

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics



Bachelor Thesis

**Relationship between unemployment and alcohol
consumption in selected European countries**

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Thesis title

Relationship between unemployment and alcohol consumption in selected European countries

Objectives of thesis

The main purpose of the thesis is to analyze the relationship between unemployment and consumption of alcohol in selected European countries, consumer behaviour on the alcohol market of employed population compared to the unemployed one, and finally, determine the strength of the correlation of unemployment rate and alcohol consumption and its potential role in targeting strategy which is dependent on the progression of an unemployment rate curve.

Methodology

Theoretical part aims to describe terms such as unemployment, methods of calculating unemployment rates, alcohol market, and other important economic terms related to the subject. Definitions which are compliant with the most significant literature reviews in the area are used and established data sources as well as quantitative methods to describe the relationship between unemployment and alcohol consumption in European region are applied in the practical part.

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Declaration

I declare that I have worked on my bachelor thesis titled "Relationship between unemployment and alcohol consumption in selected European countries" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 15.3.2019

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Relationship between unemployment and alcohol consumption in selected European countries

Abstract

The Bachelor thesis consists of two parts, first one is the literature review. In the literature review is detailed overview of the labour market. Explanation of unemployment how is calculated, which types of unemployment exists. The social and economic impacts relate to long-term unemployment. The other important part of the literature review is definition of the alcohol market, price elasticity of alcohol and alcohol consumption in different countries.

In the practical part is the aim to approve if there is a relationship between unemployment and alcohol consumption in selected European countries (Belgium, Czech Republic, Italy and Sweden). If there is a correlation, the author describes the strength of the correlation and its economic potential for alcohol producers. If producers can set amount of their production for particular country based on unemployment rate trend.

Keywords: Alcohol market, unemployment, unemployment rate, labour market, poverty, Sweden, Italy, Belgium, Czech Republic, alcohol price elasticity.

Vztah mezi nezaměstnaností a spotřebou alkoholu ve vybraných evropských zemích

Abstrakt

Bakalářská práce je složena ze dvou částí. První, teoretická, část se zaměřuje na uvedení do trhu práce, vysvětlení nezaměstnanosti a jak se nezaměstnanost vypočítává. Dále definuje druhy nezaměstnanosti a upozorňuje na sociální a ekonomické problémy spojené s dlouhodobou nezaměstnaností. Druhá část teoretické části je zaměřena na trh s alkoholem, cenovou elasticitu alkoholu a objem spotřeby alkoholu v různých zemích.

V praktické části je hlavním záměrem dokázat, zda-li existuje vztah mezi nezaměstnaností a spotřebou alkoholu ve vybraných evropských zemích. Pokud zde určitá korelace existuje, autor se snaží definovat její sílu a ekonomický potenciál pro výrobce alkoholu, jestli by se jim vyplatilo v daných zemích sledovat trend nezaměstnanosti a podle toho určovat velikost produkce pro danou zem.

Klíčová slova: Trh s alkoholem, nezaměstnanost, míra nezaměstnanosti, trh práce, chudoba, Švédsko, Itálie, Belgie, Česká republika, cenová elasticita alkoholu.

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1 Introduction

From macroeconomic point of view, there are two kinds of people. People who are economic active and people who are economic inactive. Economic inactive people are usually students, pensioners, disabled people or just persons who do not want to work, because they have enough money in their savings or have some other alternative kind of income, or they are homeless.

Economic active people are divided into groups employed and unemployed. Persons who are employed work on full-time or part-time contract. On the other hand, unemployed are those people who are actively searching for a job and are prepared to start working. Even though there are some cases people are trying to find job, but there are any possible for them.

These people are long-term unemployed. The longer unemployed, the lower is the chance to get the job. People lost their working habits, forgetting their skills. There is a common thing, long-term unemployed have lot of free time, but they do not have enough money to enjoy it. It results to lost perception of time, depression, loss of self-confidence.

In lot of cases it leads to depressions, which these people trying to solve with alcohol, drugs and in worst cases with suicides. These thesis compares trends of unemployment rates and alcohol consumption in four European countries among years 2007 and 2015. The countries are Czech Republic, Italy, Belgium and Sweden. In the end the author confirms or declines the theory of correlation between unemployment and alcohol consumption.

2 Objectives and Methodology

2.1 Objectives

The main purpose of the thesis is to analyse the relationship between unemployment and consumption of alcohol in selected European countries (Czech Republic, Belgium, Italy and Sweden), consumer behaviour on the alcohol market of employed population compared to the unemployed one, and finally, determine the strength of the correlation of unemployment rate and alcohol consumption and its potential role in targeting strategy which is dependent on the progression of an unemployment rate curve

2.2 Methodology

The Theoretical part aims to describe terms such as unemployment, methods of calculating unemployment rates, alcohol market, and other important economic terms related to the subject. Definitions which are compliant with the most significant literature reviews in the area are used and established data sources as well as quantitative methods to describe the relationship between unemployment and alcohol consumption in European region are applied in the practical part.

3 Literature Review

3.1 Unemployment

“In general sense of the term, unemployment means lack of jobs even for those who are able and willing to work at the prevailing wage. This definition is however ambiguous from the policy point of view as it does not specify the persons who should be and who should not be included in the category of job-seekers.” (1, p. 493)

This is more precisely said to be linguistic definition than economic one. From the macroeconomic point of view, unemployment relates only to working age population, which in Czech Republic is age between finishing compulsory education and retirement age. Employed means working on full-time or part-time contract, unemployed are people who do not have a job, but they are trying to find some and are willing to work as soon as possible. Employed and unemployed together are economic active population, sometimes also called total labour force. (2, p. 137)

Other people who do not have a job and are not active on labour market, are called economic inactive population, most typically this category contains children, pensioners, students, disabled people, people who are looking after child, or ill family members, etc. (2, p. 137)

3.1.1 Measurement of unemployment

3.1.1.1 Unemployment rate

Unemployment can be measured in different ways, mostly used is unemployment rate, which is a percentage of unemployed persons, who are searching job from the total labour force (economic active population). To calculate unemployment rate, we use this formula:

$$\text{Unemployment rate} = \frac{\text{Unemployed workers}}{\text{Total labour force}} \times 100$$

Total labour force, or economic active population is calculated as sum of employed and unemployed, who are active on labour market.

Unemployment rate can be calculated not only for whole country, but even for one region or a city. Often is used unemployment rate also for calculation of unemployment of specific kind of population, such as women, students, persons with university degree, and others. (2, p. 138)

Disadvantage of unemployment rate is influence of long-term unemployed on the calculation. Unemployment rate is counting with long-term unemployed, who usually have very little chance to get the job.

