

**CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE**

Faculty of Economics and Management

*Department of Economics*



**Diploma Thesis**

Cost of Living: A Case Study of the United States, the Czech Republic, and Ireland

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## DIPLOMA THESIS ASSIGNMENT

Bc. Josephine Králová

Economics and Management

Thesis title

**Cost of Living: A Case Study of the United States, the Czech Republic and Ireland**

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### Objectives of thesis

Main objective of the diploma thesis is to compare cost of living of the U.S., the Czech Republic, and Ireland. Differences of country's size, demographic aspects and economic situation are taken into the consideration. Boston, Prague and Dublin were chosen for this comparison. In order to fully compare the cost of living of these cities, specific variables were chosen for the thesis. For a survey, 9 specified goods and services are selected from four different sectors which were subsequently merged into two main sectors. Specifically, Salaries and financing, buy/rent apartment price, utilities and transportation and market.

### Methodology

Thesis is divided into theoretical and empirical part. In the theoretical part, the author works with the professional literature on the bases of printed and electronic media on cost of living background and aspects around the world.

Secondly, the empirical part of this thesis is divided into three parts in order to explain the issue.

First part of the empirical part use an analysis that includes raw and adjusted values by which author tries to explain the behaviour of prices in specific sectors.

In order to understand the difference between American, Czech and Irish cost of living, it is necessary to build a table that includes raw and adjusted values. Boston was chosen as a base value for other calculations. The adjusted (Adj) value, is calculated price of item with Boston's salary.

Regression analysis in the second part will be analysed with chosen variables and contries of OECD to compare the cost of living worldwide. This part of analysis uses Gretl tool and Excel tool.

Third part of the empirical part is concluded by questionnaire based on 300 people and their answers. One hundred people were asked in each city. The author chose City of Boston, city of Prague and city of Dublin in order to prove the reality.

Data were collected and compiled from many different sources in specific periods.

## **The proposed extent of the thesis**

60 – 80 pages

## **Keywords**

Cost of Living, Economy, Consumer Price Index, GDP

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## **Recommended information sources**

- Boskin, M. J., Dulberger, E. R., Gordon, R. J., Griliches, Z., Jorgenson, D.W. (1998) Consumer Prices, the Consumer Price Index, and the Cost of Living, *The Journal of Economic Perspectives* Vol. 12, No. 1 (Winter, 1998), pp. 3-26 [online], Available on www: [http://www.jstor.org/stable/2646934?seq=1#page\\_scan\\_tab\\_contents](http://www.jstor.org/stable/2646934?seq=1#page_scan_tab_contents) [1 March 2017]
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**Declaration**

I hereby certify that I have worked on my diploma thesis “Cost of Living: A Case Study of the United States, the Czech Republic, and Ireland” by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any third person.

In Prague .....

.....

Bc. Josephine Králová

## **Acknowledgement**

Firstly, I would like to express my gratitude to my supervisor, Ing. Petr Procházka, Ph.D., MSc, his supervision and assistance during the assessment of my diploma thesis.

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Author: Bc. Josephine Králová

## Cost of Living: A Case Study of the United States, the Czech Republic, and Ireland

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### Životní náklady: Rozdíly mezi Spojenými státy Americkými, Irskem a Českou republikou

#### Abstrakt

Tato diplomová práce se zaměřuje na rozdílné životní náklady ve specifických zemích. Práce analyzuje problematiku zvláště z pohledu deskriptivní a regresní analýzy, autor tuto kapitolu ale nepovažuje za hlavní část práce. Aby došlo k úplnému zanalyzování projektu, autor přistupuje k problematice z několika úhlů pohledu. První část práce je věnována literární rešerši, která pomáhá porozumět problematice a vysvětluje tuto oblast od základních pojmů až po detailní popis jednotlivých konceptů. Část druhá se věnuje analýze, která je rozdělená do několika podkapitol. Aby mohl autor vysvětlit a poukázat na problematiku životních nákladů z několika směrů, využívá hned tři různých analýz, které v poslední části této práce srovnává a podává tak reálný pohled na dnešní obrázek životních nákladů ve vybraných městech zkoumání. První část využívá analýzy porovnávání cenových hladin vybraných produktů na trhu určitých sektorů. Analyzuje tak rozdílné ceny ve specifických zemích s použitím upravených hodnot nominálních mezd tak, aby mohly být země porovnány. Analýza je ukázána z pohledu specifických sektorů a dále podává detailní obrázek současného stavu cen v daných zemích. Druhá podkapitola se věnuje regresní analýze zemí OECD a zemí autorem práce vybraných, která zjišťuje vztah mezi proměnnými ve světovém měřítku. Poslední část analyzuje a porovnává výsledky strukturovaného a částečně elektronického dotazníku, který byl osobně dotázán vždy v konkrétní zemi neboli městě zkoumání. Zabývá se především otázkou, jaké jsou rozdíly v daných zemích, jak tím ovlivňuje životní náklady především studentů a jejich následky. Autor považuje tuto část za stěžejní a hlavní kapitolu této práce. Výsledkem této diplomové práce je zhodnocení a srovnání životních nákladů v daných zemích. Uvedeny jsou i možné dopady na studentský život v městech zkoumání, diskuze, doporučení této problematiky ve světě a závěr práce.

**Klíčová slova:** Životní náklady, Index životních nákladů, Index spotřebitelských cen, Životní úroveň, Spojené Státy Americké, Česká republika, Irská Republika

## **Abstract**

The thesis is divided into two separate parts, the theoretical and the practical section. It examines issues of cost of living mainly from descriptive and analytical point of view. The descriptive part is considered as a first part of this thesis. In order to fully understand the notion of Cost of Living, the author approached the phenomena from several different points of view. Principles and concepts as well as the literature review are analysed in the first chapter, Chapter 1. It maps the topic from the beginning to the end. The second chapter is dedicated to the empirical part, which is divided into several sub-capitols. The theoretical as well as the practical part of the diploma thesis is focused on three chosen countries and its cities which were picked by the author. The United States of America, the Czech Republic, and Ireland were chosen for the first part of Chapter 1. Further on, Boston, Dublin and Prague were chosen for the analytical part as representative cities of these countries. The practical part is then divided into three research sections. First part provides a price analysis, which compares the price levels from different sectors in specific cities. Second part presents a regression analysis that examines CPI worldwide. It takes into account all OECD countries and extra three chosen countries from around the world. The final part consists of structured and partially electronic questionnaire with a help of quantitative analysis, where the author compares these cities and analyses it. Furthermore, the analytical part thoroughly analyses and examines the differences, influences and opinions of the cost of living in the countries. Further on, it also gives us the most recent picture of the prices and ideas in the sectors. The result of this thesis is to prove whether we can claim and complain about how expensive cost of living is, where we live and if somewhere else it is cheaper. The author examines the question if this is really the case and if this opinion is competent. Although, it is very hard to tell and there is no clear-cut conclusion about the issue, the author sums up the results to the comprehensible conclusion at the end of the thesis. In the conclusion, the results show where prices are the highest and lowest at the same time. Moreover, the research uncovers areas, which have to be investigated separately and which influence the cost of living the most, such as education for students in the United States of America or public transportation in Ireland. Generally, this work identifies both, the opportunities and obstacles that people face today in terms of cost of living.

**Keywords:** Cost of Living, Cost of Living Index, Consumer Price Index, Standard of Living, the United States of America, the Czech Republic, the Republic of Ireland

## The Table of Content

1. <b>INTRODUCTION</b> .....	12
2. <b>THESIS OBJECTIVES AND METHODOLOGY</b> .....	14
2.1 OBJECTIVES .....	14
2.2 METHODOLOGY.....	15
2.3. LITERATURE REVIEW.....	17
3. <b>THE THEORETICAL PART</b> .....	19
3.1 Essentials of Cost of Living .....	20
3.1.1 Consumer Price Index .....	20
3.1.1.1 Calculation of CPI of a single element.....	20
3.1.1.2 Calculation of CPI of multiple elements .....	20
3.1.2 Cost of Living .....	21
3.1.3 Consumer Price Index vs. Cost of Living Index .....	21
3.1.4 Consumer Price Index vs. GDP Deflator .....	23
3.1.5 Cost of Living: Local Purchasing Power .....	23
3.1.6 Sub-indexes Theory .....	23
3.1.7 Social Cost of Living Index .....	24
3.1.8 Cost of Living Index vs. Average Cost of Living .....	24
3.2 Standard of Living .....	25
3.3 Quality of Life.....	25
3.4 Economic and Social Welfare.....	28
3.5 Income Inequality .....	29
3.6 Price Indexes .....	30
3.6.1 PPP – Purchasing Power Parity.....	30
3.8 Regression Analysis.....	31
3.9 The Chosen Countries of Investigation.....	32
3.9.1 OECD.....	32
3.9.2 The United States of America .....	32
3.9.3 The Czech Republic .....	38
3.9.4 The Republic of Ireland .....	41
3.9.5 The Comparison of the Countries .....	43
4. <b>THE ANALYTICAL PART</b> .....	45
I. The First Part – The Price Analysis .....	47
4.1 Introduction to the Price Analysis.....	47



4.1.1 Methodology of the Price Analysis .....	47
4.1.2 The Price Analysis .....	49
II. The Second Part – The Regression Analysis .....	55
4.2 Introduction to the Regression Analysis .....	55
4.2.1 Methodology of the Regression Analysis .....	55
4.2.2 The dependent and independent variables .....	56
4.2.3 Data .....	56
4.2.4 Hypotheses .....	57
4.2.5 Declaration of Variables .....	60
4.2.6 Correlation .....	60
4.2.7 The Regression Outcome .....	61
4.2.8 Model Validation .....	61
4.2.9 Coefficient of determination .....	64
III. The Third Part – The Quantitative Analysis .....	66
The Structured Questionnaire .....	66
4.3 The Introduction to the Questionnaire .....	66
4.3.1 Methodology of the Questionnaire.....	66
4.3.2 Data and Data Collection .....	67
4.3.3 Sample.....	68
4.3.4 The outcome of the Questionnaire .....	70
4.3.4.1 Age .....	70
4.3.4.2 Gender .....	71
4.3.4.3 The year of college? .....	72
4.3.4.4 Do you have a job?.....	73
4.3.4.5 If YES - How many hours per week do you work? .....	75
4.3.4.6 How much you earn per hour? (USD) .....	77
4.3.4.7 Who pays for your living expenses? .....	79
4.3.4.8 Do you have a car?.....	81
4.3.4.9 How much you spend on car/month? (USD) .....	83
4.3.4.10 Do you use public transportation?.....	84
4.3.4.11 If, yes (or rarely). How much do you spend on transportation / monthly? (USD).....	85
4.3.4.12 Where do you usually eat? .....	86
4.3.4.13 How much you spend on food monthly? (USD).....	87

4.3.4.14	Where do you live? .....	88
4.3.4.15	How much does your monthly rent cost? (USD) .....	89
4.3.4.16	Which kind of school do you attend?.....	90
4.3.4.17	How much you pay for tuition per semester (If you do not have tuition write NONE)? (USD).....	91
4.3.4.18	How much you pay for books, school equipment etc per semester? (USD).....	93
4.3.4.19	Do you have a student loan? .....	94
4.3.4.20	What degree do you want to achieve?.....	95
4.3.4.21	How much do you pay monthly for all of the above (without the tuition)? (USD) ....	96
5.	<b>EVALUATION OF THE RESULTS</b> .....	97
5.1	Results report .....	97
5.1.1	Results of the Price Analysis.....	97
5.1.2	Results of the Regression Outcome .....	99
5.1.3	Results of the Structured Questionnaire.....	100
5.2	Self-criticism:.....	102
6.	<b>DISCUSSION</b> .....	103
7.	COMMON AND CONTRASTING FACTORS OF ANALYSES.....	104
8.	<b>CONCLUSION and RECOMMENDATION</b> .....	105
9.	REFERENCES.....	108
10.	THE ANNEX .....	116

### ***The List of Figures***

Figure 1: Current CPI Formula .....	20
Figure 2: The CPI for Multiple Items Formula .....	21
Figure 3: The Standard of Living Components.....	26
Figure 4: The Quality of Life Components.....	27
Figure 5: The CPI in the U.S., 1913-2016 .....	34
Figure 6: The CPI in the United States of America, 1950-2016 .....	36
Figure 7: CPI - All Urban Consumers (Metropolitan Area: Boston-Broskton-Nashua, MA-NH-ME-CT) .....	37
Figure 8: The Numbers of Price Representatives.....	39
Figure 9: Laspeyres Formula .....	40
Figure 10: The CPI in the Czech Republic, 1991-2016 .....	41
Figure 11: The CPI in the Republic of Ireland, 1969-2017 .....	42
Figure 12: The Indices Difference, Prague vs. Boston .....	43
Figure 13: The Indices Difference, Dublin vs. Boston .....	44
Figure 14: Data Set for the Price Analysis.....	49
Figure 15: The Table of Adjusted Values (Boston, Prague, Dublin) .....	53
Figure 16: Cost of Living Index Comparison .....	54
Figure 17: The Correlation Matrix .....	60
Figure 18: The Regression Outcome.....	61
Figure 19: The Economic Verification .....	62
Figure 20: Statistical Verification Based on P-value .....	63
Figure 21: Table of the most expensive items.....	97
Figure 22: Results of Outcome .....	99
Figure 23: Results of Verification.....	99
Figure 24: Results of the Structured Questionnaire .....	100
Figure 25: Results of Questionnaire Hypothesis.....	101

### ***List of Abbreviations***

Accra	-	The Council for Community and Economic Research
CSO	-	Central Statistics Office
CZSO	-	Czech Statistical Office
BLS	-	Bureau of Labour Statistics
US	-	The United States of America
CR	-	The Czech Republic
PPP	-	Purchasing Power Parity
SS	-	Statistically Significant
SI	-	Statistically Insignificant

## **1. INTRODUCTION**

There are lot of us who complain about how expensive costs of living are. And with no matter where we reside we think about how much cheaper cost of living is somewhere else. Is that really the case? There have been growing activities and importance in many different areas of cost of living. We live in 21. century, modern and rapid development in demands and the pressure from others is growing as well.

In general, people have discussed costs, living and cost of living for millennia. The main concept of cost of living, which would be considered as the simplest is probably that it compares and measures prices. Cost of living is simply a specific amount of money that is needed for a certain level of living. Significant differences exist among countries all over the world. It is very important to realize that developed countries have higher annual cost necessities and also the lifestyle is a greater issue in those countries.

The diploma thesis is focused on cost of living in specific countries, the United States of America, Ireland, and the Czech Republic were chosen for the research. A brief theoretical introduction to Cost of Living and its main concepts are explained in the first chapter, Chapter 1. Differences of these countries are provided as well.

Although it is challenging to compare the differences among the specific countries, the author decided to use several techniques and analytical tools to capture the results of analyses. The second part of the thesis is dedicated to the empirical part of cost of living topic. The price analysis, the regression analysis, and quantitative method of research – structured questionnaire is employed in this work.

Generally, it looks that all market items are cheaper in the Czech Republic, than in Ireland or the United States but the reverse is true. In order to investigate these issues around this topic all of these tools are used. Representative cities of each country were chosen as follows: Boston, Massachusetts, Prague and Dublin. The author chose the cities based on similarities of their population as well as the size. Two capital cities of the countries and Boston as a capital city of the third richest state of the U.S. based on per capita income (Mekouar, 2015).

Firstly, the price analysis examines the differences between price levels in specific sectors in the stated cities. One would claim that the United States would be the most expensive among these countries, but the reality is different. Many aspects of our life are way more

expensive in Prague, because it depends on so many things. Economic and social wellbeing depend on a whole range of factors. That is why the second part of the analysis examines the regression analysis, which takes into the consideration the most statistical significant variables to specify what influences CPI worldwide. On the basis of this research, the author reviews and study what influences the CPI. The results of this part state that based on these factors, the model can be constructed.

In the last part, the author evaluates the results of the structured questionnaire and its conclusion. To capture authentic results, the author personally gathered all information in all three countries under the examination. Over two hundred people were questioned in two foreign countries and the rest in the home country. This chapter concludes the cost of living in specific countries and its differences in the last part of the work. This part also includes the realistic picture in these countries as well as the cities.

Discussion, conclusion and recommendation could be found in the last section of the thesis. The author did not forget to include detailed description of the results of each analysis as well as common and contrasting factors of the analytical part. The References and the Annex of tables with used data for the practical part can be found at the very end of this work.

## **2. THESIS OBJECTIVES AND METHODOLOGY**

### **2.1 OBJECTIVES**

The first objective of the diploma thesis is to evaluate the differences of Cost of Living in three specific countries. The problematics of Cost of Living is generally introduced in the theoretical part of the thesis, Chapter 1, where the term “Cost of Living” is defined by using definitions of Cost of Living Index, Consumer Price Index and closely related phenomena. What does this term mean, the tools, the methods or key characteristics and features of this topic are discussed as well.

Since the topic is very extensive, furthermore the practical part of this thesis is divided into three parts. The first part of Chapter 2 is dedicated to the economical point of view in terms of consumer prices from several sectors in three chosen cities and its influence upon the Cost of Living. The second analysis of the diploma thesis tries to examine the regression analysis that investigates the relationship between CPI and specific variables worldwide. It also contains analytical results, influences and the relationship of 8 variables. The third research is then dedicated to the structured questionnaire, the quantitative analysis by studying the answers from three-hundred respondents. Mainly the impact upon student’s Cost of Living in certain sectors is investigate it. Finally, by studying all three analyses, its common and contrasting factors, it assesses the author to the results and the conclusion upon Cost of Living in the countries as well as the student’s Cost of Living in the countries.

Last but not least goal of this work is to provide readers with this topic, especially those, who are not familiar with these issues. The author tries to define and explain the differences, opinions and evaluate the criticism of cost of living between the countries. Lastly, the diploma thesis tries to find out if the costs differentiate from country to country or not. And whether it is appropriate to criticize a country that we live in, if it offers more expensive life than elsewhere. The main objective of this work is to compare these cities and answer the question of the highest and the lowest costs of living.

## **2.2 METHODOLOGY**

The diploma thesis as itself is divided into two main chapters. Chapter 1 - the theoretical part and Chapter 2 - the empirical part. The data and material are collected from scientific articles, journals, books and internet sources focused on the problematic.

Chapter 1, the theoretical part, the author works with the literature on the bases of printed and computerized media, which are listed at the end of the work. In order to clarify the definitions and terminology of Cost of Living all relevant data were gathered. Specific statistics and data were used and processed to create an inductive work.

Chapter 2, which is dedicated to the analytical part, the author of the thesis uses several analyses to fully explain and interpret the issue of Cost of Living in the countries. Three researches are included in this chapter. United States of America, Ireland and Czech Republic were chosen for the thesis. Boston, Dublin and Prague were chosen for the analytical part as representatives of these countries. The global influence is detected using regression analysis that tries to identify the influence and relationship between specific variables. Also, the price analysis is used in order to compare price levels of certain sectors such as financing and salaries, transportation and utilities, buy/rent flat price and last but not least the market items all based on the present data. The author uses it for comparison of prices and conclusion where the items are the most expensive and where are the prices the least. In order to understand the difference between American, Czech and Irish cost of living, it is necessary to do specific calculations. For this part, the author built a table, which includes raw and adjusted values.

The third part of Chapter 2 is dedicated to a quantitative analysis, more specifically the structured questionnaire. It is composed of 21 questions that are designed primarily for students and their costs. With a use of the structured questionnaire the author brought the authentic picture of the issue. The structured questionnaire includes data from student life and their costs and it is compared with other analytical tools. The data, answers and all information were collected in the area of specific country. In case of US, the author has spent several months with questioning 100 people from area of Boston, Massachusetts. In case of Ireland, the process was very similar, and the author asked over 100 people in capital city of Ireland, Dublin. Prague was set as the last city for the examination and 100 people were questioned in the capital city of Czech Republic. Moreover, the author has inquired over

three hundred people in total. All results are shown in the Chapter 2 and concluded at the end of the thesis.

Data and information were compiled from various sources in certain period. All data and computations which were used in the analyses are attached in the annex at the end of the work. The references have been provided, where appropriate, at the end of contextualisation.



### **2.3. LITERATURE REVIEW**

The wide range of the literature from field the Cost of Living is very broad. Although it is very hard to pinpoint the main works from the field, this section reviews some of the major worldwide works. For comprehensive surveys, refer to McMahon (1991), Boskin, Dulberger, Gordon, Griliches and Jorgenson (1998), Curran, Wolman, Hill and Furdell (2006), Cebula (1980) and Ostrosky (1983).

The work of Boskin, Dulberger, Gordon, Griliches and Jorgenson (1998) notes that prices and their rate of change are the centre to every economic problem. We have to realize that Cost of Living extremely differentiates from country to country and of course from region to region. Other work of Curran, Wolman, Hill and Furdell (2006) states that these differences influence also the quality of our life. For example, their study for the U.S. region shows that Cleveland is the poorest city in America and that hugely influence the life quality in Cleveland, Ohio.

A study of Cebula (1980) writes about significant geographic differentials across the United States in Cost of Living levels. Ostrosky (1983) adds that differentials in his study contain same determinants as Cebula used but fuel-price and differences in climate among the world must be considered. The difference between costs of living is the same in the worldwide measurement.

Significant inequalities in Cost of Living are among all countries worldwide (Walter W McMahon, 1991). Author of Geographical Cost of Living differences notes that on basis of United States the highest cost can be found on Hawaii.

The other issue about cost of living is, what a pressure we experience nowadays with money, quality of life and specific level of life. Work of Schwartz (2001) is pointing out some ideas about value of freedom, work, health or education and how these important aspects of our lives became a part of modern consume life. Education is becoming more or less a financial investment we have to make, and our personal world is created by careers and hard work.

Tremendous variety of opinions about the Cost of Living Index can be read all over the internet, online books or journals. Marydee (1998) claims that the Cost of Living Index even does not exist. On the other hand, even in early 1950' a book of Klein and Rubin (1948) claims that Cost of Living Index was created from knowledge of Engel curve, Laspeyres or

Paasche type indexes. Finally, professor Diewert (2013) detailly describes how to calculate the Cost of Living Index, because it is a fundamental to learn people the preferences about economic goods or services. Approximation of the Cost of Living Index is constructed, because such preferences are not possible to observe. In addition, Bureau of Labor Statistics (2017) and many more organizations in every country describes the calculation, collecting of data and explanation of the Cost of Living Index.

*Chapter 1*

**3. THE THEORETICAL PART**

As the title of the thesis indicates, the theoretical part is devoted to the notion of cost of living, social welfare, as well as economic welfare, what does it mean to live in this world and many more aspects that relate to this idea.

Thus, the concept and perspectives of Cost of Living also involves terms and ideas like Consumer Price Index, Economic Welfare, Welfare Changes or Standard of living etc. In this chapter, the author tries to summarize and carry out all information to the readers, which are necessary to obtain to understand what is happening around these issues.

First part of the Chapter 1 is dedicated to basic concepts of this issue. The essential concepts are described and gathered from academic journals, the internet as well as the books. Last but not least, the explanation of the difference between the standard of living and quality of life is included in the first part. Aspects, which are closely related to the Cost of living topic, and which needs to be explained in order to get the general idea and the difference between them are obtained in the Chapter 1. The second part of the chapter 1, the analysis of the situation in each country, which are in the interest of the thesis, is explained and described. The United States of America are analysed as first, Massachusetts state as chosen state with Boston as a base for the analysis in the practical part are chosen for the analysis as second. A picture of the Czech Republic is depicted as second one with chosen city of Prague. It is continued by the Republic of Ireland and Dublin as chosen city. The cost of living, quality of life, CPI and closely related aspects are characterized in this part as well.

As Diewert (2013) writes in his work, the CPI is very frequently used as an approximation to the Cost of Living Index. It is very important to realize the terminology in this part of the chapter. In the theoretical part both principles are discussed and explained.

## 3.1 Essentials of Cost of Living

### 3.1.1 Consumer Price Index

Consumer Price Index shows changes in the costs of average consumer on specific basket of goods and services. This basket of goods and services may be fixed, or it also can be changed in specified intervals. In general, Consumer Price Index is computed annually (The World Bank, 2015). Bureau of Labor Statistics (2017) complete the definition "CPI is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services."

CPI is very often used as a proxy for the cost of living index in contracts of indexing. It can be also claimed that CPI is used as a measure for inflation as well as for regulating prices (Diewert, 2013). As Bureau of Labor Statistics (2017) claims, CPI is often referred as Cost of Living Index but there is a difference.

According to Diewert (2013) CPI should be constructed based on income, on region or on household demographic. He also claims that CPI framework should consist of labour supply and leisure but just on an experimental basis, very important role has a person's tax position. Especially household's financial position and tax of the household should be taken into the account. If all aspects above are implemented, economists would get a clear picture on how inflation influences different groups of consumers but also, they would be aware of changes of tax policies influence the welfare of different types of households.

#### 3.1.1.1 Calculation of CPI of a single element

Boundless (2017) shows the way of computing the Consumer Price Index as follows:

Figure 1: Current CPI Formula

$$\text{Current CPI} = \text{Current item price} \times \text{Base year price} \times \frac{\text{Current CPI}}{\text{Base year CPI}}$$

Source: Boundless, 2017

#### 3.1.1.2 Calculation of CPI of multiple elements

Boundless (2017) adds that when CPI of multiple items is calculated, weighted average has to be taken into the account as well as that not every price indices uses weighted average. To simplify the formula, price has given weighted average from 1 to 100. The equation is as follows:

**Figure 2: The CPI for Multiple Items Formula**

$$\text{CPI for multiple items} = \frac{\text{Cost of CPI market basket at current period prices}}{\text{Cost of CPI market basket at base period prices}} \times 100.$$

Source: Boundless, 2017

### **3.1.2 Cost of Living**

One of the most common questions in our lives as well as in business is concerned with the Cost of Living. There are many conceptualizations and definitions of the term Cost of Living. However, economists are yet to agree with one common singular definition. The cost of living is the amount of finances that are needed to maintain a specific level of living. The certain level includes basic expenditures of housing, health, food and last but not least the taxes. The cost of living is measured on geographically basis and it is closely linked with an income. To measure the cost of living, there is a cost of living index, which compares cost of living expenses in the areas (Investopedia, 2017).

### **3.1.3 Consumer Price Index vs. Cost of Living Index**

There is a significant difference between Consumer Price Index and Cost of Living index. According to Marydee (1998) CPI is an index of changes in prices. It is based on the average change over certain period in the prices, which are paid by consumers for goods and services. CPI usually measures inflation and Cost of Living changes. He came with an interesting conclusion that there is no index for Cost of Living. The Costs of Living are costs maintain a given standard of living. It depends on many factors such as land costs, rent or labour markets in the area. Today, we know there is a Cost of Living Index.

Even in the 1950' the work of Klein and Rubin (1948) states that true Cost of Living Index was tried to be created from familiarity of Engel curves or by Laspeyres or Paasche type indexes. In their work, they try to construct the index based on observable prices and characteristics of the demand curve. History in this field still remains almost the same. More information is needed in order to evaluate the index.

To calculate the Cost of Living it is fundamental to know person's preferences over economic goods but because these preferences are not possible to observe, approximation of the Cost of Living Index is constructed (Diewert, 2013). He also adds that cost of living

differentiates between single household and also group cost of living and that these indicators and various concepts are different between these two aspects.

In detail, the theory of single household is assuming that an individual has some specific preferences on some combination of goods  $N$ . That can be shown as an utility function  $F$ ,  $u=F(x)$ , where this function represents the utility level or for example standard of living which might be attained if this individual consumes the vector  $x=(x_1, x_2, \dots, x_N)^T \geq 0_N^3$  regarding certain budget. An individual's utility maximization has two stages. Firstly, individual tries to minimize the costs of attaining specific utility level and secondly the individual tries to choose maximal utility level according to his budget (Diewert, 2013).

The group cost living index has many possible ways how to construct it. According to Diewert (2013) the true cost of living index lies between a Paasche and Laspeyres index.

The essential role for calculating the index plays the financial and tax situation and that differentiate from household to household and from country to country. Housing is generally an enormous portion of the budget. That is why Diewert (2013) claims that the rental segment of housing market is not representative in general. Although it is part of the analysis, people have to realize the obstacles of it. He also adds that we have to take into the account those who are rich, those who has a mortgage, and for example ones who have no none labour income. However, in this example richer person would pay less than a person who is poor. Generally, in Western countries the tax law makes it more profitable for the richer person who can own rather than just rent the house. As a conclusion Diewert (2013) states that "all of our bounds on the consumer's true cost of living index rested on the assumption of utility maximizing behaviour subject to a budget constraint." He adds that in case of non-durable goods, the prices that are in the budget constraint are so called observable market prices. On the other hand, durable goods that are owned by a consumer, the prices depend on the unobservable anticipated price of the durable which is depreciated because it is expected to prevail in the next period.

To conclude the difference, both of these indexes show the changes in the prices of goods and services. For example, food or clothing, goods that are directly purchased in the market. The difference between CPI and Cost of Living Index is that Cost of Living Index goes beyond this. CPI is computed from price data and weighted data. Cost of Living Index reflects also changes in the environment or Government, which also affects individual or

household well-being. Basically, it includes also public goods such as education or safety as well as broader aspects of our life such as water quality, health or crime (Bureau of Labor Statistics, 2017).

### **3.1.4 Consumer Price Index vs. GDP Deflator**

According to Boundless (2017) both tools are measures of price inflation as well as deflation for a certain base year. GDP deflator measures the level all goods, which are all new, produced on domestic bases and final goods and services in economies. But still, there is a difference between these two. The difference is, that CPI uses a fixed basket of goods and services. GDP deflator basket differs from period to period based on buyer's consumption and investment figures. It added that fact, that CPI is taken as more accurate picture of changes in cost of living.

### **3.1.5 Cost of Living: Local Purchasing Power**

Nation Master (2015) defines Local Purchasing Power in measurement of Cost of Living as a "relative power in buying services and goods in a given country for the average wage in that country." It provides an example which claims, "If domestic purchasing power is 40, this means that the inhabitants of that country with the average salary can afford to buy 60% less typical goods and services than New York residents with an average salary." New York is used as an American benchmark for US cities.

