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A MULTIDIMENSIONAL APPROACH IN MEASURING DEPRIVATION WITH A FOCUS ON TURKEY

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1 INTRODUCTION AND OBJECTIVES

This dissertation aims to contribute our understanding of substantive issues of measuring poverty in Turkey with a cross-country comparison and to the development of the methods that can be adapted to produce new insights into the questions related to deprivation. The main scope of this dissertation is to adopt a new method of multidimensional deprivation in Turkey with a cross-country comparison.

The multidimensional approach means that, in addition to income, other more direct indicators of absence from the standard of living are considered. First of all, this dissertation uses empirical data from Eurostat and the Turkish Statistical Institute entitled Statistics on Income and Living Conditions (SILC). The dissertation also aims at exploring cross-country differences based on deprivation patterns and suggests a way of measuring deprivation in a multidimensional way. The reason behind this purpose of the cross-country analysis, is to indicate that how multidimensional deprivation is in Turkey compared to other selected European countries. The countries that have been selected in this dissertation are those, which have a high deprivation rate among European countries and joined at same year to European Union additionally, sharing the same path of income and living conditions.

It is a fact that Europe has been fighting against poverty and produce the methods and the welfare systems they have developed to inspire the social policies of developing countries in the world. Turkey has a candidacy status for joining the European Union since beginning of the 2000s. Additionally, Turkey has adopted in the last fifty years, economic, social and technological developments from Europe. Turkey has started journey of being candidate country for the European Union to adopt reforms which helps to development of Turkey. The reforms and social

policies used to combat poverty effectively in Europe. Turkey has followed the adequate requirements of the European welfare model, which stated to be productive on every platform.

The core of this dissertation is adopted from famous Nobel prize economist AMARTYA SEN who clearly emphasized that the main bridge between development and freedom is poverty as measured holistically related to deprivation of basic needs as opposed to univariably related to level of income. There are several dimensions of well-being of individuals that are not captured by income indicators. Sen mentions that the well-being of an individual is best captured as an index of the individual's behaviors (SEN, 1985). In his study, particular behaviors are an expression of the state of a person and a reflection of what he or she can manage based on their available resources. By selecting a collection of living conditions items that an individual can obtain and collect from it. Therefore, living is viewed as a combination of many things "doings and beings" with quality of life to be able to reach in terms of the capabilities to behave.

This dissertation plays an important role to provide a wider concept with new implemented method using available data starting from 2005 to 2017. Certainly, there are studies where it tends to analyze deprivation from more dimensions, however, these studies just followed the tradition measurements.

1.1 Hypothesis

H1: The new multidimensional proverty measurement will yiled different poverty results, compared to the traditional uni-dimensional approach. In terms of the proportion of the population affected by deprivation, the ranking of the selected countries for traditional and the new approach are different.

H2: In terms of EU integration, Turkey has adopted EU regulations. In terms of living conditions and economic strain, Turkey catches up with Eastern European countries. Specifically those who joined to European Union in 2007.

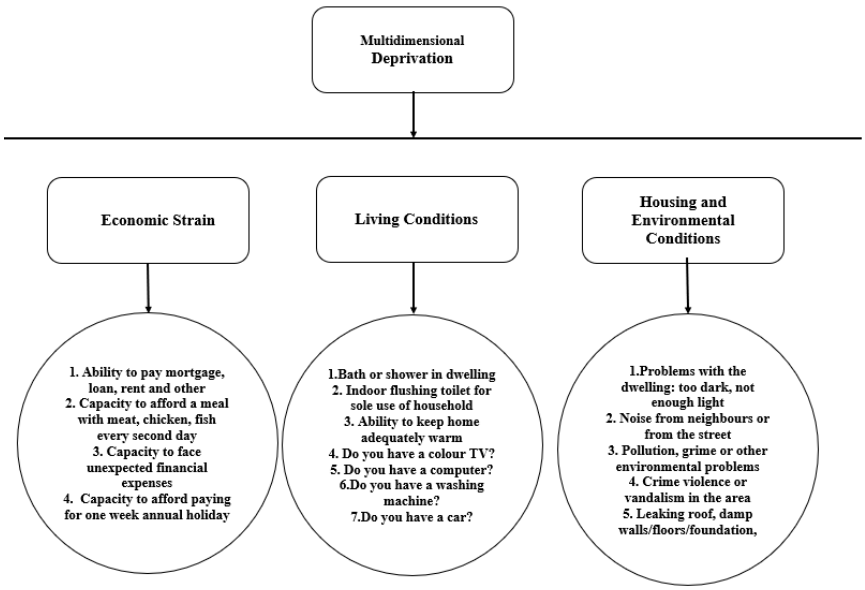
H3: Economic strain deprivation is the most significant problem, which affects the highest rate of the Turkish population, compared to other aspects of deprivation.
H4: Causes of the deprivation are significantly different from each other across the three studied dimensions.

2 MATERIALS AND METHODS

In this chapter, the author describes the data used in this dissertation. First, the author gives a brief definition of EU-SILC data and its history. All the statistical analysis been done with IBM SPSS version 25.
This section details the methods used to define standard of living and specify its dimensions. A 'critical lens' is applied to the current standard processes in Europe which are considered normative in academic and social policy settings. After reviewing the literature, first the author examines three deprivation dimensions and their indicators (items) to further develop the methodology. Then, adds further items to them and make calculations for 11 countries, based on the new deprivation definition.
The study is based on two datasets that are derived from EU-SILC and cover the years 2005 to 2017. The first one is provided by Eurostat and the second (Turkish dataset) comes from TUIK. Due to space limitation and the fact that the yearly cross-country comparisons would facilitate more the understanding of deprivation, only four years (2005, 2009, 2013, 2017) were chosen to be studied. The aim of this research is to present measurement instead of an in-depth trend analysis. At the time of writing this dissertation, the latest available data were for 2017. The author selected 10 Eastern-European countries to study based on their economic and social development: they all have a similar integration path and joined the EU in 2004 or later. Despite its negotiations for accession to the EU have been terminated, Turkey was also selected since these negotiations did begin the harmonization of the

European datasets, which resulted in the availability of the EU-SILC database in Turkey. Another reason for including these 11 countries in the study is the large gap between their yearly deprivation figures. Eurostat has two deprivation indexes; first is material deprivation index.

Figure 1: New model for Multidimensional deprivation



Soruce: own construction

3 RESULTS

Processes, which are taken into consideration after criticizing the availability of the data and looking at deeply each dimension and their indices which were thought to be academic and normative points of view to apply them in the society. Therefore, it compares the results of selected countries with an individual-based measure. Data has been provided by Eurostat from 2005 to 2017 and Turkish data is given by the Turkish Statistical Institute (Tuik) from 2005 to 2017. Countries selected in the tables are chosen by the author based on the accession time to the EU. Turkey is a

non-member state, although its poverty rates are most comparable with the newer member states of the EU. The other reason for the selection was, that in the selected countries, we can observe the most significant gaps between years in terms of three dimensions.

First empirical evidence attempts applying Kruskal – Wallis test. This will help us to compare the selected countries. As one of the aim is to find out whether Turkey has statistical significance different among the selected countries.

As a final, the second chapter of this dissertation will just focus on Turkish deprivation and logistic regression will be used. Dataset has been provided by Tuik including 2005, 2009, 2013 and 2017 years and its cross-sectional data.