3.1.1.2 Labour force participation rate

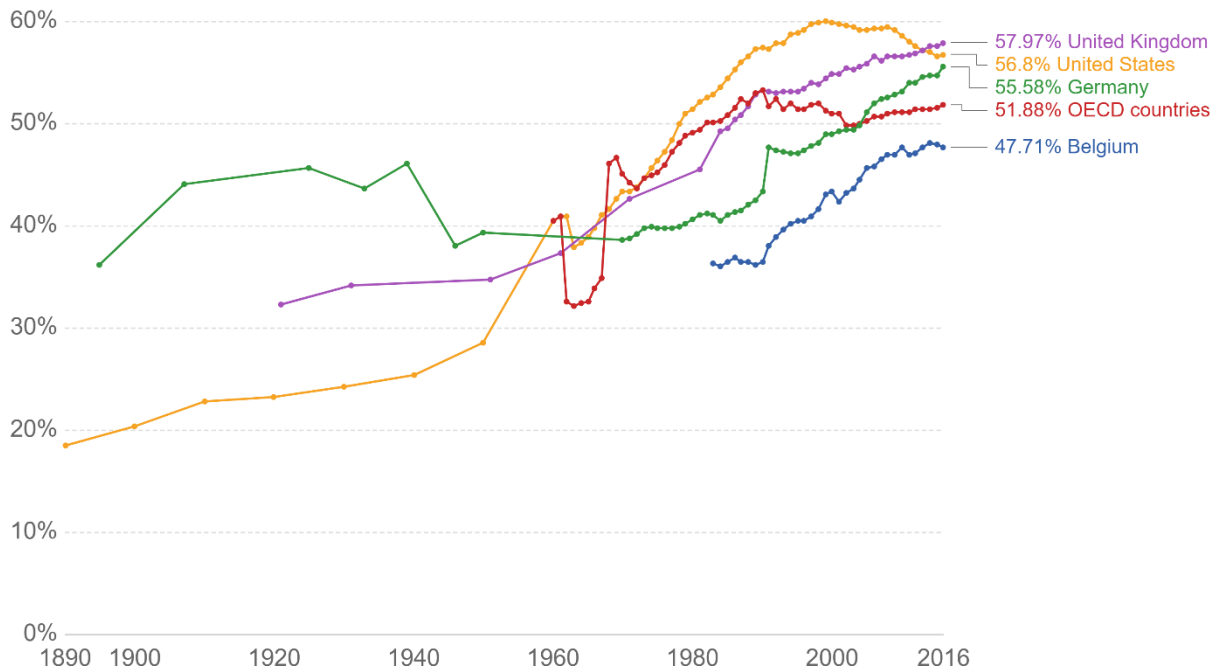
The labour force participation rate (or economic activity rate) is calculated as the economic active population divided by the total working-age population, multiplied by 100. (3)

$$\textit{Labour force participation rate} = \frac{\textit{Economic active population}}{\textit{Working age population}} \times 100$$

Historically, the progression of Labour force participation rate curve was influenced by women starting to participate in labour market in 20th century mostly in West countries. The highest change in female labour force participation rate was in United Kingdom and the United States of America. (4, p.55) Thanks to this trend recorded the curve sharp growth as we can see on the chart below.

Long-run perspective on female labor force participation rates

Proportion of the female population ages 15 and over that is economically active. Data is available for OECD member countries, as well as for non-member countries publishing statistics in OECD.stats.



Source: Our World In Data based on OECD (2017) and Long (1958)

Note: For some observations prior 1960, the participation rate is taken with respect to the female population 14 and over. See sources for details.

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Figure 1 – Female labour force

Source: OECD Database (Annual Report 2017) and Long (1958) (5)

3.1.2 Types of unemployment

3.1.2.1 Frictional unemployment

The frictional unemployment is a consequence of time needed for finding a job. It is most common type of unemployment and usually it is voluntary. Frictional unemployment ensues in many cases, for example students after graduation who are seeking for a job, people who gave notice and are looking for a new position, and many others.

What is typical for frictional unemployment is, that there are free jobs for the job seekers. For this reason, is frictional unemployed person only for short period of time, until he chooses the relevant job. (6, p. 119)

3.1.2.2 Structural unemployment

The structural unemployment is caused by structural changes in labour market. On the labour market is disbalance between supply of workers and demand for working positions. These structural changes are usually caused by recession of production in some sector of industry. For this reason, start the factories to leak out their workers, most typically in past years in Czech Republic it was in mine industry, heavy engineering, glass industry.

On the other hand, when there is a recession in one kind of industry, there are others that grow. It means, these changes create a situation, where are unemployed workers with different qualifications than are free jobs.

Other reason of structural unemployment is regional unemployment. In some region is problem with some industry, which is typical for this region. People lost their jobs, but other free positions in same industry are in long-distance and these unemployed are not able to travel there.

And last typical reason is development of new technologies and with this connected efficiency and people lost their jobs, because they are substitute by machines.

Typical sign of structural unemployment is that there is a high number of unemployed, but also lot of free jobs. Structural unemployment is slow to fix and can be long-term. The way how it can be decreased is financial help from state for the specific industry, or requalification courses for unemployed, which help them to find job in another sector. (6, p.120)

3.1.2.3 Cyclical unemployment

Unemployment is not every time at its natural level. Economies are always going through recessions or expansions, therefore also the unemployment rate changes. Cyclical unemployment appears, when there are not enough working positions for all unemployed people who are willing to start working. Normally the reason is the producers produce less, because there is no demand for goods and therefore, they need less workers.

In practise it means, even if there will be full employment, there will still be unemployed people. Keynesian economists insist that best way how to fight with cyclical unemployment are government interventions, which can help to start the economic growth and generate new working positions.

3.1.2.4 Seasonal unemployment

Seasonal unemployment is not problem of all economy, or even of all country. Usually, there are only specific kinds of industries which are affected with seasonal unemployment.

Typical examples of industries, which are very seasonal are agriculture, hunting, Christmas Tree sellers, etc. Common signs for these industries are there is a specific period of time, when is high production, it is example of agriculture sector, where most of the crops are harvested in summer, or there is high demand for the specific product, example of Christmas Tree, or in U.S.A. also turkey for Thanksgiving day. Videlicet, there are periods, when the producers need more employers to cover the production or demand of customers.

Motivation of workers, who are employed in these industries are high salary for the short period of time, or they changed the job depends on the time period, for example in winter they work in ski centre and in summer as a lifeguard. (7)

3.1.2.5 Hidden unemployment

Hidden unemployment is very difficult term to describe. It is very influencing the countries unemployment rate statistics, because it is unemployment which does not take a part in these statistics.

Usually nations use hidden unemployment to look better and have better statistics, in past countries with nondemocratic regimes use this type of unemployment to cover the real unemployment rate and reduce it.

Who are hidden unemployed? Hidden unemployed are unemployed, but they are economic inactive, it means they are not looking for a job. The reasons can be different, mostly they lost hope of finding new job.

This kind of unemployed creates the main percentage of hidden unemployment. Other part of hidden unemployment are students, who are in working age, but they are still full-time studying.

3.1.2.6 Long-term unemployment

Long-term unemployment is defined in European Union as an unemployment which lasts longer than twelve months. In other part of world are the definitions of long-term unemployment slightly different. What is same in all countries, this type of unemployment is in every industry, every age group and in every education level. The longer the unemployment lasts, the more difficult is for unemployed find a job, because of losing working habits and skills. This type of unemployment is closely connected with mental health problems, depressions and criminality.