As Cowen (2017) writes that Cost of Living Index helps with negotiation of the salary. She tries to answer the question why we care about the Cost of Living Index. The example on the website is about New York City. In case we would relocate to NY and we would like to know how much we have to earn to pay for our life and maintain a certain standard of living. By Cost of Living Index, we can differentiate the needs and wants and cover our expenditures.

"Knowing your bottom line will give you confidence when it comes time to negotiate."

### **3.1.6 Sub-indexes Theory**

Many economists are very interested in sub-indexes of cost of living index. Sub-indexes cover only certain subsets of consumer goods. There are several very interesting and important such as a food index, which contains all consumer goods in context of total cost of living index, one consumption goods index, which contains consumption decision as well as the labour supply decision in the context of consumer choice model or for example a

consumption goods subindex, which next to consumer goods contains environmental variables like pollution and public goods like for example roads or public lights (Pollak, 1975). There are many sub-indexes of the cost of living but in this work the author does not consider this topic as very important, but it should be noted that such a topic exist. It is just very important to realize that Pollak (1975) claims that we have to be aware of how many subindexes we combine in order to scheme the approximation of total cost of living index. Moreover, it can be claimed that sub-indexes are computed for different categories.

Also, durable goods play a huge role in the cost of living because a consumer can buy the product as sell it on second had market at some different price, different tax rate and that is the issue which Pollak (1975) also addresses as very important to realize.

### **3.1.7 Social Cost of Living Index**

As Slesnick (2002), professor from Western Michigan University says, the social cost of living index is "the ratio of the minimum expenditure needed to attain a given level of welfare at one set of prices to the minimum expenditure needed to attain the same level of welfare at a different set of prices." To get differences in a household we need data of household size.

### **3.1.8 Cost of Living Index vs. Average Cost of Living**

Bureau Labor Statistics (2017) describes the difference between these two issues. On the other hand, there is an ACCRA agency that does measure price differences of goods or services from place to place -from several urban areas in United States and not according to the timeframe. Cost of Living Index only looks at the consumption figures of professional households in the income top part. The consumption figure of different types of groups is as follows "Age of reference person, Occupation of reference person, Quintiles of income before taxes," etc. The average cost of living is measured differently. To compute the average cost of living, the weights of categories must be changed as well as weights of goods and services based on the consumption figures of "All Consumer Units."

The Bureau Labor Statistics completes so called Consumer Expenditure Survey. The survey gathers all possible information from the Nation's households and also information from families about their expenditures, household characteristics, and an income. The Bureau Labor Statistics assesses the data to users in order to relate the buying habits and an income of consumers to the characteristics of the consumers (Bureau Labor Statistics, 2017).



### **3.2 Standard of Living**

Across many dictionaries and many definitions, Encyclopaedia Britannica (2006) states that standard of living are the aspirations of a group or of an individual for private consumption of goods and services in terms of what is desired to increase a sense of well-being. Moreover, the purchasing is not under one's direct control and it is strongly influence by the individual's income. Standard of living also includes aspects which cannot be bought such as life expectancy or nutrition. Living standards are our minimal comforts and necessities in order to maintain a specific status. According to Eurostat (2017) living standards of countries are measured by GDP per capita that show how rich is a country in comparison to others.

The relationship between Cost of Living Index and Standard Living explains professor Diewert from University of British Columbia. According to Diewert (2013) CPI for an individual is defined as the minimum cost of attaining a specific standard of living in a given period of a time which is divided by the minimum cost of attaining the same standard of living in a base period.

An Indian economist Sen (1988) argues that standard of living was poorly understood, and the definition does not correspond with the actual meaning. He stated that "It is not just a function of opulence and cannot be seen as utility." He basically suggests the "capabilities" that are offered in states of affairs.

Furthermore, very interesting study, more than twenty years old, offers interesting opinion that our standard of living depends on our stature. Steckel (1995) says that not only measure of health is positively correlated with wealth or income but also the stature is correlated with per capita income. He adds that even in the last century height of stature influence our level of income but also the distribution of an income and that is related with consumption of basic goods, necessities by the poor.

### **3.3 Quality of Life**

Our history is full of discussion about the quality of life. What does it mean a good life? During the years thinkers, economists and scientists came with number of definitions and indicators of the good life. Many aspects could be included in this field such as health, economic indexes, well-being, levels of crime and many more. As we can see all these aspects are called social indicators as well as economic and some subjective indicators,

which evaluate the society. It is sometimes also very hard to distinguish between standard of living and quality of life. Moreover, the definitions overlap in many cases. Business Dictionary (2017) describes quality of life as daily living support by healthful food, clean water as well as a clear air, conservancy of wildlife and resources of nature, safety, security from radiation, and security from toxic and harmful substances. In addition, it could be an energy which enrich our life despite possible handicaps.

Fontinelle (2017) display the right differences between these two issues. She claims that whereas the standard of living is based on income, material goods and services or comfort which is necessary to reach a specific socioeconomic class. The aspects of standard of living are easily quantified. It is often used to a comparison of geographic areas. It is very common to compare the United States and Canada or specific states within the U.S.

**Figure 3: The Standard of Living Components**

1. Income
2. Quality and availability of employment
3. Class disparity
4. Poverty rate
5. Quality and affordability of housing
6. Hours of work required to purchase necessities
7. GDP
8. Inflation rate
9. No. of paid vacation days per year
10. Affordable access to quality health care
11. Life expectancy
12. Incidence of disease
13. Cost of goods and services
14. Infrastructure
15. National economic growth
16. Economic and political stability
17. Political and religious freedom
18. Environmental quality
19. Climate
20. Safety

Source: Fontinelle, 2017

Standard of living has many ways how to measure this index. As Fontinelle (2017) suggests one of the ways is the Human Development Index called HDI. The HDI was evolved by the

United Nations in 90' and it includes the life expectancy at birth, GDP per capita and adult literacy rates in order to measure a state's level of a development.

The Quality of life on the other side is very subjective. It includes more or less intangible aspects of our lives. Fontinelle (2017) derives the definition from a Universal Declaration of Human Rights which is well-written by the United Nations and which was accepted in 1948. Even though the declaration is almost 70 years old, it still represents the attributes of the quality of life around the world although these attributes differentiate from country to country.

**Figure 4: The Quality of Life Components**

1. Freedom from slavery and torture
2. Equal protection of the law
3. Freedom from discrimination
4. Freedom of movement
5. Freedom of residence within one's home country
6. Presumption of innocence unless proved guilty
7. Right to marry
8. Right to have a family
9. Right to be treated equally without regard to gender,
10. Race, language, religion, political beliefs, nationality,
11. Socioeconomic status and more
12. Right to privacy
13. Freedom of thought
14. Freedom of religion
15. Free choice of employment
16. Right to fair pay
17. Equal pay for equal work
18. Right to vote
19. Right to rest and leisure
20. Right to education
21. Right to human dignity

Source: Fontinelle, 2017

As a result, with standard of living people look at their income and it is measurable for example by the HDI. With the quality of life, it is not that easy. However, The Economists (2005) came with the index, which measured the quality of life around the world. The Economist Intelligence Unit developed a new index that is based on results of subjective satisfaction in life survey and objective elements such as per capita GDP. It has been measured in 2005 for 111 countries around world. Next to the regression analysis the

research also gives the information about the results. The greatest score of quality of life got the Ireland. On the other side, the lowest score had Zimbabwe with only 3.892 score.

### **3.4 Economic and Social Welfare**

How family's or an individual's well-being should be measured? That is a question for years. The consensus of well-being dimensions and appropriate measures is a big questionnaire. It depends on many factors, geographic location, culture, people etc. Slesnick's research (2002) basically says that this depends on our choices and trends in economic well-being and that means the consumption. He claims that consumption is more appropriate measure than income. Whereas income is counted as a measurement of well-being he takes the consumption as out of pocket expenditure of a consumer as a measurement. Cost of Living Index is included in the research in order to see the changes. He denies Consumer Price Index as a measure of social Cost of Living Index. He also considers economic well-being differences between groups. His findings particularly show differences of older adults. Deliberate regarding consumption as measurement, the elderly group of people have higher standard of living than non-elderly group of people. These issues are closely related to social and economic policy in every country.

The concept of developmental welfare is definitely not new. In the work of Midgley and Tang (2001) social policy has been always viewed as important link for social needs and human well-being. There is an argument that social spending more harms than cure the economy.

A work of Slesnick (2002) is delegated to welfare of United States and says that social welfare is based on agenda of family income. He adds that income of a median family has hardly changed in past twenty-five years. Inequality of income has significantly increased, and poverty is still high. That is why, the author uses the consumption as a measurement of well-being. The professor examined that standard of living in US has grown and poverty and inequality have declined.

With the idea that differences of well-being are based also on groups recognized Diewert (2013) who says that Welfare has been differentiated between individual and group consumers.

### **3.5 Income Inequality**

Income inequality means that income is distributed in uneven way among a population. Simply it is the gap between the rich and the population (Inequality, 2017).

Income disparities in the US became a huge issue. Inequality (2017) refers to several graphs and tables and the evidence that the gap is growing for 30 years is obvious. The divergence of income has become so unmistakable that US's top 10% now average nearly 9 times as much income as a bottom 90%. From the research implies that inequality is still growing alike the top percentage. The 0.1% of top nation's people rises much faster than 1% of top earners. The 1990's annual income of extra rich people exploded in its size. In the era 1992 - 2002, the four hundred highest incomes reported to the Internal Revenue Service more than doubled. On the beginning of 21<sup>st</sup> century the economic boom forced by real estate expansion tripled more than top four hundred average incomes before the financial crisis is 2007/2008. It is necessary to realize that in terms of America, differences between states need to be taken into the consideration. As Inequality (2017) writes in its research, Connecticut has the largest threshold for entry to the top 1% of earners. Nowadays, unions admit a smaller economic presence than they had years ago. That is why the gap from 1980 and 2015 between an employee and CEO pay has been 8 times greater.

From the research also implies, that between 1979 and 2014 wages, that include inflation have been stagnating for circa thirty years. Inequality (2017) adds that there is no growth in the real week wage of typical American employee and the lowest wage employee as well. However, the percentage bottom of 90% of labour does not see any radical change, the change is just 16.7 % increase in this time period even though the productivity increased. On the other hand, top 1% of earners see radical change from 1979 to 2007; it is change of 256%.

As regards to Europe, Cingano (2014), in his work for OECD, states that the gap among rich and others is in the maximum level in the last thirty years. It shows very similar picture as the U.S. Nowadays, top 10% of people in the area of OECD earn 9.5 times the wage of the bottom 10%. The increase in the income inequality is higher in top income shares than the share of lowest earners. The paper also suggests that education of richer earners, however, is not influenced by inequality.

A research of Eurostat (2017) from EU-28 states that the at-risk-of-poverty rate remains stable in 2010/2013 around 16.5%. The extent of poverty is measured also by the relative median at-risk-of-poverty gap. From 2014 rate has increased by 0.5%. Interestingly enough, the risk is higher more among men than women mainly in Hungary, Poland etc. In addition, Ireland has half or more of people at the risk of poverty. Finland with 13.2% has the lowest at-risk-of-poverty gap. As for the income inequality, Eurostat (2017) confirms that in 2015 there were high differences. Top 20% of the people with the largest disposable income collected 5.2 times as income of bottom 20%. In the Czech Republic, the ratio is 3.5 times. Due to the data of the Irish Times, Burke-Kennedy (2016) writes that Irish Gini coefficient also rose in 2012/2014. In contrast, Irish incomes of bottom 10% grew more rapidly than the top % of earners between 2012/2014. He adds that income inequality in Ireland remains rather stable.

### **3.6 Price Indexes**

We differentiate many types of price indexes. Price indexes compare the level of prices in certain location and then determine the level. It is for example the Big Mac Index, KFC Index or iPad index. The level of prices could be measured also by PPP – Purchasing power parity. OECD created also a method of comparative price levels, that use ratios of PPP to market exchange rate. These price levels bring an index measurement of differences among general prices of countries at the level of Gross Domestic Product (OECD, 2016).

#### **3.6.1 PPP – Purchasing Power Parity**

The World Bank (2015) describes PPP as price relatives which "show the ratio of the prices in national currencies of the same good or service in different economies." Basically, PPPs are used as a currency converter in order to compare the size of economies and price levels of economies within the world. As an example, The World Bank describes that the price of a burger in France is 4.80 euro and 4 dollars in the U.S., the PPP for a burger is 0.83 euro in France and 1.20 dollars from the American perspective. In order to obtain same quantity as well as the quality in the U.S. it needs to be spent 0.83 dollars in America for every one Euro that is spent for a burger in France, that is the same number of burgers. In contrast, it need to be spent 1.20 euro in France for every dollar spent of a burger in the U.S. in order to get the same quality and quantity in France which means the exact volume of burgers.

Additionally, The World Bank (2015) explains the calculation of PPP. The computation has several stages. Firstly, it is expressed for individual good or service. Secondly, it is expressed for groups of items and lastly it is expressed to each of the various level of aggregation up to Gross Domestic Product. And we differentiate PPP as relative to product group, level of aggregation or GDP. But the interpretation is different with each of them. Also, the composition of basket is always different according to the culture, price structure, income level, climate or taste. But the comparison of two baskets provide identical satisfactory result.

### **3.8 Regression Analysis**

According to Schneider (2010) regression is a statistical method for an analysis. It is an essential tool because it enables with the characterization and identification of relationship among factors. It also helps to analyse and classify a prognostic risk and to calculate the threat for an individual prognostication.

#### ***The Basic Assumptions***

According to Kennedy (2008) the multiple regression necessarily includes 5 important assumptions in the way the data are developed. The very first assumption on that list is when the dependent variable is computed as a linear function summed with the error term. Also, there are some violations listed with this assumption such as choosing wrong regressors. In terms of an exclusion of a relevant independent variable or an inclusion of irrelevant independent variables as well as the nonlinear relationship between the explained and explanatory variable. Secondly, there is an assumption of expected value of the E (error term) has to be equal to zero. Thirdly, it is expected it that there is same variance of all error terms and all error terms are not correlated with each other. Heteroscedasticity is an example of a violation of this aspect. When heteroscedasticity occurs, it means that these errors do not have same variance. Assumption number four claims that variables are fixed in repeated samples. The assumption is contravened when there are errors in the covariates or auto regression occurs. And last but not least is an assumption where the number of explained variables is greater than number of explanatory variables and so there is no specific linear relation between the explanatory variables. In reverse case, we talk about the multicollinearity problem.

### ***Ordinary Least Squares Method***

The method for estimation of unknown parameters is called so called OLS method, in case that all assumptions of the regression are met. It is a method where the sum of squared errors is minimized. This process is calculated by the derivative of these sums of the squared errors concerning particular parameter equal to zero (Kennedy, 2008).

### ***Cross Sectional Data***

Cross sectional data are used for this analysis. Cross Sectional data as one of three types of data are defined as dispersed data relating to just one period of time (Business Dictionary, 2015).

## **3.9 The Chosen Countries of Investigation**

### **3.9.1 OECD**

The Convention on Organisation for Economic Cooperation and Development was signed by 20 countries in 1960. During the 20<sup>th</sup> and 21<sup>st</sup> century another 15 countries have become members of this organisation. The second part of practical part is constructed multiple regression from OECD, including the newest member Latvia since 7.1.2016 and three more countries. The following list shows the member countries and its acceptance to the organisation: Australia (1971), Austria (1961), Belgium (1961), Canada (1961), Chile (2010), Czech Republic (1995), Denmark (1961) Estonia (2010), Finland (1969), France (1961), Germany (1961), Greece (1961), Hungary (1996), Iceland (1961), Ireland (1961), Israel (2010), Italy (1962), Japan (1964), Korea (1996), Latvia (2016), Luxembourg (1961), Mexico (1994), Netherlands (1961), New Zealand (1973), Norway (1961), Poland (1996), Portugal (1961), Slovak Republic (2000), Slovenia (2010), Spain (1961), Sweden (1961), Switzerland (1961), Turkey (1961), United Kingdom (1961) and finally the United States (1961) (OECD, 2017).

### **3.9.2 The United States of America**

A global economic leader and a country that generates an excessive return on investments which helps to create billions of goods and services. A country with very strong economic engagement, which influence Europe as well as the rest of the World every single day (U.S. Global Leadership Coalition, 2017).



### ***Historical Economic Background***

Regulations of government interventions were very characteristic for the end of the 19th century. Continued by the Great Depression during 1930' and huge development around 1960'-1970' in all aspects of life such as safety, health or environment, many agencies and commissions were established during this era. Subsidy supports remained a major support for US agriculture (Nations Encyclopedia, 2017). After World War II. there was a rapid growth in the lower and middle classes. According to Weissmann (2012) the fifth of the poorest households fared the best. 1970s as an era of oil crises and huge inflation. In addition, Nations Encyclopedia (2017) writes that during 1980' Reagan's administration government regulations of bank savings accounts relaxed as well as the car manufacture because it decontrolled the prices of gas and oil. They tried to slow the growth of social welfare spending and eliminate some programs. It was President Clinton who stopped this during 1990'. During President Bush administration huge cuts were introduced in order to stimulate the economy. The democrats had \$2.7 million loss in private sector jobs in first 3 years and they claim that G.W. Bush did not have a control over American economy. Year 1998 was a first time since 1969 with surplus in the federal budget. For three years, the federal budget stayed in the surplus.

Nowadays, the United States of America is the largest worldwide national economy in terms of nominal aspects. The data of World Bank (2015) shows that according to World Bank GDP nominal the U.S. are the largest economy around the world with 17.946 trillion dollars and percentage growth of 11.08. The United States are second biggest in terms of purchasing power parity with 22 percent of nominal global GDP and 17.1 percent of gross world product.

### ***A Picture of CPI in the U.S.***

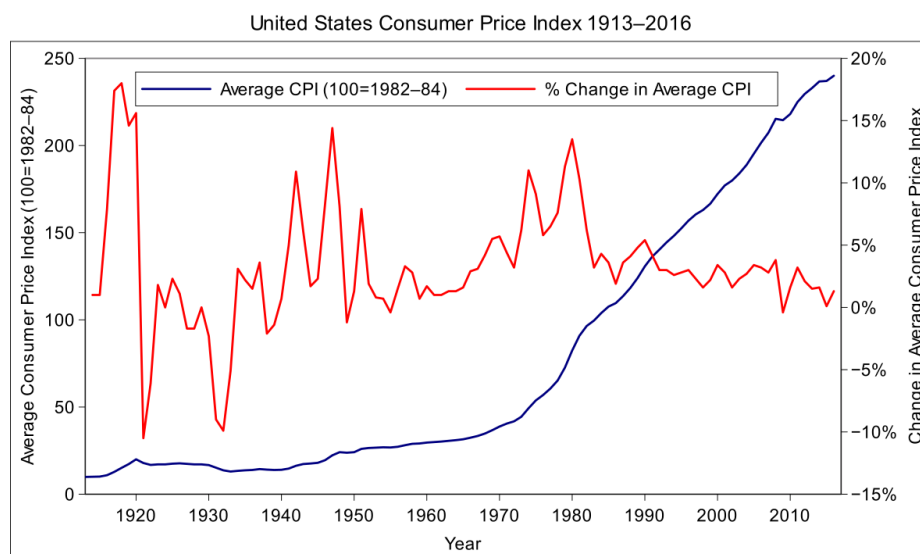
Koba (2011) notes that in the United States of America BLS - Bureau of Labor Statistics measures the CPI. What does the American CPI cover? American Bureau of Labor Statistics (2017) classified all items that consumers consumer into more than two hundred categories. Eight major groups were created as follows: "food and beverages(breakfast cereal, milk, coffee, chicken, wine, full service meals, snacks), housing(rent of primary residence, owners' equivalent rent, fuel oil, bedroom furniture), apparel(men's shirts and sweaters, women's dresses, jewellery), transportation(new vehicles, airline fares, gasoline, motor vehicle insurance), medical care (prescription drugs and medical supplies, physicians' services,

eyeglasses and eye care, hospital services), recreation (televisions, toys, pets and pet products, sports equipment, admissions), education and communication(college tuition, postage, telephone services, computer software and accessories), other goods and services(tobacco and smoking products, haircuts and other personal services, funeral expenses). "Bureau also adds that many kinds of government fees of users are included as well. Such an example includes sewerage charges or water charges, car registration fees, and tolls of vehicles. CPI also includes sales and excise tax, as a direct association with certain price of specific goods or specific service.

On the other side, there is necessary to say that CPI does not include income tax or social and security tax as well as investment items. Between investment items are bonds, stocks or for example life insurance and real estate. For each item in these major 8 categories, the Bureau choose a specific sample. For example, "a plastic bag of golden delicious apples, U.S. extra fancy grade, weighing 4.4 pounds to represent the *Apples* category."

Prices are collected based on monthly checks of economic assistants all over the U.S. to obtain all price changes and price information. The most used CPI is called "All Items Consumer Price Index for All Urban Consumers (CPI-U) for the U.S. City Average, 1982-84 = 100." In general, the CPI could not be used as Cost of living in individual areas, because it shows just the change of prices over time in a certain area. It does not show if the prices are higher or lower (Bureau of Labor Statistics, 2017).

**Figure 5: The CPI in the U.S., 1913-2016**



Source: BLS, 2017

The figure above shows the consumer price index in the US between 1913 and 2016. The axis X indicates a year, on the other side the axis Y indicates the Consumer Price Index showed on the left side, the axis Y shows an annual % change in Consumer Price Index showed on the right side. The right side of the figure can be used as a measurement of inflation.

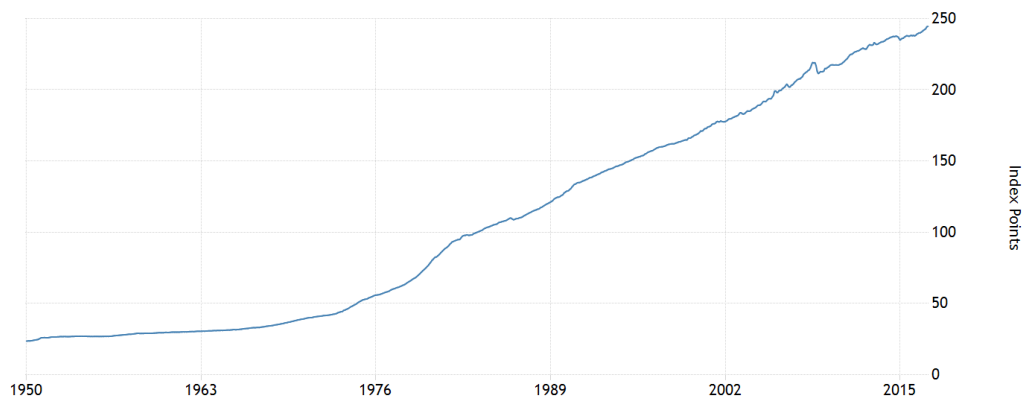
Flesher (2012), an economics instructor from New York, states that the increase in the CPI is a way of measurement of inflation. From governmental point of view, an increase is a positive aspect, because the government can sign contracts and pay the employees. In addition, an increase in the CPI is good for business too. On the other hand, the increase has also its drawbacks. Mostly the consumers suffer from the increase of the CPI. With an increase, there is a drop-in wages and consumers feel this effect directly. Flesher (2012) gives an example to realize what happens if this situation occurs. If inflation goes up and my wage is still the same or lower throughout the year I will buy less goods or services than at the end of the year. He concludes the paragraph by saying that with increase in the CPI, an individual or a group have to spend more to maintain its standard of living. An increase is very beneficial for the economy, government and the business but less beneficial for a consumer.

Koba (2011) a senior editor from CNBC also notes, that CPI is in America used for many aspects of economy. The CPI shows prices changes and it is related to the wages in relation when the CPI increases, wages also increases. The CPI also influences Social Security. According to the article, 47.8 million of Social Security beneficiaries obtain adjusted boost of the CPI in their incomes. He adds that also Federal Civil Service retirees and those who survived have specific bonuses tied to the CPI. When the CPI changes, it affects many other aspects of everyday life, such as a lunch at schools of 27 million children. As reported by Koba (2011) that is the reason why American "CPI has been used to adjust the federal income tax code to prevent inflation-induced increases in taxes" since 1985.

As Fontille (2017) writes in comparison with the last the century, the US standard of living has enhanced greatly. She adds that the same extent of work purchases a greater quantity of goods or services. Necessary to add, that goods, which used to be considered as luxury goods, like refrigerators or cars, are nowadays widely available. There is a significant

increase in leisure time as well as in the sector of life expectancy. On the other side, the annual hours worked show decreasing trend.

**Figure 6: The CPI in the United States of America, 1950-2016**



Source: Trading Economics and CNB, 2017

The CPI in the US raises in Feb - 244.46 Index Points from 244.16 in Jan, 2017. The American CPI has an average of 108.03 Index Points calculated between years 1950 – 2017. The record was deliberated in Feb, 2017 and it reached 244.46 Index Points. The lowest Index was measured in Feb, 1950 and it reached 23.51 Index Points (Trading Economics, 2017).

### ***Quality of Life***

Quality of life measured The Economists (2005), which claims that the United States occupied 13<sup>th</sup> place out of 111 countries under the measurement. The U.S. scored 7.615 in comparison with Ireland (8.333), which was the first one.

### ***Cost of Living***

Data from 2016 show, that city of New York is still a benchmark of US cities. The highest cost of living remains in San Francisco. Three percent higher rental costs and for example twenty-two percent higher food prices are in San Francisco than in New York City (Investopedia, 2017).

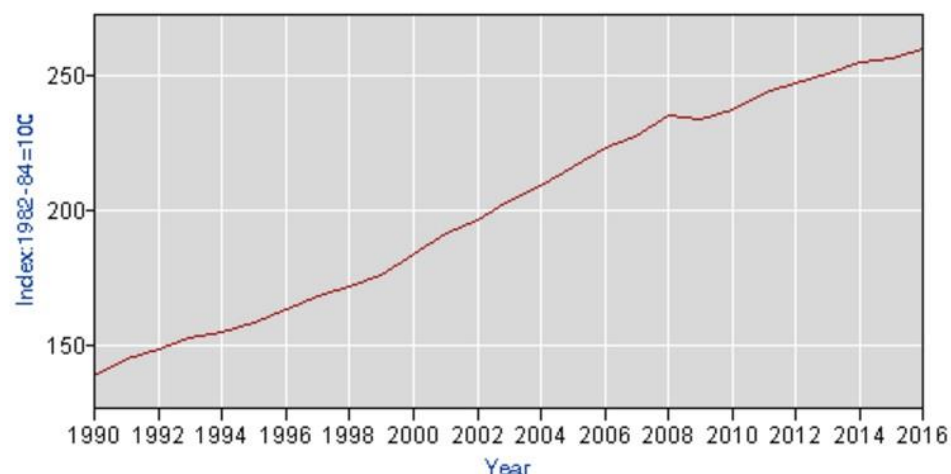
The average cost of living in the U.S. was calculated in 2015 for \$65.000 per year for family consisted of two adults and two children. Investopedia (2017) adds that this calculation excludes nonessential goods such as entertainment, luxury components and leisure.

### *A Picture of CPI in the U.S. and Massachusetts*

The Council for Community and Economic Research (2015), called Accra, does not measure CPI over time but it does measure price differences of goods and services from place to place, more specifically from several urban areas in United States. Fifty-seven specific goods and services are chosen for each area into six categories (grocery, housing, health care, utilities, miscellaneous goods and services and transportation). All based on typical professional household to get general cost of living index including average cost of the market basket for specific areas.

Basically, Accra Index is able to measure cost of living from 11 metropolitan or urban areas to let people know where they should or should not take the job or just for an information of costs and standard of living in particular area. It is gathered to a certain demographic as well. As Cowan (2017) answers, the Index is created for comparison of the costs of certain standard of living in the urban area. It does not matter if this standard of living is typical for an average or overall population in this area. She also adds that the Index is able to measure a city or a town. There is one requirement, in order to be included, the city has to have a population larger than 50, 000 people. There is no evidence of Cost of Living Index for particular state.

**Figure 7: CPI - All Urban Consumers (Metropolitan Area: Boston-Broskton-Nashua, MA-NH-ME-CT)**



Source: BLS, 2017

This figure shows not seasonally adjusted data with the base period 1982-1984=100 in the area of New England, which consist of following states: MA, NH, ME, CT. Data were set to

show the Consumer Price Index from 1990 up to 2017. From annual data from 1990 where the CPI was 138.9 the trend shows increasing tendency. An increase in the CPI means also an increase in cost of living, which is closely linked with the inflation. In 2016 the index increased up to 260.496 (Bureau of Labor Statistics, 2017).

### **3.9.3 The Czech Republic**

A small country in the centre of the Europe is experiencing huge economic growth. The Czech Republic has increased the minimum wage in January 2017 and it is keeping inflation above 2 percent. The Czech economy is greatly integrated in the global value chain because of the foreign investments (OECD, 2017). The interest rate of the Czech Republic is 0.05 % and the GDP growth rate is at 1.3% (Trading Economics, 2017).

#### ***A Picture of CPI in the Czech Republic***

As well as around the world, CPI in the Czech Republic is measured by the consumer basket of selected kinds of goods and services, which are paid by Czech population. Czech Statistical Office (2016) stated that the cost of living is showed basically by the development of consumer price indices. According to Czech Statistical Office (2016) the consumer basket in the Czech Republic is annually updated, always it is since January of a particular year. According to the new requirements of Eurostat in 2010-2011, Czech Statistical Office had to revise the consumer basket (index plan) likewise the methodology of a consumer price index.

These changes were adjusted based on the indices harmonization of a consumer price indices and moreover the suggestions of the Consulting Commission for the Consumer Price Statistics that consists of the CNB, ministries representatives, the Economic University Prague, selected departments of CZSO and last but not least the trade unions and research institutes (Czech Statistical Office, 2016).

