

AN INVESTIGATION OF THE CHANGE IN THE SEVERE MATERIAL
DEPRIVATION RATE OF TURKEY

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ABSTRACT

An Investigation of the Change in the Severe Material Deprivation Rate of Turkey

On September 2014, Turkish Statistical Institute has announced the results of the Income and Living Conditions Survey for 2013. According to the survey the severe material deprivation rate, which is defined as the percentage of population with an enforced lack of at least four out of nine material deprivation items in the economic strain and durables dimension, was calculated as 49.7% for 2013 whereas it was 59.2% for 2012. These numbers have been recalculated for the announcement made on 18 September 2015 and were updated to fall from 55% in 2012 to 42.8% in 2013 and to 29.4% in 2014. Following the announcement indicating a severe drop in the severe material deprivation rate, it was noted that 4 questions of the survey have been slightly changed. This study aims to find out if the drop in the severe material deprivation rate has its roots in the changed questionnaire as well as finding out if the change in the questionnaire has changed the material deprivation status of certain demographic groups.

ÖZET

Türkiye'nin Maddi Yoksunluk Oranındaki Değişiminin İncelenmesi

Eylül 2014'te Türkiye İstatistik Kurumu, 2013 yılı Gelir ve Yaşam Koşulları Anketi sonuçlarını açıkladı. Ankete göre, ciddi finansal sıkıntıyla karşı karşıya olan nüfusun oranı olarak tanımlanan ve belirlenmiş 9 maddeden en az 4 tanesini karşılayamama ya da mahrum olma durumunu tanımlayan “maddi yoksunluk” oranı 2012'de% 59.2 iken 2013 için% 49.7 olarak hesaplandı. Bu rakamlar, 18 Eylül 2015 tarihinde yapılmış olan yeni bir duyuru için tekrar hesaplanarak 2012 için 55% , 2013 için 42.8% ve 2014 için 29.4% olarak düzeltildi. Maddi yoksunluk oranının ciddi oranda azaltıldığına dair yapılan açıklamanın ardından, anketin 4 sorusunda bazı değişiklikler yapılmış olduğu açıklandı. Bu çalışma, maddi yoksunluk oranındaki düşüşün, değişen anket sorularından kaynaklanıp kaynaklanmadığını ve anketteki değişikliğin hangi demografik grupların maddi yoksunluk durumunu değiştirip değiştirmediğini araştırmayı amaçlamaktadır.

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CHAPTER 1

INTRODUCTION

European Union measures poverty through its reference survey, the European Union Statistics on Income and Living Conditions (EU-SILC) to monitor social developments, income distribution and poverty figures.

EU-SILC provides two types of annual data: cross-sectional and four year longitudinal. It is based on the idea of a common framework, which defines the following:

- The harmonized lists of target primary and secondary variables to be transmitted to Eurostat which is the European Union Statistical Office,
- Common guidelines and procedures

These two are in the end, common concepts and classifications aimed at maximizing comparability of the information produced across Europe.

Hauser (2008), states that in a conference organized by Eurostat in Helsinki on November 2006 where various quality criteria related to national surveys were discussed and applied, the criteria of “exactitude”, “reliability” and “international comparability” were the outstanding quality criteria that were discussed as being the attributes of EU-SILC surveys.

However, since EU-SILC is aimed at obtaining pre-specified variables and is not a harmonized survey across all countries, authorities of each country have the rights to the scope of collecting the required information, which may give rise to issues relating to reliability and comparability of the results (Nolan & Whelan, 2010).

From the outcomes of the survey ‘people at risk of poverty or social exclusion’ as defined by Eurostat is obtained and it shows the number of people affected by at least one of three forms of poverty: monetary poverty, material deprivation and low work intensity (Eurostat,2016).

Severe material deprivation rate represents the percentage of people living in households that cannot afford at least four out of a list of nine items that are deemed necessary for an acceptable standard of living in the country they dwell.

At-risk of poverty rate (income poverty) is the share of people with an equivalised disposable income below the at-risk-of-poverty threshold, which is set at 60% of the national median, equivalised disposable income after social transfers. At risk of poverty rate is often related to material deprivation rate, since being in a materially deprived status is strongly correlated with income. The relationship between the two has been analyzed by many studies in the literature.