3.1 Results of the Kruskal – Wallis test

This chapter will focus on whether Turkey has significant differences among European Union countries in terms of deprivation dimensions. The sum varable which have been used as a test variable of each dimension shows how many selected items a person cannot afford.

Table 1: Kruskal – Wallis Test for Sum of Living Conditions items 2009

Countries	Test Statistic	Standard Error	Standard Test Statistic	Sig.	Adj. Sig
Slovenia -Turkey	-70,553	414.686	-170.138	0.0	0.00
Czech Republic -Turkey	-64,509	450.911	-143.065	0.0	0.00
Estonia Turkey	-43,590	556.087	-78.389	0.0	0.00
Slovakia -Turkey	-57,158	514.329	-111.132	0.0	0.00
Hungary- Turkey	N/A	N/A	N/A		
Lithuania- Turkey	-31,377	557.949	-56.237	0.0	0.00
Poland- Turkey	-47,200	387.395	-121.741	0.0	0.00
Latvia -Turkey	-26,782	539.447	-49.65	0.0	0.00
Romania- Turkey	648.985	483.337	1.343	**0.1**	**1.00**
Bulgaria-Turkey	5,074	523.985	9.685	0.0	0.00

Source: own construction based on EU – SILC and TUIK
Note: Each row tests the null hyphothesis that the countries distributions are same

Note: N/A means that in 2009, Hungary did not provide living conditions information to Eurostat.

The Table 1 above shows the Kruskal -Wallis test for living conditions items for 2009. Kruskal-Wallis test provides very strong evidence of a difference ($p < 0.001$) between the mean ranks of countries. There was very strong evidence ($p < 0.001$, adjusted using the Bonferroni correction) of a difference between the countries who could not afford the living condtions items in 2009. That means comparing Turkey with each European countries. The author states that there is a strong evidence that Turkey has significant difference among selected European countries in terms of living conditions in 2009. However, Kruskal- Wallis test provides that Turkey has no difference with Romania in terms of living conditions items ability to afford by a person.

Table 2: Kruskal – Wallis Test for Sum of Economic Strain items 2013

Countries	Test Statistic	Standard Error	Standard Test Statistic	Sig.	Adj.Sig
Slovenia -Turkey	-57,085	507.158	-112.561	0.0	0.00
Czech Republic - Turkey	-62,975	585.090	-107.633	0.0	0.00
Estonia Turkey	-53,257	654.686	-81.348	0.0	0.00
Slovakia -Turkey	-52,804	640.618	-82.43	0.0	0.00
Hungary- Turkey	-9,916	527.476	-18.80	0.0	0.00
Lithuania- Turkey	-43,177	705.083	-61.238	0.0	0.00
Poland- Turkey	-38,653	461.840	-83.696	0.0	0.00
Latvia -Turkey	-24,170	654.731	-36.916	0.0	0.00
Romania-Turkey	-22,700	591.340	-38.388	0.0	0.00
Bulgaria- Turkey	-94,625	693.846	-0.136	**0.8**	**1.000**

Source: own construction based on EU – SILC and TUIK
Note: Each row tests the null hyphothesis that the countries distributions are same

Table 2 illustrates that comparison of each country with Kruskal – Wallis test result. There is a strong evidence that Turkey is different than other European countries. However, in 2013, items that one person cannot afford for economic strain indices

do not show any significant difference between Turkey and Bulgaria. That shows that Bulgaria and Turkey are same (no difference, p = 0.8), in terms of economic strain dimension.

Table 3: Kruskal – Wallis Test for Sum of Living Conditions items 2013

Countries	Test Statistic	Standard Error	Standard Test Statistic	Sig.	Adj.Sig
Slovenia -Turkey	-73,424	468.591	-156.692	0.0	0.00
Czech Rep. -Turkey	-66,103	540.597	-122.279	0.0	0.00
Estonia Turkey	-47,577	602.692	-78.942	0.0	0.00
Slovakia -Turkey	-60,220	588.919	-102.256	0.0	0.00
Hungary- Turkey	-39,418	485.424	-81.205	0.0	0.00
Lithuania- Turkey	-26,787	651.438	-41.121	0.0	0.00
Poland- Turkey	-54,801	426.714	-128.428	0.0	0.00
Latvia -Turkey	-17,967	604.942	-29.701	0.0	0.00
Romania- Turkey	-41,157	546.371	-0.750	**0.9**	**1.00**
Bulgaria-Turkey	2,228	641.005	3.565	0.0	0.02

Source: own construction based on EU – SILC and TUIK
Note: Each row tests the null hyphothesis that the countries distributions are same

Table 3 illustrates that pairwise comparison of each country with Kruskal – Wallis test result. Pairwise comparisons using Dunn's test indicated that Turkey is significantly different among selected European countries (p <0.005). But, only pairwise comparison of Dunn's test shows that there is no statistically significant difference between Romania and Turkey. This means that in terms of living conditions, a person who cannot afford living conditions items are same in Turkey and Romania (p = 0.9).

Table 4: Kruskal – Wallis Test for Sum of Economic Strain indices 2017

Countries	Test Statistic	Standard Error	Standard Test Statistic	Sig.	Adj.Sig
Slovenia -Turkey	-42,212	526.553	-80.171	0.0	0.00
Czech Republic - Turkey	-55,512	594.914	-93.312	0.0	0.00
Estonia Turkey	-42,307	652.796	-64.812	0.0	0.00
Slovakia -Turkey	-27,581	640.516	-43.06	0.0	0.00
Hungary- Turkey	-19,175	602.746	-31.81	0.0	0.00
Lithuania- Turkey	-19,118	748.139	-25.554	0.0	0.00
Poland- Turkey	-33,353	476.923	-69.935	0.0	0.00
Latvia -Turkey	-10,076	689.372	-14.617	0.0	0.00
Romania-Turkey	1,018	621.525	1.639	**0.1**	**1.000**
Bulgaria- Turkey	8,889	615.599	14.441	0.0	0.00

Source: own construction based on EU – SILC and TUIK
Note: Each row tests the null hyphothesis that the countries distributions are same

In the last part of Kruskal – Wallis test for 2017, in given Table 4 above it is clearly seen the result of the average rank. Based on that, in each pairwise comparison of the countries, Turkey does not show any similarities to selected European countries ($p < 0.0$). However, in 2017, average rank of Romania and Turkey is not significant that is why it states that there are no significant difference between Romania and Turkey. One assumption of Kruskal – Wallis test is the each group is assumped to have normal distrution of the dependent variable (Economic strain sum of indices). As it is mentioned earlier, thanks to the EU-SILC dataset where each EU member countries and adoption of Turkey – EU accession, economic strain indices shows the how many items cannot be afforded by a single person. Based on that Kruskal Wallis test proves that there is no statistically difference between Romania and Turkey ($p = 0.1$).

Considering all of the facts that said in all years for different dimensions, Turkey has significant differences among selected European countries. However, in 2009 there

was not seen any statistically difference between Romania and Turkey in terms of sum of living conditions indices. In 2013, based on test applied, there is also no statistical difference between Bulgaria and Turkey on an individual who cannot afford all economic strain items. In the same year, no statistical difference observed between Romania and Turkey on sum of living conditions indices. Lastly, in 2017, it is proven that Turkey and Romania are same based on an individual who cannot afford economic strain items.