New price representatives and new weights of goods and services was completed in this timeframe. The cost of living, the framework of aggregate consumer price indices, resulting from international CZ-COICOP, Classification of Individual Consumption by Purpose. In comparison with US system, where 8 specific areas can be found, CZ-COICOP distinguish 12 specific divisions as follows: Food and non-alcoholic beverages, alcoholic beverages and tobacco, clothing and footwear (where materials, garments, accessories, including repair and hire of the footwear), "housing, water, electricity, gas and other fuels (comprises rentals

including imputed rentals, payments for the use of cooperative dwellings, miscellaneous services relating to the dwelling, materials and services for the maintenance and repair of the dwelling, water supply and sewage collection, refuse collection, all kinds of energy (gas, electricity, heat) and solid fuels. Furnishings, household equipment and routine maintenance of the house (comprises furniture and furnishing, carpets and other floor coverings, household textiles including bed linen, household appliances, glassware, porcelain, tableware and household utensils, goods and services for routine household maintenance, tools and equipment for house and garden. Health – comprises pharmaceutical and other medical products, dental products, services of optometrists, services of physicians, thermal bath care, regulatory fees. Transport – comprises personal transport equipment including repair and spare parts, automotive fuel, transport services (by railway, by road, by air, local), school transport services. Communication – comprises postal services, telephone equipment (mobile phones), telephone services. Recreation and culture – comprises radio and television receivers, tape and cassette recorders, computer technology, musical instruments, sport equipment including repair, books, periodicals, toys, stationery, cultural services, sporting services, domestic and foreign holiday, flowers and flower products, pets and related products including veterinary services. Education – comprises all levels of education including language teaching and art education. Restaurants and hotels – comprises meals and drinks provided by restaurants, dinner in works canteens, catering services of canteens in schools and universities, accommodation services of hotels boarding houses, chalets, accommodation in boarding schools and universities. Miscellaneous goods and services – comprises personal care services, electrical appliances for personal care, beauty products, jewellery, clocks, leather fancy goods, insurance (insurance connected with the dwelling, insurance connected with health, insurance connected with transport), social and financial services, administrative fees"(Czech Statistical Office, 2016).

**Figure 8: The Numbers of Price Representatives**

<u>Group of goods and services</u>	<u>Number of representatives</u>
Total	700
1. Food and non-alcoholic beverages	161
2. Alcoholic beverages and tobacco	23
3. Clothing and footwear	65
4. Housing, water, electricity, gas etc	45
5. Furnishings, household equipment etc	80

6. Health	21
7. Transport	82
8. Communications	4
9. Recreation and culture	108
10. Education	12
11. Restaurants and hotels	43
12. Miscellaneous goods and services	56

Source: Czech Statistical Office, 2016

Czech Statistical Office, 2016 adds that some goods and services are not present in given social group or household. The Czech Republic professes a same routine as the U.S. In 35 chosen areas all over the Czech Republic, statisticians collect prices of given goods and services directly in pre-selected shops stationed on monthly basis. The number sums about 8500 items. In addition, the average price is computed from collected information except the Capital City of Prague household living.

The system of weighting was revised in 2010/2011 as well. Since 2012, household expenditure statistics 2010 were taken as a base for the new weight system. As 2014 begin, CZSO has started to publish price index calculated based on the new pattern. The new system of weights is calculated based as follows: "household in total, households of pensioners, households living in the Capital City of Prague." The Consumer Price Index is computed from average expenditures of households. In case of Prague, the index is computed from household expenditures of Prague. Supposing pensioners, the index is computed from expenditures of all households of pensioners (Czech Statistical Office, 2016).

### ***Index Calculation***

According to the Czech Statistical Office (2016) the index (cost of living) is calculated from Laspeyres formula as follows:

**Figure 9: Laspeyres Formula**

$$I = \frac{\sum \frac{p_1}{p_0} * p_0 q_0}{\sum p_0 q_0} * 100$$

$p_1$  = a price of a good or a service in present period.

$p_0$  = a price of a good a service in base period.

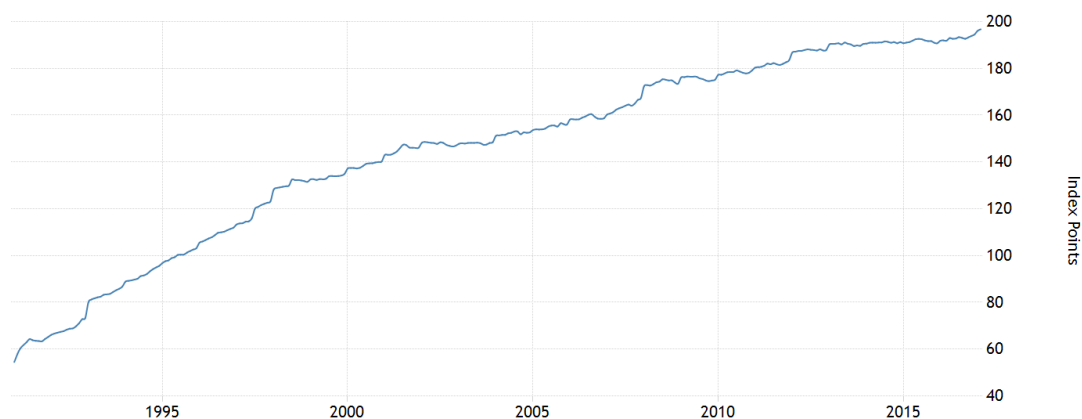
$p_0 q_0$  = constant weight, an expenditure of household of a good or service in base period

Source: Czech Statistical Office, 2016



Since 2014, the base period is changed to Dec, 2013. All of the levels of the basket are computed with the base period 2005=100. Transferred index with base of Dec, 2013=100 into the index time series of 2005=100.

**Figure 10: The CPI in the Czech Republic, 1991-2016**



Source: Trading Economics and CNB, 2017

The CPI of the Czech Republic has increased from February 2017 up to 196.7 in comparison with 196.0 in January 2017. The Czech Republic average is 145.25 Index Points in the timeframe of 1991 – 2017. February Index Points of 196.7 has been a record until the April 2017. The lowest statistic could be found in January 91 with number 54.43 Index Points (Trading Economics, 2017).

### ***Quality of Life***

Regarding the research of The Economist (2005) of the quality of life, the Czech Republic took the 34<sup>th</sup> place out of 111 countries. The Czech Republic scored 6.629, with GDP \$17.600 per person, which is on 35<sup>th</sup> place out of 111 worldwide countries.

### **3.9.4 The Republic of Ireland**

A country with rich economic history located in the Western Europe which economy strongly expands in last two years. As OECD (2017) confirms, the Republic of Ireland is highly opened to global economy and that the Irish economy is projected to grow rapidly in the future.

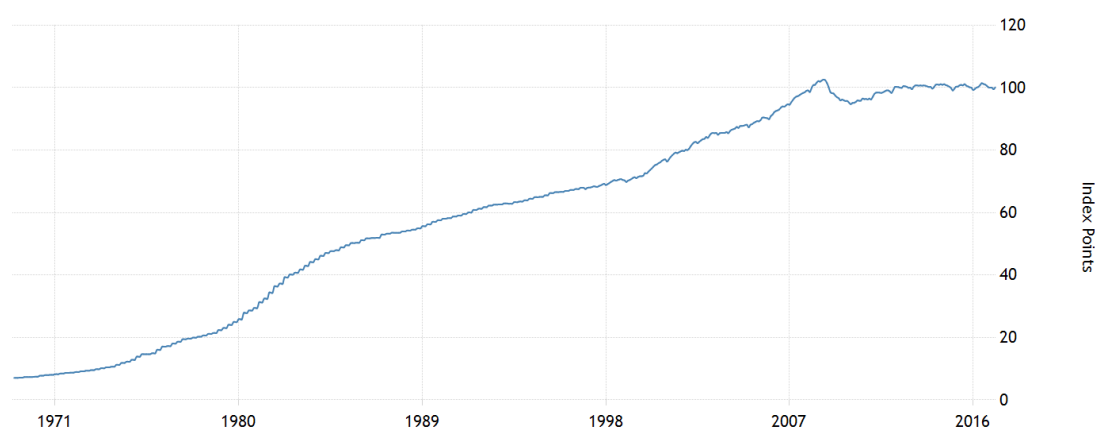
#### ***A Picture of CPI in the Republic of Ireland***

The CPI basket in the Ireland is according BBC News (2017) updated every five years. The reason is very simple. The basket has to keep up with modern shopping trends. Interestingly

enough, BBC News writes for example about Champagne that has been back in the Irish consumer basket.

Central Statistics Office, CSO, as a main agency, takes care of the collection and measurement of the CPI in the Republic of Ireland. There has been a reintroduction and new inclusions of products into the Irish CPI basket. Avocado or sweet potatoes as well as e-cigarette refills or craft beer has been counted in the basket. The statistical checkers computed 0.3 % increase in prices of goods and services from Jan, 2016 until Jan, 2017 (BBC News, 2017).

**Figure 11: The CPI in the Republic of Ireland, 1969-2017**



Source: Trading Economist and CNB, 2017

The CPI of Ireland has increased from February 2017 up to 100.1 in comparison with 99.5 in January 2017. The Irish average reached 59.31 Index Points in the timeframe of 1969 – 2017. September 2008 Index Points of 102.6 has been a record till the April of the year 2017. The lowest statistics can be found in February 69 with number 7 Index Points (Trading Economist, 2017).

CSO (2017) sets following factors which contributes to the CPI basket. There are several categories as follows: Transport, Clothing & Footwear decreased due to sales, Housing, Water, Electricity, Gas & Other Fuels, Food & Non-Alcoholic Beverages, Miscellaneous, Goods & Services, Restaurants & Hotels, Education, Furnishings, Household Equipment & Routine Household Maintenance, Recreation & Culture.

### *Quality of Life*

Regarding the quality of life, surprisingly the most suitable country with the highest level of quality of life is Ireland. Ireland scored 8.3, with GDP \$36.790 per person (The Economist, 2005).

### **3.9.5 The Comparison of the Countries**

#### *The Indices Difference*

According to Numbeo (2017) comparison of indices between Boston with Prague and Boston with Dublin show the two figures under the text. As it can be seen the prices of goods and services are mostly higher in Boston than in these two cities as well as the average month net salary. Almost 400,000 contributors around the world filled in the form for Numbeo database. As a result, for Boston there were 2037 entries during 18 months from 295 consumers and the website is lastly updated in May 2017. Prague got 7774 entries during one year from 550 contributors and it is lastly updated in May 2017. Lastly, Dublin has 4561 entries in past 12 months as well and it is from 495 different consumers with the last update in May 2017.

**Figure 12: The Indices Difference, Prague vs. Boston**

#### **The Difference of Indices between Prague and Boston, MA**

Consumer Prices are lower in Prague by 45.73 % than in Boston

Consumer Prices Include Rent are lower in Prague by 58.23 % than Boston

Rent in Prague are lower by 73.05 % than in Boston

Restaurant Prices in Prague are lower 59.45 % lower than in Boston

Grocery Prices in Prague are 53.54 % lower than in Boston

Local Purchasing Power in Prague is 42.51 % lower than in Boston

Source: Numbeo, 2017

**Figure 13: The Indices Difference, Dublin vs. Boston**

**The Difference of Indices between Dublin and Boston, MA**

Consumer Prices in Dublin are lower by 3.46 % than in Boston

Consumer Prices Include Rent in Dublin are lower by 16.47 % than in Boston

Rent in Dublin is lower by 31.89 % than in Boston

Restaurant Prices in Dublin are **higher** by 3.93 % than in Boston

Grocery Prices in Dublin are lower by 22.87 % than in Boston

Local Purchasing Power in Dublin is lower by 28.53 % than in Boston

Source: Numbeo, 2017

As a result of the figures above, it can be claimed that the highest conditions for living, the highest costs of living, are found in Boston. In the first figure, the comparison of Boston and Prague is described. In all aspects of life such as rent, restaurant or consumer prices are lower values found in Prague. Same scenario is showed in the second figure, where the comparison of Boston with Dublin could be found. The only section which show higher prices in Dublin are restaurant prices by 3.93%.

In case of Gross Domestic Product per capita adjusted by purchasing power parity Trading Economics (2017) describes as GDP per capita power purchasing parity obtained as a ratio of country's GDP adjusted by PPP and total population. The United States of America represents 52 704 US Dollars in 2015 and 297% of the worldwide average. The U.S. average at 45 650 US Dollars between years 1990 and 2015 and the lowest was in 1991 with 36 543 USD. The Czech Republic represents 171 % of the world average and CR averaged 23664 US dollars from 1990 to 2015, with highest amount of 30 380 US Dollars in 2015 the lowest value is recorded in 1993 as 17 573.7 US Dollars. The Republic of Ireland was recorded lastly at 61 378 USD and it is equivalent to 346% of average world percentage. Irish average is 39631 USD. The highest value was reached in 2015 with 61 378 USD.

#### **4. THE ANALYTICAL PART**

The practical part of the thesis is divided into three parts. Each part represents one analysis, which at the end, gives us a broad picture of the Cost of living topic in specific cities.

Three representative cities were chosen for the comparison based on population similarities and location. The author chose two European cities, one from the eastern Europe – Prague, capital city of Czech Republic and one from the western Europe – Dublin, capital city of Republic of Ireland. Thirdly, the author chose an American city to be compare with – Boston, capital city of Massachusetts as a third richest state in the United States with \$69,161 household income and poverty rate only 9,2 % (Mekouar, 2015). The reason of choosing Prague is the sixth place among richest regions in the EU. According to Johnston (2017) Eurostat ranking of GDP per capita based on regional grounds, the European Union counts 276 regions and the data are based on PPS, the purchasing power standard, and Prague is 78 % above the average. Finally, the author selected Ireland as a representative and Dublin as its capital city with similar size of population as two previous cities.

Firstly, the price analysis is investigated in the first part of chapter 2. The analysis uses data from Numbeo databank, the biggest database around the world of approximately 400,000 contributors, which personally answered questions about prices and cost of living. The author then compared data of prices and living standards in Boston, Prague and Dublin. Even though the prices are much lower in the Czech Republic than in the U.S. or Ireland, one would say the lowest cost of living is in Prague, but the reverse is true. It is also very important to add that the average disposable salary is the lowest in Prague, so specific adjustments need to be done. At the end, the author tried to investigate the levels of prices and living in the city and compare them to each another.

Secondly, in order to determine the relationship and the dependency between cost of living and other variables, the regression analysis was chosen as a second sub capitol in the practical part. The author chose cross sectional data for the analysis. The data were gathered from year 2014 due to the lack of data in several sectors of previous years. Eventually, the author compiled the regression of OECD countries and decided to add several worldwide relevant countries. Finally, the analysis consists of 38 countries all around the world.

In the last part, a structured questionnaire is analysed in order to get a wider picture of the topic. Another purpose of the third analysis is to show the difference among the countries and compare it with the first two analyses as well from the personal point of view. Because the author personally interviewed people in the countries of interest, the answers show the authentic picture of the city.

At last, the discussion of results can be found at the end of the analytical part as well as the comparisons, personal opinions, confirmation of hypotheses and conclusion.

The author used Microsoft Excel 2016 and Gretl for all these analyses. Both of these tools proved to be very useful tools to analyse the relationship, dependency and data. Data for the practical part were collected from many different online sources such as Czech statistical office database, Numbeo database, OECD Database or The World Bank Database. All tables and figures with data that have been used, could be found in the appendix at the end of the contention.

## **I. The First Part – The Price Analysis**

### **4.1 Introduction to the Price Analysis**

The first analysis called price analysis uses the Numbeo database as a primary source of data. Numbeo is the biggest database of information about countries and cities around the world. It includes not only the cost of living data but many more aspects of life such as health care, crime or housing indicators etc. This dependable web source is a collection of data around the world from almost 397,200 contributors and it is the most reliable data source, because anyone can contribute or modify the information. Around 3,620,900 prices are collected there, and it is updated by online software lately in May 2017 (Numbeo, 2017). Numbeo's base 100 has New York city and other calculations are based on this.

#### **4.1.1 Methodology of the Price Analysis**

The main goal of this analysis is the comparison of Cost of Living of Czech, U.S and Irish households. The author chose a sample of three specific cities. The cities were chosen according to the comparable size of population. More specifically, according to the Suburban Stats (2017) Boston has 617,594 people and according to World Population Review (2017) that Prague has 1,335.000 people and Dublin with 1,201.000 people. All of these estimates include urban agglomeration.

In order to fully compare the Cost of Living of the cities, certain items were selected for this part. For a survey, the authors used 8 specific sectors of goods and services as follows. Grocery store, where 12 food or drinks were chosen. Milk, loaf of fresh white bread, eggs, chicken breasts, apples, banana, tomato, potato, onion, water 1.5l, domestic beer per 0.5l and pack of Marlboro cigarettes. The second sector is called Restaurant where 4 meals or drinks are included such as meal in inexpensive restaurant, Mc-Meal at McDonalds, domestic draught beer 0.5l, coke or Pepsi for 0.33l. The third sector is called Transportation and it is including one-way ticket, monthly pass and gasoline per 1l. The fourth one called monthly Utilities includes 3 items, such as Basics where electricity, heating, water and garbage is included for 85 square meter apartment or 915 square feet apartment as well as price for 10 Mbps internet and 1min of prepaid mobile tariff. The fifth sector is leisure time that includes only one item, a ticket to a cinema for international release. The seventh sector of this analysis is called Clothing, and jeans 1 pair and Nike running shoes 1 pair are included in the sector. The eighth sector named Salaries and Financing represents average monthly

disposable salary (after tax). And last but not least sector of the analysis is a collection of items is as follows, price per square feet to buy apartment in city centre, apartment (1 bedroom) in city centre per month, as well as the apartment outside of city centre.

To thoroughly analyse the differences between prices in Boston, Prague and Dublin several adjustments need to be done. Because the average monthly net salary, which is the salary after all taxes truly diversify, the author decided to choose the average net salary of Boston as a base value for next calculations.

Prague has approximately 3.5 times smaller average monthly net income than Boston. It means that if a person in Prague would have the same salary as a person in Boston, then in Prague he/she would pay \$2.08 for a bottle of water. So, a table with raw and adjusted values was modelled.



#### 4.1.2 The Price Analysis

**Figure 14: Data Set for the Price Analysis**

		<b>Boston</b>	<b>Prague</b>	<b>Dublin</b>	
<b>Grocery Store</b>	Milk (Regular, 1 liter)	0.86	0.76	1.06	
	Loaf of Fresh White Bread (500 g)	2.78	0.94	1.45	
	Eggs (12)	3.02	1.56	3.08	
	Chicken Breasts (Boneless, Skinless, 1 kg)	10.62	6.2	8.46	
	Apples (1 kg)	4.56	1.24	2.41	
	Banana (1 kg)	1.46	1.33	1.69	
	Tomato (1 kg)	4.68	1.72	2.85	
	Potato (1 kg)	3.35	0.75	1.71	
	Onion (1 kg)	3	0.66	1.39	
	Water (1,5 liter bottle)	1.55	0.57	1.51	
	Domestic Beer (0.5 liter bottle)	1.75	0.69	2.62	
	Pack of Cigarettes (Marlboro)	10.55	4.24	12.38	
	<b>Restaurant</b>	Meal, Inexpensive Restaurant	15	5.52	16.88
		Mc-Meal at McDonalds	8	5.52	8.97
Domestic Beer (0.5 liter draught)		6	1.49	5.63	
Coke/Pepsi (0.33 liter bottle)		1.81	1.21	1.87	
<b>Transportation</b>	One-way Ticket (Local Transport)	2.5	1.02	3.04	
	Monthly Pass (Regular Price)	84.5	23.34	136.7	
	Gasoline (1 liter)	0.61	1.29	1.49	
<b>Utilities (Monthly)</b>	Basic (Electricity, Heating, Water, Garbage) 85 m sq	149.82	171.16	173.69	
	Internet (10 Mbps, Unlimited Data, Cable/ADSL)	57.23	17.87	51.21	
	1 min. of Prepaid Mobile Tariff Local (no discount plan)	0.1	0.13	0.29	
	Cinema, International Release	12.5	7.6	11.25	
<b>Clothing</b>	1 Pair of Jeans (Levi's 501 or Similar)	49.83	72.65	87.58	
	1 Pair of Nike Running Shoes (Mid-Range)	80.72	82.45	91.53	
<b>Salaries and Financing</b>	Avg* Monthly NET Salary (After Tax)	3951.3	1080.8	2698.2	
<b>Buy/Rent Apartment Price</b>	Price per Sq Ft to Buy Apartment, City Centre	9248.1	3870.7	5529.3	
	Apartment (1 bedroom) in City Centre/month	2466.9	7	5	
	Apartment (1 bedroom) outside City Centre/month	1701.2	639.88	1539.3	
	Apartment (1 bedroom) outside City Centre/month	9	467.37	6	

Source: Numbeo, 2017

The figure above shows the raw prices of goods or services in three chosen cities among eight specific sectors. As it can be seen in comparison of Boston and Prague almost all goods are less expensive between 30-80% in Prague than in Boston. Services are usually more

expensive in Prague than in the U.S. More specifically, mainly Gasoline per 1litter 109.8% is more expensive for Czech people than for Americans. Among services, it is basic utilities that are more expensive by almost 14% and 1min of prepaid internet that shows percentage by 27%. Also 1 pair of Levi's jeans costs more money, specifically by 45%. Only small difference is in higher price of Nike shoes, which is almost by 2%. Except items named above all other goods and services are cheaper in Prague than in Boston.

The contrast between Boston and Dublin is a little bit different than with Prague. Half of the restaurant prices are more expensive in Dublin than in Boston. Especially market price of domestic and imported beer is higher almost by 50%. There is a big unit tax on beer in the United States, that is why the alcoholic beverages are more expensive there anywhere else. Also, the price of a pack of cigarettes is higher by 16%. The reason why a pack of cigarettes is so expensive in the U.S. are teenagers, because state tries to avoid possible purchases by them. Also, it is necessary to say, that tax systems are totally different in each country.

The biggest difference could be seen in prices of transportation where the monthly pass is more than 60% and one-way ticket by 20%. Identically with Prague, also Dublin has very expensive gasoline. 1 liter of gasoline is higher by 140% in comparison with Boston. Basic utilities are also higher by 15% but what is really expensive is 1 prepaid minute of the internet by 188%. Also, clothing is more expensive in Dublin. 1 pair of Levi's by 75% and Nike shoes by 13%.

From the paragraphs above there can be picked several items which are less expensive in Prague, because Prague's consumer prices are lower by almost 45% as well as the rent. The biggest difference can be showed on prices in restaurant. It is lower by 60% than in Dublin. Grocery prices are also lower in Prague by 40% but it is necessary to say that local purchasing power is lower in Prague as well as Dublin and it is lower by 19%.

To conclude the third comparison, all items on the list are cheaper in Prague than in Dublin. The average disposable income is lower by approximately 60%.

The distribution of Boston's expenses are very similar to Prague or Dublin. The highest expenses in Boston city are spent for the rent per month sector as we can see from the data the prices of grocery are also quite high so the second highest expense in Boston is for market goods. On the other hand, the least expenses in Boston people spend for clothing and shoes. In general, clothing and shoes have been very cheap in the U.S. in comparison to Europe.

According to Numbeo (2017) that counts with 516 cities in its database around the world, it claims that Boston city has fifth most expensive rent for one-bedroom apartment in the city centre in the world and same result is for United States ranking. Neither utilities or leisure time or sport is expensive expense in the city of Boston. Continuously, the prices in the restaurants are very high especially for domestic or imported beer in comparison with world prices. Interestingly, price of bananas shows low price as well as the price for a milk. Furthermore, transportation show very high prices of monthly pass and high price of one-way ticket. Utilities display lower prices than in the Czech Republic, but it is still very expensive in comparison to world. What is very expensive in Boston is monthly rent and to buy an apartment in contrast with very high average disposable income.

The highest expense for Czech people in Prague is also the monthly rent as well as grocery goods. It is very interesting that Prague has the most expensive Marlboro cigarettes among 39 eastern cities. In terms of eastern part of Europe, Prague has also the second most expensive ticket to cinema among 42 eastern European cities. Also, the second most expensive 10Mbps internet with unlimited data as well as utilities like energy, garbage or water in comparison with 40 cities among eastern European cities. In comparison with Europe, Prague has the third cheapest international primary school education per year counting for 18 European cities. To compare the prices in terms what is priceless or expensive in Prague with the rest of the world, meal or drinks in the restaurant would be taken as low priced and draught beer as very low. In expectation of grocery prices, Prague has moderate, low or very low prices of goods. Moderate prices would be for chicken breasts, banana, tomatoes and a pack of Marlboro cigarettes. Gasoline prices are very high in Prague as well as utilities such as heating, energy or garbage for 85 square meters flat. The rent of flat shows moderate prices in comparison when you want to buy a flat, because the prices for buy are extremely high. Average disposable income is 25,500 in Prague, Czech Republic (Numbeo, 2017).

The expenses distribution is also very similar to these two European cities. The biggest portion of expenses is in rent/month and also the markets goods. The least occupies clothing sector. Interesting fact is that Dublin has the fourth most expensive monthly pass in the worldwide measure out of 377 cities. Dublin also occupies the fourth place with least expensive international primary school for one year for one child right behind Prague. Very high prices can be seen in restaurants. Market prices of grocery are mostly high and moderate

prices show only apples and loaf of fresh bread. Alcoholic beverages are extremely expensive in Dublin, where domestic beer for 0.5 costs 2.33 Euro on average. The most expensive items in Dublin is transportation. One-way ticket as well as a monthly pass show very high prices in comparison with world. Same as Boston, Dublin has also very high prices or rents and buys of an apartment in comparison with Prague. It is necessary to add that average monthly net salary is high in this city.

**Figure 15: The Table of Adjusted Values (Boston, Prague, Dublin)**

		Boston	Prague Adj*	Dublin Adj
<b>Salaries and Financing</b>	<b>Average Monthly NET Salary (After Tax)</b>	<b>3951.3</b>	<b>3.66</b>	<b>1.46</b>
<b>Grocery Store</b>	Milk (Regular, 1litter)	0.86	2.78	1.55
	Loaf of Fresh White Bread (500g)	2.78	3.44	2.12
	Eggs (12)	3.02	5.70	4.51
	Chicken Breasts (Boneless. Skinless. 1kg)	10.62	22.67	12.39
	Apples (1kg)	4.56	4.53	3.53
	Banana (1kg)	1.46	4.86	2.47
	Tomato (1kg)	4.68	6.29	4.17
	Potato (1kg)	3.35	2.74	2.50
	Onion (1kg)	3	2.41	2.04
	Water (1.5 litter bottle)	1.55	2.08	2.21
	Domestic Beer (0.5 litter bottle)	1.75	2.52	3.84
	Pack of Cigarettes (Marlboro)	10.55	15.50	18.13
<b>Restaurant</b>	Meal. Inexpensive Restaurant	15	20.18	24.72
	Mc-Meal at McDonalds	8	20.18	13.14
	Domestic Beer (0.5 litter draught)	6	5.45	8.24
	Coke/Pepsi (0.33 litter bottle)	1.81	4.42	2.74
<b>Transportation</b>	One-way Ticket (Local Transport)	2.5	3.73	4.45
	Monthly Pass (Regular Price)	84.5	85.33	200.18
	Gasoline (1 litter)	0.61	4.72	2.18
<b>Utilities (Monthly)</b>	Basic (Electricity. Heating. Water. Garbage) 85m sq	149.82	625.73	254.35
	Internet (10 Mbps. Unlimited Data. Cable/ADSL)	57.23	65.33	74.99
	1 min. of Prepaid Mobile Tariff Local (no discount plan)	0.1	0.48	0.42
<b>Leisure Time</b>	Cinema. International Release	12.5	27.78	16.47
<b>Clothing</b>	1 Pair of Jeans (Levis 501 or Similar)	49.83	265.60	128.25
	1 Pair of Nike Running Shoes (Mid-Range)	80.72	301.42	134.04
<b>Buy/Rent Apartment Price</b>	Price per Sq Ft to Buy Apartment. City Centre	9248.1		8097.2
	Apartment (1 bedroom) in City Centre/month	2466.9	14150.9	2254.2
	Apartment (1 bedroom) outside City Centre/month	1701.2	1	1816.4
	*adjusted Centre/month	9	1708.63	0

Source: Numbeo, 2017, own processing of data

The table above shows the adjusted prices with base values of Boston average monthly net salary. The disposable salary in Boston is very high in comparison with Prague and Dublin. Prague has around 3.5 lower average disposable monthly salary than Boston and Dublin have around 1.5 lower salary. That is why the author did several adjustments in order to fully

explain and compare the values. The first column shows data from Boston, Boston was picked as a base city for next calculations. The column showing the adjusted (Adj), is calculated price of item with Boston's salary. The regular price of milk in Prague is 0.76 but the salary in Prague is also 3,66 lower than in Boston. In case of same salary, the milk would cost 2.78 dollars. Numbeo (2017) has completed a perfect conclusion about the prices, cost of living and standard of living.

***Cost of Living Index Comparison***

**Figure 16: Cost of Living Index Comparison**

	Boston	Prague	Dublin
<b>Cost of Living Index (Excl. Rent):</b>	88.56	48.02	85.03
<b>Rent Index:</b>	77.75	20.9	52.66
<b>Groceries Index:</b>	90.59	42.05	69.49
<b>Restaurants Index:</b>	88.14	35.7	91.12
<b>Cost of Living Plus Rent Index:</b>	83.26	34.73	69.16
<b>Local Purchasing Power:</b>	123.42	71.21	89.26

Source: Numbeo, 2017

As the table above shows, the highest cost of living numbers is shown in Boston, where are the most expensive costs situated as well. According to the website, Boston is 40. in the list in terms of the highest costs of living from the World scale, which is counting for 511 cities on that list (Numbeo, 2017). Also, there is an interesting rank of Dublin, which shows 46. Order in the same list. Prague has very low cost of living index and in the mentioned list it is on the 357<sup>th</sup> place.

A similar order can be seen in the rest of the data. Boston fulfils the highest index also for the rent and grocery as well as the local purchasing power is the highest in Boston. The only index, which violates this order is a restaurants index which is the highest in the capital city of Ireland.

## **II. The Second Part – The Regression Analysis**

### **4.2 Introduction to the Regression Analysis**

The main goal of the regression is to analyse how Consumer Price Index Local Purchasing Power is related to Consumer Price index with base year 2010, GDP Growth, Average Monthly Disposable Salary, Unemployment, Population, Education and Economic Freedom from selected 38 countries on annual basis from 2014 and quantify the relationship between chosen variables. By cause of number of independent variables, a multiple regression was used for the research.