Severe Material Deprivation rate statistics averages for Europe and Turkey are summed up in Table 1. As vividly represented in Table 1, the numbers for Turkey are poorer than the EU averages for the material deprivation figures. The severe material deprivation rate for Turkey has come close to being 50 percentage points above the EU averages. The difference has decreased from being 51.3 percentage points in 2011 to 36.5 percentage points in 2013. The percentages for the at risk of poverty rates for Turkey are roughly only 6-9 percentage points above the EU averages. Furthermore, the at-risk of poverty rate for Turkey in 2009 was 25.3% whereas in 2013 it was 23.1%. Thus, as one may deduct, there is a relatively worse picture for Turkey to worry about, if the concern were the material deprivation status rather than the income poverty status.

Table 1. Severe Material Deprivation Percentages for EU and Turkey

	2009	2010	2011	2012	2013
European Union (28 countries)		8.4	8.8	9.9	9.6
European Union (27 countries)	8.2	8.3	8.8	9.8	9.6
European Union (15 countries)	5.2	5.4	6.1	7.3	7.2
New Member States (12 countries)	19.7	19.8	19.1	19.9	18.9
Euro area (19 countries)	6	6.1	6.9	7.8	7.5
Euro area (18 countries)	5.9	5.9	6.8	7.7	7.4
Euro area (17 countries)	5.8	5.8	6.6	7.5	7.3
Turkey	56.7	59.3	57.9	55	43.8

Source: Eurostat, April 14, 2016

Furthermore, whereas the at risk of poverty rate for Turkey from 2012 to 2013 has experienced a drop of 0.6 percentage points, the materially deprived population has decreased between 2012-2013 by 11.2 percentage points. This drop is in fact at the focus of this thesis. The drop is experienced after a change in the material deprivation questionnaire announced by the Turkish Statistical Institute (TUIK/Turkstat) for the 2013 questionnaire and we are aiming to find out if the change in the questionnaire is associated with the drop and if so, which groups are most affected from the change.

For Turkey, the application of the survey of Eurostat began in 2006 within the framework of the European Union Compliance Program and first results for 2006 were published by Turkstat in 2009. In doing so, EU-SILC methodology was referenced by Turkstat where statistics on relative poverty rate, poverty gap, persistent at-risk-of-poverty rate, and as part of the Europe 2020 strategy, material deprivation statistics have been published (Karadag, 2013).

As stated previously when compared against the averages of the European Union, the statistics of Turkey may as well come to being rated as relatively far below. Especially for the case with respect to the rate of change observed in the 2013

severe material deprivation rate for Turkey which showed a drop of 11.2 percentage points from the 2012 number of 55%. This sort of a percentage change of the severe material deprivation rate has not been observed among any of the individual EU countries over two consecutive years since 2006 up until year 2015 as represented in Table 2 except for Bulgaria for the period 2007-2008. However, this drop for Bulgaria has been related to the changes in the income dynamics of Bulgaria for the period 2006-2010. In the period 2006- 2010, the real monetary household incomes in Bulgaria increased by around 19%, whilst in 2008 the incomes increased by 11% (Tsanov et al., 2013). Alternatively, for Bulgaria, there may also have been issues related to the survey methodology. The deprivation rate for Bulgaria was found to be around 60% based on pilot surveys conducted by BBSS Gallup International in 2006 and 2007. When the surveys were conducted by Bulgarian National Statistics Institute in 2008 and 2009, the rate turned out to be around 40% (NSI Bulgaria, 2010).

The change for Turkey however cannot be related to the income variation between 2012 and 2013 since the change in income is incomparable to the change in material deprivation status between 2006 and 2013.

When information has been searched to find out if there have been any Eurostat imposed changes between 2010 and 2013 in the wording of the questionnaire, none were found. When the questionnaires for individual countries such as UK and Germany are reviewed as obtained from Eurostat it has been seen that there does not exist a standard questionnaire format. This means every country receives the required information using different wording.