3.1.1 Causes of deprivation for Economic Strain

In this section, the main findings of the logistic regression analysis will be illustrated. The main focus of this part is to examine the trends for the odds ratios of the socio-economic characteristics of the deprived individuals, and to investigate the chances of being economically deprived in terms of selected key variables. The independent variables of the logistic regression model are taken from the TUIK database. Secondly, investigating the literature, and based on own experience, the model is created to be a simple, but meaningful. During the model specification process, issues have been rising such as; missing data, low goodness-of-fit in the sub-groups and low explained variance. The model that has been created in this dissertation meets all requirements and assumptions of logistic regression.

Table 5: Odds ratios of the Economic Strain deprivation by socio-economic characteristics

Covariates	*2009*		*2013*		*2017*	
	B	**Exp(B)**	**B**	**Exp(B)**	**B**	**Exp(B)**
Gender (reference: Male)						
Female	0.14	0.87	0.12	0.89	0.07	0.93
Marital status (reference: Married)						
Never Married	0.28	0.75	0.09	1.09	0.12	1.13
Widowed	0.23	1.26	0.23	1.26	0.17	1.18

Divorced	0.22	1.25	0.40	1.49	0.46	1.59
Age (reference: 65+)						
15-19	1.26	3.51	1.01	2.75	1.20	3.33
20-24	0.95	2.58	1.06	2.89	1.01	2.73
25-29	1.04	2.83	0.92	2.52	0.87	2.38
30-34	0.97	2.63	0.91	2.49	0.84	2.32
35-39	0.89	2.43	0.83	2.29	0.83	2.28
40-44	0.88	2.42	0.73	2.07	0.83	2.30
45-49	0.85	2.34	0.73	2.07	0.76	2.13
50-54	0.59	1.80	0.61	1.83	0.53	1.70
55-59	0.45	1.58	0.43	1.54	0.42	1.52
60-64	0.43	1.53	0.30	1.35	0.33	1.39
Eduaction (reference: Faculty/Master/Doctorate)						
Illeterate	1.36	3.88	1.21	3.35	1.80	6.05
Primary School	1.02	2.78	0.97	2.64	1.40	4.06
High School	0.51	1.67	0.75	2.12	1.02	2.77
Higher Education	0.48	1.62	0.57	1.78	0.74	2.09
Household type (reference: Single Person)						
Two adults no independent children and at least one or two 65 years old member	0.94	2.55	0.56	1.76	0.61	1.84
Single person with dependent children	1.79	5.98	1.16	3.19	1.17	3.21
Two adults with one, two or more children	1.34	3.82	0.98	2.65	1.06	2.87
Other household types	2.07	7.90	1.43	4.20	1.52	4.56
Household income (reference: Above)						
0-10000 TL	3.26	26.11	4.24	69.14	3.03	20.77
10000 to 20000 TL	1.94	6.94	2.57	13.03	1.99	7.35
20000 to 30000 TL	1.06	2.88	1.33	3.78	1.21	3.35
Economic status (reference: At work)						
Looking for a job	0.90	2.45	0.53	1.70	0.48	1.62
In retirement/Early retirement or has given up business	0.19	1.21	0.02	1.02	0.16	0.85
Other inactive person	0.12	0.89	0.05	0.95	0.18	0.83
Health status: (reference: Very good)						
Good	0.31	1.37	0.19	1.21	0.08	1.08

Fair	0.76	2.15	0.55	1.74	0.49	1.64
Bad	1.10	3.01	0.86	2.36	0.85	2.34
Very Bad	1.36	3.90	0.91	2.49	1.01	2.75
Constant	2.65	0.07	3.53	0.03	3.92	0.02

Source: *Based on the SILC (EUROSTAT) and TUIK (note: all percentages are measured with weighted cases*
Note: Nagelkerke R square: 0.294 for 2009, Nagelkerke R square: 0.374 for 2013, Nagelkerke R square: 0.266 for 2017

The result will be explained by each covariate. Based on the result, each covariate is statistically significant in terms of becoming economically deprived (economic strain deprivation dimension). As it is known in the literature, causes of deprivation have major determinants, for instance; educational level, income level, household type, etc. But one of the purposes of this analysis is to analyze the changes in odd ratios over the years, in Turkey.

Results show that at a micro-level being a female does not have a big probability of being economically deprived compared to males in Turkey. But the probability of being economically deprived increases towards 2017 for females.

Concerning the relationship between marital status of likelihood of deprivation, divorced individuals have more probability of being economically deprived in 2017 in Turkey. However, age has a unique effect on being deprived in economic strain. The general statement is that older people are less likely to be a necessity, but it is found that younger generations who are under 40-44 also have high probability of being deprived in Turkey. Specifically, those who are between 15-19 years old have e = 3.33 more chances to be deprived compared to the old generation.

Results also show that educational level has indeed a significant effect on economic deprivation. Those, who have no education should face multiple odd if being economically deprived in each year. Moreover, those, who have primary education has close odd ratio (e = 4.06) to those who have no education (e = 6.05) in 2017 in Turkey.

Household type – being a unique determinant of economic deprivation – shows, that if a person with dependent children household has more chance to be economically deprived during all years. On the other hand, household type where it is not defined and categorized as other household types has the highest likelihood of being deprived.

Total disposable income – being deprived of the individual in a household total disposable income between 0-10000 TL has the highest chance to be deprived (e = 20.7) compared to those households above 30.000 TL in 2017.

Current economic status is the unique sign of economic strain deprivation, it is clear that looking for a job people have a high likelihood to be deprived in Turkey in 2017. However, those who are retired, and inactive have also similar likelihood to be deprived during the years.

The last examined variable is the general health status, consideration of general health status is a determinant of the deprivation. Based on results, it is indicated those, whose general health status is bad and very bad have more likelihood of being deprived in Turkey.

3.1.2 Causes of deprivation for Living Conditions

Living conditions are considered as one dimension of multidimansional deprivation. In this part of the dissertation, the analysis of the logistic regression analysis result will be illustrated with key variables of the socio-economic characteristics. As it was described earlier, logistic regression has a binominal (0/1) dependent variable. In this dissertation, those, who are not deprived for living conditions are defined as 0, and deprived as 1.

The next table illustrates the odds ratios of the socio-economic characteristics by years. The target variable is the living condition deprivation dimension.

Table 6: Odds ratios of the Living Conditions deprivation by socio-economic characteristics

Covariates	*2009*		*2013*		*2017*	
	B	**Exp(B)**	**B**	**Exp(B)**	**B**	**Exp(B)**
Gender (reference: Male)						
Female	0.22	0.80	0.14	0.87	0.14	0.87
Marital status (reference: Married)						
Never Married	0.06	0.94	0.13	1.14	0.19	1.20
Widowed	0.13	1.14	0.13	1.14	0.02	0.98
Divorced	0.57	1.77	0.43	1.53	0.43	1.53
Age (reference: 65+)						
15-19	1.28	3.60	1.18	3.25	1.27	3.56
20-24	1.16	3.20	1.19	3.30	1.11	3.03
25-29	1.25	3.50	1.08	2.96	1.05	2.86
30-34	1.10	2.99	0.93	2.54	1.01	2.74
35-39	0.94	2.57	0.80	2.22	1.00	2.71
40-44	0.75	2.11	0.57	1.77	0.80	2.23
45-49	0.59	1.80	0.52	1.68	0.69	1.99
50-54	0.49	1.63	0.55	1.73	0.57	1.77
55-59	0.32	1.37	0.36	1.43	0.41	1.51
60-64	0.33	1.39	0.24	1.28	0.39	1.47
Eduaction (reference: Faculty/Master/Doctorate)						
Illeterate	2.02	7.57	1.80	6.05	2.24	9.43
Primary School	1.31	3.70	1.20	3.33	1.46	4.29
High School	0.93	2.55	0.84	2.33	1.06	2.88
Higher Education	0.61	1.83	0.46	1.58	0.52	1.68
Household type (reference: Single Person)						
Two adults no independent children and at least one or two 65 years old member	0.69	1.99	0.51	1.67	0.58	1.78
Single person with dependent children	1.28	3.58	1.35	3.86	1.15	3.17
Two adults with one, two or more children	1.07	2.92	1.05	2.85	1.26	3.53
Other household types	1.56	4.76	1.68	5.36	1.72	5.58
Household income (reference:						