#### **4.2.1 Methodology of the Regression Analysis**

A hypothetical deductive method was used in this section of thesis. The regression is divided into several parts. First of all, the research questions were asked, and hypothesis established as well as the predictions of the hypothesis. Variables and predictions were established and analysed. Lastly, the predictions showed a correct or an incorrect result and based on that the hypothesis could be confirmed or not. The statistical analysis was chosen as confirmation tool.

A systematic deductive procedure for evaluation and analysis has been developed. The paper represents results of multiple regression of specific 38 countries using cross sectional data in time dimension of the year 2014. Due to the lack of data in education sector - Chile, China and Russian Federation represents data of tertiary education from year 2013.

Between 38 chosen countries belongs, OECD 35-member countries, which are listed in the theoretical part of the thesis plus the author decided to add 3 more countries to fully cover the worldwide measurement. Even though Chile is part of OECD, the author pointed Brazil as a main economic player of the South America. China was chosen as a main representative of East Asia and finally Russian Federation as an integral part of worldwide economics. So, the dependency is measured on worldwide scale.

Secondly, the regression analysis is continued by correlation between specific variables. This sub-section shows and strength the relationship between the variables. Finally, at the end of the second part, the results can be found under the analysis.

## **4.2.2 The Dependent and Independent Variables**

The dependent variable represents the Consumer Price Index: Local Purchasing Power from 2014. Nation Master (2015) describes the index as "relative purchasing power in buying goods and services in a given city for the average wage in that city. If domestic purchasing power is 40, this means that the inhabitants of that city with the average salary can afford to buy 60% less typical goods and services than New York City residents with an average salary." Between 7 independent variables belong: Consumer Price Index with Base Year 2010 in percentage, GDP Growth in percentage, Average Monthly Disposable Salary in US \$. It follows by Unemployment, that OECD (2017) describes as percentage of unemployed people of the labour force, as people without work but capable of work plus those in-paid or as people that are self-employed, which is the lowest in Iceland and the highest in Greece according to OECD data from 2014. Also, there is necessary to say that data from China (4.09% of unemployment) is irrelevant data due to fact that the reality in Republic of China is different. The percentage of unemployment is rounded only to one decimal place. For example, unemployment of Denmark is 6.593% and the author has rounded the value to 6.6%. Followed by Population in millions as fifth independent variable. The sixth variable - education that is declared as tertiary highest level of adult education of the 25-64-year-old people. This indicator is expressed in % of same age people and the data are broken down also by gender (OECD, 2017). Finally, the overall Economic Freedom defined by The National Heritage (2017) as "fundamental right of every human to control his or her own labour and property." The economic freedom index comprises 12 kinds of freedom from basic property rights down to financial freedom. This index is compiled from 186 countries around the world. The most free country out of the list is New Zealand and Switzerland. No dummy or time variable was used in the regression.

## **4.2.3 Data**

The data collection is performed by several relevant web based data mainly from OECD, The World Bank, Nation Master and The Heritage Foundation. All data were gathered focused on the topic. The multiple regression analysis contains only one dependent – explained variable and 7 independent – explanatory variables. Data are compiled only from one year of 2014. Total modeled regression consists of 8 variables as follows  $y$ ,  $x_1$ ,  $x_2$ ,  $x_3$ ,  $x_4$ ,  $x_5$ ,  $x_6$  and  $x_7$ . The author did mathematical analysis through checking for outliers, which were not found in the data set and the correctness of the data. Statistical analysis is further



described in chapter 4.2.8 Model Validation. The data set can be found at the end of the thesis in the annex section.

#### **4.2.4 Hypotheses**

In this section, the author sets 7 hypotheses. Hypothesis uses statistics in order to determine the probability that the statement is true. At the end of this section the author compares the p-value of each explanatory variable with significant value  $\alpha$ , the confidence interval is 99% in this case. If the p-value is lower or equal to the level of significance the null hypothesis is negative and alternative hypothesis is positive and the phenomena is statistically significant. Another way of testing would be the t-test for each explanatory variable.

##### **Hypothesis 1:**

an increase in the Cost of Living Index base 2010 in % will lead to an increase in Cost of living Index: Local Purchasing Power in %.

##### **Assumption: Positive sign**

**Reason:** If the Cost of Living index base 2010 increases, logically the Cost of Living: Local Purchasing Power will increase, because of the higher prices of goods and services. Due to higher costs of living for population the cost of living purchasing power would be higher as well.

##### **Hypothesis 2:**

an increase in GDP Growth % will lead to an increase in Cost of Living Index: Local Purchasing Power in %.

##### **Assumption: Positive sign**

**Reason:** If Gross Domestic Product Growth increases, the amount of production goes up too, population will get higher income and because they spend more money into economy, the economy goes up as well as standards of living for example for healthcare or better education. Due to this fact costs of living will go up. In general, the target of every Government should be to increase GDP.

**Hypothesis 3:**

an increase in Average Monthly Disposable Salary in US \$ surely leads to rise in Cost of Living Index: Local Purchasing Power in %.

**Assumption: Positive sign**

**Reason:** When an Average Monthly Disposable Salary registers a raise, people spend more money. When the income increase, population can afford more such as education, healthcare or more expensive goods or services. A person is able to buy higher combination of goods or services. The rule stands for - with higher income there is a higher demand, so the costs are higher due to rise in the demand. Cost of Living Index: Local Purchasing Power increases due to larger volume of money that households have.

**Hypothesis 4:**

an increase in Unemployment % will lead to decrease Cost of Living Index: Local Purchasing Power.

**Assumption: Negative sign**

**Reason:** If an Unemployment increases, economy goes down, very low unemployment level could be for example during a recession. People spend less money into the economy due to lower income levels. The higher the unemployment is, workers accept lower wage. Lower wage means low demand. The Cost of Living Index: Local Purchasing Power would decrease due to lack of money of households.

**Hypothesis 5:**

an increase in Population in millions, leads to increase in Cost of Living Index: Local Purchasing Power.

**Assumption: Positive sign**

**Why:** If the population increases, there is a higher amount of people, who can spend money. So logically, the Cost of Living Index: Local Purchasing Power will increase due to higher demand.

---

**Hypothesis 6:**

an increase in Adult Education Tertiary Level Attainment in percentage of 25-64-year-olds, leads to an increase in Cost of Living Index: Local Purchasing Power.

**Assumption: Positive sign**

Why: If the Adult Education Tertiary Level Attainment increases, the Cost of Living Index: Local Purchasing Power will increase, because with higher education, people, in general, have more money and so they can spend more. Higher education level in most cases would probably lead to higher income.

---

**Hypothesis 7:**

an increase in overall Economic Freedom in percentage, leads to an increase in Cost of Living Index: Local Purchasing Power.

**Assumption: Positive sign**

Why: If the overall Economic Freedom percentage increases, the Cost of Living Index: Local Purchasing Power will increase, because the more freedom people have the more spending they can afford.

---

***Economic Model***

The Cost of Living Index: Local Purchasing Power as an index is influenced by Consumer Price index with base year 2010 in %, GDP Growth in %, Average Monthly Disposable Salary in US \$, Unemployment in %, Population in millions, Education in % and Economic Freedom in %.

$$y_1 = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7)$$

$$\text{CPI: LPP} = f(\text{CPI, GDP, I, U, P, E, EF})$$

#### 4.2.5 Declaration of Variables

##### Endogenous:

y1 ... CPI: LPP            the 2014 Consumer Price Index Local Purchasing Power in %

##### Exogenous:

x1 ... CPI            the 2014 Consumer Price Index (2010=base) in %  
x2 ... GDP            the 2014 GDP Growth in %  
x3 ... I            the 2014 an Average Monthly Disposable Salary in US\$  
x4 ... U            the 2014 Unemployment in %  
x5 ... P            the 2014 Population in millions  
x6 ... E            the 2014 Education [Tertiary, % of 25 - 64 year - old]  
x7 ... EF            the 2014 overall Economic Freedom in % \*

\* all data are annual data

#### 4.2.6 Correlation

Another part of this analysis is a correlation matrix between explanatory variables. This sub capitol shows and compares the relationships between the covariates. Results are shown in the last section of the paper. Correlation is also one of the possibilities how to detect the multicollinearity (Kennedy, 2008).

##### *Multicollinearity*

**Figure 17: The Correlation Matrix**

	y1	x1	x2	x3	x4	x5	x6	x7
y1	1							
x1	-0,49605	1						
x2	-0,15062	0,158078	1					
x3	0,921249	-0,49381	-0,08076	1				
x4	-0,27667	-0,19848	-0,43055	-0,288	1			
x5	-0,17506	0,183385	0,555235	-0,2015	-0,18586	1		
x6	0,537684	-0,23924	-0,09073	0,562985	-0,18537	-0,39803	1	
x7	0,68077	-0,39522	0,037047	0,629055	-0,33044	-0,43186	0,465421	1

Source: Own processing of data

Multicollinearity is measured as coefficient R with values higher than 0.9 (respectively 0.8) between and only explanatory variables. Solution for multicollinearity differentiates, in this

case, there is no multicollinearity among the explanatory variables. It is not necessary to further edit or modified the variables or the data.

## 4.2.7 The Regression Outcome

Figure 18: The Regression Outcome

<i>Regression Statistics</i>	
Multiple R	0,952315
R square	0,906904
Adjusted R square	0,885181
Standard Error	8,857074
Observation	38

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	7	22926,08	3275,155	41,7495	9,38609E-14
Residual	30	2353,433	78,44776		
Total	37	25279,52			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-25,8355083	42,49959531	-0,6079	0,547829	-112,6312613	60,960245
CPI x <sub>1</sub>	-0,0751594	0,259039221	-0,29015	0,7737	-0,604188065	0,4538693
GDP x <sub>2</sub>	-44,5531199	13,57608078	-3,28174	0,002621	-72,27917576	-16,82706
I x <sub>3</sub>	0,01388342	0,001822746	7,616757	1,71E-08	0,010160871	0,017606
U x <sub>4</sub>	-0,10561723	0,398809688	-0,26483	0,792951	-0,920095269	0,7088608
P x <sub>5</sub>	0,03260406	0,010384995	3,139536	0,003783	0,011395075	0,0538131
E x <sub>6</sub>	0,16577902	0,163294166	1,015217	0,318121	-0,16771216	0,4992702
EF x <sub>7</sub>	1,11385317	0,31552601	3,530147	0,001363	0,469463095	1,7582433

Source: Own processing of data

### *Final model estimation*

$$y_1 = -25.8355083x_8 - 0.075159x_1 - 44.5531199x_2 + 0.01388342x_3 - 0.10561723x_4 + 0.03260406x_5 + 0.16577902 x_6 + 1.11385317x_7 + u_1$$

## 4.2.8 Model Validation

In order to receive a representative model, it is important to examine the data as well as the results of the regression. Model validation is very important and done by several methods and statistical tools. T-statistics, p-value or another example of the validation is a goodness of fit – denoted as R<sup>2</sup>.

### 1) *Mathematical Verification*

In the mathematical validation, the correctness of numbers of estimated parameters has to be verified. The mathematical verification includes checking of the calculations and data.

### 2) *Economic Verification*

Economic verification is one of the most important parts of the regression. It explains estimated parameters and also the relationships between variables based on the theory. The interpretation of economic verification is based on signs that are in the results of data set and the values of estimated parameters.

**Figure 19: The Economic Verification**

<b>Parameter</b>	<b>The values</b>		<b>Assumption</b>
$\gamma_8$	- 25.835508	Ceteris Paribus: If all explanatory variables remain zero, CPI: LPP will be -25.835508 %.	Positive sign <i>Not Confirmed</i>
$\gamma_1$	- 0.075159	If Consumer Price Index (2010=base) increases by 1 % per year, the CPI: LPP will decrease by 0.075159 % per year.	Positive sign <i>Not Confirmed</i>
$\gamma_2$	- 44.553119	If GDP Growth increases by 1 % per year, the CPI: LPP will decrease by 44.553119 pounds per capita per year.	Positive sign <i>Not Confirmed</i>
$\gamma_3$	0.0138834 2	If the Average Monthly Disposable Salary increases by 1 USD per year, the CPI: LPP will increase by 0.01388342 % per year.	Positive sign <i>Confirmed</i>
$\gamma_4$	- 0.1056172	If the Unemployment increases by 1 % per year, the CPI: LPP will decrease by 0.1056172 % per year.	Negative sign <i>Confirmed</i>
$\gamma_5$	0.0326040 6	If the Population increases by 1 million per year, the CPI: LPP will increase by 0.03260406 % per year.	Positive sign <i>Confirmed</i>
$\gamma_6$	0.1657790 2	If the Education [Tertiary, % of 25-64-year-olds] increases by 1 % per year, the CPI: LPP will increase by 0.16577902 % per year.	Positive sign <i>Confirmed</i>

$\gamma_7$	1.1138531 7	If the overall Economic Freedom increases by 1 % per year, the CPI: LPP will increase by 1.11385317% per year.	Positive sign <i>Confirmed</i>
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Source: Own processing of data

The regression analysis shows, that out of eight estimated parameters, five fulfilled its assumptions. The intercept, CPI and GDP growth did not fulfil the requirements. Five assumptions go with the economic theory as well as the result. The most significant impact on the CPI: LPP has the overall economic freedom. And the lowest impact on the CPI: LPP has the Average Monthly Disposable Salary.

### 3) Statistical Verification

Statistical significance of parameters and statistical significance of equation is a main object of statistical verification. T-test is described below and for this testing comparison of p-value and alpha was used.

Steps of Statistical verification

#### 1. Hypothesis

$H_0: \gamma = 0$                       Parameter is statistically significant (SS)

$H_A: \gamma \neq 0$                       Parameter is not statistically significant (SI)

2. Calculation of adjusted residual variance – adj.  $S_u^2$
3. Quantify variance of each estimated parameter -  $S_{ii}$
4. Error of each estimated parameter –  $S_{bi}$
5. Quantify t-value for each of estimated parameters
6. Compare t-value with t-table

### Statistical Verification Based on P-Value

Figure 20: Statistical Verification Based on P-value

	P-value	$\alpha$	SS/SI
<b>Intercept</b>	0.547828519	0.01	SI
<b>X1</b>	0.773700104	0.01	SI
<b>X2</b>	0.002620974	0.01	SS
<b>X3</b>	0.0000000170596	0.01	SS
<b>X4</b>	0.792950689	0.01	SI
<b>X5</b>	0.003782684	0.01	SS
<b>X6</b>	0.318120603	0.01	SI
<b>X7</b>	0.001363069	0.01	SS

Source: Own processing of data

Another possibility might be done by the comparison of p-value and level of significance  $\alpha$  (in this case 0.01, 99%). The parameter is statistically significant if the certain p-value is lower than the level of significance.

As the table 4 above presents, four out of eight parameters are statistically significant. More specifically, GDP Growth, Average Monthly Disposable Salary, Population and overall Economic Freedom are statistically significant. However, four parameters including the intercept are statistically insignificant.

#### **4.2.9 Coefficient of determination**

Coefficient of determination in other words goodness of fit, shows how well the explanatory variables explains the variance of the explained variable (Winton, 2009). Kennedy (2008) describes adjusted  $R^2$  as coefficient which takes into consideration degrees of freedom.

The results from the regression outcome defines coefficient of determination

**$R^2 = 0.9069035$ .**

0.9069035% of variance of dependent variable is explained by this relationship.

0.9069035% of variance of Consumer Price Index Local Purchasing Power in % is explained by the 2014 Consumer Price Index (2010=base) in %, the 2014 GDP Growth in %, the 2014 an Average Monthly Disposable Salary in US\$, the 2014 Unemployment in %, the 2014 Population in millions, the 2014 Education [Tertiary, % of 25- 64-year-olds], the 2014 overall Economic Freedom in %.

**Adj.  $R^2 = 0.88518$ .**

#### ***Implication of the model***

The results of the model COST OF LIVING: LOCAL PURCHASING POWER and its influence on Average Disposable Salary and people's behaviour are the main objectives of the regression. The economic verification was confirmed in majority of cases. The significance testing was also confirmed in most cases. The coefficient of determination confirmed the model on 90.6%. Very high percentage explains the model, it can be claimed that the model is appropriate to use for further investigation. The parameter estimation by the model showed statistically significant relationship between the CPI: LPP and GDP Growth, Income, Population and overall Economic Freedom. All of these aspects influence



our life the most. These results do not support only two assumptions, all other assumptions were confirmed as well as the dependency of this relationship. This model could be a representative model to further investigation in this field.

### **III. The Third Part – The Quantitative Analysis**

#### **The Structured Questionnaire**

##### **4.3 The Introduction to the Questionnaire**

As Trueman (2016) writes, the structured or closed questionnaire is a method of quantitative research created by Durkheim (1858-1917). It is so called positivist method of research because it involves only low level of entanglement of the author and great number of respondents. We distinguish many types of questionnaires such as: postal questionnaire, telephone asking questionnaire, electronic questionnaire and personally administered questionnaire.

The main disadvantage of structured questionnaire is difficulty for the author to study complex issues. Also, another disadvantage is that one question can have different meaning to different people.

According to Trueman (2016) the greatest planning goes into the questionnaire's objectives, because questionnaire is also a scientific experiment that requires its goals, methodology, data collection and conclusion of hypothesis proving or disproving.

##### **4.3.1 Methodology of the Questionnaire**

This questionnaire was obtained by two types of questionnaires. Partially by the electronic questionnaire and partially by the structured questionnaire. The structured questionnaire was compiled by the author in 2015 in Worcester State University, Massachusetts with a help of Professor William F. O'Brien from Economics and Business Administration Faculty. Then the author asked one-hundred students on the school field of Worcester State and University of Massachusetts Boston – Umass Boston. In 2016, the author edited the questionnaire, so it could be sent and asked by Irish students from Trinity College and mostly from DIT – Dublin Institute of Technology. In 2016/2017, the author prepared the questionnaire for the Czech students. Charles University, University of Economics in Prague and mostly students from Czech University of Life Sciences in Prague answered the form. In total, 300 undergraduate respondents answered the structured questionnaire in a period of almost two years.

The population is mostly made from students from 7 public universities from three different cities. The age range moving around 18-50+ years old. It is associated with the fact, that in the U.S. even older people starts with studies on daily basis.

This structured questionnaire consists of 20 closed ended questions, which includes answers yes or no and multiple-choice questions. At the beginning of the questionnaire, there is an exception of 1 question about respondent's age. In total, the questionnaire consists of 21 questions, which are divided into 6 sections.

The sections are as follows:

- Personal Data
- Income
- Transportation
- Food
- Living
- Education

#### **4.3.2 Data and Data Collection**

The used structured questionnaire, that can be found in the appendix 3, was developed by the author who asked for professional academic help from Worcester State University professor Mr. William O'Brien. Then the questionnaire was created through google forms, which makes it very clear and easy to import the data into the graphs or Microsoft Excel.

The survey method of data collection was completed by a self-conducted, web-based and face-to-face questionnaire, which was sent or asked to the specific group of population. There are many advantages, which goes with method of sending the form. People have a freedom to fill out the questionnaire in their free time and it is also very quick method to do so. Another advantage is also an anonymity. One of the disadvantages is the unwillingness to answer the form or that the form jumps between the spam messages. That is why the author decided to approach people in person in the second round of questionnaire and filled the form with them. To be ensured that respondent understands the questions and also the unwillingness to fill out the form declined.

This process of the data collection was made quantitatively so that the developed hypotheses could confirmed on a basis on three hundred respondents.

### **4.3.3 Sample**

Sample of three hundred forms was analysed and compiled into 63 representative graphs. It is important to note that the empirical survey has limited interpretative power due to the observation's sample by age. It does not correspond with whole population. It does correspond with students between 18-50+ age from particular city of observation. Two kinds of methods were included. Mainly personal face to face questioning by the author of the thesis and it was also done partially by the google link or google form questionnaire sent by email.

In order to be ensured of the quality, the author looked in detail to every single answered form in every city the questions were asked. In several cases, the author had to re-ask the responded for new information. Missing data did occur in the questionnaire, those papers where the author found a missing value, or an answer were due to this problem removed from the sample and asked again.

Final sample consists of 300 respondents. One hundred from each city. Men vs. women in indefinite proportion. And the questions were adjusted in each city. For example, in the U.S. first year of college is called freshman year but in Europe it is simply called first year of studies etc.

***Hypothesis questions***

H<sub>1</sub>: Respondents from all cities work mostly part time.

H<sub>2</sub>: Parents are those, who pay for the living in all chosen cities.

H<sub>3</sub>: American respondents use their cars unlike the rest. They spend the most money on a car.

H<sub>4</sub>: American respondents do not use public transportation unlike the rest.

H<sub>5</sub>: Respondents from Dublin spend the highest amount of money of the transport.

H<sub>6</sub>: Majority of all respondents from all cities cook for themselves.

H<sub>7</sub>: American respondents spend the highest amount of money on food.

H<sub>8</sub>: American respondents live in dormitories unlike the rest.

H<sub>9</sub>: American respondents spend the highest amount of money on rent.

H<sub>10</sub>: American respondents pay the highest amount of money for tuition fees and equipment.

H<sub>11</sub>: Majority of American respondents have a student loan.

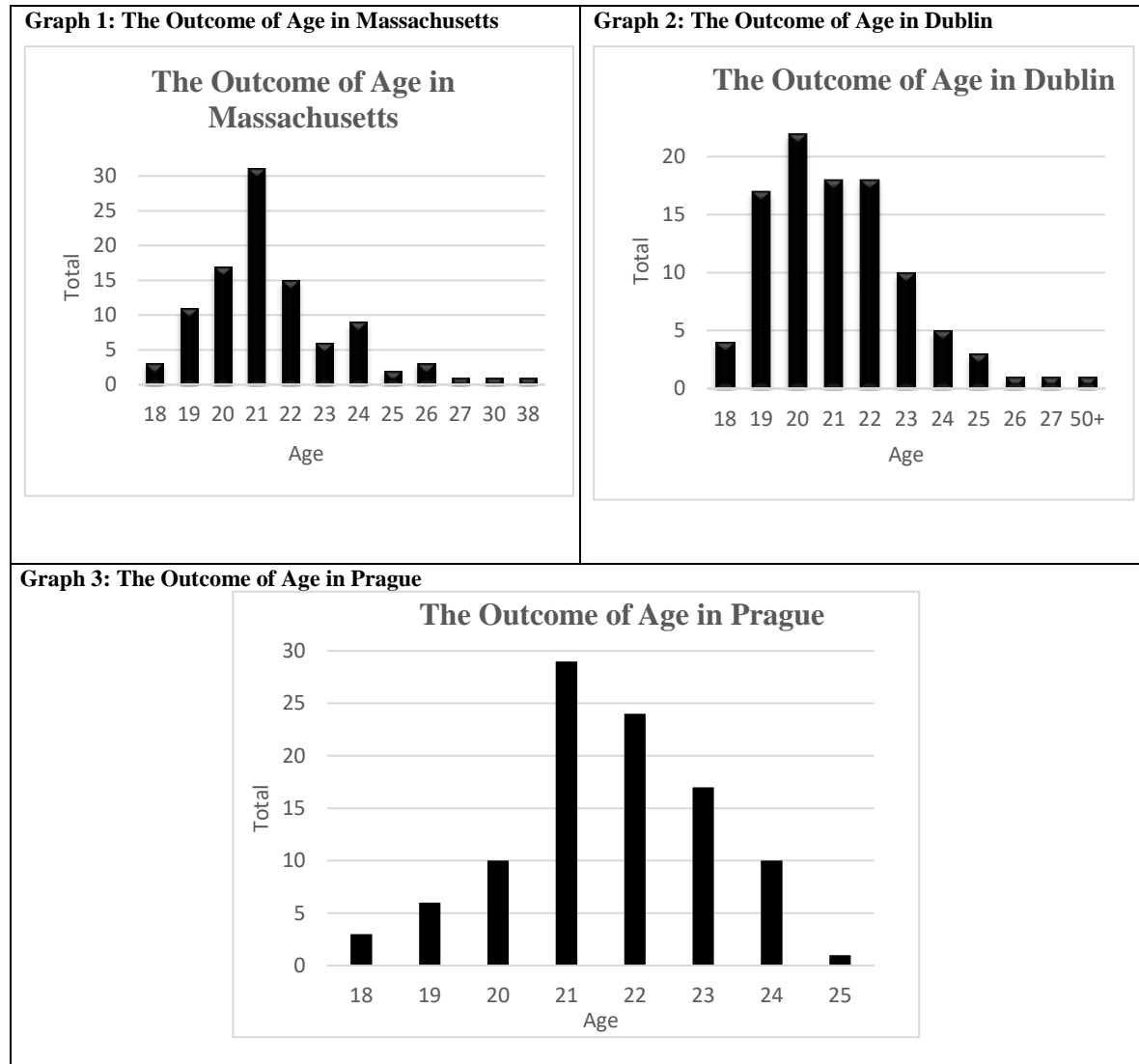
H<sub>12</sub>: Respondents from Prague are the only ones, who would like to achieve MSc degree.

H<sub>13</sub>: American respondents pay the highest amount of money for living per month.

## 4.3.4 The outcome of the Questionnaire

### 1. Personal Information

#### 4.3.4.1 Age

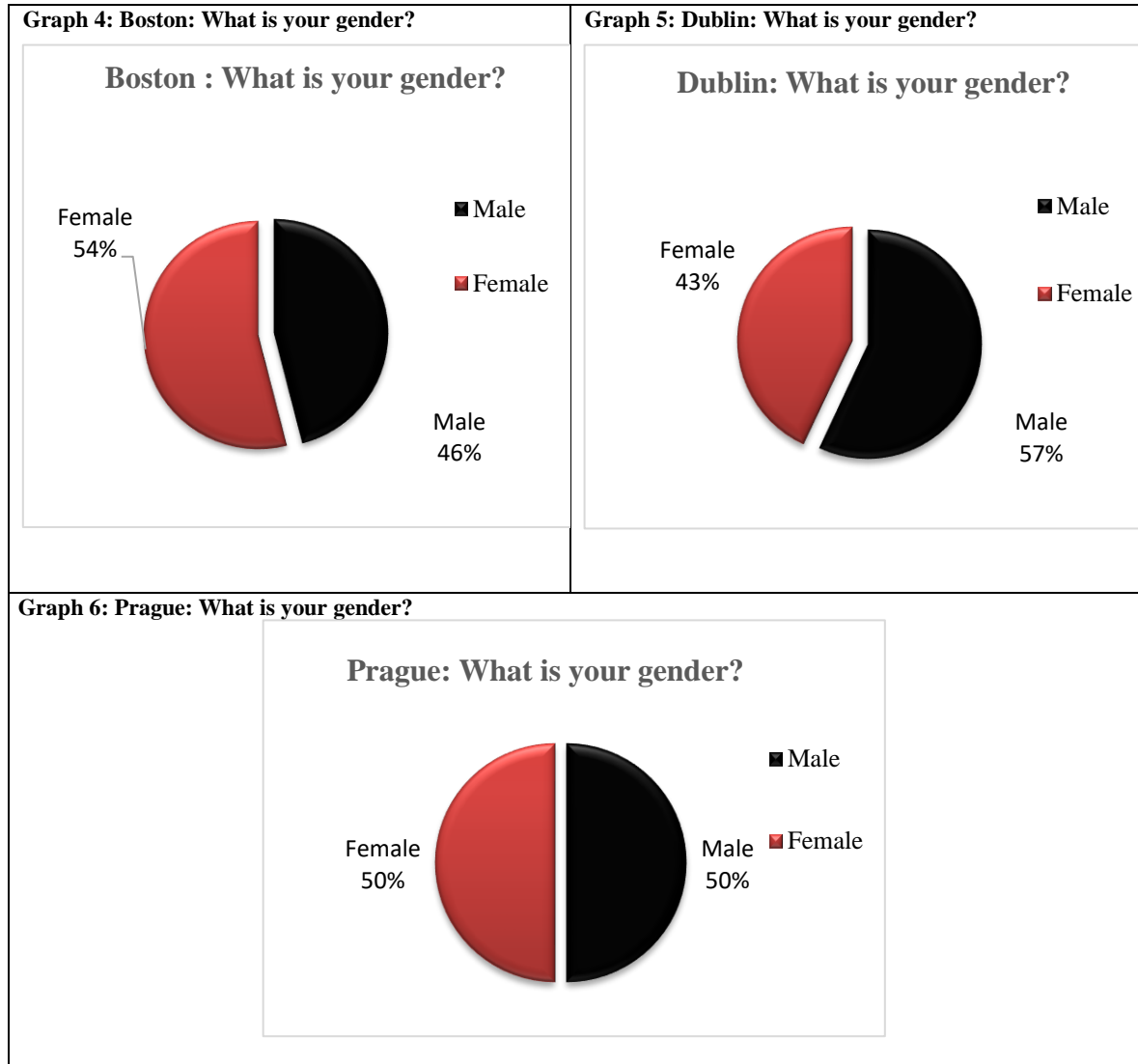


The outcome of the age in all three countries is very similar. Majority of the respondents are aged between 18-24 years old. The share of older people with an age more than 24 is the highest in the United States, where there are 8 people, who studied at the university older than 24 at undergraduate program. Dublin counts for 8 students older than 24 and only 1 student was older than 24 in Prague.

The first graph demonstrates that the most often age of an American respondent is 21 years old with total of 30 people in this questionnaire. Furthermore, Dublin shows that the most often age of Irish an undergraduate student is 22 years old with total 22 people asked in the

sheet. Prague reports the same result as Massachusetts of an age with total 29 persons. The least range between age 18-19 shows graph from Prague, as well as the highest range between age 23-24.