3.1.3 Beveridge curve

A Beveridge curve is a graphical representation of the relationship between unemployment and the job vacancy rate. There is rate of free jobs on vertical axis and on horizontal one is unemployment rate. The curve is hyperbolic and slopes downwards. When there is lower unemployment rate, usually is also high percentage of free jobs and reversely it works the same. (2, p.141)

As we can see on the picture below, from the position on the curve we can recognize the economic situation. When there is a recession, the unemployment rate is high and there is lack of job vacancies, on the other hand, when there is an expansion of economy, in the economy is low unemployment rate and lot of free jobs.

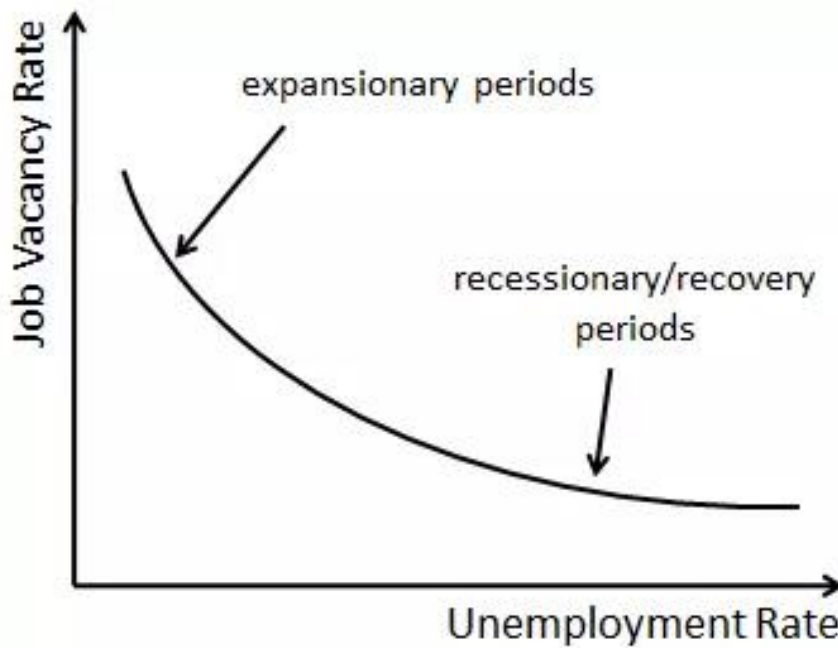


Figure 2 – Beveridge curve

Source: <https://www.thoughtco.com/overview-of-the-beveridge-curve-1148116>

3.1.4 Economic impacts of unemployment

3.1.4.1 Okun's Law

Logically there must be connection between state economy and unemployment. As was mentioned before when the economy is in recession the unemployment rate is high. Okun's Law describes the relationship between unemployment and Gross domestic product (GDP). If there is high unemployment in a country, country cannot produce on the maximal value and therefore the is economy losing. Okun's law says, if the real unemployment rate increase by 1% compared to natural unemployment rate, decrease the real product by 2-3% compared to value of potential product. For this reason, in countries, where is unemployment a big and long-lasting issue is normal that the state budget deficit is growing. (2, p. 148)

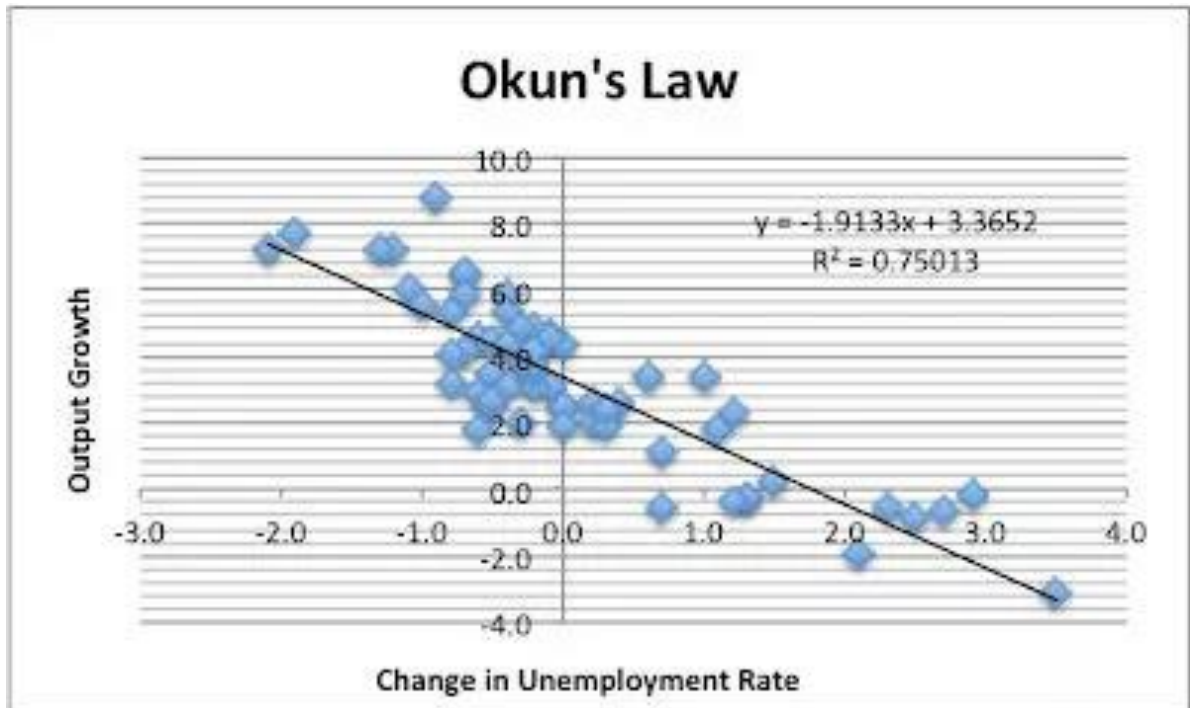


Figure 3 – Okun's law

<https://www.investopedia.com/articles/economics/12/okuns-law.asp>

3.1.4.2 Taxes and fees

Other reason why the state budget deficit is growing in countries with long-lasting unemployment, are higher fees paid to unemployed people, such as workfare, and less amount of collected taxes. Unemployed do not pay income tax, and due to low income from workfare they usually do not spend as much money as employed, ergo state economy gets less money from value added tax (VAT). (6, p.127)

3.1.5 Social impacts of unemployment

3.1.5.1 Criminality

According to the theory of economics of crime, increased long-term unemployment rates lead to higher criminality. (8, p. 20) This theory calculating with the need for money of unemployed, who has very low income, or even any income, for long period of time. In the chart below is the progression of crimes and unemployment rate during last century in United States of America.