Above)						
0-10000 TL	2.76	15.82	3.69	40.08	3.18	24.16
10000 to 20000 TL	1.70	5.48	2.46	11.67	2.15	8.54
20000 to 30000 TL	0.88	2.40	1.46	4.30	1.52	4.58
Economic status (reference: At work)						
Looking for a job	0.39	1.48	0.38	1.47	0.51	1.66
In retirement/Early retirement or has given up business	0.19	0.82	0.33	0.72	0.15	0.86
Other inactive person	0.19	0.83	0.22	0.80	0.15	0.86
Health status: (reference: Very good)						
Good	0.19	1.21	0.18	1.20	0.15	1.16
Fair	0.44	1.55	0.46	1.58	0.40	1.49
Bad	0.72	2.05	0.69	1.99	0.70	2.02
Very Bad	0.70	2.00	0.85	2.35	0.65	1.92
Constant	4.94	0.01	5.45	0.00	5.84	0.00

Source: *Based on the SILC (EUROSTAT) and TUIK (note: all percentages are measured with weighted cases*
Note: Nagelkerke R square: 0.326 for 2009, Nagelkerke R square:0.368 for 2013, Nagelkerke R square: 0.292 for 2017

Results for causes of living conditions deprivation shows that at a micro level, being a female gives less likelihood to become living condition deprived compared to males in Turkey, and this likelihood did not change over the studied years. In terms of marital status, being never-married has less likelihood (e = 0.94) to be deprived in Turkey compared to those, who are married. The relation between them changed over the years, in 2017 single individuals are more likely to have living condition problems comepared to the married. On the other hand, divorced people have the highest probability (e =1.53) to be deprived in Turkey, and the likelihood did not change significantly over the years. Interesting to observe, how the social safety net works in Turkey, widowed individulas are less likely to become living condition deprived compared to the divorced. It is probably due to the protective behaviour of the family in case of any disaster happening in the family.

Considering the relationship between age and the likelihood of deprivation, age has a unique effect on being poor. In the literature, it is discussed that older generations are less likely to be poor. In this analysis, 65+ people are set as a reference category based on the bivariate analysis. In Turkey, those, who are below 25-29 years old have the highest likelihood of being deprived in living conditions. Specifically, 15-19 years old young generations have e = 3.56 times a chance to be deprived compared to the old generation. Although it is not surprising that young people start their life with poorer living conditins, the trend observed in the results show that this is not likely to change significantly. As a general observation we can say, that the likelihood of having living condition deprivation decreases by time, older generations are more likely to have decent living conditions, and there was not much change observed over the studied years.

Educational level – has also unique effect on poverty, it is a fact that the contribution of education to poverty is certain and accepted by all scientists. It is, unfortunately, having a significant effect on deprivation in the society. Specifically those, who are illiterate have e = 9.43 times more probability to be deprived in 2017, and it increased from e = 7.57 in 2009. Secondly, primary school graduates have e = 4.29 more likelihood of being deprived in 2017 in Turkey.

In terms of household type, the reference category was the single person household. Household type -being a unique determinant of the deprivation- indicates that if a household defined as two adults with one, two or more children has the highest probability (e = 3.53 compared to the single person household) have living condition problems. Moreover, a single person with dependent children has e = 3.17 likelihood of being deprived in 2017 in Turkey, compared to the state, when the household comprises a single person without child.

The total disposable income of the household – has a significant effect on living condition deprivation in Turkey. Those households whose income level is between 0 – 10000 TL has twenty-four times higher probability to have living condition

deprivation in Turkey compared to the most rich category, and this probability almost doubled between 2009 and 2017. Those, whose total disposable income is between 10003 – 20000 TL has e = 8.54 higher chance of being deprived in 2017 in Turkey compared to the richest category. Also, those households that have a higher total disposable income level between 20001 – 30000 (e = 4.58) is still at relatively high risk of becoming deprived.

Current economic activity of individuals is a key variable to analyze. Items that analyzed in this section start with looking for a job individual which has e = 1.66 more likelihood of probability to become deprived compared to working people. At the same time, those persons who are retired and inactive have the same likelihood chance (e = 0.86) of being deprived in 2017 in Turkey.

The last examined variable is the general health status focuses on the differences between self-defined health status. It is considered that the status of the health condition has a significant impact on being deprived. Interestingly, those individuals who are stated that their health condition is bad have more chance (e = 2.02) to be deprived compared to those who stated very good. On the other hand, very bad health status has a lower chance (e = 1.92) compared to bad general health status. However, comparing those very bad health condition in living condition dimension and economic strain dimenson, those who stated very bad health condition, are more likely to be deprived in economic strain, which means that economic strain dimension effects them more significantly than living condition dimension. This result indicates that for those whose health status are under bad conditions, their priority needs are economic items not the living conditions. Nevertheless, the author observes the opposite case in equilivized disposable income, those cases, where individuals have 0-1000TL equlivized disposable income in terms of economic strain dimension have less odd ratios compared to those ones who have same amount of equilivilized disposable income for living conditions dimension. Which expresses that those cases, where individuals have 0-

1000TL priorties the living conditions items to meet their basic daily life of standards.

3.1.3 Causes of deprivation for Housing and Environmental Conditions

The last dimension of the deprivation is housing and environmental conditions where individuals consider that their housing and environmental situation affect their basic way of living. The reason why logistic regression is important to analyze the housing and environmental deprivation is that we can see the unique effect of socio-economic factors on housing and environmental conditions deprivation. However, it is observed that differences between categories are not significant as much as in economic strain or living conditions dimension.

Table 7: Odds ratios of the Housing and Environmental deprivation by socio-economic characteristics

Covariates	*2009*		*2013*		*2017*	
	B	**Exp(B)**	**B**	**Exp(B)**	**B**	**Exp(B)**
Gender (reference: Male)						
Female	0.10	0.90	0.08	0.92	0.08	0.92
Marital status (reference: Married)						
Never Married	0.04	0.96	0.07	1.07	0.12	1.12
Widowed	0.08	1.09	0.03	1.03	0.06	1.06
Divorced	0.08	1.08	0.38	1.46	0.13	1.14
Age (reference: 65+)						
15-19	0.83	2.30	0.63	1.88	0.85	2.34
20-24	0.76	2.15	0.65	1.91	0.82	2.27
25-29	0.83	2.30	0.65	1.92	0.78	2.18
30-34	0.77	2.16	0.61	1.83	0.86	2.37
35-39	0.69	1.99	0.59	1.80	0.86	2.37
40-44	0.63	1.88	0.51	1.66	0.75	2.13
45-49	0.48	1.62	0.51	1.67	0.63	1.88
50-54	0.36	1.43	0.38	1.46	0.49	1.63
55-59	0.25	1.28	0.27	1.31	0.29	1.34