#### 4.3.4.2 Gender

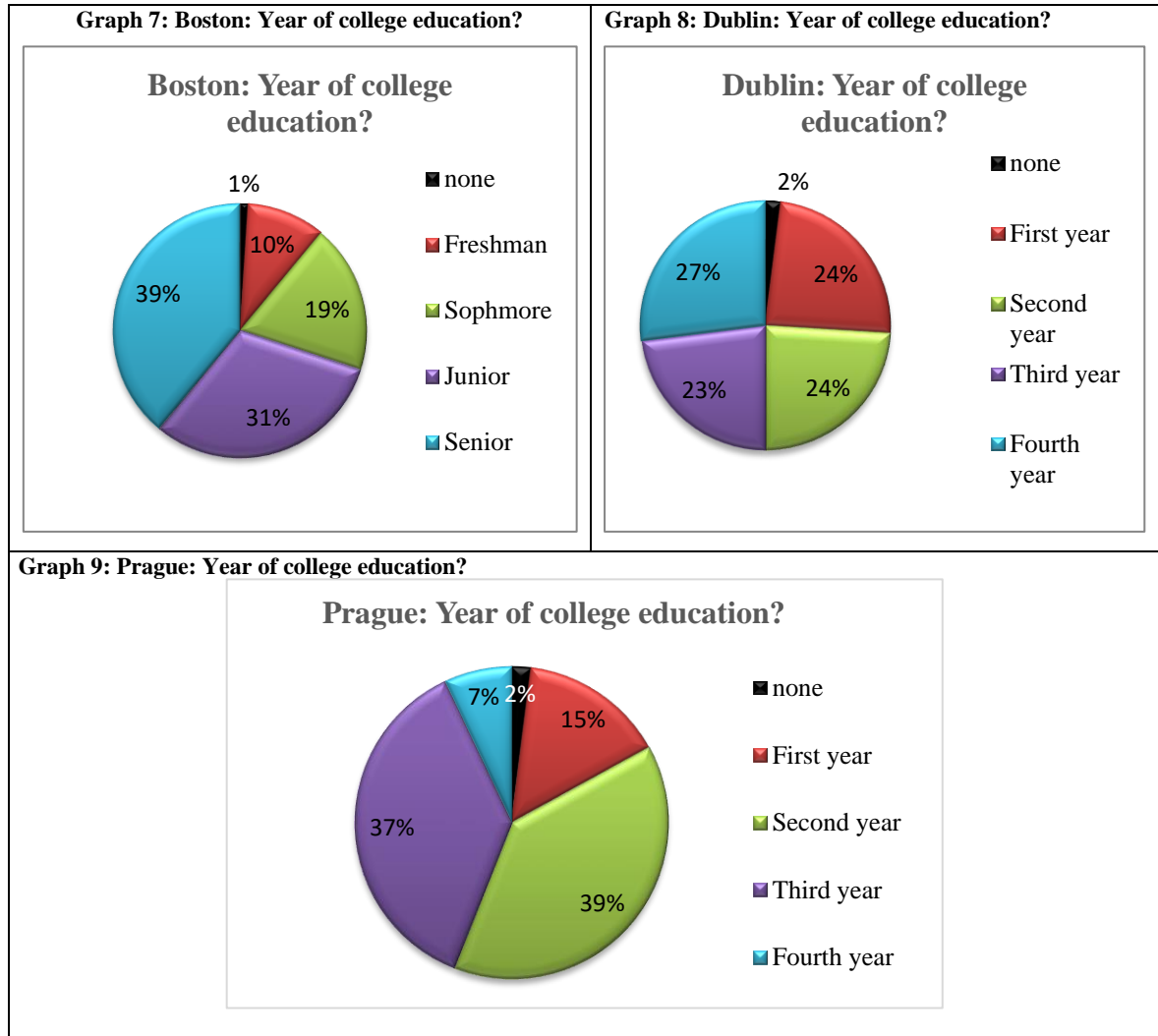


The graphs above show the percentage share of males and females in the questionnaire. The first outcome reports higher share of females than males. On the other hand, graph from Dublin shows opposite results. 57% of males answered in the questionnaire and only 43 females were asked in the questionnaire. The graph from Prague shows equal percentage of female and male respondents.

It is necessary to add, that the willingness to answer of males and females was the same and the percentage share is random. The author also had to delete and edit people's information

in the questionnaire, due to missing data of gender from the sheet. So, the information had been changed in the questionnaire.

#### 4.3.4.3 The year of college?



In the following graph, the years of college are showed. The American chart differentiates from the other two in the names of years in college. It is due to the fact, that U.S. named their students according to the years of college as follows: first year is called freshman year, second year is called sophomore year, third year is called junior year and last but not least there is fourth year, which is called senior year.

To keep the sample consistent, the author asked people from 4 years of study. Due to the education rules in the Czech Republic, universities in this country have undergraduate programmes only for 3 years, fourth year is mostly an exception. In case of Czech



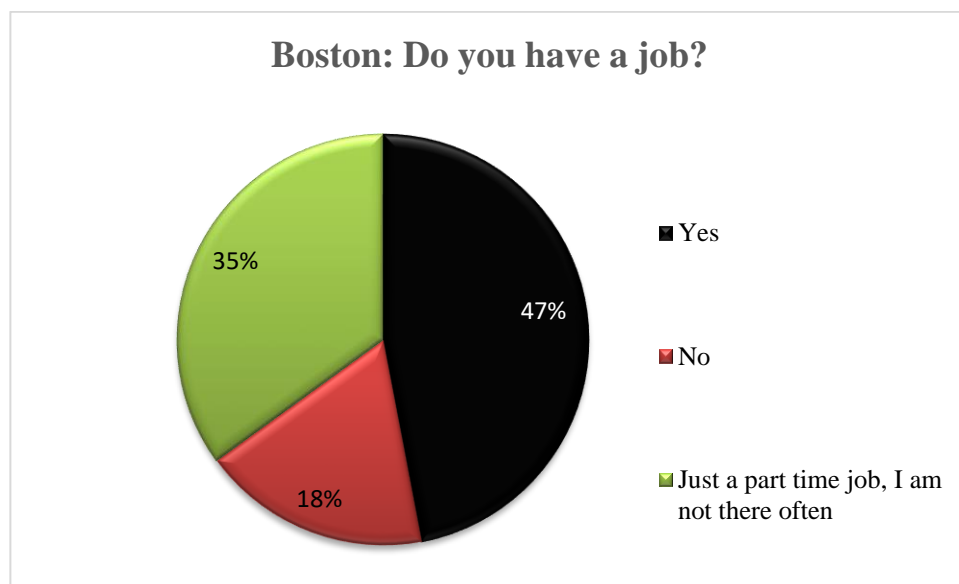
universities, the author asked Czech people from fourth year maximum. The other two countries are undergraduate programmes only.

American results show that mainly seniors and juniors answered the questionnaire. And only 10% of freshman students are included in the questionnaire. Balanced results are seen in the Irish graph, where the highest share of answers occupied students from the last year as well. The situation is similar in the Czech graph. Mainly second and third year of university is included in the questionnaire. But only 7% of people from last year are included in the questionnaire. The highest amount of 39% students from second year answered the structured questionnaire. There is a same balance of none possibility in all three countries.

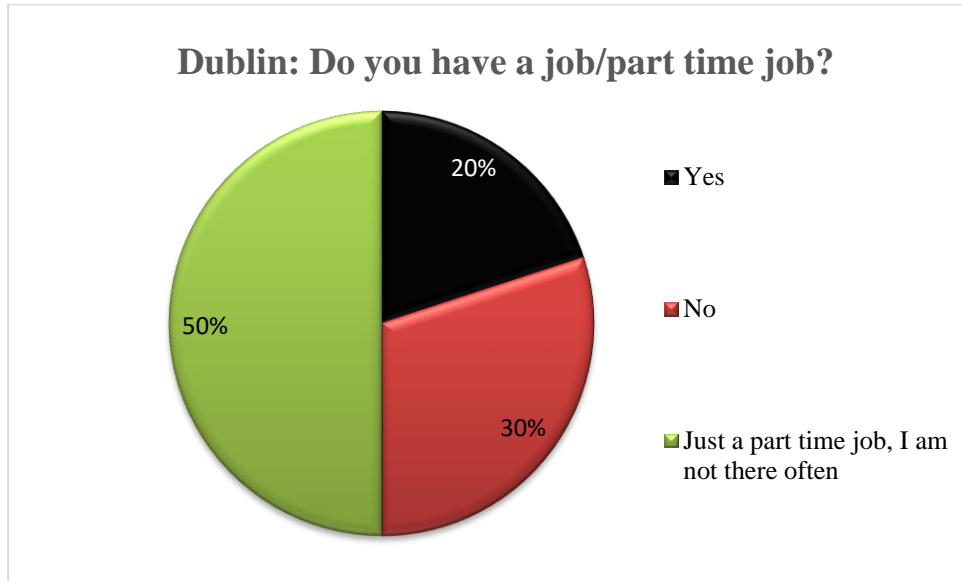
## 2. Income

### 4.3.4.4 Do you have a job?

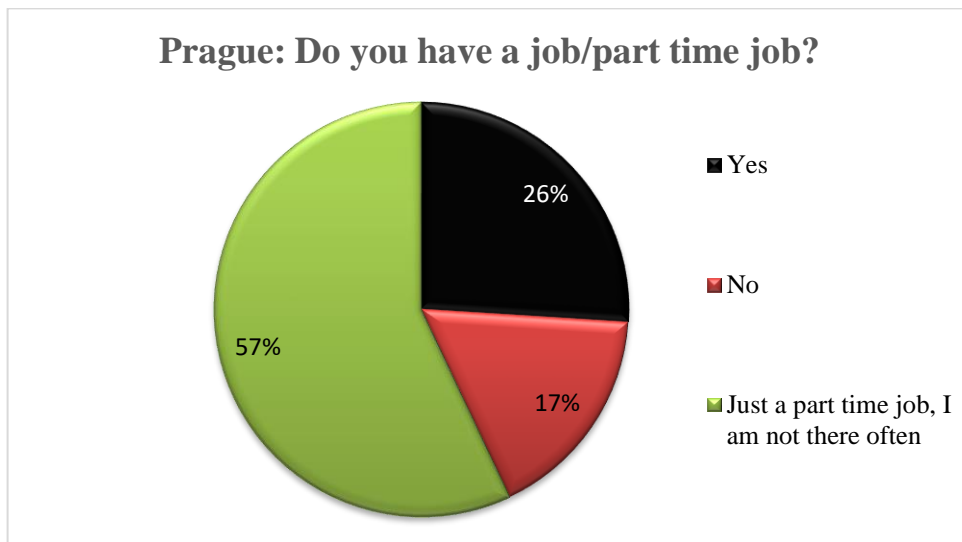
Graph 10: Boston: Do you have a job?



**Graph 11: Dublin: Do you have a job?**



**Graph 12: Prague: Do you have a job/part time job?**



To compare these three graphs, it has to be mentioned that the loan system in the U.S. for studies is very different to rest of the world, more information can be found under the question number 17. The education in the United States is extremely expensive so there is no surprise that most of the people, who answered the structured questionnaire, have a job for more than a part time in the U.S. In comparison with only 20% in Ireland and 26% in the Czech Republic, who responded positively for a full-time job option.

In other two countries prevailed an option of a part time job. As a result, people in Ireland or Czech Republic pay less money during their studies. The highest share of those who does not have any job is seen in Dublin. 30% of Irish people answered that they have no

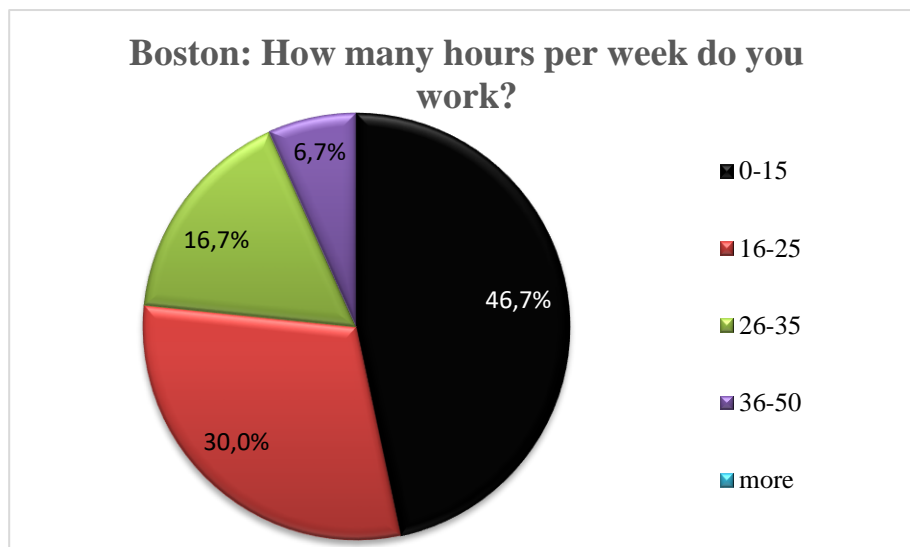
employment relationship. The lowest share is seen in Prague with only 17% of people, who answered that they have not a job. Even though the expenses during the studies are the lowest in Prague, majority of people works part time or in full time employment relationship.

The highest number of people with part time job could be seen in Prague. Students most likely work 20 hours and less to earn a specific amount of money to pay their cost of living. Also, many other factors influence these results. Mainly the accommodation and how much they earn per hour.

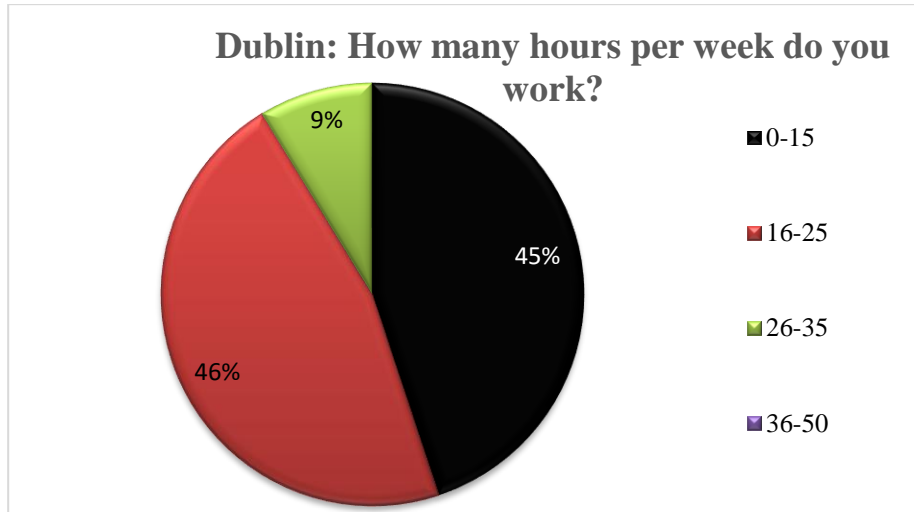
The following graphs are related to the number of hours that a person works weekly. The same result went out from all three countries. Percentage between 45-48 matches 0-15 hours per week, which is the minimum number of hours in the questionnaire. The biggest share of a range between 16-25 states shows Dublin with 46%. Surprising result is the lowest share of 30% of 16-25 hours per week in Boston. On the other hand, the highest number of people working more than 36 hours per week is in the U.S.

#### 4.3.4.5 If YES - How many hours per week do you work?

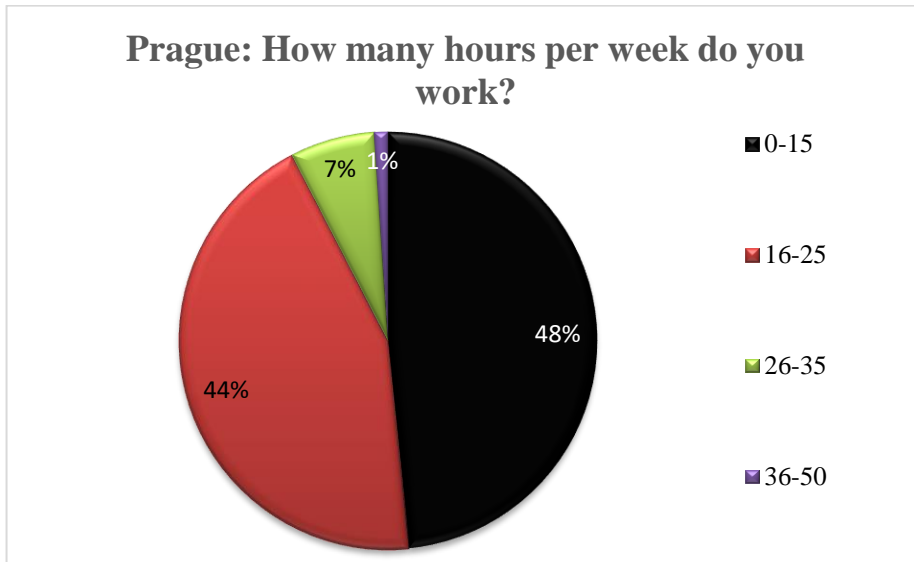
Graph 13: Boston: How many hours per week do you work?



**Graph 14: Dublin: How many hours per week do you work?**

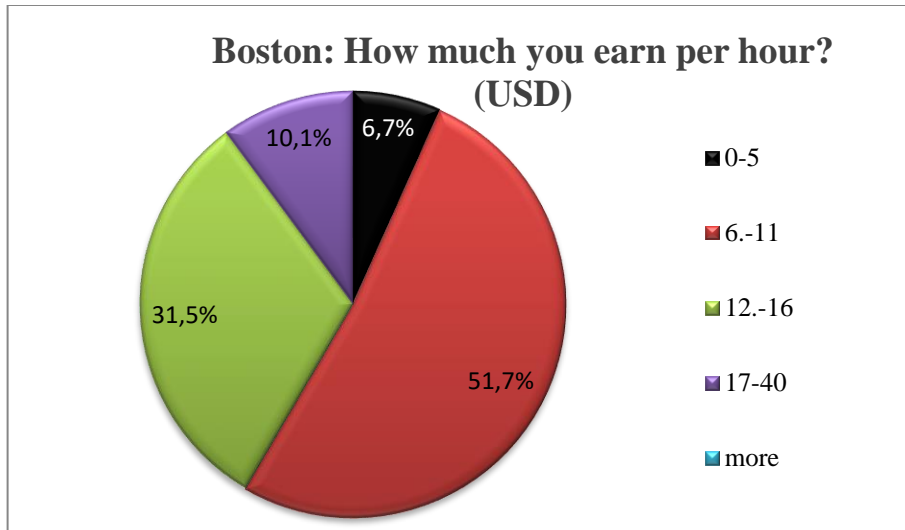


**Graph 15: Prague: How many hours per week do you work?**

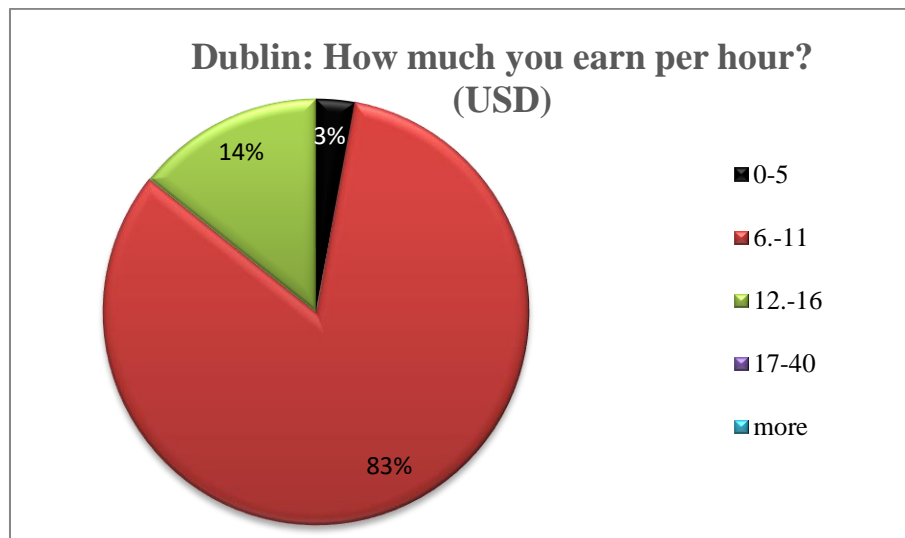


#### 4.3.4.6 How much you earn per hour? (USD)

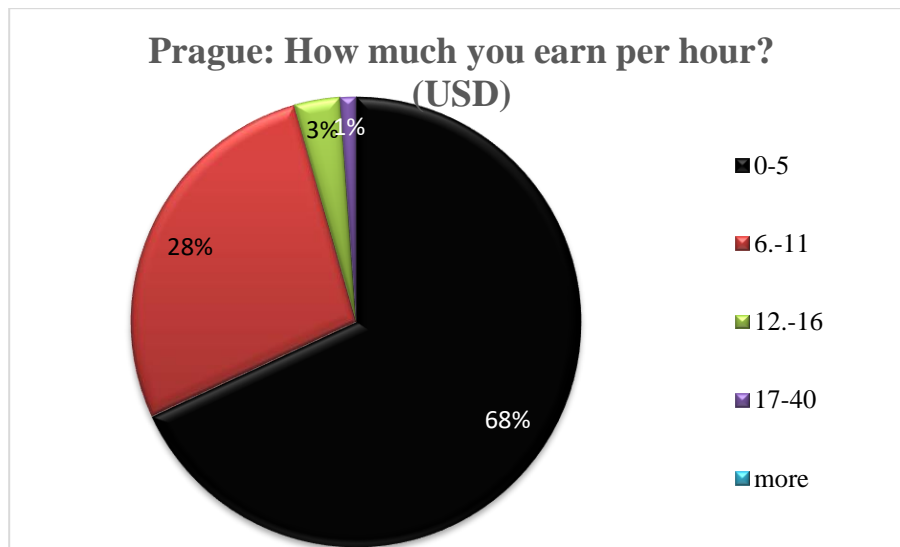
Graph 16: Boston: How much you earn per hour? (USD)



Graph 17: Dublin: How much you earn per hour? (USD)



**Graph 18:Prague: How much you earn per hour? (USD)**



The results of part, money earned per hour that are indicated in U.S. dollars, are very different in each country. Almost balanced results indicate American graph, where almost 52% of respondents earn \$6-11 and less than 32% of respondents earn between 12-18 US Dollars. On the other side, there is only 6.7% of those who earn less than \$5 per hour, which is the lowest number in the whole graph. Quite high is percentage of \$17-40, which is represented by 10% of respondents. It is necessary to add, that minimum federal wage in the U.S. did not raise since year 2009 and as it has been already set that the minimum wage in Massachusetts is 11 USD (Economic Policy Institute, 2017).

Similar result of highest share of money per hour is seen in Dublin's graph. 83% of people earn between \$6-11 representing the biggest share of the responses. Only 3% of people earn less than 5 US dollars and 14% earn between \$12-16. There is nobody, who earns more than \$17.

The most disparity can be seen in Prague. The majority of respondents that counts for 68% do not earn anything or they earn up to \$5. There is no surprise that only 28% of people, who answered the questionnaire, earn between \$6-11, which is almost same number for American respondents, who earn \$12-16.

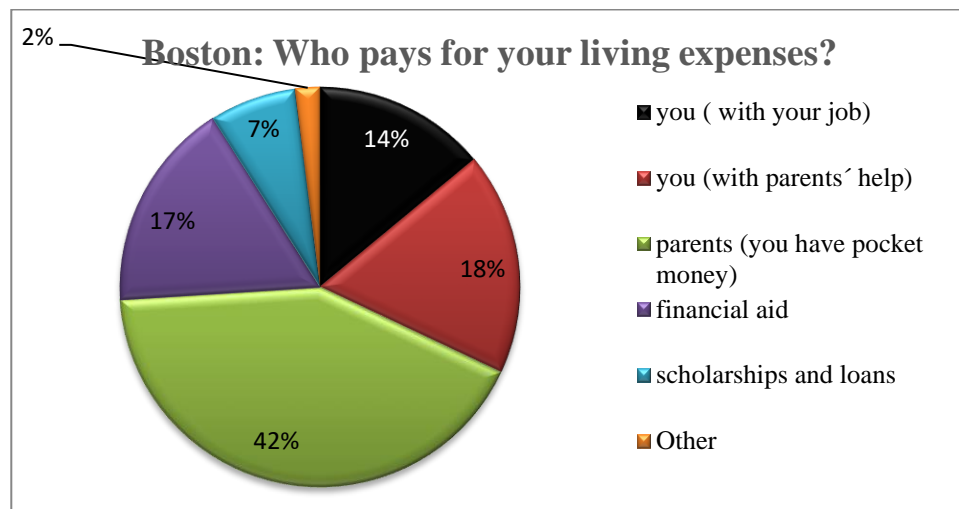
In terms of cost of living there is a very close relationship between hour wage and who pays for the living. Because there is a different percentage of people who work full or part time in close relation to who really pays for their expenditures. In the graphs below, there are data from 300 respondents, about who pays for their living expenses.

The very first graph, there are responses from the Boston and Worcester area and mainly parents pay for expenses of their children. Only 18% of respondents pay for their own living with very similar percentage of 17% that counts for financial aid. The share of financial aid is definitely the highest in the United States. Students rely on loans and it is very common issue in U.S., in terms of this graph 7% of people out of 100 got a student loan. There is a lack of people in Prague, who rely on any financial aid or a student loan. And Dublin counts only 8% of people, who pay their living out of a student loan or that they are dependent on a scholarship. Which is very different situation from Prague where is 0% of people dependent on any of these aspects.

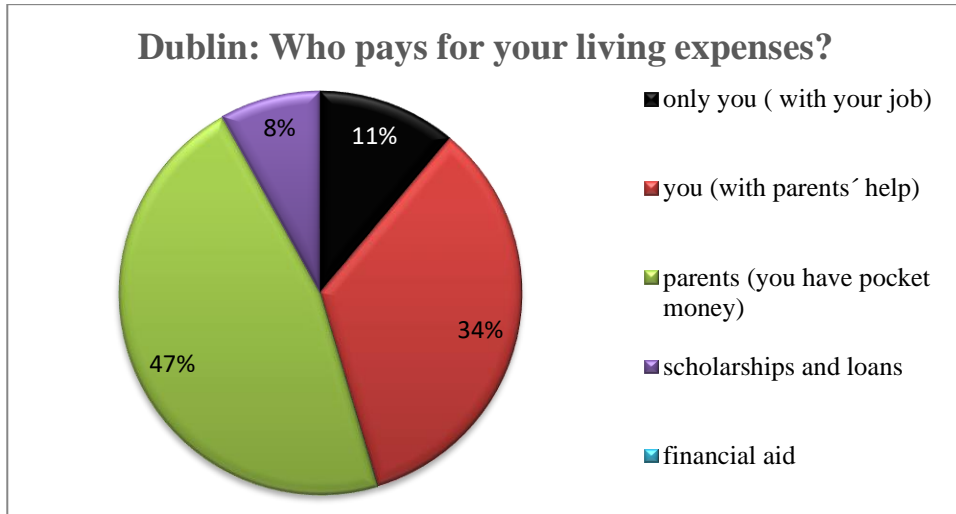
However, the results are the same in all countries. 42%, 47% and 56% of respondents answered that parents pay for most of their expenses. Second most common answer was that people themselves pay for their living, sometimes with some pocket money from parents.

#### 4.3.4.7 Who pays for your living expenses?

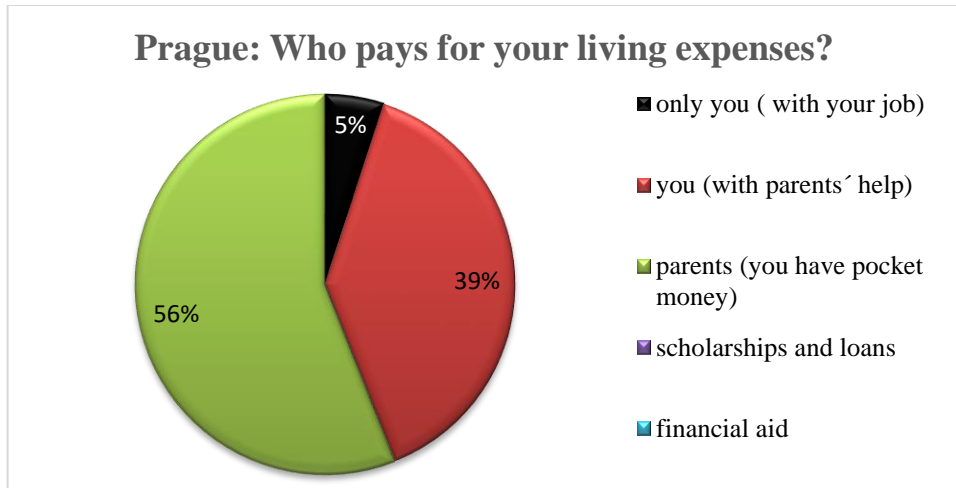
Graph 19: Boston: Who pays for your living expenses?