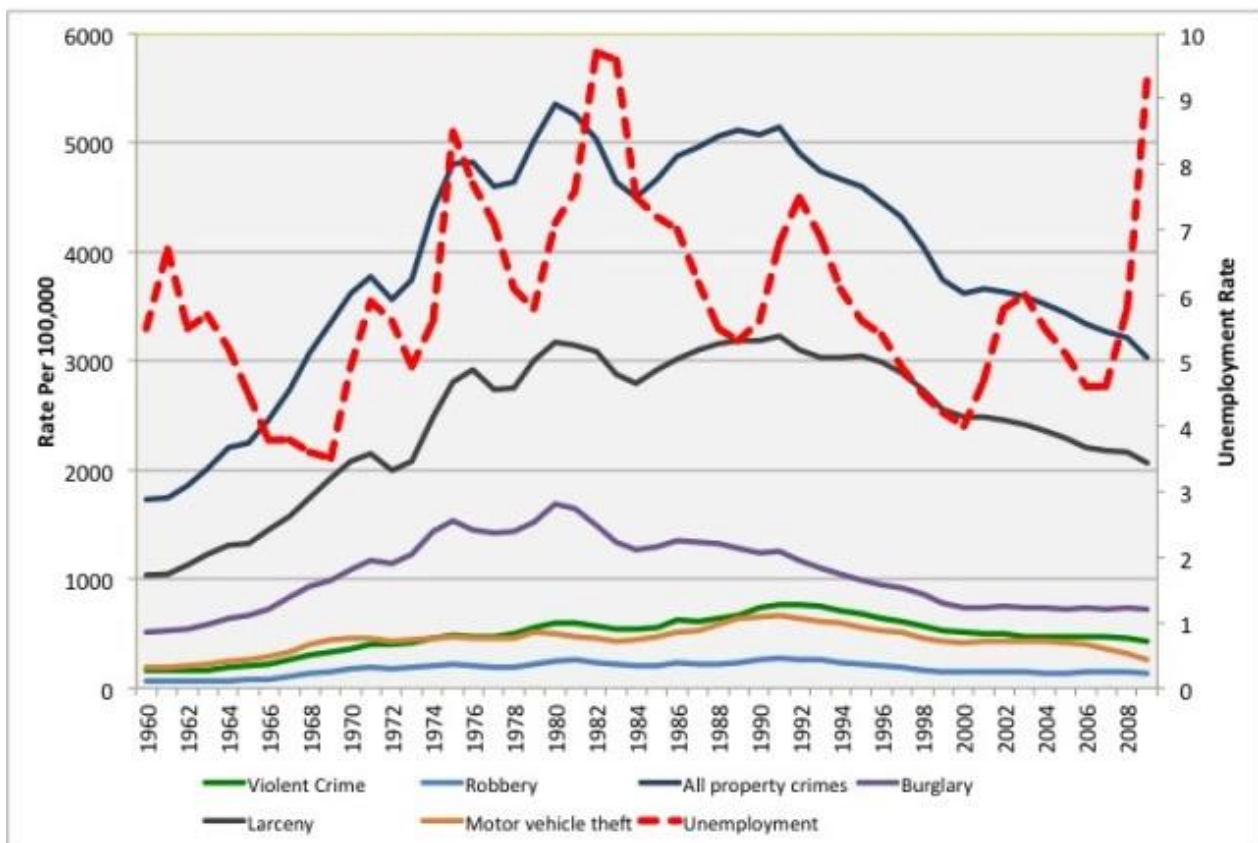


Figure 4 – Unemployment and crime

Source: <https://inequalitiesblog.wordpress.com/2011/07/21/crime-and-the-economic-downturn/>

In the United States of America was very strong correlation between unemployment rate and property crimes, especially in 1970s and 1980s. From the chart can be also predicted the trend of criminality after 2008, because the unemployment is sharply raising.

3.1.5.2 Depression and alcoholism

Other very common social impacts connected with unemployment are depression and drug abuse. Depression is an entailment of social exclusion. Long-term unemployed always losing work habits, have lot of free time, which cannot be unfortunately fully used due to low income. This all leads to lost perception of time, lost of social contact and depression, which are solved by alcohol or drugs. (9) In practical part will be found the correlation between unemployment and alcohol consumption.

3.2 Alcohol market

The worldwide alcohol market was valued at \$1,439 billion in 2017 and is expected to reach \$1,684 billion by 2025. The alcohol market is still every year growing for several reasons. The most important is that worldwide population is also growing, so there are more consumers of alcohol every year. The other is problem of under-age drinking, which is every year growing as well.

Typical for alcohol market is, every country has typical alcohol type, which is historically the strongest one. In Czech Republic it is a beer market, in Italy wine market. The alcohol market is not strongly globally influenced. There are very strong worldwide alcohol producers, but the proportions of specific alcohol kinds in each country are still the same.

What other influences the alcohol market are the raw materials used to alcohol production, such as hops, grapes, yields, etc. Where there is some natural disaster, or dry summer, that influence or fatally influence the amount of the raw materials production, it also influences the price of alcohol itself. (10)

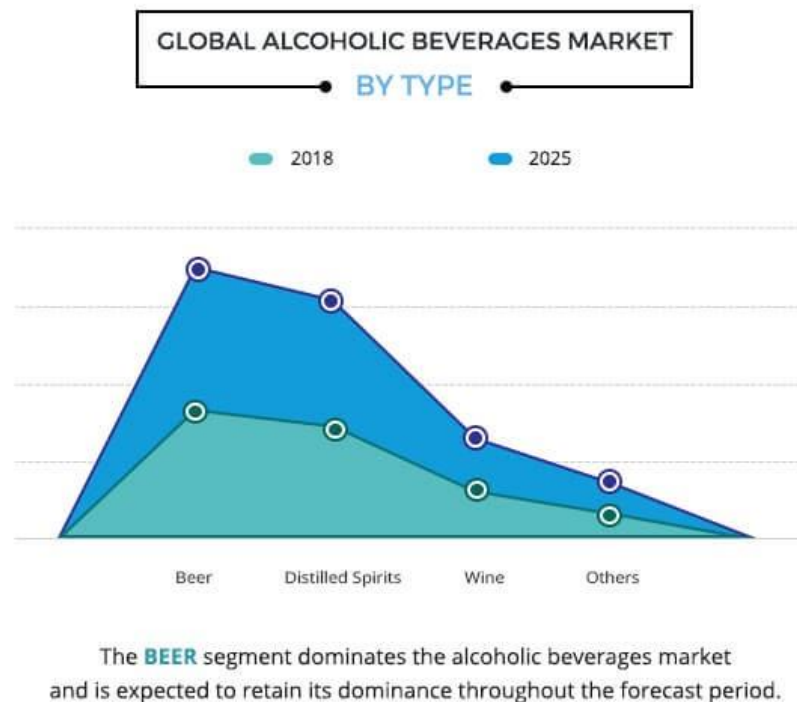


Figure 5 – Alcohol market

Source: <https://ourworldindata.org/alcohol-consumption>

3.2.1 Alcohol consumption

As was mentioned before alcohol consumption is very important in lot of countries. Alcohol is historically very strong commodity and as a social drug is consumed in lot of occasions in different kinds. In charts bellow is the alcohol consumption per capita in different countries. What is important to say, and it can be seen in the second chart is the consumption per capita in Muslim countries. Muslims due to their religion should not drink alcohol drinks, that is the reason, why in Muslim countries is the consumption almost zero.