60-64	0.15	1.17	0.15	1.16	0.25	1.28
Eduaction (reference: Faculty/Master/Doctorate)						
Illeterate	0.14	1.15	0.08	1.09	0.54	1.71
Primary School	0.04	0.96	0.06	0.94	0.27	1.30
High School	0.02	0.98	0.02	0.98	0.17	1.19
Higher Education	0.05	0.95	0.04	0.96	0.08	1.09
Household type (reference: Single Person)						
Two adults no independent children and at least one or two 65 years old member	0.15	1.16	0.06	1.07	0.07	1.07
Single person with dependent children	0.41	1.51	0.38	1.46	0.32	1.38
Two adults with one, two or more children	0.42	1.52	0.33	1.39	0.30	1.34
Other household types	0.30	1.35	0.33	1.40	0.42	1.52
Household income (reference: Above)						
0-10000 TL	0.35	1.42	0.70	2.01	0.52	1.69
10000 to 20000 TL	0.23	1.26	0.45	1.58	0.20	1.22
20000 to 30000 TL	0.12	1.13	0.32	1.38	0.18	1.20
Economic status (reference: At work)						
Looking for a job	0.45	1.57	0.27	1.32	0.22	1.25
In retirement/Early retirement or has given up business	0.22	1.25	0.15	1.16	0.14	1.15
Other inactive person	0.11	1.12	0.09	1.09	0.02	1.02
Health status: (reference: Very good)						
Good	0.21	1.23	0.30	1.35	0.17	1.19
Fair	0.66	1.94	0.68	1.98	0.53	1.69
Bad	0.78	2.18	0.84	2.31	0.62	1.85
Very Bad	0.97	2.64	0.84	2.31	0.53	1.70
Constant	1.97	0.14	2.25	0.11	2.50	0.08

Source: *Based on the SILC (EUROSTAT) and TUIK (note: all percentages are measured with weighted cases)*
Note: Nagelkerke R square: 0.040 for 2009, Nagelkerke R square: 0.041 for 2013, Nagelkerke R square: 0.035 for 2017

The results of the logisitic regression on housing and environmental conditions show that at a micro level, being female in a household decreases the chance to be deprived compared to males during the selected years in Turkey. Nevertheless, living in a household as a divorced person affects deprivation compared to married,

divorced persons have e = 1.46 more chance to be deprived in 2013. But in 2017 it decreases to e = 1.14. The reason of this is the reform in civil law.

Age has a significant effect on deprivation. The general statement explains that older people have better life quality. In this dissertation, age follows the general statement but, the aim is to show how age affects the deprivation during the selected years. It has mentioned in previous dimensions that younger generations are more likely to be deprived in Turkey. However, in housing and environmental conditions deprivation age has expanded to older generations. Those, who are between 40-44 years old have two times more likelihood chance (e = 2.13) of being deprived in 2017, while it has less odd ratio e = 1.66 in 2013.

Indeed, education level is one of the key factors of being deprived in all dimensions. Those, who have no education should face multiple odd of being deprived in each year for housing and environmental conditions. However, odds are less than expected for selected years. The most disadvantaged are those, who have no education, has e = 1.71 likelihood of being deprived in 2017 and it increased compared to the previous years. Those, who have primary school, their highest odd of being deprived is e = 1.30 in 2017 and it increased during the studied years. Lastly, those, who have a higher education have better living standards compared to other educational levels, although their chance for becoming housing and environmentally deprived also increased during the studied years.

Household type – being a unique determinant of deprivation – explains that a single person with a dependent child has the highest likelihood of being housing and environmental conditions deprived in almost all selected years in Turkey. It follows with two adults with one, two or more children have e = 1.34 more chance to be deprived in 2017. Lastly, two adults no independent children and at least one or two 65 years old family member has a better chance to reach higher housing and environmental standard.

Total household disposable income illustrates that it does not affect housing and environmental deprivation as much as has other dimensions. Because, it is a fact that, total disposable income effect can be seen on living conditions and economic strain dimensions. However, housing and environmental condition also has a unique effect on deprivation. Results show that those households who have total disposable income between 0-10000 TL have a more likelihood to be deprived e = 1.69 in 2017. The relatively low level of likelihood is somewhat surprising, which suggest, that low income households are able to maintain almost the same level of housing and environmental conditions like the highest income level households. Other total disposable income levels have even lower odds ratios.

On the other hand, current economic status is also a significant factor for housing and environmental conditions. An individuals economic status can determine under what conditions he/she can live and wether he/she can have satisfactory environmental condition. With the light of this information, unemployed people have e = 1.25 more chance to be deprived compared to those who are at work and those, who are retired have e = 1.15 compared to working people. This means that Turkey is performing better in terms of housing and environmental conditions compared to other dimensions. It is also be proven with the odds ratio of the inactive people compared to working people is e = 1.02 meaning that there is almost no difference between working people housing and environmental conditions and inactive people ones.

The last socio-economic factor is the general health status, the relationship between general health status and housing and environmental conditions is about whether there is any significant difference in the chance of deprivation in different health statuses. The highest difference is with “bad” and “very bad” health status individuals. Those, who have “bad” general health status has e = 1.85 more chance of deprivation compared to “very good” ones. Additionally, those, who have “very

bad" general health conditions have e = 1.70 more likelyhood chance of being deprived compared to "very good" ones.

4 CONCLUSION AND RECOMMENDATION

The purpose of this dissertation was to analyze the different concepts of the deprivation while analyzing for cross-country comparison. First, the dissertation discussed the definition and concept of poverty used in literature as well as existing deprivation approaches. Analyzing the explanatory power of deprivation with three dimensions in a multivariate model, assumes a significantly stronger explanatory power.

Secondly, in the cross-country comparison with the three-dimensional concept of deprivation, analyzing the main differences of economic strain, living conditions, and housing and environmental conditions between selected European countries and Turkey proves that with using same panel data (Statistics on Income and Living Conditions Survey, 2018), countries show significant differences compared to the traditional deprivation measure.

This dissertation, focuses on constructing a multidimensional deprivation measure of poverty that can reduce the disadvantages of existing deprivation method. It is discussed that deprivation measures can be alone used to assess the poverty both theoretically and empirically. The author described the methodological problems of the existing measure, for instance, missing dimensions, replacement of the existing deprivation indices, improvement of the data quality, data-driven specifications and more importantly neglecting the multidimensionality.

The proposed measure has three different design features compared to existing deprivation index. First, it is a concept-oriented measure in which measurement design is primarily determined by the definition of deprivation. To do this, an

important part of the analysis is to focus on the meaning and the context of deprivation.

The measure is more comprehensive compared to its existing deprivation items including dimensions such as needs related to economic items, living conditions, housing, and environmental issues.

In the proposed multidimensional measure, each dimension has been evaluated separately to reach total deprivation measure for each dimension. This choice is again adopted from the theoretical point of view, i.e. not being able to meet identified needs due to the lack of available resources forbid people from maintaining their social activities and participation in society. As it is shown in the empirical results, evaluating each dimension separately improves the accuracy of measurement. The reason why one dimension is not created is because of a sizable group of individuals who are identified only by one dimension (material deprivation) which is discussed in the literature due to its unidimensional design.

In Table 8, a brief summary of the three dimensions is dicussed in terms of country differences.