**Graph 20: Dublin: Who pays for your living expenses?**



**Graph 21: Prague: Who pays for your living expenses?**

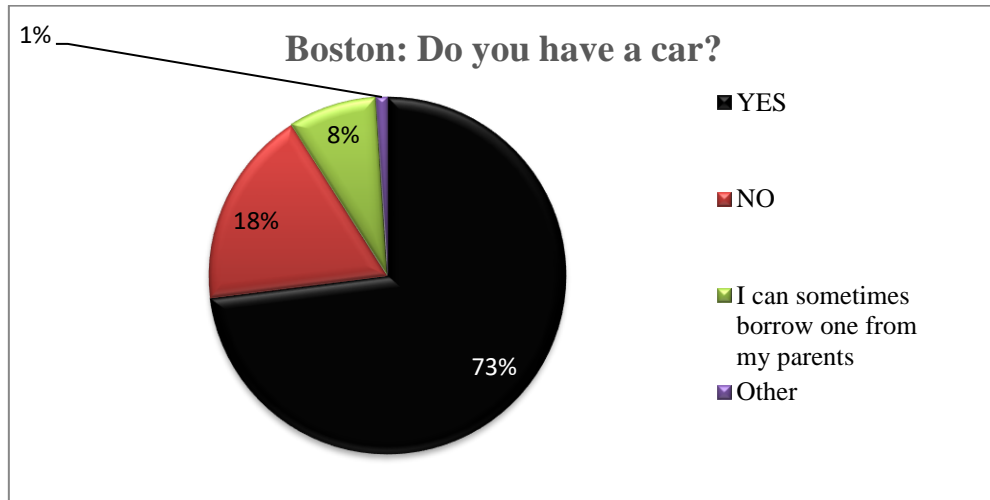




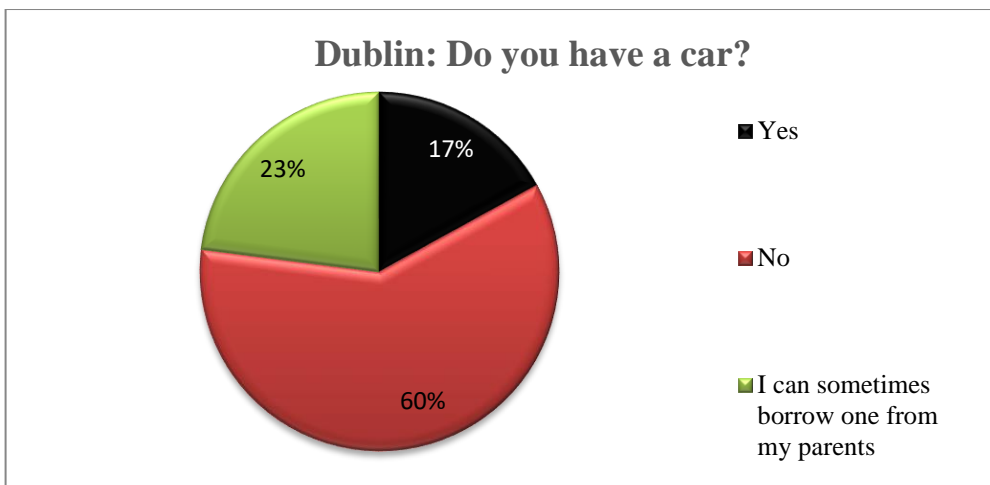
### 3. Transportation

#### 4.3.4.8 Do you have a car?

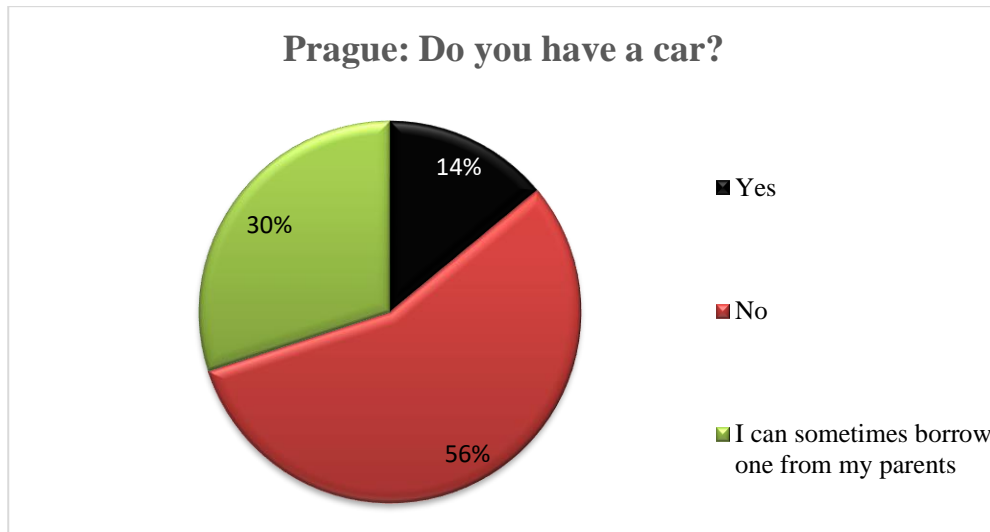
Graph 22: Boston: Do you have a car?



Graph 23: Dublin: Do you have a car?



Graph 24: Prague: Do you have a car?



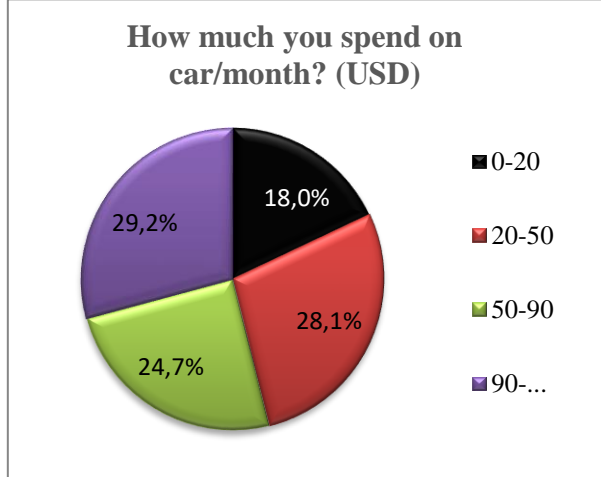
In the United States, people rely on their cars very much. 73% of asked people own a car in the U.S. and only 17% own car in Ireland and the least percentage could be found in Prague. That is why different taxation is in the U.S. A unit tax, tax per units of good, which is now approximately 27.30 cents per gallon as an average for all American states (EIA, 2017). A huge argument is also poor transportation in the U.S. in comparison with Prague or Dublin. There is a same percentage of Americans, who do not own a car as Irish people, who own a car. There is no surprising result from these graphs. Transportation in Dublin is also very expensive however Irish people are used to ride a bike within the city and that is why 60% do not own a car. US Gas is much cheaper when comparing these three, poor transportation in the U.S. is a reason why they own car and have unit tax on gas. There are totally different tax systems in these three countries. The U.S. has property tax or social security tax as well as for example alimony tax system unlike the others.

If people own or use the car in their daily lives, there is an important question about how much money they spend on it. In the U.S. the answer is very clear and not surprising, because the highest share of people owns a car and spend more than 90 USD per month. And reversely, the lowest number of people spend only up to 20 USD. The situation in Ireland and Czech Republic is different from America. Due to the fact that almost nobody owns a car, people from other two countries spent mostly maximum \$20 per car on gas. Most of the respondents just borrow their cars from parents or other people, so most of the 64% and 87% do not spend money on car at all. Only 10% of people from Prague spend up to \$50 and only 3% spend more than \$50. There are 17% of people who spend more than \$50 for gas per

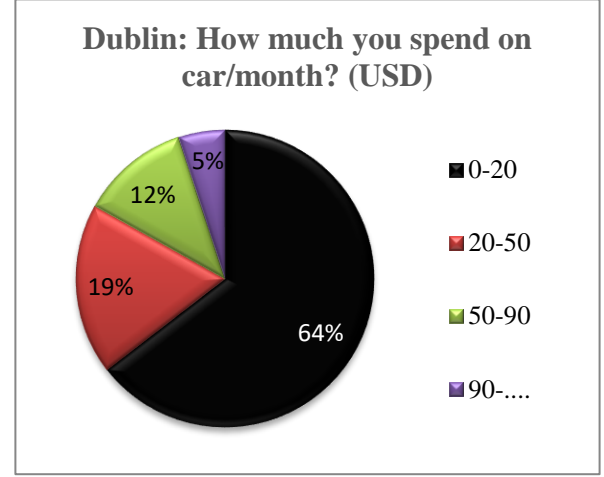
month in Dublin. There is no surprise about these results about spending money on cars and public transportation.

**4.3.4.9 How much you spend on car/month? (USD)**

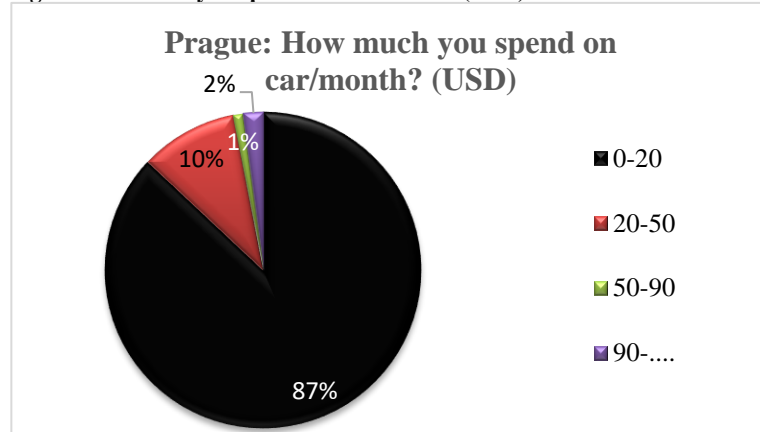
**Graph 25: Boston: How much you spend on car/month? (USD)**



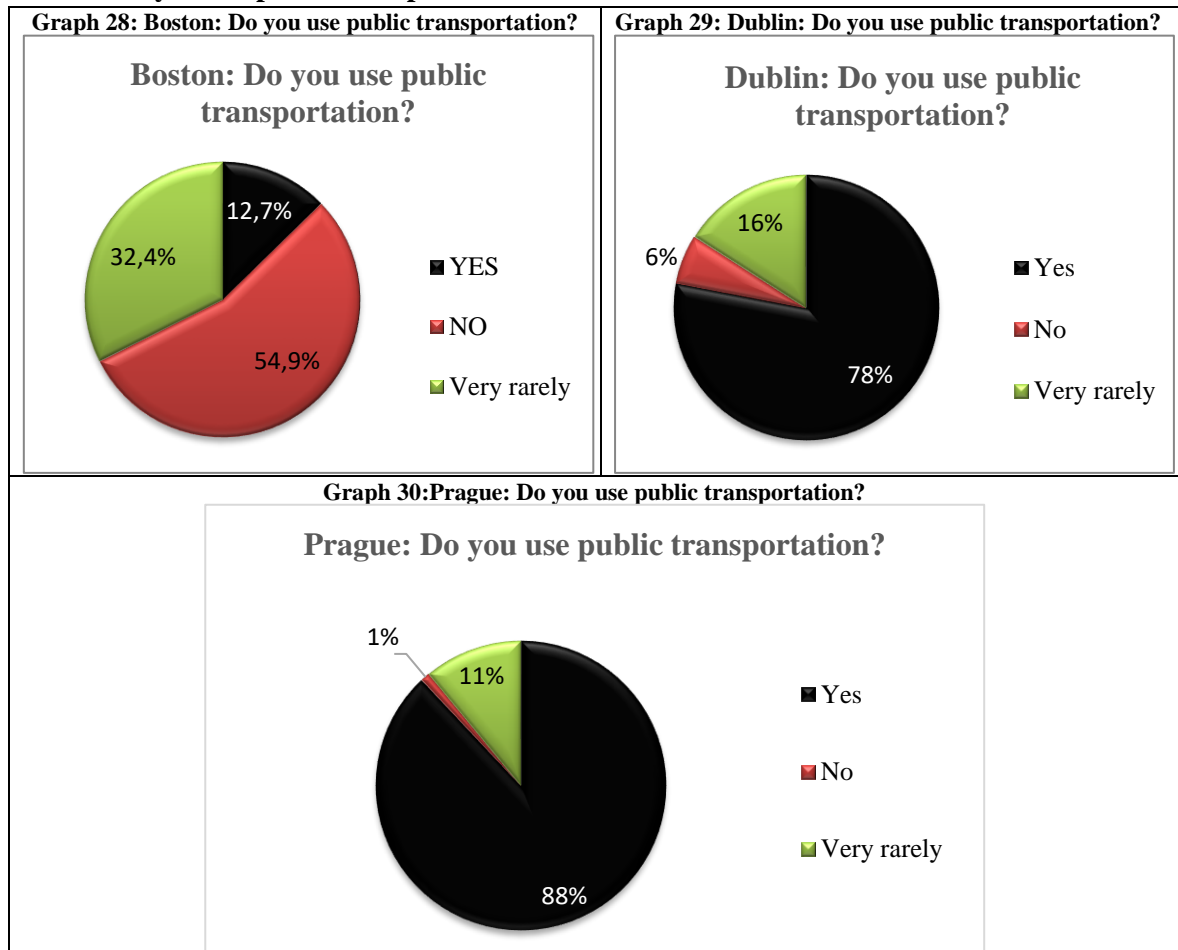
**Graph 26: Dublin: How much you spend on car/month? (USD)**



**Graph 27: Prague: How much you spend on car/month? (USD)**



#### 4.3.4.10 Do you use public transportation?



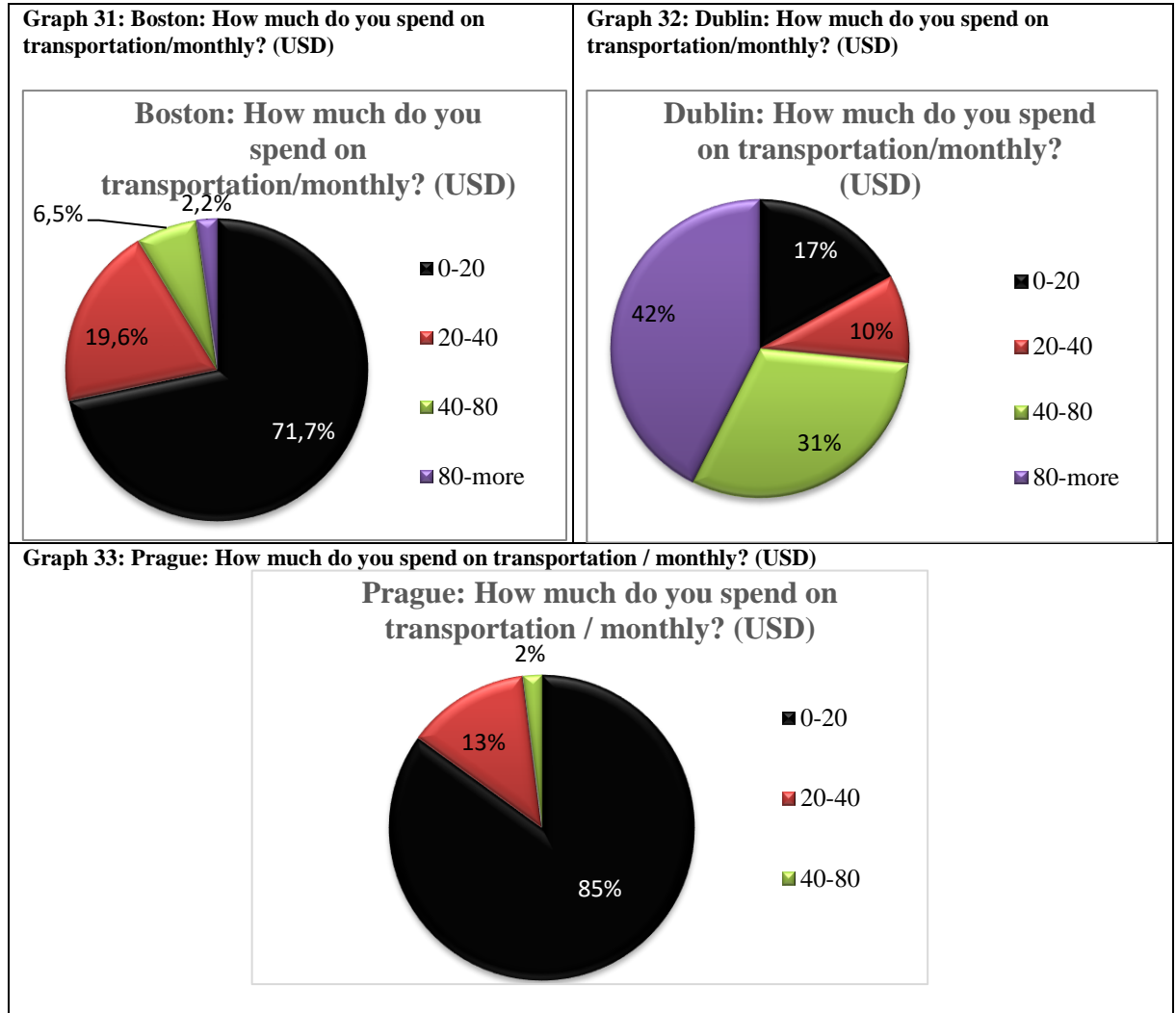
Another question, which is concerned with transportation and which is very important to answer is whether people use public transportation. Nowadays, good public transportation is very important not only from ecological point of view but also because of traffic jams and many car incidents, which happen on daily bases.

Almost 55% of American citizen do not use public transportation. Network of American transportation in cities or within a state is very poor according to the respondents. Less than half of the American respondents answered that they never or very rarely use the transportation and less than 13% use public transportation. The percentage is warning to those who does not use public transportation.

A reverse result could be seen in Europe. According to the first practical part of this thesis, public transportation is extremely expensive in Dublin and even though Irish people know the fact, 78% of respondents use public transport anyway. Prerequisite of Czech result was

confirmed and 88% of people use a public transportation and only 1 person out of 100 answered negatively. Decent amount of people uses public transport very rarely in Prague.

**4.3.4.11 If, yes (or rarely). How much do you spend on transportation / monthly? (USD)**



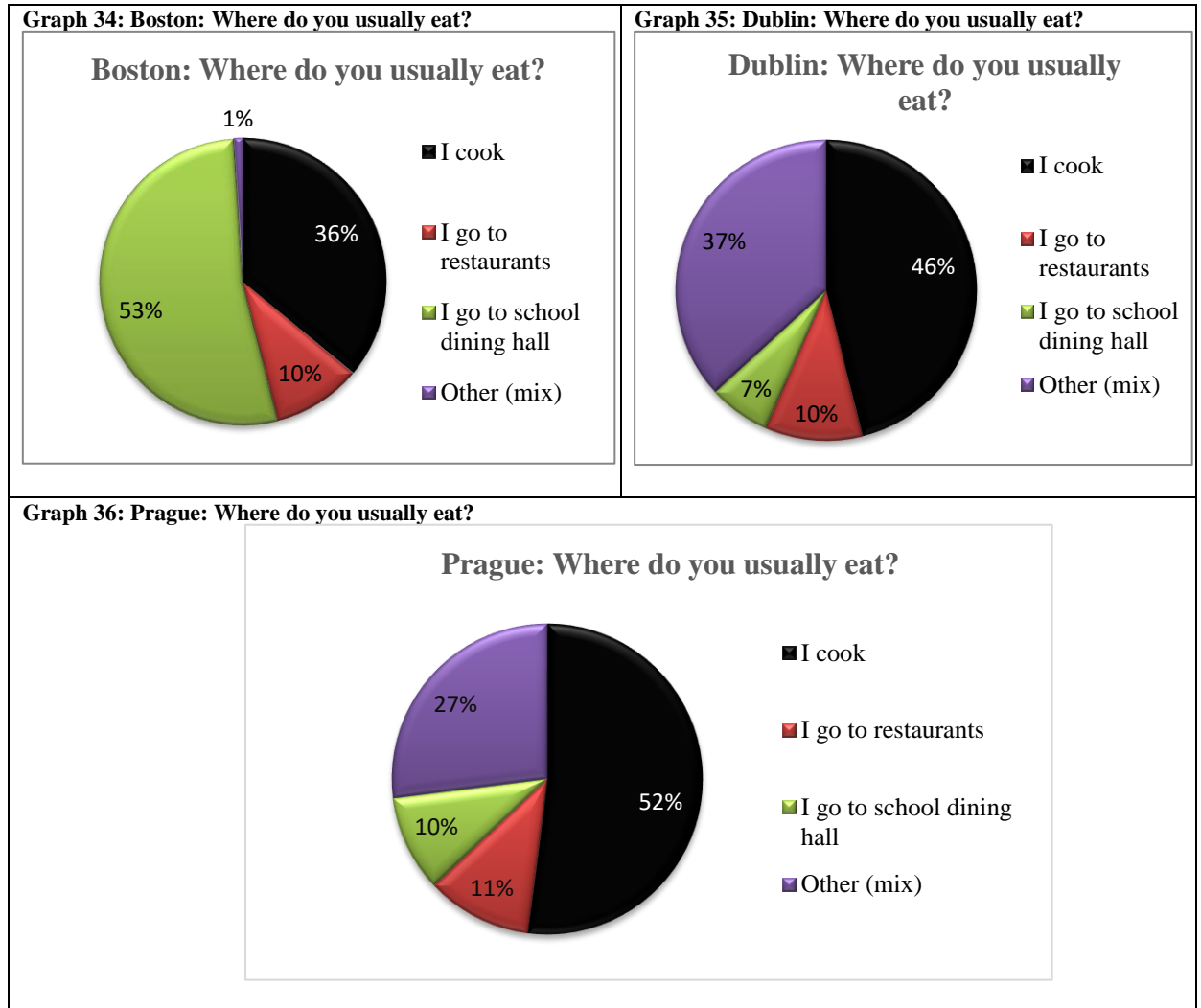
Due to the results of first answer, American respondents spend only 0-20 US Dollars for public transport per month. Sadly enough, only 2% of respondents answered that they spend 80 or more USD for buses. On the other hand, the highest percentage of Dubliners use public transport and spend more than 80 USD per month. Just 17% of Irish respondents spend the least amount of money for transportation.

Another situation can be seen in Prague. In fact, the public transport is very cheap there. According to Numbeo (2017) the one-way ticket is only 1.02 USD in comparison with one-way ticket in Dublin for 3.04 USD. 85% of people from Prague spend 0-20 USD per month

and there is none who spends more than 80 USD. Only 2% of respondents put in 40-80 USD on monthly bases.

## 4. Food

### 4.3.4.12 Where do you usually eat?



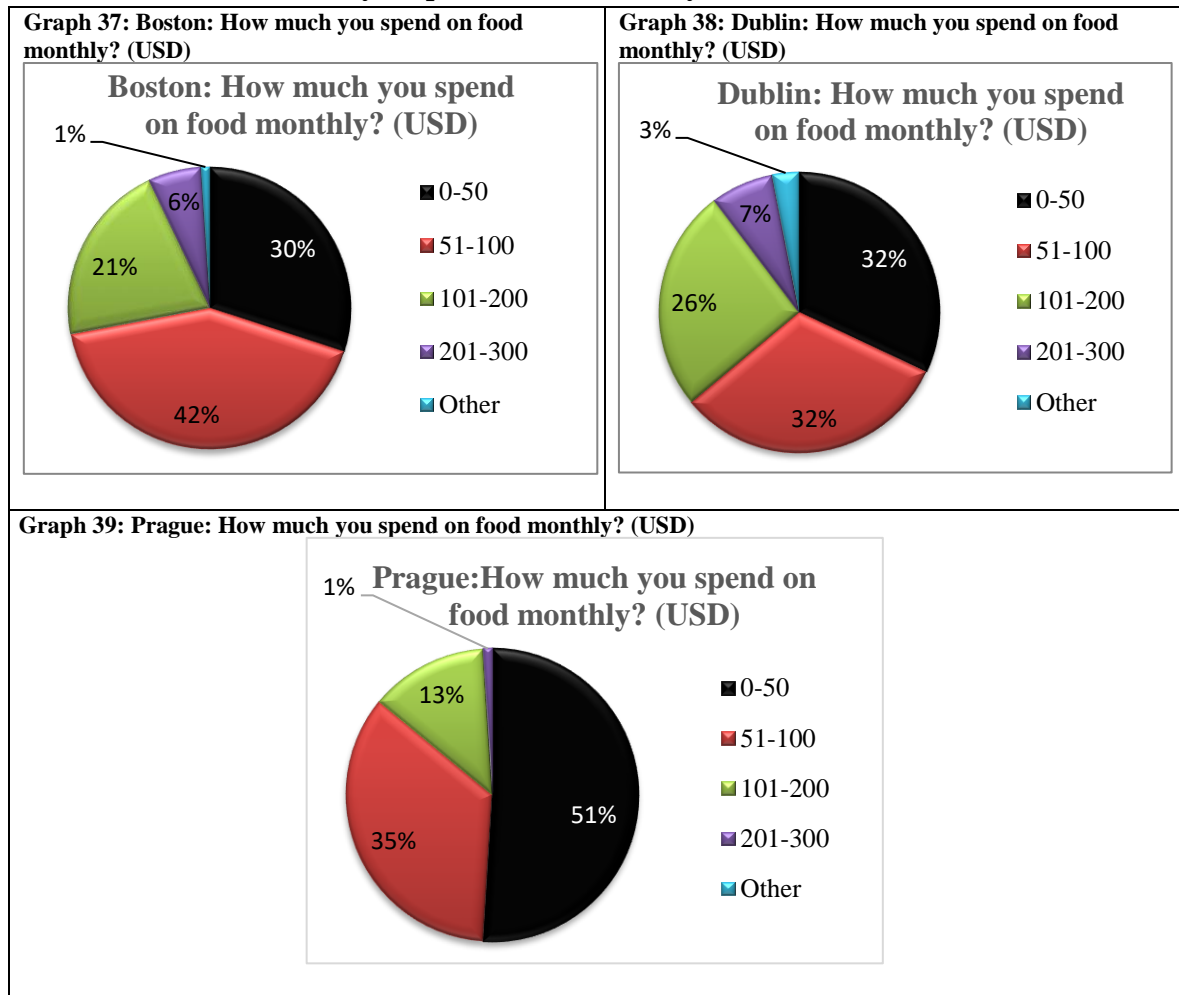
Another section called food, shows interesting but expected results. American respondents partially cook, or they use an option of school dining hall. The American system is very different from the European one. It is mandatory for all Freshmen students use a dining hall as well as the accommodation which school offers. Opposite to European students, who usually stay home or rent a flat from very first year of studies. To go to school dining hall is also more convenient and faster for American students, due to the big distances of US cities.

Most respondents from Dublin used an option for self-cooking at home or the other. Complementary answer for other was chosen as a mix of all options from the question. Very similar situation happened in Prague, where most of the respondents cook at home or elsewhere and they use all of the above options from time to time depending on situation.

Going for food to restaurants got a same low popularity in all three cities and it counts only for 10-11percent.

There is nothing to be surprised about in this section. According to the possibilities, prices and distances all of the data were obtained as expected.

**4.3.4.13 How much you spend on food monthly? (USD)**

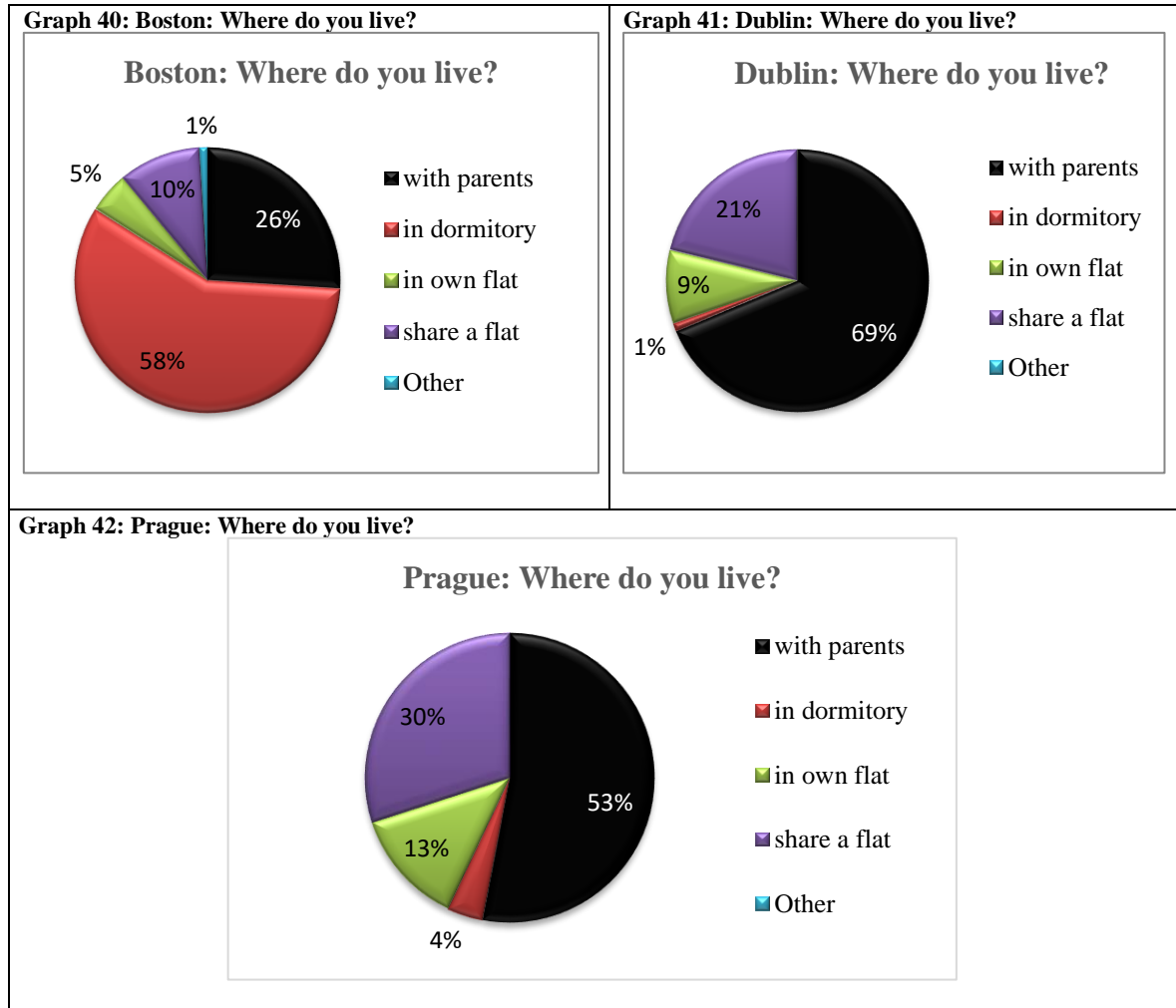


Very similar results are allotted in all three charts above. People from the sample usually spend between 0-50 USD or in case of the U.S. \$51-100 per month for food. The percentage in Dublin is fifty-fifty between \$0-100.

Only 1% of students in Prague spend between \$201-300, which is also small percentage shown in Boston or Dublin.

## 5. Living

### 4.3.4.14 Where do you live?



As the author mentioned before the school system differentiates from other countries and freshmen students and sometimes sophomore students need to use the accommodation at school. That is the reason for expected result in Boston chart. Less than 60% of respondents live in dormitory and only 10% of them share a flat. Decent amount of people still lives with their parents. 5% of them live in their own flat.