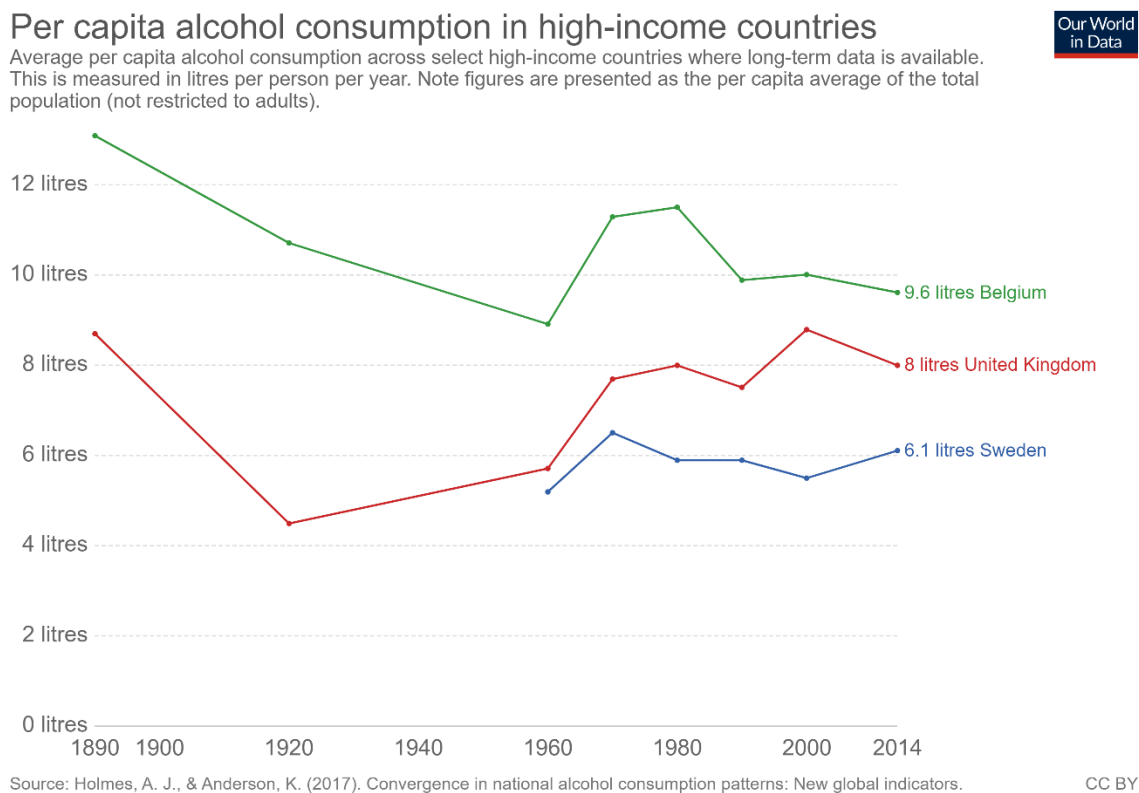
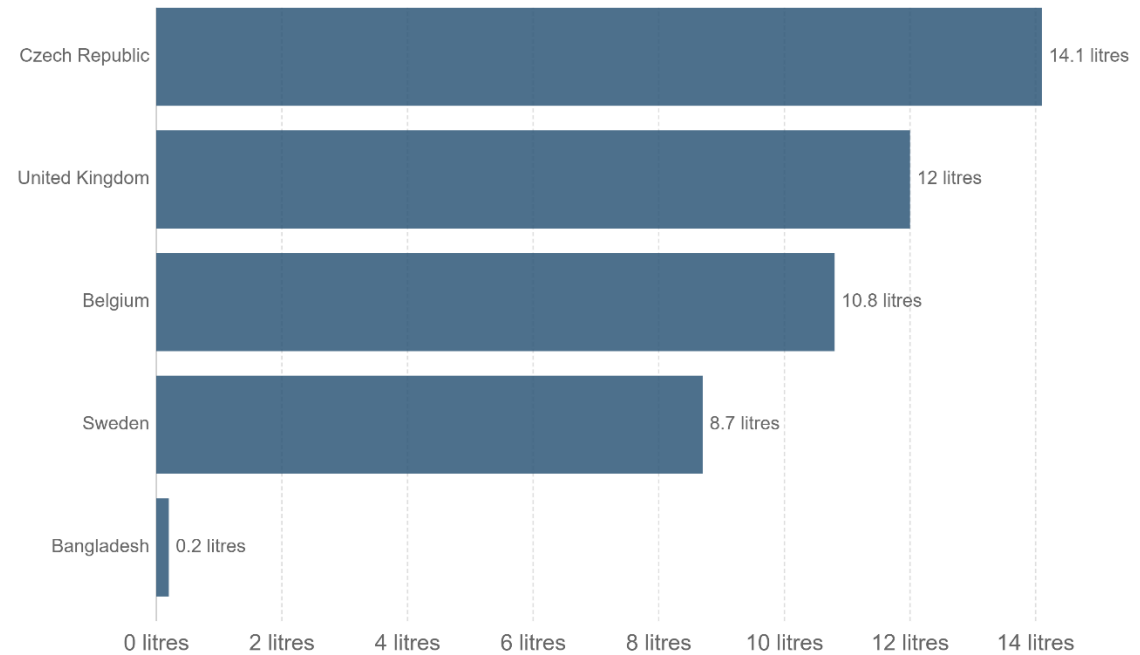


Figure 6 – Alcohol consumption

Total alcohol consumption per capita (litres of pure alcohol), 2015

Total alcohol consumption per capita is based on projections for the amount of alcohol consumption (litres of pure alcohol) per person ages 15+ per year.



Source: World Bank – WDI

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Figure 7 – Alcohol consumption 2

3.2.2 Elasticity

The price elasticity is an economic and statistical problem. There were lot of studies research this problem. The elasticity of alcohol is strongly connected with the particular country, kind of alcohol and used data. There are studies in United States of America, which find the demand for beer to be price inelastic. There is also question if we can take different kinds of alcohol as substitutes.

The UK Government produces its own chart of price elasticity of different kinds of alcohol based on two university studies made in the United Kingdom and some other economic aspects. In chart can be observed that for example wine has very low elasticity in U.K. (11)

Figure 7: UK Government estimates of the price elasticity of different alcoholic drinks

Price	Quantity	Beer		Spirits		RTDs		Cider		Wine	
		On	Off	On	Off	On	Off	On	Off	On	Off
Beer	On	-0.34***	0.03	0.26***	0.08	0.08	0.11	0.05	0.11	0.10*	-0.04
	Off	-0.08	-0.74***	-0.10	-0.11**	0.02	-0.01	-0.02	0.07	-0.02	-0.08*
Spirits	On	-0.10***	-0.01	-1.25***	0.01	0.04	0.00	0.00	0.03	0.01	0.05*
	Off	0.00	0.04	-0.16**	-0.45***	-0.22	-0.09	-0.06	0.13	-0.01	-0.02
RTDs	On	0.00	0.09	0.17*	0.05	-0.24*	-0.03	-0.02	0.00	-0.04	0.00
	Off	0.00	-0.03	-0.03	-0.02	-0.03	-0.52***	0.03	-0.04	0.04	-0.03
Cider	On	-0.06	0.05	0.04	0.10	-0.04	0.24	-0.49***	-0.13	0.02	-0.06
	Off	-0.06	-0.01	0.02	0.05	0.30*	0.13	-0.25**	-0.74***	-0.04	-0.09**
Wine	On	0.02	0.02	0.12***	0.00	-0.07	0.01	0.07	-0.04	-0.24***	0.02
	Off	0.01	0.00	-0.02	-0.07*	0.14*	0.10	0.15*	0.05	0.03	-0.08***

* p<0.05, ** p<0.01, *** p<0.001

Source: Sousa, J. (2014), 'Estimation of price elasticities of demand for alcohol in the United Kingdom', HMRC Working Paper 16.

