	26159	48718	76643	111095	108451	469131	351502	368002	376392
Net cash provided	1160322	668915	1262528	1439736	1405284	1960210	1957361	2074991	2058490	2050100
INVESTING ACTIVITIES										
Cash outflow:					453333					
Purchase of equipment					453333					
Net cash used					453333					
FINANCING ACTIVITIES										
Cash outflow:	753076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Repayment of long-term loans	753076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Share capital reduction	1200000									
Net cash used	1953076	753076	753076	753076	753076	753076	753076	753076	753076	753076
Net increase in cash	-792754	-84160	509452	686660	198874	1207134	1204285	1321915	1305414	1297025

AP12 Financial ratios

Selected financial indicators; optimistic

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Current ratio	3.40	4.30	4.83	5.43	6.03
Quick ratio	2.68	3.51	4.05	4.66	5.26
Cash ratio	2.18	2.96	3.52	4.13	4.73
Total debt ratio	0.74	0.70	0.65	0.61	0.563
The equity ratio	0.26	0.30	0.35	0.39	0.44
Coverage ratio	2.40	2.82	3.07	3.41	3.85
Relative profit/loss	5.13%	6.12%	6.23%	6.38%	6.55%
Operating profit margin	17.35%	18.14%	18.14%	18.14%	18.14%
Net profit margin	8.19%	9.48%	9.91%	10.38%	10.88%
Return on assets		6.16%	6.32%	6.45%	6.62%
Return on equity		21.37%	18.34%	16.17%	14.54%
Inventory turnover		3.25	3.25	3.25	3.25
Days of inventory on hand		112.37	112.37	112.37	112.37
Receivables turnover		9.39	9.39	9.39	9.39
Average collection period		38.89	38.89	38.89	38.89
Fixed assets turnover		1.44	1.63	1.88	2.23
Total assets turnover		0.65	0.64	0.62	0.61

Selected financial indicators; conservative

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Current ratio	2.41	1.62	1.96	2.55	3.17
Quick ratio	1.48	0.81	1.18	1.79	2.40
Cash ratio	0.83	0.24	0.64	1.26	1.87
Total debt ratio	1.04	1.05	0.98	0.90	0.824
The equity ratio	-0.04	-0.05	0.02	0.10	0.18
Coverage ratio	-1.06	0.80	2.76	3.41	3.85
Relative profit/loss	-15.18%	-1.39%	8.31%	9.87%	10.03%
Operating profit margin		7.90%	16.74%	18.14%	18.14%
Net profit margin			8.65%	10.38%	10.88%
Return on assets			8.70%	10.05%	10.18%
Return on equity				118.84%	56.18%
Inventory turnover		4.24	3.79	3.25	3.25
Days of inventory on hand		86.02	96.25	112.37	112.37
Receivables turnover		12.08	10.92	9.39	9.39
Average collection period		30.22	33.41	38.89	38.89
Fixed assets turnover		0.94	1.59	1.88	2.23
Total assets turnover		0.70	1.01	0.97	0.94