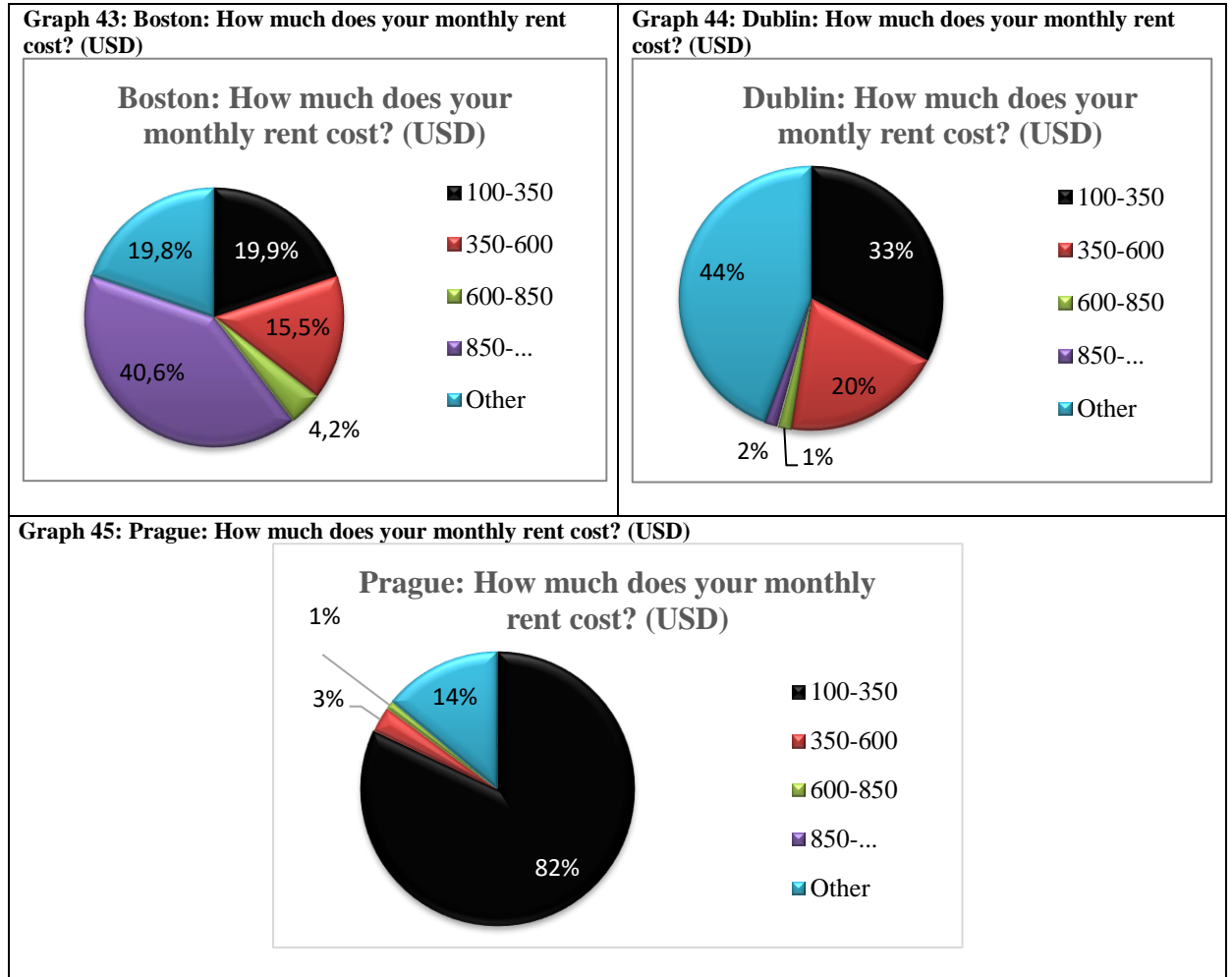
Same result can be seen in two other cities, where most of the people live with their parents. 9% of Dubliners own their flats and highest percentage of an ownership of an apartment is in Prague with 13%. Twenty-nine percent of Irish people share a flat with others and again,



the highest amount of people, who share a flat can be found in Prague. Thirty percent of respondents from Prague used an option of sharing a flat with others as a living choice.

The biggest difference is a choice of living that can be seen in percentage of living in dorms. 58% of Americans live in dormitories but only 4% respondents in Prague live in dorms and it is an option of only 1% in Dublin to live in dormitory.

#### 4.3.4.15 How much does your monthly rent cost? (USD)

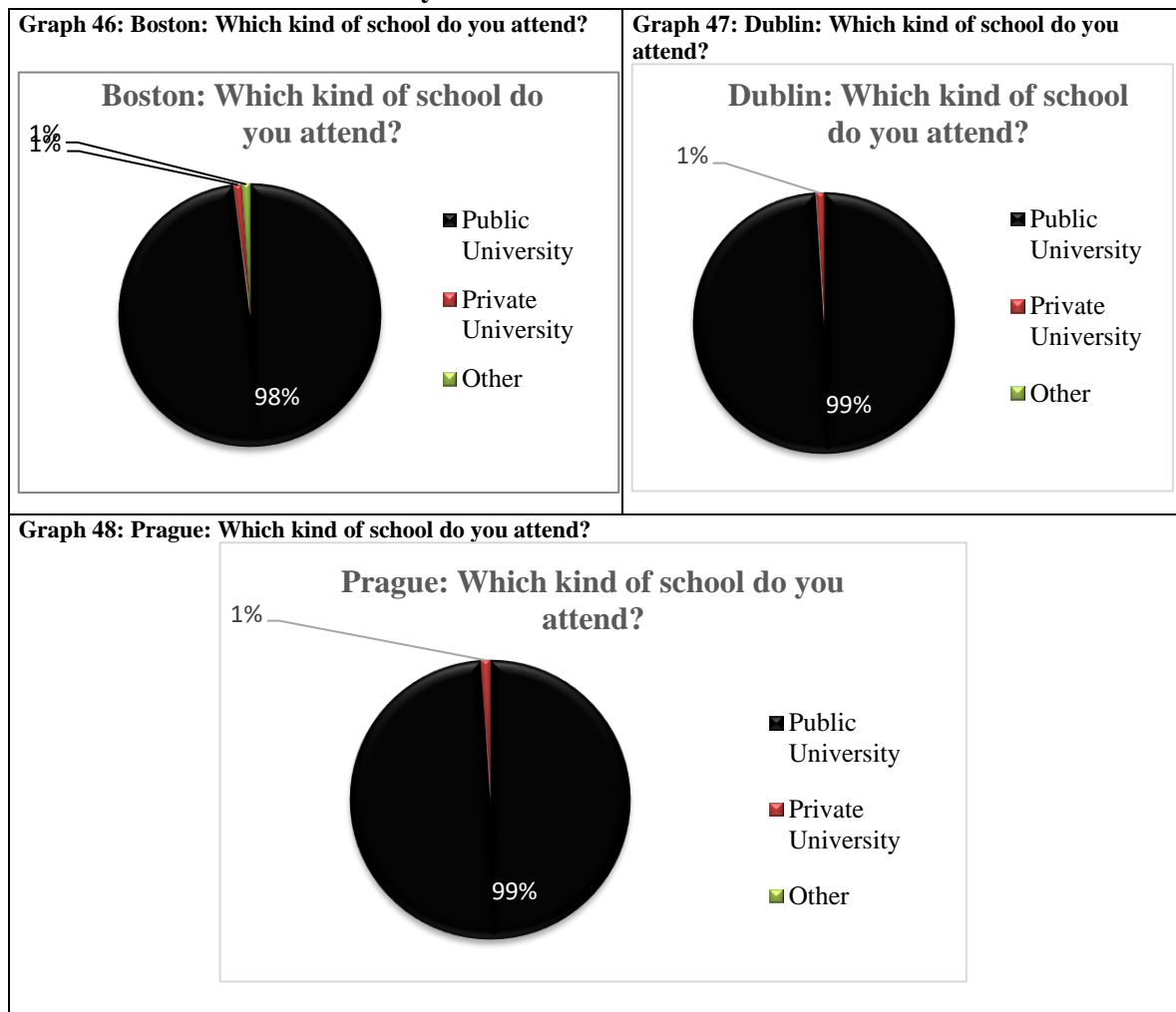


The reason of high prices of accommodation in the U.S. is not only the minimum wage but also the different educational system. A minimum wage in state of Massachusetts is according to Economic Policy Institute (2017) 11 U.S Dollars, which has been raised from 10 U.S Dollars in Jan, 2017. Almost 41% of American students spend more than \$850 for a housing per month. Alarming results for people who count only for 20% that pay similar prices as the European cities. Since most of the respondents live still with their parents in Dublin and also in Prague chose option other, because they do not pay monthly rent.

Due to the fact that higher percentage of people still live with their parents in Dublin, more people in Prague contribute to family monthly rent than people in Dublin. Majority of them spend between 100 and 350 USD per month. Just a part of only 33 percent of people in Dublin pay this amount as a contribution to the housing. Necessary to add that in these 33% there are also people who own or share the flat. Same in the eighty-two percent of respondents from Prague.

## 6. Education

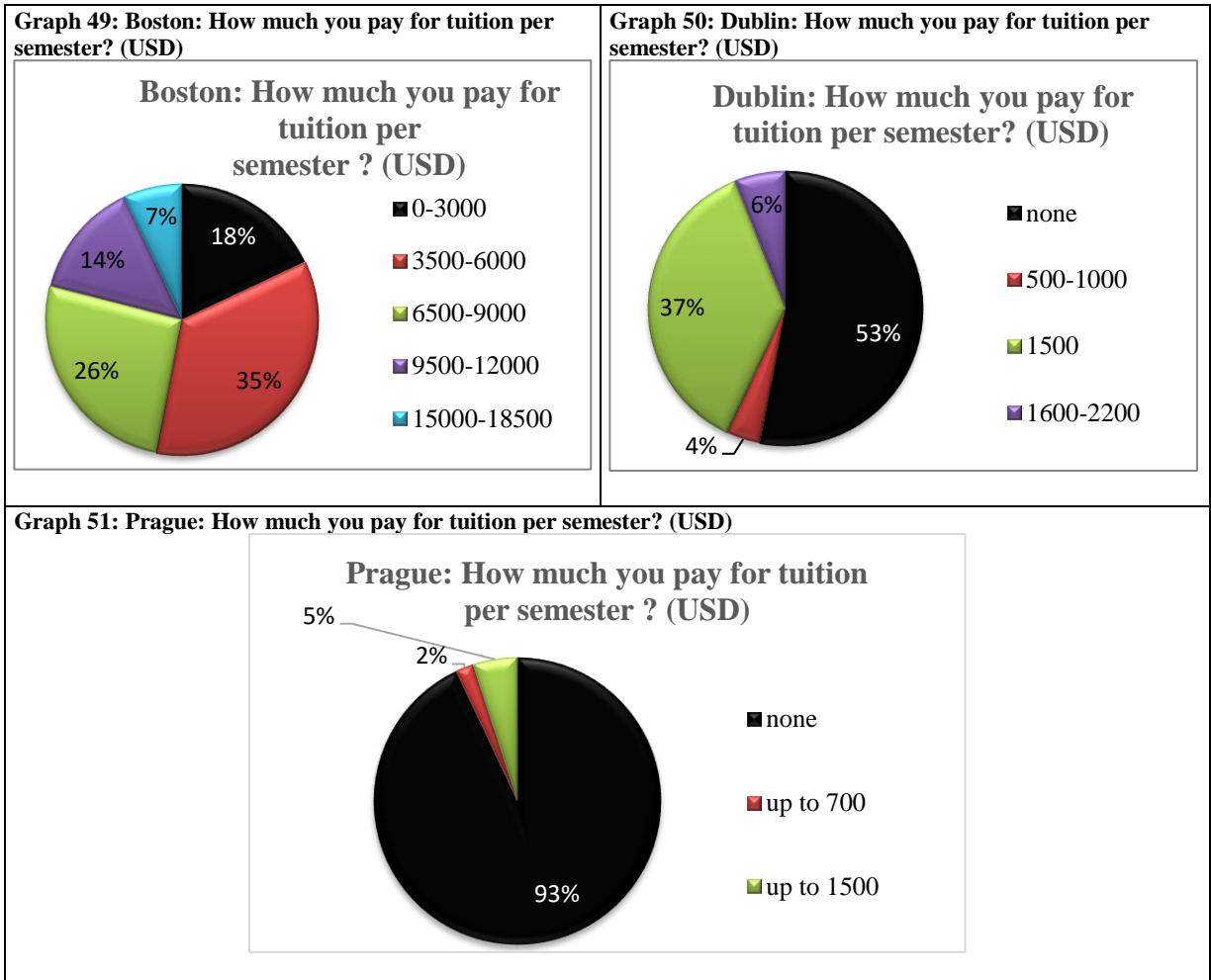
### 4.3.4.16 Which kind of school do you attend?



The author asked people only from public schools. One American respondent put an option other, because he attends both types of school. This questionnaire is unified so that the questions only match the answers from public schools.

The author used this question in order to confirm the respondent's school status. Which in most cases corresponds with expected results.

**4.3.4.17 How much you pay for tuition per semester (If you do not have tuition write NONE)? (USD)**



Under this question all respondents got same addition information in case they do not pay any tuition at all. The information was as follows, if you do not have tuition write none, and many of the respondents chose it as a positive answer. Due to the fact, that all the countries have totally different tuition system, the author had to modify the answer to an open answer possibility. That is the reason of different numbers in the charts, all respondents put different answers into the sheet and the author modified the graphs according to the answers.

The highest tuition amounts can be found in the United States. As student support organization called College Board (2017) published, the data for American students are as follows. Tuition for 2016/17 at public four-year university and college is average 9,650 USD

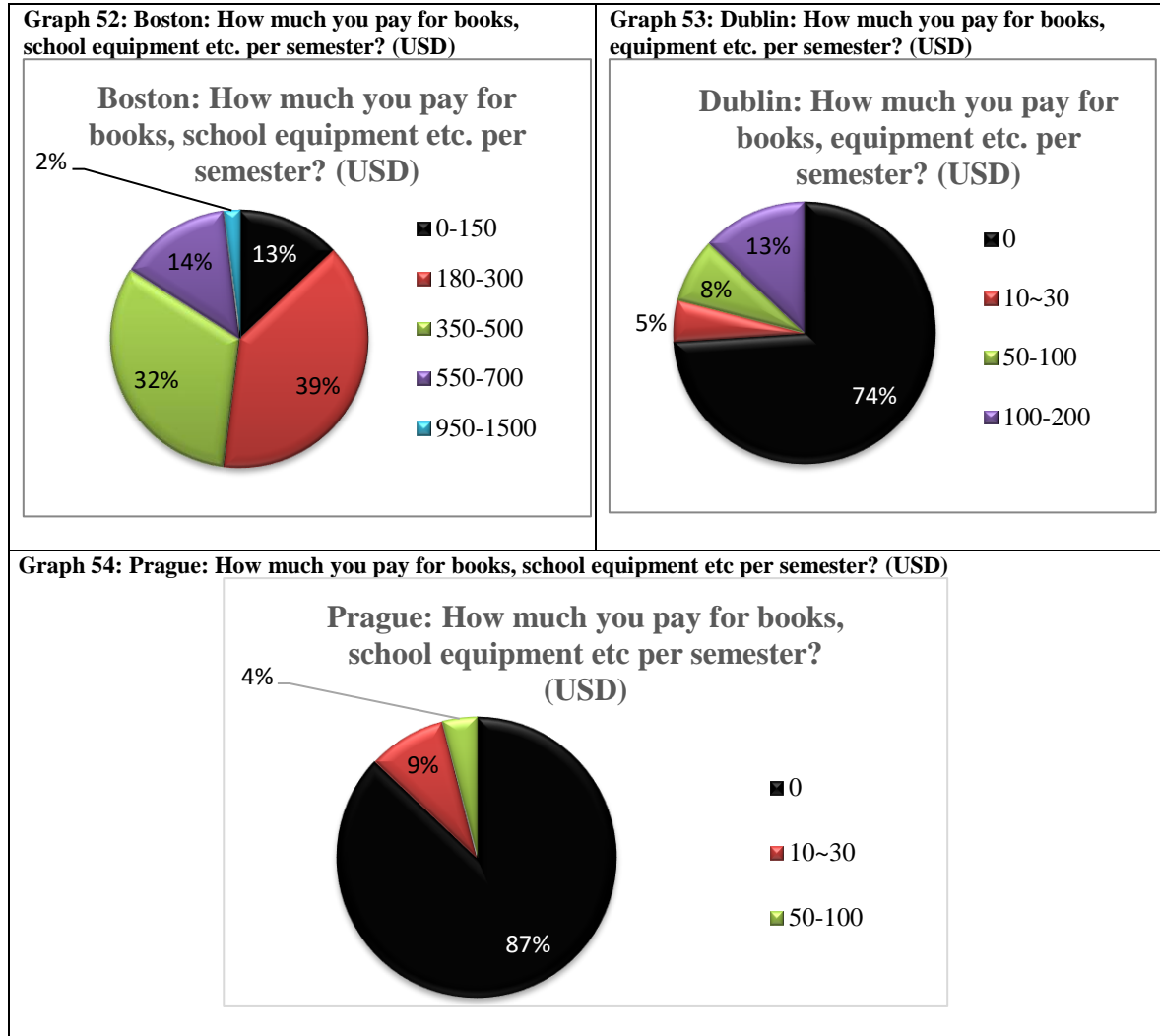
an in-state student and average 24,930 USD for an out of state student both without housing and food. Tuition, fees, room and board counting for average 20,090 USD for an in state and average 35,380 USD for an out of state. As the website notes, all of the data are not adjusted for inflation. Public sector two-year college is the cheapest among the options in the U.S. it is called also community, technical or city college. The fee is in 2016/17 average on 11,580 USD including all fees.

Different scenario is in Europe. If a person meets specific requirements such as residency within the European Union for at least 3-5 years, full time student status, refugee status in Ireland and many similar requirements, the so-called Ireland's Higher Education Authority under the Free Fees Initiative pays for university education (University Guide, 2017).

Very similar scenario can be seen in the Czech Republic, where the education is tuition fee free. With an exception of few charged majors for example taught in English but still on public school.

In this particular chart number 1 it can be seen that majority of respondents pay between 3500-6000 USD per semester. Which is extremely different situation from Dublin or Prague, where most of the respondents replied with free tuition answer. 37% of Dubliners pay up to 1500 USD per semester and only 5% of people in Prague pay up to same amount.

#### 4.3.4.18 How much you pay for books, school equipment etc per semester? (USD)

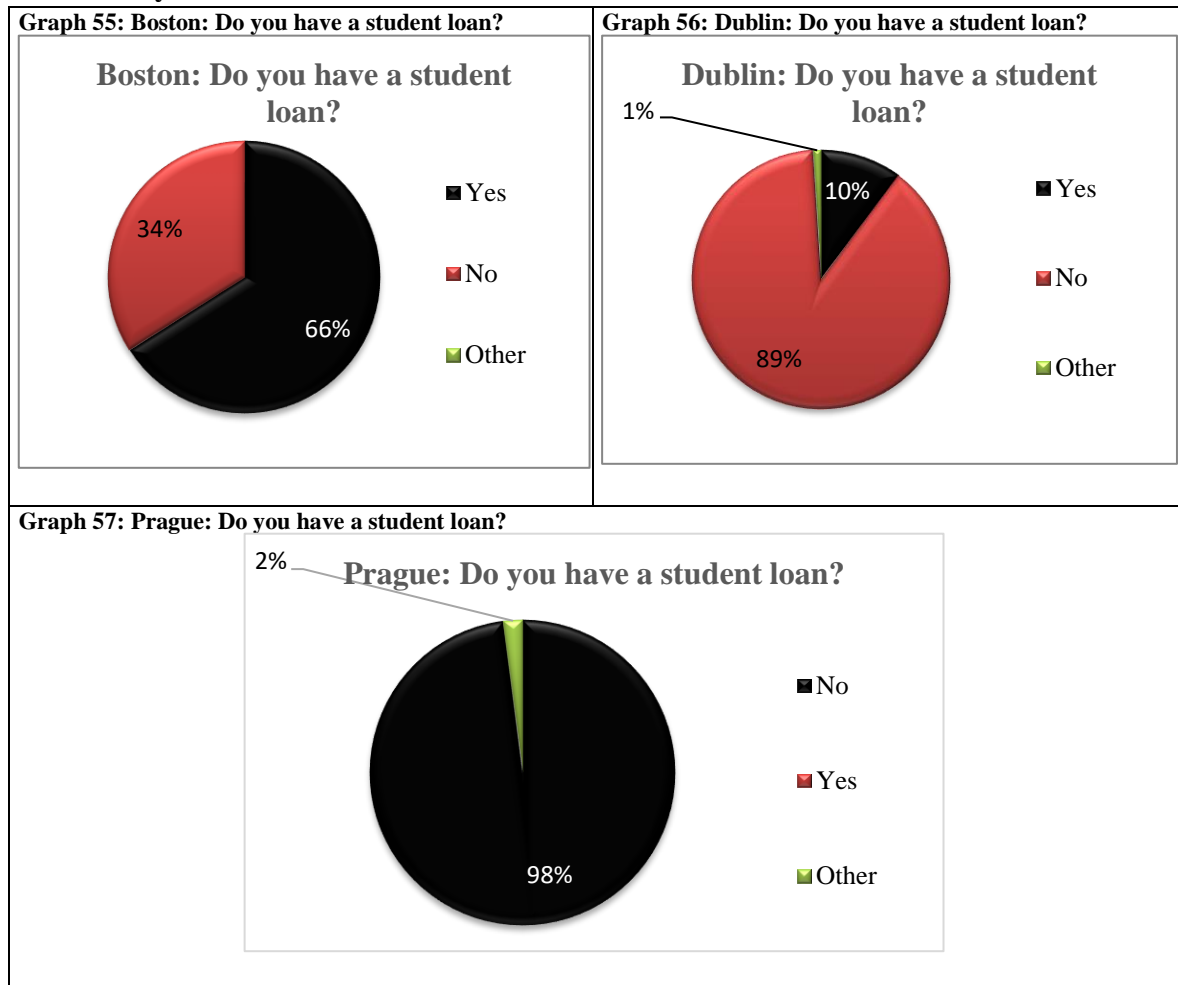


Enormous amount of money also goes to school equipment such as books, electronic materials, accesses, specialized tools and etc, especially in the United States. Almost 40% of respondents have to spend between US\$ 180-300 per semester. It is another unscrupulous and huge expense out of a student's pocket in the United States.

In comparison with Dublin and Prague the percentage is ridiculous. 74% of Dubliners pay no extra money for school equipment, because all the needed tools are possible to borrow free or for a deposit. If there is any extra expense, it is the highest of amount US\$ 100-200 per semester.

Similar situation shows the third graph. Prague's respondents do not have any extra expenses in terms of school equipment. Only 4% of them answered that they pay US\$ 50-100 per semester.

#### 4.3.4.19 Do you have a student loan?



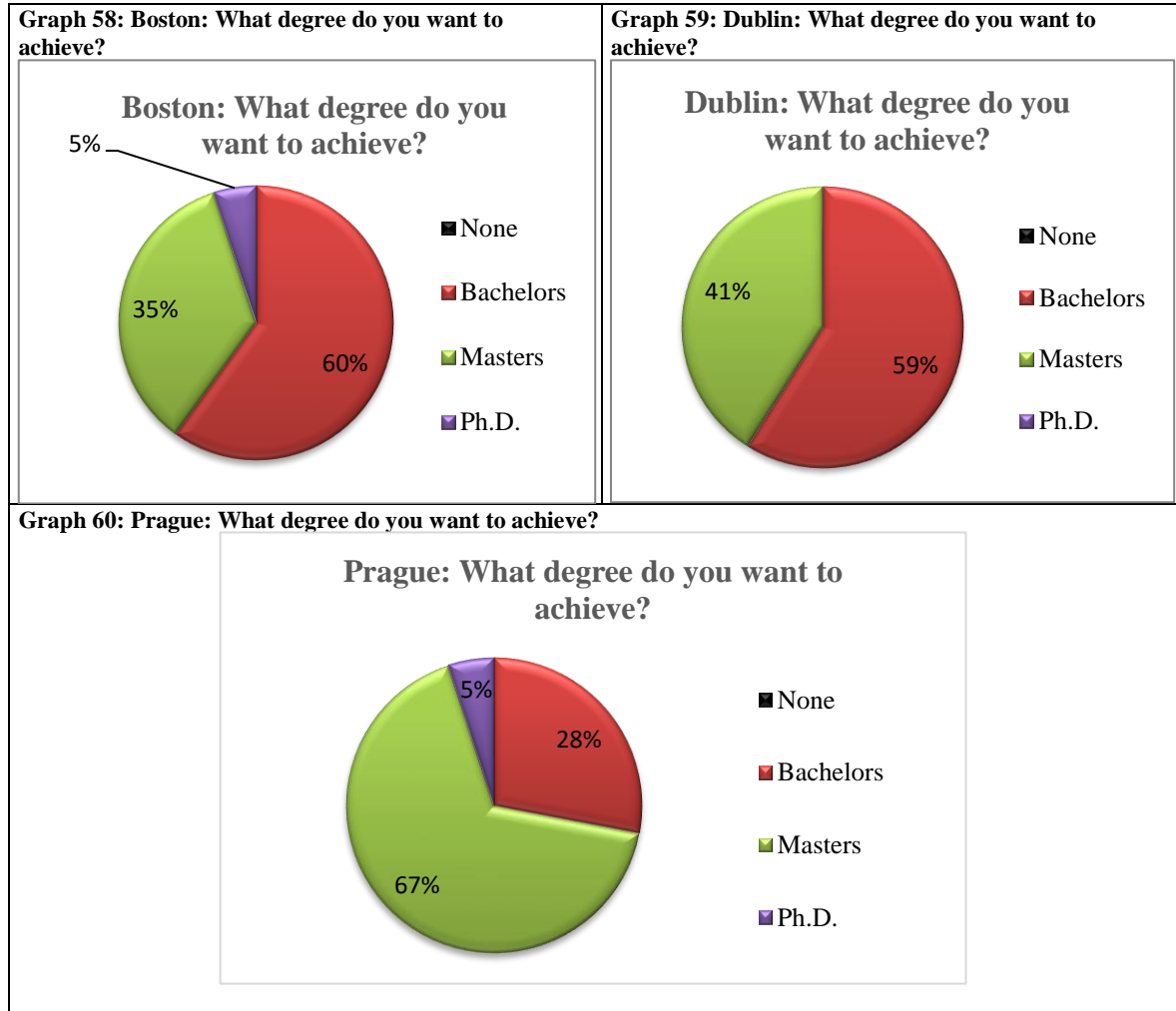
Another interesting part of the questionnaire is focused on student's loans. There is a lack of student loans on the Czech market, that is why ninety-eight percent of respondent in Prague do not have any student loan.

Eighty-nine people out of 100 from Dublin do not have any student loan either and only 10% answered positively on this question. There are multiple options for taking a student loan in Ireland but since the tuition fee is usually free of charge, people are not forced to take one.

The importance of student loans is extremely different in the United States. There is a huge variety of possibilities which student loan a person can take. Starting with federal student loan and ending with a private student loan option. Friedman (2017) writes about the Debt from student loans in 2017. He notes that there are 44 million students who borrowed and the debt itself is 1.3 trillion USD. He also adds data what a student owns on average. In the year of 2016 it is a number around 37,000 USD in student loan debt.

Almost 70% of the respondents from the questionnaire have a student loan. The percentage share was expected in all three graphs.

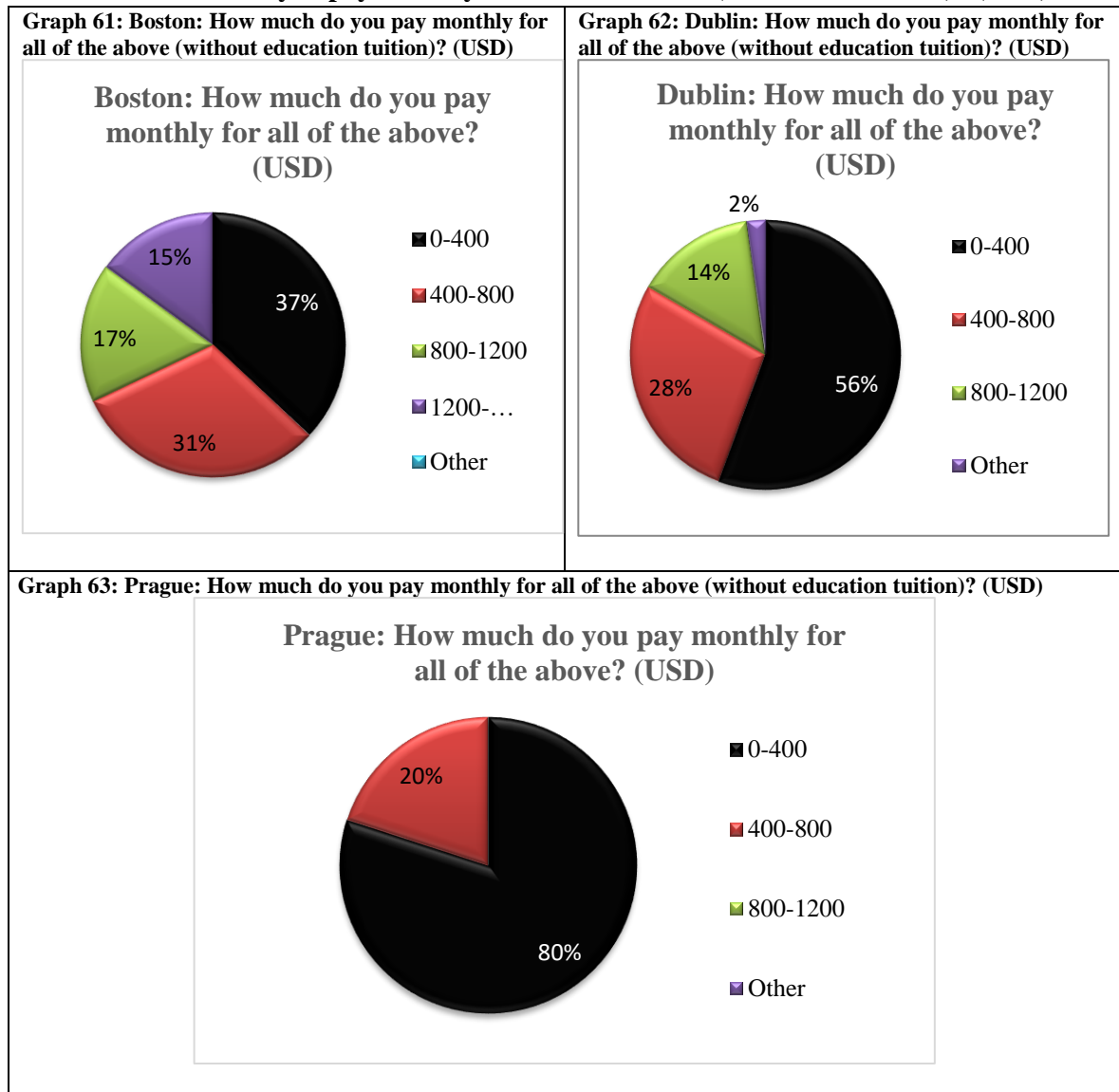
#### 4.3.4.20 What degree do you want to achieve?