This leads us to believe that since, as stated before, EU-SILC is aimed at obtaining the pre-specified variables and is not a harmonized survey across all

Table 2. Severe Material Deprivation Rates for Turkey and EU Countries

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Belgium	6.4	5.7	5.6	5.2	5.9	5.7	6.3	5.1	5.9	5.8
Bulgaria	57.7	57.6	41.2	41.9	45.7	43.6	44.1	43	33.1	34.2
Czech Republic	9.6	7.4	6.8	6.1	6.2	6.1	6.6	6.6	6.7	5.6
Denmark	3.1	3.3	2	2.3	2.7	2.3	2.7	3.6	3.2	3.7
Germany	5.1	4.8	5.5	5.4	4.5	5.3	4.9	5.4	5	4.4
Estonia	7	5.6	4.9	6.2	9	8.7	9.4	7.6	6.2	4.5
Ireland	4.8	4.5	5.5	6.1	5.7	7.8	9.8	9.9	8.4	:
Greece	11.5	11.5	11.2	11	11.6	15.2	19.5	20.3	21.5	22.2
Spain	4.1	3.5	3.6	4.5	4.9	4.5	5.8	6.2	7.1	6.4
France	5	4.7	5.4	5.6	5.8	5.2	5.3	4.9	4.8	4.5
Croatia					14.3	15.2	15.9	14.7	13.9	13.7
Italy	6.4	7	7.5	7.3	7.4	11.1	14.5	12.3	11.6	11.5
Cyprus	12.6	13.3	9.1	9.5	11.2	11.7	15	16.1	15.3	15.4
Latvia	31.3	24	19.3	22.1	27.6	31	25.6	24	19.2	16.4
Lithuania	25.3	16.6	12.5	15.6	19.9	19	19.8	16	13.6	13.9
Luxembourg	1.1	0.8	0.7	1.1	0.5	1.2	1.3	1.8	1.4	2
Hungary	20.9	19.9	17.9	20.3	21.6	23.4	26.3	27.8	24	19.4
Malta	3.9	4.4	4.3	5	6.5	6.6	9.2	9.5	10.2	8.1
Netherlands	2.3	1.7	1.5	1.4	2.2	2.5	2.3	2.5	3.2	2.5
Austria	3.6	3.3	5.9	4.6	4.3	4	4	4.2	4	3.6
Poland	27.6	22.3	17.7	15	14.2	13	13.5	11.9	10.4	8.1
Portugal	9.1	9.6	9.7	9.1	9	8.3	8.6	10.9	10.6	9.6
Romania		38	32.7	32.1	30.5	29.5	31.1	29.8	25.9	22.7
Slovenia	5.1	5.1	6.7	6.1	5.9	6.1	6.6	6.7	6.6	5.8
Slovakia	18.2	13.7	11.8	11.1	11.4	10.6	10.5	10.2	9.9	9
Finland	3.3	3.6	3.5	2.8	2.8	3.2	2.9	2.5	2.8	2.2
Sweden	2.1	2.2	1.4	1.6	1.3	1.2	1.3	1.4	0.7	0.7
United Kingdom	4.5	4.2	4.5	3.3	4.8	5.1	7.8	8.3	7.4	6.1
Iceland	2.1	2.1	0.8	0.8	1.8	2.1	2.4	1.9	1.4	1.6
Norway	2.8	2.3	2	2.2	2	2.3	1.7	1.9	1.2	1.3
Switzerland		2.3	2.1	2.1	1.7	1	0.8	0.7	1.3	
Macedonia					34.7	40.3	40.9	37.7	35.7	
Serbia								26.9	26.3	24
Turkey	60.4	58.8	57.7	56.7	59.3	57.9	55	43.8		

Source: Eurostat, April 14, 2016

countries, the changes in the wording of the questionnaire are allowed because authorities of the country in question have the rights to the scope of collecting the required information. Hence, Turkstat has done changes in the questionnaire based on its own judgment. After this judgment, certain factors that are related to how people respond to the questions may have shifted in Turkey and as previously stated

this study aims to find out if the change in the questionnaire is related to the drop in the material deprivation rate for Turkey. It would not be realistic to assume that welfare of Turkey has suddenly improved with respect to material deprivation when there is no drastic change in other welfare related indicators such as income.

However, to quantify the impact of the change in the questionnaire would be a bit tricky, since part of the change may be attributable to a welfare increase due to fluctuations in income. In order to isolate the effect of the questionnaire change from that of the income we will create subsamples such that the observations in the subsamples would not have experienced significant income changes throughout the period. To re-iterate the purpose of this study, how the change in the statuses of certain groups can be related to the change in the wording of the questions would be another discussion that we would focus on.

CHAPTER 2

BASIC CONCEPTS AND LITERATURE REVIEW

2.1 Basic concepts and definitions in the study

2.1.1 What is material deprivation?

Material deprivation concept is based on the affordability of a selection of goods and services, which are deemed necessary, or desirable for people to have in order for those people to have an acceptable standard of living considering the conditions of the country they live in (Stankovičová et al.,2013).