Table 8:Percentage of deprived as of the three dimensions, by country

Countries	D_{eco}				D_{living}				$D_{housing}$			
	2005	*2009*	*2013*	*2017*	*2005*	*2009*	*2013*	*2017*	*2005*	*2009*	*2013*	*2017*
Bulgaria	-	71.5	79.2	70	-	49.1	38.7	33.7	-	26.4	17.8	17.9
Czech Republic	56.5	50.3	52.7	35.5	11	6.1	4.8	3.1	24.1	20.9	15.6	11.7
Estonia	70	56.8	59.6	45.8	31.1	15.8	11.7	8.9	27.4	17.9	12.8	10.1
Hungary	77.1	82.5	82.4	52.6	19	–	14.6	9.8	26.3	15.8	20.6	16.6
Lithuania	80.5	62.1	66	59.7	42.4	27.7	23.1	–	23.7	18.1	16	14.6
Latvia	86.4	81.2	78.4	67.8	47.9	29.5	27.4	17.9	37.3	32.6	22.5	19.8
Poland	79.3	68.9	68.7	51.3	29.8	14.4	8.8	6.4	25.9	16.3	12.5	12
Romania	-	79.7	78.8	73.8	-	53.4	42.7	33.8	–	31.7	23.2	16.7
Slovenia	53.8	52.4	56.4	46	3.6	3.1	3	2.9	21.8	25.8	17.3	16.1
Slovakia	77.2	64	59.7	53.3	20	8.9	6.7	5.5	18.2	20.4	12.9	10.2
Turkey	92.3	99.4	81.1	63.9	53.3	44.8	33.1	20	49.1	38.3	32	28

Source: *own construction based on the SILC (EUROSTAT) and TUIK (note: all percentages are measured with weighted cases*

Table 8 represents the percentages of the three dimensions by countries over years. Based on the author's definition of deprivation, countries has shown significant development to overcome deprivation. Based on these results, Bulgaria is the only country where there is a slower change in terms of economic strain dimension. It can be observed that percentages of economic strain dimension did not change significantly from 2009 to 2017 compared to other countries. On the other hand, Bulgaria has shown decrease in living conditions and environment and housing condition deprivation. In Czech Republic, economic strain deprivation is still high compared to living condition, environmental and housing condition compared to the country itself. In 2017, 35% of the population was deprived in economic strain dimension in Czech Republic. Ratio of the living condition dimension is one of the lowest among the other selected European countries. However, in Baltic zone, Estonia is a country where there is a high gap between dimensions. The results show that percentage of economically deprived population is higher than those who are deprived in living condition and housing and environmental conditions. The population of Hungary still have the financial burdens to meet their financial needs. But, since 2005, Hungary has performed well to decrease the ratio of economic strain deprivation. Nevertheless, inidividuals who live in Hungary are fairly able to afford their living conditions by 2017, only 16.6% of the individuals commit that they have environmental and housing difficulties. Another Eastern European country Romania, still figth economic strain dimension from 2009 to 2017 where ratio of the individuals who cannot afford economic strain dimension items are still not changed significantly compared to other selected European countries. However, percentage of individuals who has difficulties about their living, environmental and housing condition are relatively low. In Slovenia, surprisingly, living condition dimension is sustainably lowest from 2005 to 2017. Turkey is the country where all dimension

are the highest in 2005 and sharing the same percentages of the individuals who have difficulties about their living conditions with Romania and Bulgaria in 2017. Most importan issue in Turkey is the economic problems while living, environmental and housing conditions are less problemati compared to other selected countries.

To conclude, almost all of the countries analyzed have economic issues where individuals cannot afford their basic needs. Czech Republic is the only country who has lowest ratio of individuals who cannot afford their needs (35.5% in 2017). After economic strain dimension, living condition dimenions is the second funtemental issue in all counties where individuals consider themselves deprived. Slovenia is a country which has lowest percentage of the individuals who report living condition difficulties. Where countries do not have significant issues is the environmental and housing problems. Estonia has the lowest percentage of the individuals who state that they have environmental and housing issues.

In this study, a multidimensional approach was followed to measure deprivation based on proportions of people reported various forms of deprivation. The author has increased the number of deprivation dimensions from one to three (economic strain, living conditions, and housing and environmental conditions) and examined 11 countries' EU-SILC data by dimension. The results of the international comparison indicate that in the 10 selected European countries and in Turkey, the most problematic economic strain indicator was 'going on a one-week annual holiday away from home'. Whether unaffordability to go on a one-week annual holiday is a sign of deprivation or not is still under debate. Nevertheless, the official Eurostat material deprivation measure does consider it as an indicator of deprivation. In terms of living conditions, deprivation is defined as a lack of basic goods and amenities required to have an acceptable standard of living. According to the results shown above, in 2005 a tragic share of the countries' population was considered deprived in this regard; the figures, however, have improved significantly over the

years. Yet, even today, there are people who lack basic amenities or do not have the capacity to keep their homes warm and their proportion in each country depends on the country's development. Thus, for example, the percentage of those, who do not have a bath in their home is still high in Romania, Bulgaria, Latvia, and Lithuania. The dissertation considered also the dimension of housing and environmental conditions as a fundamental life-standard measuring factor. Conceptually, this third dimension includes housing conditions and crime- and pollution-related environmental factors (i.e. the external characteristics of people's dwellings) also taken into account. In most countries, it was found that housing and environmental conditions were less problematic for people than the other two dimensions, because a smaller proportion of the population reported being deprived in this respect. However, the opposite was true for Turkey, where people had significant housing and environmental problems in the years examined.

This study provides evidence on deprivation and has implications for both methodology and policy. It attempts to broaden the scope of deprivation by identifying survey questions that may serve as a base for a cross-country comparative assessment. However, this study has limitations in several aspects. Although it is based on micro-level statistics, it did not deal with the multiple overlaps between financial and non-financial deprivation. The author found that each deprivation item showed remarkable changes in the countries, and the relations between the dimensions were country-specific.

4.1 Tested Hypothesis

The author explains the results of the tested hypothesis. Each hypothesis will be explained.

H1: *The new multidimensional proverty measurement will yiled different poverty results, compared to the traditional uni-dimensional approach. In terms of the*

proportion of the population affected by deprivation, the ranking of the selected countries for traditional and the new approach are different.

Table 9: Percentage of deprived as of author's deprivation dimensions and Eurostat material and severe material deprivation by countries in 2017

	$D_{econ\ 2017}$		$D_{living\ 2017}$		$D_{housing\ 2017}$		$EU_{severe\ 2017}$		$EU_{material\ 2017}$	
Country	%	ranking	%	ranking	%	ranking	%	ranking	%	ranking
BG	70	**2**	33.7	**2**	17.9	**3**	30	**1**	44.4	**2**
CZ	35.5	**11**	3.1	**9**	11.7	**9**	3.7	**11**	7.8	**11**
EST	45.8	**10**	8.9	**6**	10.1	**11**	4.1	**10**	10	**10**
HU	52.6	**7**	9.8	**5**	16.6	**5**	14.5	**4**	25.1	**6**
LT	59.7	**5**	–		14.6	**7**	12.4	**5**	26.2	**4**
LV	67.8	**3**	17.9	**4**	19.8	**2**	11.3	**6**	25.2	**5**
PL	51.3	**8**	6.4	**7**	12	**8**	5.9	**8**	11.4	**8**
RO	73.8	**1**	33.8	**1**	16.7	**4**	19.7	**3**	47.7	**1**
SL	46	**9**	2.9	**10**	16.1	**6**	4.6	**9**	10.5	**9**
SK	53.3	**6**	5.5	**8**	10.2	**10**	7	**7**	13.3	**7**
TR	63.9	**4**	20	**3**	28	**1**	28.7	**2**	30.8	**3**