An additional question concerning education is dealing with the needed degree that one would like to achieve at the end of his or her studies. Most of the respondents from Boston and Dublin would like to achieve only the first stage. Sixty percent of Americans from the questionnaire wants to achieve maximum bachelor's degree and 59 percent of Dubliners had a same result.

The result from Prague is opposite, because almost 70% of people want to achieve master's degree. Only 28% is for bachelor's degree and only 5% for Ph.D., which on the other hand corresponds with the chart from Boston. Very interesting data shows the graph from Dublin, where nobody put a positive answer to study Ph.D. degree out of 100 people.

**4.3.4.21 How much do you pay monthly for all of the above (without the tuition)? (USD)**



The very last question sums up the whole questionnaire. Final question number 21 is concerned with a total amount of money that one spends on his living per month excluding tuition and school fees. Even though the share of percentage is different in all three cities the result is the same for all of them. In Boston, Dublin and Prague the respondents spend between 0-400 USD to pay for their monthly expenses.

The lowest share of respondents can be found in America, where 37% of people spend this amount monthly and 31%, who spend 400-800 USD. Higher share of Dubliners, 56% spend the same amount and 28% spend 400-800 USD. Quite high share of people spends 800-1200 USD a month. It is 17% of Americans and 14% of Irish respondents. The highest share of people, who spend 0-400 USD is found in Prague with 80% of positive responses.



## 5. EVALUATION OF THE RESULTS

### 5.1 Results report

#### 5.1.1 Results of the Price Analysis

**Figure 21: Table of the most expensive items**

		Boston	Prague	Dublin
<b>Salaries and Financing</b>	<b>Avrg* Monthly NET Salary (After Tax)</b>	3951.3	1080.8	2698.2
Grocery Store	Milk (Regular, 1l)		x	
	Loaf of Fresh White Bread (500g)		x	
	Eggs (12)		x	
	Chicken Breasts (Boneless, Skinless, 1kg)		x	
	Apples (1kg)	x		
	Banana (1kg)		x	
	Tomato (1kg)		x	
	Potato (1kg)	x		
	Onion (1kg)	x		
	Water (1.5 liter bottle)			x
	Domestic Beer (0.5 liter bottle)			x
	Pack of Cigarettes (Marlboro)			x
	Restaurant	Meal, Inexpensive Restaurant		
	Mc-Meal at McDonalds		x	
	Domestic Beer (0.5 liter draught)			x
	Coke/Pepsi (0.33 liter bottle)		x	
Transportation	One-way Ticket (Local Transport)			x
	Monthly Pass (Regular Price)			x
Utilities (Monthly)	Gasoline (1 litre)		x	
	Basic (Electricity, Heating, Water, Garbage)			
	85m sq		x	
	Internet (10 Mbps, Unlimited Data, Cable/ADSL)			x
	1 min. of Prepaid Mobile Tariff Local (no discount plan)		x	
Leisure Time	Cinema, International Release		x	
Clothing	1 Pair of Jeans (Levis 501 or Similar)		x	
	1 Pair of Nike Running Shoes (Mid-Range)		x	
Buy/Rent Apartment Price	Price per Sq Ft to Buy Apartment, City Centre		x	
	Apartment (1 bedroom) in City Centre/month	x		
	Apartment (1 bedroom) outside City Centre/month			x
*average				

Source: own processing of data

The table above shows the final results of the most and least expensive items in the sheet. In order to mark the most expensive item among the cities, the author used -x as a resulting sign.

Firstly, grocery items are the cheapest in Dublin, due to the fact that only Prague or Boston are labelled as -x. Six out of nine grocery items are more expensive in Prague after adjustment and only three in Boston. It is the rest from Grocery Store section such as bottled beer, bottle of water and pack of cigarettes. Low grocery prices partially confirmed the results in Prague. But half of the grocery prices are the most expensive in Prague after the adjustment. Gasoline prices are extremely high in Prague as well as utilities and this fact is confirmed by the sheet above as well. Meal in not expansive restaurant is most overpriced in Dublin. High prices of domestic draught beer can be also found in Dublin.

It has been already said that the most expensive public transportation one can find in Dublin. As it is known, Dublin has the fourth most expensive monthly pass around the 377 world cities and the table of results confirmed that people in Dublin have to spend the most for the public transportation.

The distribution of expenses is very similar in all three chosen cities. The highest percentage of expenses can be found in a rent per month and the least expenses in clothing and leisure time. As a result, price per square feet is the most expensive in Prague, one bedroom flat inside of the city is the most expensive in Dublin. The highest expense for Americans is to rent a flat. Also, the results of adjusted values in the table above confirmed that 1 bedroom outside of a city is the most expensive variant of living for Americans.

As Numbeo (2017) claims the cost of living in city of Boston is 83.58% in contrast with New York city 100. The fact has to be taken into the account that single person in Prague spends around 13.200 CZK and in Boston 23.400 CZK. Additionally, the cost of living in Prague is approximately 45% lower than in Boston, but the salary is not taken into the account.

Interestingly enough, one would claim that the most expensive living is in the U.S., also the cost of living index is the highest but when the author adjusted the salary data with base of Boston to other cities. Salary in Dublin is 1.4 times smaller than in Boston and 3.6 smaller in Prague and still the majority of the most expensive items in comparison to the cities can be found in Prague.

### 5.1.2 Results of the Regression Outcome

Figure 22: Results of Outcome

Multiple R	<b>0.952</b>
R <sup>2</sup>	<b>0.906</b>
Adjusted R <sup>2</sup>	<b>0.885</b>
E	<b>8.857</b>
No. of observations	<b>38</b>

Figure 23: Results of Verification			
Economic Verification			Statistical Verification
Assumption	1	$\gamma_8$ Not confirmed	Intercept $\alpha$ SI
Assumption	2	$\gamma_1$ Not confirmed	x1 0.01 SI
Assumption	3	$\gamma_2$ confirmed	x2 0.01 SS
Assumption	4	$\gamma_3$ Confirmed	x3 0.01 SS
Assumption	5	$\gamma_4$ Confirmed	x4 0.01 SI
Assumption	6	$\gamma_5$ Confirmed	x5 0.01 SS
Assumption	7	$\gamma_6$ Confirmed	x6 0.01 SI
Assumption	8	$\gamma_7$ Confirmed	x7 0.01 SS

Source: own processing of data

The second sub-capitol of Chapter 2 examined the relationship between Consumer Price Index Local Purchasing Power and selected variables with the use of multiple linear regression. Hypothesis were defined, and multicollinearity was not found among explanatory variables. Excel tool was used, and parameters estimated.

In terms of economic verification five out of eight parameters including the intercept were confirmed. Five confirmed parameters are as follows: Average Monthly Disposable Salary, Unemployment, Population, Education and last but not least the overall Economic Freedom. It can be claimed that majority part of the model was consistent with the theory.

In terms of statistical verification, 99% level of significance was used, and comparison of p-value and 0.01 value applied. As a result, four out of eight parameters including the intercept were statistically significant. Four statistically significant parameters are as follows: GDP Growth, Average Monthly Disposable Salary, Population and the overall Economic Freedom.

Explanatory variables Average Monthly Disposable Salary, Population and overall Economic Freedom confirmed its positive signs and their parameters are statistically significant. As a result, three out of seven explanatory variables are relevant for the analysis.

Testing for coefficient of determination -  $R^2$  defined, that 90% of the variation of the explained variable is defined by the explanatory variables and the function of this relationship. The author confirms, that the model might be a representative model for further investigation in this topic.

### 5.1.3 Results of the Structured Questionnaire

Figure 24: Results of the Structured Questionnaire

<b>Personal Information</b>	<u>Boston</u>	<u>Dublin</u>	<u>Prague</u>
Age	21	20	21
Gender	F	M	F/M
Year of Education	4	4	2
<b>Income</b>			
Job	Yes	Part-time	Part-time
Hours	0-15	16-25	0-15
Money	6 -11	6 -11	0-5
Who pays for living	Parents	Parents	Parents
<b>Transportation</b>			
Car	Yes	No	No
USD spent for car	90 - more	0-20	0-20
Public Transportation	No	Yes	Yes
USD spent for transport	0-20	80 - more	0-20
<b>Food</b>			
Where	Dining Hall	I cook	I cook
USD spent for food	51-100	51-100	0-50
<b>Living</b>			
Where	Dormitories	with parents	with parents
Rent costs	850 - more	other	100-350
<b>Education</b>			
University	Public	Public	Public
Tuition/semester	3500-6000	none	none
USD spent for equipment	180-300	0	0
Student Loan	Yes	No	No
Intended Degree	Bachelors	Bachelors	Masters
<b>USD spent on living*</b>	0-400	0-400	0-400

To sum-up the results of the questionnaire, the sample of the questionnaire has limited interpretative power due to the observation's sample age. It does not correspond with whole population. It does correspond with students between 18-50+ age from particular city of observation. Nevertheless, the questionnaire is a scientific experiment which has its objectives, hypothesis and results. And in this case the objectives met the expectations.

***Hypothesis Results***

**Figure 25: Results of Questionnaire Hypothesis**

H <sub>1</sub> : Respondents from all cities work mostly part time.	Not confirmed
H <sub>2</sub> : Parents are those, who pay for the living in all chosen cities.	Confirmed
H <sub>3</sub> : American respondents use their cars unlike the rest. So, they spend the most money on car.	Confirmed
H <sub>4</sub> : American respondents do not use public transportation unlike the rest.	Confirmed
H <sub>5</sub> : Respondents from Dublin spend the highest amount of money of the transport.	Confirmed
H <sub>6</sub> : Majority of all respondents from all cities cook for themselves.	Not confirmed
H <sub>7</sub> : American respondents spend the highest amount of money on food.	Not confirmed
H <sub>8</sub> : American respondents live in dormitories unlike the rest.	Confirmed
H <sub>9</sub> : American respondents spend the highest amount of money on rent.	Confirmed
H <sub>10</sub> : American respondents pay the highest amount of money for tuition fees and equipment	Confirmed
H <sub>11</sub> : Majority of American respondents have a student loan.	Confirmed
H <sub>12</sub> : Respondents from Prague are the only ones, who would like to achieve MSc degree.	Confirmed
H <sub>13</sub> : American respondents pay the highest amount of money for living per month.	Not Confirmed

Nine out of thirteen chosen hypothesis are positive and confirmed. The first hypothesis is not confirmed, because majority of American respondents have a job. Hypothesis 6 is negative, because American respondents usually go to school dining hall and cook for themselves as a second option. Hypothesis 7 is not correct, because Dubliners spend the same amount of money according to the results. And finally, the hypothesis number thirteen

is not confirmed, because majority of the 300 respondents spend the same amount of money for the living.

The results are as expected, with a few interesting differences. It is confirmed that the studies are the lowest in Prague and for example that majority of people works part time or in full time employment relationship. Another important fact is that there are huge wage differences between the countries and respondents from the U.S. earn the highest amount of money per hour. In general, the educational system in the U.S. is very different from European and that mostly influence the respondents in the questionnaire. Living in the U.S. is very expensive for students especially because of education. Mostly parents pay for their expenses, because students do not have enough money. The highest share of people with student loan is in the U.S. and there is nobody from Prague, Czech Republic, who is dependent on a financial aid or a student loan. There is apparently a huge gap on the Czech market, with student loans. Only 8% of respondents from Ireland take advantage of a loan or scholarship.

Fifty-eight percent of American respondents live in dormitories and 53% eat at school dining hall, which is very different from chosen European cities. 53% of respondents from Prague still live with their parents and 52% cook for themselves, only 10% go to school dining hall. The situation in Dublin is similar. 69% respondents from Dublin live with their parents and 46% of them cook. Only 7% of Dubliners go to school dining hall.

## **5.2 Self-criticism:**

In addition, generally the questionnaire has low validity, because the research cannot be done into the depth. This questionnaire is not detailed, and it excludes the explanation of the answer. Trumen (2016) also adds that it is very simple to omit an important question. On the other hand, if the questionnaire is anonymous, there is high probability of truthfulness of respondents.

In terms of second analysis, the author is aware of negative assumptions and not statistically significant parameters, which occurred in the minority of cases. However, all the other criteria were correct, and they are consistent with the theory. Despite the fact, that reality might be different, the rest of the parameters justify the results. Yet, it is interesting to study what is happening in this sphere of examination.

## 6. DISCUSSION

Unexpected results from the Price Analysis show that the highest expenses could be found in Prague. The author's hypothesis inclined to the result that it would be the United States, but the opposite is true. OECD ranking report shows that the Czech Republic's minimum wage workers have to work the most hours out of the list in order to stay above the Czech Republic poverty level (Park, 2015). Furthermore, he further concludes that Czech people have the toughest minimum wage from 34 countries of OECD. The Czech Republic is trapped in a low salary conditions and as DW (2017) confirms, the Czech salaries are not low in comparison only to Western Europe, even though the economic potential says difference. Due to this fact, Prague shows results of the most expensive city out of the three cities under examination.

In the second analysis, four out of eight variables ended as statistically significant. Gross Domestic Product Growth in % was indicated as statistically significant but it did not confirm the positive assumption. So as Ronnasi (2014) claims, consumer spending, which is closely related to the costs of our living, is essential part of a growth in the economy, therefore the author claimed that with higher GDP Growth there are higher costs. The assumption was not confirmed, and the author admits, that it goes against the theory. On the other hand, all other three variables consist with the theory.

Thirdly, the last analysis confirmed that the highest expenses for Americans are rent and education. Not only there are over 44 million of people, who rely on loans, but the average tuition stays around 20 – 35 000 USD per year in the U.S. (Hess, 2017). It confirms the statement of the author as well as the results. Another conclusion from the third part is that Dublin is a place for the most expensive public transportation. As Ailbhe (2016) confirms in the article Dublin's transport is the four highest in Europe and bus fares are the biggest. He adds that the prices are twice as the European average. The Czech Republic has one of the most expensive mobile data among European countries. As a result, there are also utilities and gasoline prices which are extremely expensive for people from Prague. The Global Petrol Prices (2017) proves that the Czech Republic's average price for gasoline was 29.83 CZK from July to October 2017 in comparison with the USA, where the prices is 0.73 per litre on 16 October 2017. But the Czech Republic is very near the world's average, which counts for 29.70 CZK per litre in the same time period. The results were confirmed with majority of the hypothesis.

## **7. COMMON AND CONTRASTING FACTORS OF ANALYSES**

### ***COMMON FACTORS***

The common results of first, second and third analysis inclined to the conclusion that average monthly disposable salary, population and the overall economic freedom influence the consumer price index local purchasing power. These variables are statistically significant and confirmed its assumptions. It goes hand in hand with the results of first analysis where salary influence the outcome the most. One would say, before the adjustment, that the most expensive city would be Boston but after the author adjusted the values, Prague is the resulting city. It explains the result from the second analysis. The third analysis proves very similar conclusion, because salary per hour influences cost of living of 300 respondents in their answers very much. Another common factor is between the first and third analysis. The salary conditions are very poor in Prague, as the third analysis confirms and that is the reason why the result of the first analysis proves that Prague is the most expensive cities among cities of examination. Also, the highest expense in Dublin is the transportation, especially the bus one-way ticket proved its results in the first as well as the third analysis. Conclusion from the U.S. is a high rent status. The price analysis as well as the questionnaire proved the same result. It can be seen that the data met the personal opinion of respondents in most of the cases.

### ***CONTRASTING FACTORS***

One of the contrasting factor can be seen between the second and the third analysis. Even though the education confirmed its assumption, it does not show the statistical significance. The main result out of the third analysis is that the highest expense in the cost of living for Americans is the education. Due to the fact, that Prague offers small salaries in comparison with western countries of Europe or the USA, the items after the adjustment shows extreme difference between prices but data from questionnaire shows that items in Prague are very affordable to the respondents. Even though the prices are low in Prague, for Czech citizens the cost of living is really high and the ratio between prices and salary is unacceptable. When people come from abroad Prague is priceless but that does not work for people from Prague. Also, the price analysis shows that price per square meter is the most expensive in Prague but the highest share of people who own a flat can be found in Prague. More or less, there are more similarities and common factors found in the analysis than the contrasting results.



## **8. CONCLUSION and RECOMMENDATION**

Cost of living, as one of the most important aspects that influence our life. The aspect, with which we must work every single day. And aspect, which is influenced by so many factors. Some of them we can change and some of them are fixed. As it was explained in the section of the literature review, cost of living is an aspect of our life, about which everybody talks all the time for many reasons. Money, inflation, standard of living, quality of life these and many more forms of our life are dependent on the cost of living. Simply, cost of living is an integral part of each of us.

The theoretical background can be found in the Chapter 1, where all the basic concepts, ideologies and approaches are explained. Furthermore, the author chose three representative countries, more specifically, cities that are similar in their size and population. Also, the overview of the countries under the investigation was made. The cost of living point of view in the U.S., the Czech Republic, and the Republic of Ireland is available at the end of the Chapter 1 as well as the comparison of these countries. Chapter 2, the analytical part, contains three different researches in order to answer the problematic of cost of living from broader point of view. The price analysis, the regression analysis and the structured questionnaire.

As the first analysis confirmed, one would say that it is the most expensive in the United States, because as the data shows, the items are the most expensive there. Even though market items are very cheap in Prague in comparison to Irish or American items, it is not necessary cheap for Czech people, due to the lower monthly disposable salary, which is approximately 3.5 times lower than in the city of Boston. One would say that at least a bottle of beer is cheaper in the Czech Republic, but the reverse is true. Vegetables and fruit show very high prices in Prague but the most expensive is definitely gasoline and the price of utilities. Final conclusion for the second city is that the transportation is extremely expensive in Dublin. The author explains this fact that it might be due to the lack of public transportation in the city, because there is no subway in Dublin and there are only two lines of tram. Thirdly, including the worldwide measurement, Boston's most expensive good or service, also confirmed by the sheet, is related to monthly rents and buying an apartment. Subsequently, the cheapest way to live could be found in Boston, when the information of salary is included, and data of nominal prices adjusted. When the author modified the salary to other cities, the highest salary in Boston supports statement that the majority of cheaper

items from examined sheet could be found there. Therefore, it can be claimed that the cheapest way, in terms of the items under examination, could be paradoxically found in Boston and the most expensive in Prague, because the salary is too low although the cost of living is quite high.

Secondly, the regression analysis with dependent variable CPI: LPP, was met in three cases out of seven and the model was explained by 90.6%. An average monthly disposable salary in \$US, population in millions and the overall economic freedom confirmed its assumptions and were statistically significant. This result confirms the author's conclusion and it met the results of other two analyses. Also, any policies which will support high average monthly disposable salary or overall economic freedom will also support the cost of living in this area.

Third of all, the sampling frame was lastly done by structured questionnaire. The sample represents mostly students from 7 public universities from three different cities. Three hundred people were interviewed by the author between the age of 18-50 years old. The aim of this research was to conclude a realistic picture of cost of living from personal perspective. The questionnaire then confirmed the difficulties of cost of living in specific areas of investigation in the cities under the examination and also other results, which confirmed the other two analyses. The author assumed that the most problematic part in the U.S. can be found in education, and this fact was later confirmed. Secondly, the Irish problem was found in the transportation that is extremely expensive and the main problem of Prague was found in salary conditions.

To sum up the analyses, the United States struggles with costs of education and rents, Dublin with grocery items and transportation and Prague with salary, gasoline prices and the price of utilities, because in comparison to other cities, Prague resulted as the most expensive city among all of them. It is very necessary to realize that despite priceless items in Prague, Prague is actually very expensive for Czech citizens.

Author's recommendation is that the Czech government has to realize that as long as the salary stays at the same level in Prague, it is not possible to change the city into the western type of a metropole. Even though majority of items are cheap in Prague, after adjustment Prague is the most expensive city after all.

Also, another recommendation would be an information. The lack of information in one's mind is the biggest problem. The author suggests to study, fight with ignorance and get information about possibilities on the market. For example, the internet and calling are extremely expensive in Prague and since there is a new law of no-roaming tariffs, there is a possibility to pay a German number and got cheaper internet and calling with foreign number. Information is the key to success.

The difference between Eastern and Western Europe is not that striking as the difference between Europe and the United States. So, no matter where we reside, the cost of living differentiates. It is not possible to look only at nominal prices, because if we were only looking at the nominal prices of items, we would make a conclusion that the Czech Republic is probably the cheapest destination, more specifically that Prague is the cheapest among these three cities. The reality is different. Because of the power of purchasing parity and the adjustment of nominal prices, we have to designate that the place with the highest costs for the life could be found in Prague. So as a result, the most expensive city under examination is Prague, in terms of price analysis. Boston would be the most expensive one from the student's point of view, due to high costs of education in the United States of America.

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## 10.THE ANNEX

### Annex 1: Data Set for Price Analysis

		Boston	Prague	Dublin	
<b>Grocery Store</b>	Milk (Regular, 1l)	0,86	0,76	1,06	
	Loaf of Fresh White Bread (500g)	2,78	0,94	1,45	
	Eggs (12)	3,02	1,56	3,08	
	Chicken Breasts (Boneless, Skinless, 1kg)	10,62	6,2	8,46	
	Apples (1kg)	4,56	1,24	2,41	
	Banana (1kg)	1,46	1,33	1,69	
	Tomato (1kg)	4,68	1,72	2,85	
	Potato (1kg)	3,35	0,75	1,71	
	Onion (1kg)	3	0,66	1,39	
	Water (1,5 liter bottle)	1,55	0,57	1,51	
	Domestic Beer (0.5 liter bottle)	1,75	0,69	2,62	
	Pack of Cigarettes (Marlboro)	10,55	4,24	12,38	
	<b>Restaurant</b>	Meal, Inexpensive Restaurant	15	5,52	16,88
		McMeal at McDonalds	8	5,52	8,97
Domestic Beer (0.5 liter draught)		6	1,49	5,63	
Coke/Pepsi (0.33 liter bottle)		1,81	1,21	1,87	
<b>Transportation</b>	One-way Ticket (Local Transport)	2,5	1,02	3,04	
	Monthly Pass (Regular Price)	84,5	23,34	136,7	
	Gasoline (1 liter)	0,61	1,29	1,49	
<b>Utilities (Monthly)</b>	Basic (Electricity, Heating, Water, Garbage) 85m sq	149,82	171,16	173,69	
	Internet (10 Mbps, Unlimited Data, Cable/ADSL)	57,23	17,87	51,21	
	1 min. of Prepaid Mobile Tariff Local (no discount plan)	0,1	0,13	0,29	
<b>Leisure Time</b>	Cinema, International Release	12,5	7,6	11,25	
<b>Clothing</b>	1 Pair of Jeans (Levis 501 or Similar)	49,83	72,65	87,58	
	1 Pair of Nike Running Shoes (Mid-Range)	80,72	82,45	91,53	
<b>Salaries And Financing</b>	Avrg Monthly NET Salary (After Tax)	4491,3	1080,82	2698,22	
<b>Buy/Rent Apartment Price</b>	Price per Sq Ft to Buy Apartment, City Center	9248,17	3870,77	5529,35	
	Apartment (1 bedroom) in City Center/month	2466,91	639,88	1539,34	
	Apartment (1 bedroom) outside City Center/month	1701,29	467,37	1240,36	
	<b>Cost of Living Index (Excl. Rent):</b>	88,56	48,02	85,03	
	<b>Rent Index:</b>	77,75	20,9	52,66	
	<b>Groceries Index:</b>	90,59	42,05	69,49	
	<b>Restaurants Index:</b>	88,14	35,7	91,12	
	<b>Cost of Living Plus Rent Index:</b>	83,26	34,73	69,16	
	<b>Local Purchasing Power:</b>	123,42	71,21	89,26	

Source: Numbeo 2017, Own processing of data

**Annex 2: Data Set for the Regression Analysis**

Country	Consumer p	Consur	GDP Growth	DISPOSABLE SAL	UNEMF	POPULATION	EDUCATION	ECONOMIC FREED
Australia	101,6	108,5	0,195	3780,69	6,1	23,125868	41,9	82
Austria	90,03	109,7	0,097	2457,33	5,6	8,534492	29,9	72,4
Belgium	83,65	108	0,071	2564,89	8,5	11,225207	36,86	69,9
Brazil	41,19	126,9	0,023	757,92	4,9	206,077898	14,32	56,9
Canada	101,96	107,5	0,059	2773,5	6,9	35,540419	53,61	80,2
Chile	56,48	113,1	0,136	949,5	6,4	17,762647	21,09	78,7
China (Pec	42,36	113,3	0,682	731,14	4,09	1364,27	3,6	52,5
Czech Rep	60,64	107,2	-0,011	1020,48	6,1	10,510566	21,51	72,2
Denmark	92,77	106,7	0,052	3269,62	6,6	5,639565	35,8	76,1
Estonia	47,46	112	0,348	914,97	7,4	1,313645	37,5	75,9
Finland	93,94	109	0,072	2924,1	8,7	5,463596	41,78	73,4
France	88,95	100,2	0,050	2761,99	10,3	66,20693	33,54	63,5
Germany	108,14	106,7	0,141	2851,85	5	80,889505	27,06	73,4
Greece	43,16	102,6	-0,193	953,44	26,5	10,95774	28,11	55,7
Hungary	43,47	111,5	0,073	667,58	7,7	9,861673	23,36	67
Iceland	60,84	116	0,250	2176,15	4,9	0,327589	37,09	72,4
Ireland	90,81	105	0,113	2991,21	11,3	4,612719	40,97	76,2
Israel	66,92	107,3	0,212	1874,63	5,9	8,2153	48,53	68,4
Italy	73,81	107,4	-0,026	2117,76	12,7	61,336387	16,91	60,9
Japan	93,22	102,8	-0,156	2782,43	3,6	127,1318	48,19	72,4
Korea, Rep	78,46	109	0,263	2174,36	3,5	50,423955	44,57	71,2
Latvia	38,69	107,4	0,409	713,11	10,84	1,990351	30,23	68,7
Luxembou	115,06	108,7	0,086	4479,8	5,9	0,556074	45,94	74,2
Mexico	55,76	116,2	0,154	729,94	4,8	125,385833	16	66,8
Netherlan	93,87	108,5	0,025	2937,58	7,4	16,854183	34,42	74,2
New Zeala	82,19	107,7	0,313	2693,05	5,8	4,5097	35,63	81,2
Norway	89,36	106,3	0,111	4215,43	3,5	5,136475	41,76	70,9
Poland	56,1	109,2	0,151	905,62	9	37,995529	27	67
Portugal	52,78	106,5	-0,020	1081,73	13,9	10,397393	21,72	63,5
Russia Fec	35,93	131,2	0,193	686,16	5,2	143,506911	54,3	51,9
Slovak Rep	50,55	109,1	0,115	947,95	13,2	5,418506	20,38	66,4
Slovenia	57,92	106,5	0,023	1275,66	9,7	2,062218	28,6	62,7
Spain	70,59	107,1	-0,015	1635,15	24,4	46,404602	34,68	67,2
Sweden	104,33	103,6	0,131	3181,11	8	9,689555	38,7	73,1
Switzerlan	134,41	99,3	0,178	6301,73	4,5	8,190229	40,2	81,6
Turkey	53,17	135,7	0,041	756,06	9,9	75,932348	16,69	64,9
United Kin	90,99	111,8	0,189	2960,54	6,1	64,510376	42,22	74,9
United Sta	128,73	108,6	0,129	3258,85	6,2	318,857056	44,22	75,5

Source: Own processing of data

**Annex 3: The Original Structured Questionnaire**

<p><b>COST OF LIVING</b></p> <p>1. What is your age? ♣ .....</p> <p>2. Gender? ♣ F ♣ M ♣ other</p> <p>3. Year of college education? ♣ None ♣ Freshman ♣ Sophomore ♣ Junior ♣ Senior ♣ Graduated</p> <p><b>INCOME</b></p> <p>4. DO YOU HAVE A JOB? ♣ YES ♣ NO ♣ just a part time job, I am not there often</p> <p>5. How many hours per week do you work?</p> <p>♣ 0-15</p> <p>♣ 15-25</p>
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- ♣ 26-35
- ♣ 36-50
- 6. How much you earn per hour? (US Dollars)
- ♣ 0-5
- ♣ 6-11
- ♣ 12-16
- ♣ 17-40
- 7. Who pays for your living expenses?
- ♣ you (with your job) ♣ you (with parent's' help) ♣ parents (you have pocket money)
- ♣ financial aid ♣ scholarships and loans ♣ other
- TRANSPORTATION*
- 8. Do you have a car?
- ♣ yes ♣ no ♣ I can sometimes borrow one from my parents
- 9. How much you spend on car/month
- ♣ 0-20
- ♣ 20-50
- ♣ 50-90
- ♣ 90 and more
- 10. Do you use public transportation?
- ♣ yes ♣ no ♣ very rarely
- 11. If, yes. How much do you spend on transportation / monthly?
- ♣ 0-20
- ♣ 20-40
- ♣ 40-80
- ♣ 80- and more
- FOOD*
- 12. Where do you usually eat?
- ♣ I cook ♣ I go to restaurants ♣ I go to school dining hall
- 13. How much you spend on food monthly?
- ♣ 0-50
- ♣ 51-100
- ♣ 101-200
- ♣ 201-300
- LIVING*
- 14. Where do you live?
- ♣ with parents ♣ in dormitory ♣ in own flat ♣ share a flat
- 15. How much does your monthly rent cost?
- ♣ 100-350 ♣ 350-600 ♣ 600-850 ♣ 850 and more
- EDUCATION*
- 16. Which kind of school do you attend?
- ♣ public university ♣ private university ♣ other
- 17. How much you pay for tuition per semester {approximately}? ♣
- 18. How much you pay for books, equipment etc per semester? ♣
- 19. Do you have a student loan? ♣yes ♣no ♣ How much? {optional}
- 20. What degree do you want to achieve? ♣ none ♣ Bachelors ♣ Masters ♣Ph.D.
- 21. How much do you pay monthly for all of the above (without education tuition)?
- ♣ 0-400 ♣ 400-80 ♣ 800-1200 ♣1200 ...

Source: Own processing of data