Townsend (1979) who was the first to develop a material deprivation index, argued that under the light of the relative theory of poverty “people's needs, even for food, are conditioned by the society to which they belong” (p.38), thus the material deprivation he describes is determined by the necessities that the majority of population deems as basic needs. He criticizes that the criteria of the need concept, as in basic needs, is not then independent of personal judgment and could not be based on the spending of the poorest families. He notes that the spending of the poorest families cannot represent what they in fact need to spend. Instead, in defining the concept, Townsend refers to basic needs as those that are commanded by the average individual or family in the societies to which a person or group belongs.

The material deprivation rate based on the definition of Eurostat represents the proportion of people living in households that cannot afford at least three of these items:

- Mortgage or rent payments, utility bills, hire purchase installments or other loan payments
- One week's holiday away from home
- A meal with meat, chicken, fish or vegetarian equivalent every second day
- Unexpected financial expenses
- A telephone (including mobile telephone)
- A colour TV
- A washing machine
- A car
- Heating to keep the home sufficiently warm

The severe material deprivation rate based on the definition of Eurostat represents the proportion of people living in households that cannot afford at least four of those nine items.

2.1.2 Changes that have been done in the Turkstat questionnaire

Beginning in 2006, in order to assess the income distribution among individuals and households, Turkstat has started to conduct, 'Survey of Households and Living Conditions' using the 'panel survey' methodology. With the purpose of attaining comparability with the EU, since Turkey is a candidate country for the EU, the EU-SILC methodology including the modular questions is referenced by Turkstat. In the announcement by Turkstat for the 2013 numbers, it was noted that there have been changes done in the wording of certain questions, however the date of the change or which cohorts the changes applied to were not detailed.

According to the announcement in 2013 made by Turkstat the changes are detailed in the sections 2.1.2.1 to 2.1.2.4. Original versions of the questions can be found in the Appendix.

2.1.2.1 Question 32.1.a Item related to affording a holiday away from home

In 2011 and for the preceding panels at hand, question 32.1.a related to one week's holiday away from home was, "Do you have the economical means to afford a one-week holiday away from home for all household members in a holiday camp, motel or hotel?" whereas in 2013, the question was modified to be, "Does your household have the means to afford a one week holiday expense away from home for all household members in a holiday camp, hotel, motel, summerhouse that belongs to the household, a relative's home or an institutional or governmental camp?"

Thus, one example of a difference resulting from such a change in the wording of the questionnaire would be that, it is, after the change, acceptable if the household was not able to afford a budget-wise affordable one week holiday away from home and having the chance of exploring new surroundings. It would be acceptable because the respondent of the questionnaire would still be able to give a positive response if they were to go for two weeks away from home in Istanbul to help their family in the Black Sea Region for the harvest season of hazelnuts. Going to the extreme, they could then be able to afford the transportation on credit, perhaps from the future earnings, the sum of which could may well be equal to the sum of their transportation expenses, only again from the opportunity of the hazelnut harvest season. The children would be of course feeling the sense of a holiday or a vacation, as if it were afforded as a result for the sole purpose of it being a vacation, and the

parents as well, since what they regard as a holiday is to be given accommodation in another region and with different surroundings and again of course, not necessarily the surroundings that they would have enjoyed if the budget was a bit more convenient for the desired vacation.

Obviously, this is not to say that every respondent is within such a position, but the change in the wording broadens the horizon of the description of the holiday and it also increases the probability of receiving a positive answer.

2.1.2.2 Question 32.1.b Item related to the affordability of a protein diet

For the 2010 and 2011 panels, question 32.1.b related to affordability of meat, chicken or fish was, “Do you have the economical means to afford the consumption of red meat, chicken or fish (or vegetarian equivalents) at least three times in a week?” whereas in 2013, the question was modified to be “Is your household able to afford the consumption of red meat, chicken or fish (or vegetarian equivalents) every other day?”

The wording of the question can generate a minuscule moment of confusion when asked impromptu. In the pre-change case; one is considering the options within the limited budget set of a week or maybe a month at the time of being asked the question, possibly by means of considering the amount of the available income within a month.