Source: Source: *own construction based on the SILC (EUROSTAT) and TUIK*
Note: BG: Bulgaria, CZ: Czech Republic, EST: Estonia, HU:Hungary, LT: Lithuania, LV: Latvia, PL: Poland, RO:Romania, SL: Slovenia, SK: Slovakia, TR: Turkey

Table 9 shows the deprivation ratios of the three dimensions created by the author, and two official Eurostat calulations, the $EU_{severe\ (severe\ material\ deprivation)}$, and the $EU_{material}$ (material deprivation). Based on this table, it is observed that Romania is in the first rank of the economic strain and living conditions additionally, Romania is in the third rank for the housing and environmental conditions dimensions while in Eurostat definition Romania is in the first rank for material deprivation and third place in the severe material deprivation. Based on author's definition Bulgaria shares the second place for economic strain, living conditions and third place for housing and environmental conditions dimensions. On the other hand, based on

Eurostat definition, Bulgaria is first rank for severe material deprivation and second for material deprivation.

As a conclucsion, based on author's definition and Eurostat definition, it is a fact that higher rate of population is affected by multidimensional deprivation compared to Eurostat definition also ranking of the countries are different compared to official publication of Eurostat. This hypothesis is accepted.

H2: *In terms of EU integration, Turkey has adopted EU regulations. In terms of living conditions and economic strain, Turkey catches up with Eastern European countries. Specifically those who joined to European Union in 2007.*

Turkey has significant differences among selected European countries. However, in 2009 there was not seen any statistically significant difference between Romania and Turkey in terms of sum of living conditions items. In 2013, based on test applied, there is also no statistical difference between Bulgaria and Turkey on an individual who cannot afford all economic strain items. In the same year, no statistical difference observed between Romania and Turkey on sum of living conditions items. Lastly, in 2017, it is proven that Turkey and Romania are same based on an individual who cannot afford economic strain items. Therefore, H2 hypothesis - *In terms of EU integration, Turkey has adopted EU regulations. In terms of economic strain, living conditions and housing & environmental conditions, Turkey has no difference with Eastern European countries. Specifically those who joined to European Union in 2007 - is rejected.*

H3: *Economic strain deprivation is the most significant problem, which affects the highest rate of the Turkish population, compared to other aspects of deprivation.*

The evidence from result section points towards the idea that economic strain dimension has a critical role in Turkey. The results intimates that in 2005, 92.3% of individuals could not afford the economic strain indices. This follows in 2009, 99.4%, in 2013, 81.1% and finally in 2017, 63.9% while living condition dimension and housing and environmental condition dimension have less effect on society in

Turkey. Finding of this study for economic strain dimension suggest that most problematic indice is "going one week holiday away from home" and 59.1% of Turkish society could not afford to have a one week holiday away from home. This follows with "to eat meat, fish or a protein equivalent every second day". 32.8% of Turkish society stated that they are not able to consume meat, fish or chichen every second day of the week. Third item where individuals indicates that 30.4% of society cannot pay "unexpected expenses" meaning that those individuals do not have savings to bear the unexpected situations. The last item is the "cannot afford to pay rent/mortgage or utility bills on time" where 25.7% of Turkish society has difficulties with their payments.

In summary, with the light of this results, it can be said that Turkish society has economic and financial difficulties in society where they clearly mentioned that they are not able, can not afford and can not pay their basic needs for maintaining their life while this percentages are lower in other countries.

Therefore H3 hypothesis - economic strain deprivation is the most significant problem, which affects the highest rate of the Turkish population, compared to other aspects of deprivation is accepted.

H4: *Causes of the deprivation are significantly different from each other across the three studied dimensions.*

Table 10: A summary of logistic regression result of three deprivation dimensions in 2017

Covariates	D_{eco}	D_{living}	$D_{housing}$
	Exp(B)	**Exp(B)**	**Exp(B)**
Gender (reference: Male)			
Female	0.93	0.87	0.92
Marital status (reference: Married)			
Never Married	1.13	1.2	1.12
Widowed	1.18	0.98	1.06

Divorced	1.59	1.53	1.14
Age (reference: 65+)			
15-19	3.33	3.56	2.34
20-24	2.73	3.03	2.27
25-29	2.38	2.86	2.18
30-34	2.32	2.74	2.37
35-39	2.28	2.71	2.37
40-44	2.3	2.23	2.13
45-49	2.13	1.99	1.88
50-54	1.7	1.77	1.63
55-59	1.52	1.51	1.34
60-64	1.39	1.47	1.28
Eduaction (reference: Faculty/Master/Doctorate)			
Illeterate	6.05	9.43	1.71
Primary School	4.06	4.29	1.3
High School	2.77	2.88	1.19
Higher Education	2.09	1.68	1.09
Household type (reference: Single Person)			
Two adults no independent children and at least one or two 65 years old member	1.84	1.78	1.07
Single person with dependent children	3.21	3.17	1.38
Two adults with one, two or more children	2.87	3.53	1.34
Other household types	4.56	5.58	1.52
Household income (reference: Above)			
0-10000 TL	20.77	24.16	1.69
10000 to 20000 TL	7.35	8.54	1.22
20000 to 30000 TL	3.35	4.58	1.2
Economic status (reference: At work)			
Looking for a job	1.62	1.66	1.25
In retirement/Early retirement or has given up business	0.85	0.86	1.15
Other inactive person	0.83	0.86	1.02
Health status: (reference: Very good)			
Good	1.08	1.16	1.19
Fair	1.64	1.49	1.69
Bad	2.34	2.02	1.85
Very Bad	2.75	1.92	1.7
Constant	0.02	0	0.08

Source: *own construction based on the SILC (EUROSTAT) and TUIK (note: all percentages are measured with weighted cases*

Table 10 indicates a summary of logistic regression results with the three dimensions. Exp(B) refers to exponential β which was explained in the section of statistical methods used (Exponantial β is the odd ratios of the covariates on dependent variable).

Based on logistic regression results, females have higher chance to face financial difficulties in Turkey compared to male. Studies have showed that Turkey is 131st in gender gap index among 144 countries according to World Economic Forum 2017.

Situation of the mariatial status showed that worst case are the those who are divorced andindividuals grumble about their affordability to meet their financial needs. This is partly due to the lack of reforms that individuals who are willing to divorce are not protected by law (GÜNDÜZ-SMITS, 2008).

Demographic factors that increase the odds ratio of being poor is the age of the individuals. The probability of being deprived increases until middle age of 25-29 then, it start declining compared to those who are above 65 years old. However, needs of the age groups vary due to their life cycle. 15-19 years old youngsters have difficulties to afford their living conditions. This is the reason result show that they have higher chance to be deprived compared to 65+ age group. This cycle is same until 25-29 age group, where the likelihood ratio is highest for living conditions dimension.

Most of the studies have done about educational level of population. As it is mentioned earlier, there is a strong positive association between educational level and standards of living. In this research, result have showed the similiraties when level of education increases, standards of living increases as well. But illiterate individuals have higher chance to be deprived in living conditions dimension as a prior rather than economic conditions in Turkey. On the other hand, an individual who does not have a education and he/she is illiterate has just e = 1.71 odd ratio to

be deprived in living conditions dimension. This odd ratio is relatively low compared to other dimensions. Comparison of those who have higher education has e = 2.09 likelihood chance to face the financial difficulties compared to those who have faculty, master and doctorate.