Figure 8 – Alcohol price elasticity

4 Practical Part

4.1 Relationship between unemployment and alcohol consumption

Most early studies about the relationship between alcohol consumption and unemployment, for example Brenner in 1979 found that when the unemployment rate increases, the alcohol consumption decreases. He argument that the alcohol consumption is connected with height of households' income. On the other hand, Swedish scientist Hammarström found in his work in 1992 the positive correlation between unemployment rate and alcohol consumption per capita. There were lots of other works about this topic, lot of them are saying that alcohol consumption has no relationship with unemployment, and it is cyclical as the whole macroeconomic model, there recessions as well as expansions. (12) (13)

4.1.1 Mental health

Research about relationship between mental health and unemployment status achieves the strong correlation between them. High impact of unemployment on mental health relates to financial anxiety of lower income. People are forced to live on debt, when they want to afford their standards and not live in poverty, then they are living in stress caused by repayments of the debt. This all leads to depression deepened with social isolation.

4.2 Situation in selected European countries

In next pages the author tries to find the correlation between alcohol consumption per capita and unemployment rate. There are four European countries from four different European regions. Czech Republic is as a representative from Eastern Europe, Italy is as a representative from South Europe, Belgium is as a representative from Western Europe and Sweden as a representative from Scandinavia. For making the relationship statistically relevant are used data from same years from 2007 till 2015. The calculation of correlation is made by MS Excel function.

4.2.1 Czech Republic

4.2.1.1 Unemployment in Czech Republic

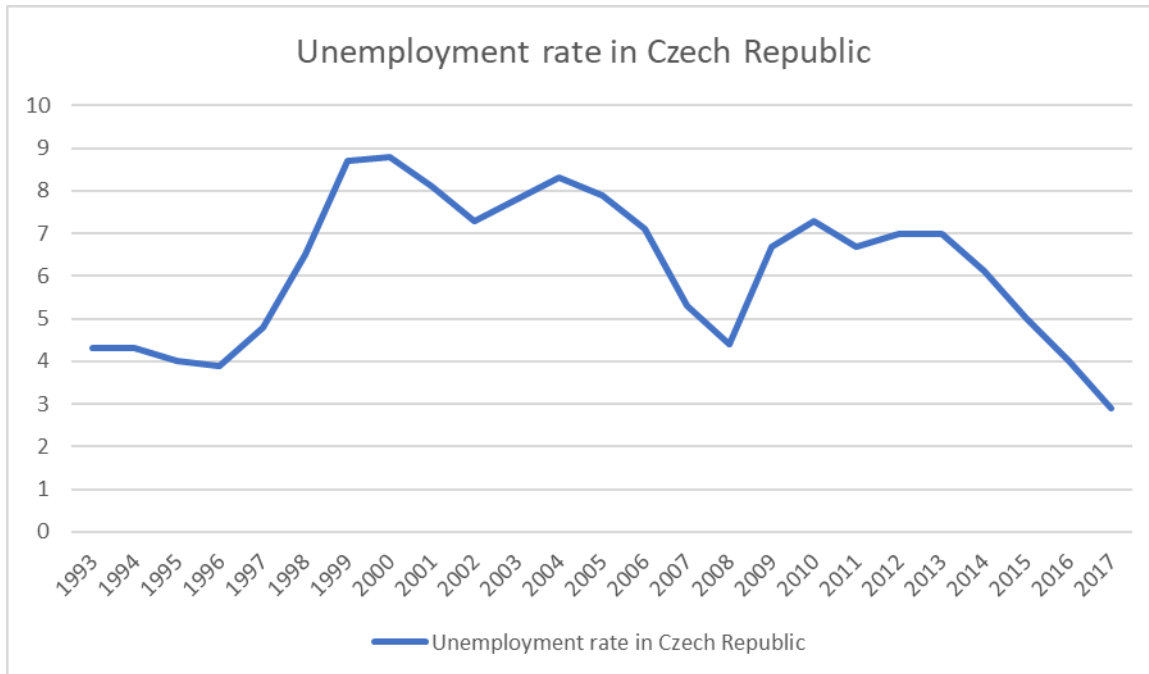


Figure 9- Unemployment in Czech Republic

Data: https://www.czso.cz/documents/10180/62755324/32018118_0501.pdf/f6504a94-e9c5-42c7-ae17-454a7c4dcb11?version=1.1

Table 1 – Unemployment in Czech Republic

Year	Unemployment rate in Czech Republic
2007	5,3
2008	4,4
2009	6,7
2010	7,3
2011	6,7
2012	7
2013	7
2014	6,1
2015	5

4.2.1.2 Alcohol consumption per capita

Table 2 – Alcohol consumption in Czech Republic

Year	Consumption of pure spirit per capita in litres
2007	10,4
2008	10,4
2009	10,4
2010	9,8
2011	9,8
2012	9,9
2013	9,8
2014	10,1
2015	9,8

Data: https://www.czso.cz/documents/10180/62755322/32018118_0303.pdf/d7db0579-8a3f-43ec-b8c8-73337ca696d5?version=1.0

4.2.1.3 Correlation

For Czech Republic is there value of $-0,51278$, which means that there is slightly negative correlation between unemployment rate and alcohol consumption. A moderate downhill (negative) relationship means that when the unemployment rate in Czech Republic grows the consumption of alcohol per capita decreases. The reason is probably the height of personal income. This correlation signals the price elasticity of alcohol as well. From the trend is obvious the dependency of alcohol on its price or income of households.

The graphical results of correlation in Czech Republic are below.

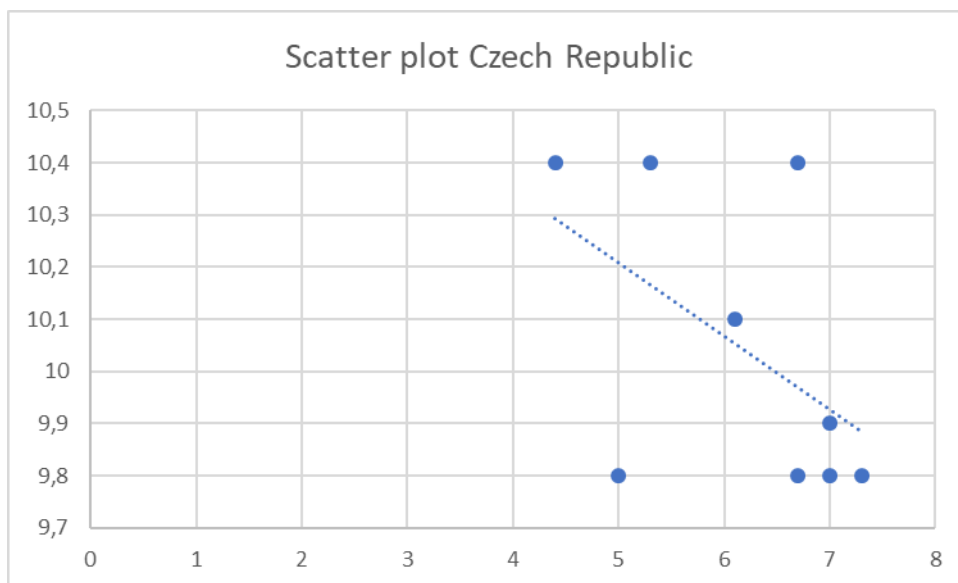


Figure 10 – Correlation in Czech Republic

Source: MS Excel attachment

4.2.2 Belgium

4.2.2.1 Unemployment in Belgium

Table 3 – Unemployment in Belgium

Year	Unemployment rate in Belgium
2007	7,5
2008	7
2009	8
2010	8,4
2011	7,2
2012	7,6
2013	8,5
2014	8,6
2015	8,6