In the second version of the question, the question is asked such that the recipient of the question well may be in the position to think with respect to numbering the first day as the day of being asked the question. The household head may be thinking that even if he or she had not had meat for the first 29 days of the

month, with the future coming income in three days, he or she would be able to afford meat or vegetarian equivalent every other day for a number of days. Again, this interpretation is not representative of the whole sample at hand, but the way the question is asked broadens an interpretation for a positive response.

2.1.2.3 Question 32.1.c Item related to affording unexpected expenses

In 2011 and for the preceding panels at hand, question 32.1.c related to affording unexpected expenses was, “Are you economically able to afford an unexpected expense of around 445 TRY?” whereas in 2013, the question was modified to be “Is your household able to afford an unexpected expense of 410 TRY with its own means? (Affording through debt is also considered as 'Yes')”.

It could be regarded as necessary to underline that; removing the constraint of the possibility of taking on continuous debt in order to afford an unexpected expense is accepted in the second version of the question as a positive response. There is also a drop in the amount of the unexpected expense despite the fact that the annual OECD- adjusted income in 2011 as announced by Turkstat is 10,774 in 2011 and 13,250 in 2013. The reason for such a drop has not been officially documented or announced.

2.1.2.4 Question 32.1.b Item related to heating of home

In 2011 and for the preceding panels at hand, question 32.1.d, related to heating the home sufficiently warm was, “Are you economically able to afford the heating necessity to keep your home sufficiently warm?” whereas in 2013, the question was

modified to be “Is your household able to afford the heating necessities of your home?” An example to giving a positive answer to the second version of the question but not to the first version of it could be if everyone agreed in the household, given the budget constraint of the household, a measure of warmth that can be accepted as the heating necessity of the home. Given the amount of expenditure to be spent on a heating necessity such as natural gas to keep the home sufficiently warm, household members could have decided to instead put on more clothing instead of spending money on a heating necessity, to save for various relatively low-cost other necessities.

Sufficient may also be regarded as a subjective term, but as Townsend (1979) suggested needs are based on personal judgment and do not always correspond to what is being regarded as sufficient by an average dweller of the same surroundings.

Again, the relativity allowed in contemplating for an answer to the question is broadened in terms of the way the question is asked.

As a last note, there was another announced change in the questionnaire related to the economical ability to affording the renewal of old or worn out furniture, but this question is not among the items that determine the severe material deprivation index.

As mentioned previously, there is no standard questionnaire applied across the EU. Each country has individual questionnaires with different formats. Thus, a couple of questionnaires will be reviewed to shed a light on how the EU countries are wording the items.

In the Irish questionnaire for example the question for holiday consists of “Can your whole household afford to go for a week’s annual holiday, away from home?” There is no additional wording in the questionnaire defining the concept of a

holiday away from home. The question related to heating is “Does the household keep the home adequately warm?” similar to the unchanged version of the Turkstat questionnaire. The question related to household diet is “Does your household eat meals with meat, chicken, fish (or vegetarian equivalent) every second day?” which is similar to the changed Turkstat questionnaire. The question related to the affordability of unexpected expenses is “Can your household afford an unexpected expense of €1,145 without borrowing? If the payment was made on credit then the account should be debited within 1 month.” The wording of this question is much more restrictive of giving means to a positive answer than both of the Turkstat versions, both in terms of the amount of the unexpected expense and through the restriction of payment on credit.

The 2013 UK version of the questionnaire for the changed questions are as follows: The holiday related question is if the household is able to afford to pay for a week's annual holiday away from home, the question related to unexpected expenses is if the household is able to afford to pay an unexpected, but necessary, expense of £750, the question related to heating is if the household is able to afford to keep their home adequately warm. These three questions are similar to the unchanged version of the Turkstat questionnaire. The question related to the diet is if the household is able to afford to eat meat, chicken or fish (or vegetarian equivalent) every second day. This question is similar to the changed version of the Turkstat questionnaire.

When the 2013 German version is reviewed the holiday, heating and diet items are the same as the UK version, and the item related to unexpected expenses is determined to be 952 EUR and should be afforded without any mention of a credit allowance.

Thus, when the questionnaires of the three EU-SILC countries are reviewed it has been seen that most of the items but the diet item are worded like the more conservative Turkstat questionnaire.

2.2 Literature review

The preliminary sections have displayed for Europe and Turkey what has been observed by the statistical institutions as the percentage of the population that has been determined as being under the relative income poverty line and deemed as being severely materially deprived. The change in the poverty rate for Turkey has almost shown no difference between the 2012-2013 period whereas there has been a drastic drop in the severe material deprivation rate between 2012 and 2013.