Household characteristic is a category where each category shows different behaviour towards deprivation dimensions. However, each group's odd ratios is close to each other. Those households, who are two adults no independent children and at least one or two 65 years old member has slightly more chance e = 1.84 to be deprived compared to living condition dimension while housing and environmental problems have lowest likelihood chance e = 1.07. Housing and environmental dimension have lowest odd ratios among the other deprivation dimensions. Two adults one, two or more children households are more likely to be deprived in terms of living condition dimension e =3.53. This is the sign of those families who have two adults have an economic activity where they have income and two adults consider living conditions more important for their children. Studies show that households with more children are more likely to be deprived (COOPER et al., 2013).

Many studies show strong relationship between living standards and income level. Total equivalised disposable income is the factor, where the author observes the biggest differences within the income categories. Those individuals whose equivalised disposable income is lower than 10000 TL faces more living condition difficulties e = 24.16 compared to above. On the other hand, all total equivalised disposable income categories have less likelihood ratio for housing and environmental dimension. That means that difficulties in financial and living issues are basic need to maintain their life while housing and environmental issues are less essential.

Another one of the most important factors is the economic status of the individuals. In this category, looking for a job category explains that both economic strain and

living conditions are more likely to be deprived compared to those who are at work. Those who are retired are less likely to be deprived compared to those who are at work. Those individuals who are inactive people are less deprived than those who are looking for a job due to the protection by law and benefits.

Based on health status, there is a slight gap between those status who reported good compared to very good in terms of three dimensions. However, those whose health status is less than good are more likely to be financially deprived. But it can be explained that those individuals whose health status is less than good considers all three dimensions have more or less same priority.

To sum up, it can be stated that by means of logistic regression model, the author finds the significant difference with regards to multidimensional deprivation. Threfore H4 hypothesis - *causes of the deprivation are significantly different from each other across the three studied dimensions* is accepted.

4.2 New Research Findings

1. The author introduces a new deprivation index with a more complex approach, which the author gained by adjusting and correcting existing deprivation index.
2. The author examined the deprivation with a multidimensional approach and applied this model with a cross-country comparison within selected European countries and Turkey, and revealed significant differences in deprivation rates.
3. The author finds that if deprivation is considered to be a multidimensional phenomenon, there will be more identified deprived people.
4. The author proves that Turkey is far away from European Union standards in terms of three deprivation dimensions.
5. This is a first study that based on official Eurostat data, it is proved that Turkey, Bulgaria and Romania has no difference in terms of economic strain

and living conditions deprivation. Bulgaria and Romania are only statistically different in terms of the housing & environmental conitions deprivation.

5 RELATED PUBLICATIONS OF THE CANDIDATE

PEER-REVIEWED SCIENTIFIC BOOK

Hakan Ünal (2019): Comparison of three poverty measurement methods in case of Turkey, In: Bruder, Emese; Obádovics, Csilla (eds.): Changing society, changing economy, Budapest, Magyarország: Scolar Kiadó, pp. 15-33., 19 p. ISBN: 9789635090358

SCIENTIFIC JOURNALS

Bruder, Emese; **Hakan Ünal**; Obádovics, Csilla (2021): Migration and ageing patterns in agricultural areas of Hungary *GAZDASÁG ÉS TÁRSADALOM* (acceptance letter available)

Hakan Ünal; Obádovics, Csilla; Bruder, Emese (2020): Detailed Description on the Three Dimensions of Deprivation *GAZDASÁG ÉS TÁRSADALOM* 13 : 1 pp. 37-55. , 19 p. DOI: 10.21637/GT.2020.1.03

Bruder, Emese; Obádovics, Csilla; **Hakan Ünal** (2019): Determinants of deprivation in Turkey, a logistic regression analysis *STUDIA MUNDI - ECONOMICA* 6 : 2 pp. 102-112. , 11 p. DOI: 10.18531/Studia.Mundi.2019.06.02.102-112

Sean, Forbes; Rebecca, Robichaux-Davis; Wade, Smith; Emese, Bruder; **Hakan Ünal**; A. J., Guarino (2018): Inverse Relationship: Social Integration and Persistence in an Introductory Psychology Course for Secondary Students, *ADVANCES IN SOCIAL SCIENCES RESEARCH JOURNAL* Vol. 5, No. 10, pp. 372-374. , 3 p. DOI: https://doi.org/10.14738/assrj.510.5312

Bruder, Emese; **Hakan Ünal** (2017): Causes of deprivation in regions with different urbanisation level, *VADYBA: JOURNAL OF MANAGEMENT* 2: 31 pp. 31-36. , 6 p.

PROCEEDINGS OF SCIENTIFIC CONFERENCES

Full Papers

Bruder, Emese; Obádovics, Csilla; **Hakan Ünal** (2018): Migration and Ageing Patterns in Agricultural Areas of Hungary, In: Harun, Uçak (ed.) Proceedings Book : 2nd INTERNATIONAL CONFERENCE ON FOOD and AGRICULTURAL

ECONOMICS Alanya, Turkey: Alanya Alaaddin Keykubat Üniversitesi 314 p. pp. 13-19. , 7 p. DOI: 10.22004/ag.econ.296695

Hakan Ünal; Obádovics, Csilla; Bruder, Emese (2018): Beyond Turkish Poverty In: Resperger, Richárd (ed.) DEMOGRAPHIC CHANGES, CHANGING ECONOMIC CHALLENGES International Scientific Conference. Sopron, 8 November 2018. – Publications. Sopron, Hungary: Soproni Egyetem Kiadó (2018) 692 p. pp. 482-489. , 8 p., ISBN: 9789633343135

Hakan Ünal (2018): Regional differences of urban and rural poverty in Hungary In: Földi, Péter; Borbély, András; Kápolnai, Zsombor; Zsarnóczky, Martin Balázs; Bálint, Csaba; Fodor-Borsos, Eszter; Gerencsér, Ilona; Gódor, Amelita Kata; Gubacsi, Franciska; Nyírő, András; Szeberényi, András (eds.) Közgazdász Doktoranduszok és Kutatók IV. Téli Konferenciája: Konferenciakötet Budapest, Hungary: Doktoranduszok Országos Szövetsége (DOSZ) 761 p. pp. 650-660. , 11 p. ISBN: 9789632697680

Hakan Ünal; Bruder, Emese; Obádovics, Csilla (2018): Factors of Migration in Agricultural Areas In: Harun, Uçak (ed.) Proceedings Book : 2nd INTERNATIONAL CONFERENCE ON FOOD and AGRICULTURAL ECONOMICS Alanya, Turkey: Alanya Alaaddin Keykubat Üniversitesi 314 p. pp. 2010-2016. , 7 p. ISBN: 9786052451960

Emese, Bruder; **Hakan, Ünal** (2017): Drivers of urban and rural poverty in Central Europe, In: Kamila, Borseková; Anna, Vanová; Katarína, Vitálisová (eds.) 6th Central European Conference in Regional Science "Engines of Urban and Regional Development": Conference Proceedings, Banská Bystrica, Slovakia: Faculty of Economics, Matej Bel University in Banská Bystrica 776 p. pp. 476-485. , 10 p. ISBN: 9788055713359

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