Data source: OECD (16)

4.2.2.2 Alcohol consumption in Belgium

Table 4 – Alcohol consumption in Belgium

Year	Alcohol consumption per capita
2007	10,3
2008	10,5
2009	10,1
2010	10,2
2011	10,1
2012	10,1
2013	11,8
2014	12,6
2015	12,6

Data source: OECD (17)

4.2.2.3 Correlation

In Belgium is the value of correlation between unemployment rate and alcohol consumption per capita 0,71043242. A strong uphill (positive) linear relationship means that in Belgium influences the unemployment rate the alcohol consumption per capita. Graphically, there are small deflections on linear relationship, but the strong relationship is observable.

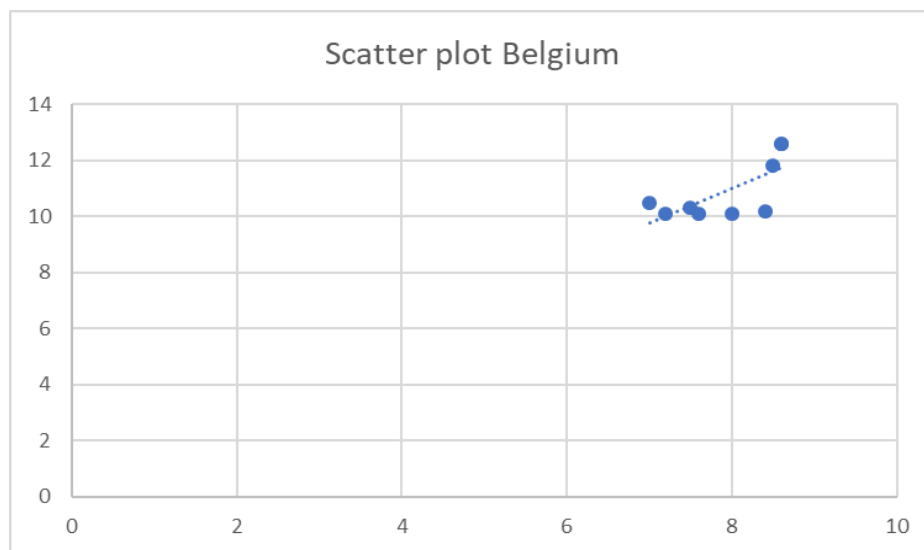


Figure 11 – Correlation in Belgium

Source: MS Excel attachment

4.2.3 Italy

4.2.3.1 Unemployment in Italy

Table 5 – Unemployment in Italy

Year	Unemployment rate in Italy
2007	6,1
2008	6,7
2009	7,7
2010	8,4
2011	8,4
2012	10,7
2013	12,1
2014	12,7
2015	11,9

Data Source: OECD (16)

4.2.3.2 Alcohol consumption in Italy

Table 6 – Alcohol consumption in Italy

Year	Alcohol consumption per capita
2007	7,2
2008	6,8
2009	6,4
2010	7
2011	7
2012	7,5
2013	7,4
2014	7,6
2015	7,1

Data Source: OECD (17)

4.2.3.3 Correlation

In Italy is the value of correlation of the relationship between unemployment and alcohol consumption 0,656545321. A strong uphill (positive) linear relationship means the influence of unemployment rate on alcohol consumption per capita. When the unemployment rate grows, then the consumption of alcohol also increases.

Scatter plot of the correlation in Italy is below. There are long distances among the points of alcohol consumption. The trend is still linear and copying the linear curve.

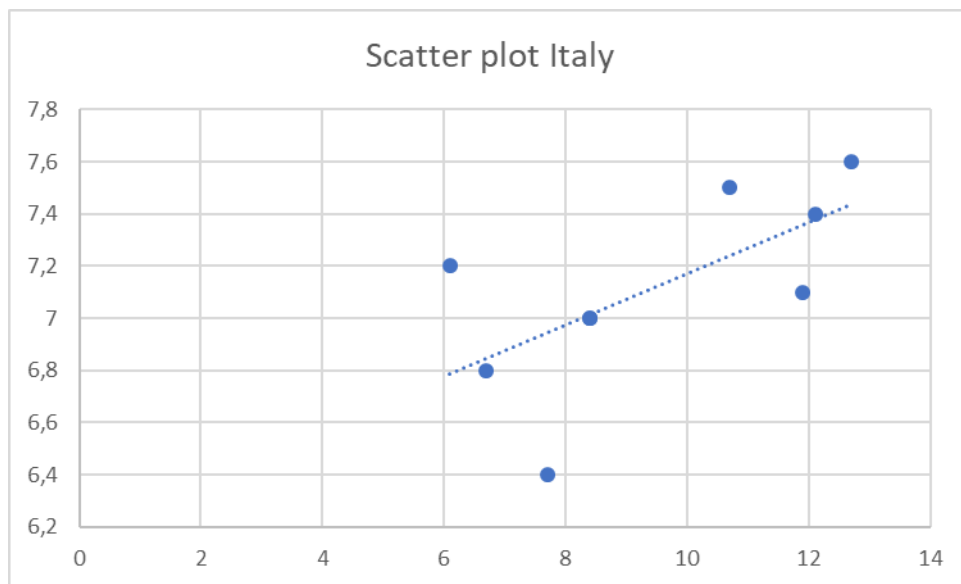


Figure 12 – Correlation in Italy

Source: MS Excel attachment

4.2.4 Sweden

4.2.4.1 Unemployment in Sweden

Table 7 – Unemployment in Sweden

Year	Unemployment rate in Sweden
2007	6,1
2008	6,2
2009	8,3
2010	8,6
2011	7,8
2012	8
2013	8
2014	7,9
2015	7,4

Data Source: OECD (16)

4.2.4.2 Alcohol consumption in Sweden

Table 8 – Alcohol consumption in Sweden

Year	Alcohol consumption per capita
2007	7
2008	7
2009	7,3
2010	7,3
2011	7,4
2012	7,2
2013	7,3
2014	7,2
2015	7,2

Data Source: OECD (17)

4.2.4.3 Correlation

For Sweden is the correlation between unemployment rate and alcohol consumption per capita 0,865808013, which is a very strong uphill (positive) linear relationship, approved by Scatter plot chart below, where are the point nearly in one row, which would meant absolute correlation.