So which measure gives a better picture of Turkey's poverty and social exclusion status?

Before we answer this question, we will review the concepts of severe material deprivation and income poverty measurements in the literature.

There have been many studies that have attempted to assess the validity of the income and the material deprivation measurements of poverty.

2.2.1 The relationship between the income measurement and material deprivation measurement of poverty

One of the pioneers in the literature on the subject matter, Ringen (1988) has argued that there is a problem with the income measurement related to the poverty line method which is a method that depends on measuring the amount of people the

income of those fall below a certain line. There is a problem since income is an abstract form of measurement that gives no consideration to how people in fact live. It may be the case that, those with low income do not necessarily have a housing deprivation and have wealth compensation. Ringen (1988) also claims that the deprivation definition of poverty is a direct definition since it defines poverty as the lowest standard of consumption that excludes those who suffer it from the normal way of life of their community. In addition, many who do not belong to low-income groups suffer from deprived consumption and the European type welfare state includes social services, which are bypassed in the income measurement of poverty therefore has argued that a measurement, which incorporates low income and material deprivation indicators, should be put into practice (Ringen, 1988).

Whelan and Maitre, in their 2013 study, using EU-SILC data, conclude that basic deprivation which is related to enforced absence of clothes, a leisure activity, a holiday, a meal with meat or a vegetarian alternative to the intake of protein, adequate home heating and shoes has turned out to be the key deprivation dimensions that are associated with economic stress. Whelan and Maitre, also argue that a 'mixed consistent poverty' indicator, which defines an individual as poor when the he or she is both lacking the necessary income to be above the EU poverty threshold and when the he or she is materially deprived according to the EU standards is best suited for assessing the rate of exclusion from the minimal standards of living in the individual EU countries (Whelan & Maitre, 2009). The necessity of using both measures has also been emphasized by Treanor (2014) and Bossert, Chakravarty and D'Ambrosio (2013). Niemietz (2010) argues that relative poverty measures, due to their shortcomings can lead to counterproductive policy conclusions. He further suggests that material deprivation indicators should be added

to the measurement of poverty. Main (2014) in a study to assess the linkages of poverty and social exclusion restrictions to children found that measurement of both low income and material deprivation indicators were better predictors of children's subjective well-being.

Several researchers have indicated that low-income groups and high deprivation groups of the population do not necessarily intersect (Nolan and Whelan, 1996), (Whelan, Maître & Layte, 2004), (Perry 2002). Hick (2015) concludes that low income and material deprivation surveys identify substantially different people as being poor but whilst displaying different trends over time, they do indicate that same groups are identified as being at risk of poverty.

Fusco (2015) concludes that high incomes are related with reduced levels of housing deprivation and the long-term relationship between income and deprivation is found to be negative and strong. Berthoud and Bryan (2011) based on British household panel survey find out that there is a close underlying link among the income and deprivation measures whereby people that have low incomes for the long term report long term deprivation. However, there also exists a weak dynamic link, meaning if people's income increases they do not report a fall in deprivation. Berthoud and Bryan (2011) conclude that if the measures of poverty and deprivation are done over a widely spaced period of years, the mismatch between income poverty and deprivation poverty is not so great.

Poverty is also related to the economic well being of a country. In one study done, higher GDP levels are found to lower the effects of individual heterogeneity in determining material deprivation levels. In the same study, social policy generosity is also found to play a reducing role in the effects of the individual characteristics (Bárcena-Martín, Lacomba, Moro-Egido & Pérez-Moreno, 2014). Whelan, Layte,

Maître and Nolan (2001) find that income is related to deprivation for the housing and environment dimensions and this varies significantly across countries. They find that in richer countries where the level of deprivation is lowest the relationship is the weakest. Whelan et al. (2001) also indicate that economic strain is much more related to deprivation rather than income.

Fahey (2006) uses the data of 25 Member States of the EU and three candidate countries that consist of Romania, Bulgaria and Turkey and he groups countries into clusters based on GDP per capita and finds out that the lower the income within each cluster, the higher the proportion who are deprived.

Crettaz (2015) finds out that working material deprivation, which he considers to be the material deprivation as defined by Eurostat with the additional attribute of the person being working at the time of the interview, reacts to changes in economic growth and unemployment whereas working poverty, usually does not.

In addressing why the discrepancy between income and material deprivation measures may produce varying results, Nolan and Whelan (2010) mention that income may be low for a household but the household may have savings to live on. Alternatively, income may be misreported as low but the non-monetary indicators may suggest a higher standard of living. Furthermore, if the household uses non-cash benefits from the state, it would enable the household to obtain a higher standard of living. On the contrary the house may have certain needs that act as a drain on income such as a disability or sickness, in which case income would not be a valid indicator for the deprivation level of the household (Nolan & Whelan,2010).

2.2.2 Criticisms against material deprivation measurement

The criticisms against material deprivation measures claim that information collected through surveys limit cross-country comparability since surveys differ in the wording of the questions, especially the type of wording that would shade the differentiation of enforced lack and chosen lack of a particular item. Experience has also shown that in some OECD countries such as Ireland, after a change that had been done to the surveys, the material deprivation status of some groups showed large changes, which may reflect changes in the order in which some questions were put (Boarini & d'Ercole, 2006).

The answers also may depend on the willingness of the household cohort for admitting deprivation. Also, the survey questions may bypass the fact that some groups are more likely to choose not to possess the item in question, the chosen lack criterion. For example inability to afford a holiday may be more critical for households with children than households with the elderly. This is basically related to what Hick (2013) also mentions, whether there is enforced lack or chosen lack of the item considered as a benchmark for material deprivation. Hick (2013) finds that the enforced lack measures are in the end have proven to be more effective in discriminating households that were saving, with an unemployed member etc. and turned out to be a more reliable measure of financial stress.

2.2.3 The variables that determine economic vulnerability of households and individuals

Certain qualities of households and individuals are found to affect the risk of poverty or social exclusion irrelevant of the definition being done from the income or

material deprivation perspective. Berthoud and Bryan (2010) underline that preferences of budgeting efficiency of within household processes, such as living in rented accommodation or being a couple, do have effects on predicting the deprivation scores. Extended households which consist of other adults among the nuclear family also broadens the network information on employment possibilities (Gurak & Kritz, 1996). Extended households can also create advantages for women with children to participation in the work force (Tunali&Baslevent,2003).

Dumitru (2014), in his study based on data from Romania, states that the major factors that account for the variance in material deprivation are income, labor market participation, education and the medium of residence. Aya (2009) using 2006 Japanese data shows that childhood poverty influences adult well-being via education and occupation. Limanli, (2015), using 2006-2009 household panel data for Turkey, determines that households with female heads are vulnerable to poverty, whereas health and education are the crucial determinants of the standing of the households in the income distribution. Besharov and Call (2009) using European, US and Australian household data have put forth that reducing the number of female headed households would help alleviate the risk of poverty. Berenger and Bresson (2012) using Turkish data for the 2003-2005 period find that welfare gains of economic growth were less important for the four lowest education groups, since economic growth was fostering sectors that required high-skilled workers. Hick's 2015 study using the British Household Panel Survey shows workless households, households where the head is in very poor health or single parent households experience a higher rate of material poverty irrespective of the measure of material poverty. While investigating the consequences of shifting from the European Community Housing Panel data set to the EU-SILC instrument using Irish data

Whelan and Maitre (2007) find out that employment status, marital status, number of children, being a lone-parent, age-group, education, location of the dwelling being urban or not and the tenure status of the household creates overlaps between the two surveys in terms of economically vulnerable groups. Hick, in his 2016 work identifies groups that are under risk of poverty or social exclusion, based on their age, health status, employment status, household composition and whether the person is the owner of the dwelling.

In addition to the individual characteristics affecting poverty and social exclusion, Whelan and Maitre (2010) find the effects of the country dynamics of vulnerability to economic exclusion by using the latent class approach, where they identify people as being a member of a distinct cluster. It is found in their study that the levels of vulnerability to economic stress increase as the country's political structure changes where consumption deprivation is higher in the limited and less generous welfare regimes, and the polarization between the vulnerable and non-vulnerable is highest in the more generous regimes (Whelan & Maître, 2010). Nelson (2012) analyzes the link between social assistance benefit levels and material deprivation in European countries and finds that the relation between assistance and deprivation is negative.