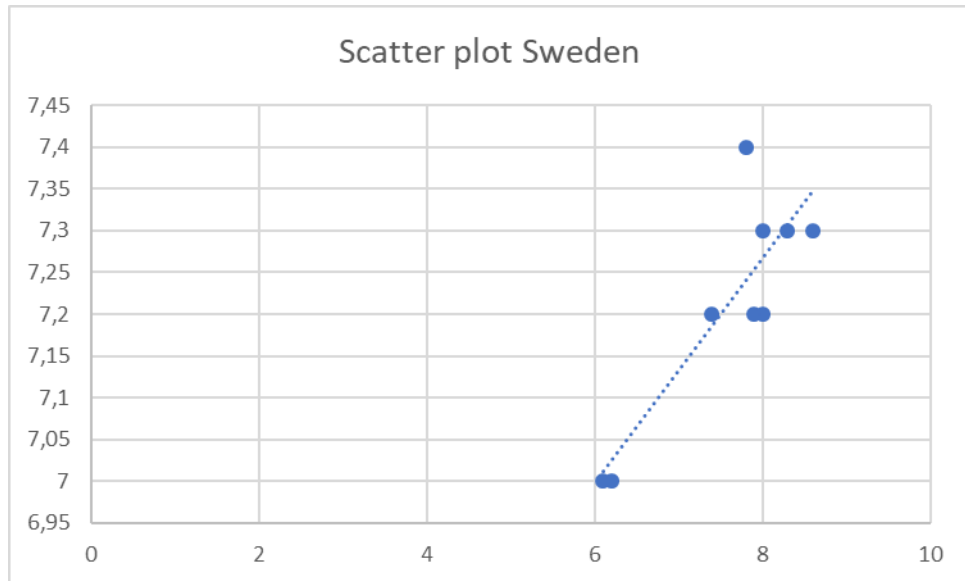


Figure 13 – Correlation in Sweden

Source: MS Excel attachment

5 Results and Discussion

5.1 Economic potential in selected countries

5.1.1 Belgium

From selected years has Belgium the highest alcohol consumption per capita from selected countries. Population of Belgium is around 11 million people. And the correlation between unemployment rate and alcohol consumption per capita was second highest from selected countries, it was around 0,71. This number declare very strong positive relationship, which means, that there is a possibility of predicting the trend of alcohol consumption in Belgium, if it decreases or increases based on the progression of the curve of the unemployment rate. When the unemployment in Belgium starts to grow up, there is a precondition that the alcohol consumption will also increase, and the potential alcohol producer can parlay his production.

5.1.2 Sweden

In Sweden was the relationship between unemployment and alcohol consumption in years 2007-2015 strongest. Sweden has population around 10 million people. On the other hand, the consumption of alcohol in Sweden is half of consumption of alcohol in Belgium, so the Swedish alcohol market even that it is strongly influenced by unemployment rate is not so interesting for alcohol exporters.

For local alcohol producers is this trend interesting, and there is huge possibility of economic benefit of observing the unemployment rate curve to fix amount of production.

5.1.3 Italy

Italy has very similar correlation as Belgium, the only difference is in amount of alcohol drunk in Italy. In Italy is the alcohol consumption per capita lowest from selected countries, but the population of Italy is approximately 60 million people, which means it is the biggest alcohol market from the selected countries and it has strong correlation between unemployment and alcohol consumption as well. From economic point of view is Italy most interesting country from selected.

5.1.4 Czech Republic

Only country from selected, which has negative correlation. Basically, the economic potential of observing the unemployment rate curve is in Czech Republic as well, nevertheless it is opposite than in other countries. When the unemployment rate in Czech Republic grows the alcohol, consumption decreases.

6 Conclusion

Finally, answer for question if there is any relationship between unemployment and alcohol consumption is that in three countries were the correlations very strong and are positively linear.

In Belgium, Italy and Sweden is the correlation rate over 0,6. This correlation means that unemployment strongly influences alcohol consumption. In Czech Republic is the trend opposite and the correlation is negative, but as well quite strong over -0,5, approving that in Czech Republic is the linear relationship as well, but negative.

The question is about the economic potential in these correlations. From the data published in this thesis, are the correlations very high and influencing. On the other hand, are the changes in alcohol consumption very low in decimal numbers. It means that the correlation is observable, yet from the economic point of view the costs for observing the trend of unemployment and firstly the costs from changing the producing strategy are not equal to the economic potential of this correlations.

The question is, if there is possibility to measure the correlation worldwide and then approved whether the correlation is strong enough for global alcohol producers to change amount of their export to countries based on the trend of unemployment rate. As was mentioned before according to data in this thesis for the four countries is the correlation and especially the change of alcohol consumption among different years not crucial enough.

7 References

1. DWIVEDI, D. N. *Macroeconomics: Theory and Policy. Third Edition*. New Delhi: Tata McGraw Hill, 2010. 669 p. ISBN 978-0-07-009145-0.
2. JUREČKA, Václav. *Makroekonomie. 2., aktualiz. vyd.* Praha: Grada, 2013. Expert (Grada). 342 p. ISBN 978-80-247-4386-8.
3. Employment - Labour force participation rate - OECD Data, <https://data.oecd.org/emp/labour-force-participation-rate.htm>
4. JAUMOTTE, Florence. *Labour force participation of women. OECD Economic studies*, 2004, 2003.2: 51-108.
5. OECD.stat: <http://stats.oecd.org/>. Long (1958): <http://econpapers.repec.org/bookchap/nbrnberbk/long58-1.htm>. Heckman and Killingsworth (1986): http://public.econ.duke.edu/~vjh3/e262p/readings/Killingsworth_Heckman.pdf
6. PAVELKA, T. *Makroekonomie : základní kurz*. Praha: Melandrium, 2007. ISBN 978-80-86175-52-2.
7. Seasonal Unemployment | Encyclopedia.com <https://www.encyclopedia.com/social-sciences-and-law/sociology-and-social-reform/sociology-general-terms-and-concepts/seasonal-unemployment>
8. EDMARK, Karin. *Unemployment and crime: Is there a connection?*. Scandinavian Journal of Economics, 2005, 107.2: 353-373.
9. Bartley M *Unemployment and ill health: understanding the relationship*. Journal of Epidemiology & Community Health 1994;48:333-337.

10. <https://ourworldindata.org/alcohol-consumption>
11. <http://www.ias.org.uk/Alcohol-knowledge-centre/Price/Factsheets/How-does-the-price-of-alcohol-affect-consumption.aspx>
12. Does Unemployment Lead to Greater Alcohol Consumption?
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3609661/>
13. LESÁKOVÁ, Dagmar. *Consumption in the period of unemployment and retirement*. Prague: Wolters Kluwer, 2017. ISBN 978-80-7552-901-5.
14. https://www.czso.cz/documents/10180/62755322/32018118_0303.pdf/d7db0579-8a3f-43ec-b8c8-73337ca696d5?version=1.0
15. https://www.czso.cz/documents/10180/62755324/32018118_0501.pdf/f6504a94-e9c5-42c7-ae17-454a7c4dcb11?version=1.1
16. Unemployment - Unemployment rate - OECD Data
<https://data.oecd.org/unemp/unemployment-rate.htm#indicator-chart>
17. Health risks - Alcohol consumption - OECD Data
<https://data.oecd.org/healthrisk/alcohol-consumption.htm>