2.2.4 Studies related to the wording of the survey questionnaires

In the study done by Choi and Pak (2005) where they review the literature on bias in questionnaires due to design, 48 types of biases are identified and the types of biases are categorized into three sources which are either stemming from the way the question is designed, the way the questionnaire is designed or the way the

questionnaire is administered. The way the question is designed is associated with problems of wording. Wording problems may occur when the question is complex due to its length and its construction. Uncommon words such as ‘sufficient’, ‘terminate’ or ‘reside’ that have more common alternatives such as ‘enough’, ‘end’ or ‘live’ cause perception issues and can be regarded as examples of vague concepts associated with wording in the question or response choices. This type of bias can be attributed to the heating related item 9 of the Turkstat questionnaire, which used the word ‘sufficient’ in its previous version and instead of replacing it with a simpler word or quantifying what is ‘sufficient heating’, the new version instead blurred the concept and made it relative by using ‘heating necessities of the home’. The study also mentions that in addition to wording, missing or inadequate data can be administered in a questionnaire for intended purposes. One example would be failure to properly specify a starting time in a question. Instead of specifying a time frame such as ‘between January 1 to December of last year’, the question may blur the respondent’s mind by a form of wording such as ‘in the last 12 months’. This type of bias brings to mind the Turkstat questionnaire change related to item 8 regarding the protein diet. The wording was changed from affording the ‘protein diet at least three times in a week’ to ‘every other day’. Again there seems to be a specification issue creating vagueness and confusion. Inconsistency in questionnaires with respect to changes of wording over different years the survey is administered, may also make the results incomparable. Bias created by the design of questionnaires may also arise from changes in the whole questionnaire, for example when the questionnaire is made too long such that it creates response fatigue in the respondent (Choi and Pak, 2005).

Schuman in his 1977 study regards question wording as an independent variable in survey analysis. Schuman puts forth two hypotheses in his study. He claims that first the persons being affected from the wording of a survey question are unlikely a random subsample of all respondents, and the effects of the change in the wording are some sort of self-selection. Second, he claims that better educated respondents would more likely better interpret what is being asked in the question and give a corresponding response. Thus, he concentrates on the correlation of survey wording and education in the paper. He finds out after several experiments that there is not a strong link between education and the form of the question in general, however it does exist in some survey types (Schuman,1977).

CHAPTER 3

DATA AND UNITS OF ANALYSIS

In this study 4-year panel data of households and personal registers for 2010,2011,2012 and 2013 obtained from Turkstat as well as cross-sectional household and personal register data for 2011, 2012 and 2013 also obtained from Turkstat are used.

The household is defined in the surveys as the groups of people comprised by one or more individuals, living in the same housing unit and meeting the basic needs of the household together.

Turkstat employs rotational design in its panel survey. According to the methodology, some households stay in the sample frame from year to year, and the remaining data is generated from new households. Approximately 25% of the households exit the survey from year to year so at year four only 25% of the year1 households remain among the survey participants. This methodology produces three overlapping longitudinal samples of different durations as seen in Figure 1; 2013 panel consists of two year duration panels from subsamples 9,10 and 11; three year duration panels from subsamples 9 and 10; and a four year duration panel from subsample 9. A rotational sample of this type each year produces a cross-sectional sample as well. For example referring to Figure 1, the cross sample data for 2013 will be the 2013 data for subsamples 9,10,11 and 12, that is the bottom set of boxes in Figure 1.

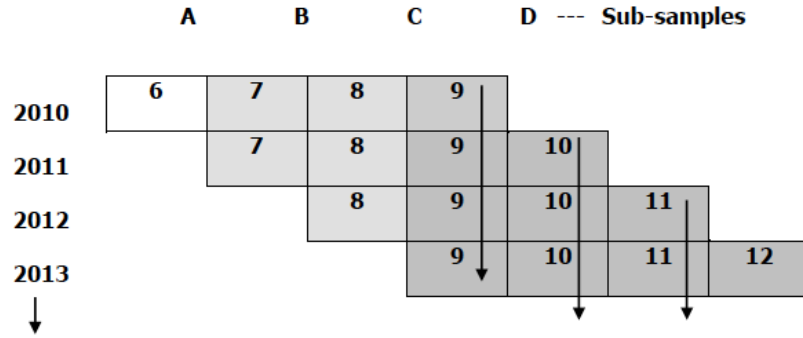


Figure 1. Description of the Cohort Creation Process

Source: Turkstat, 2016

The reference period for income in the survey is the previous calendar year. The incomes of the households are adjusted in the study based on the OECD modified equivalence scale, which produces the equivalised household income. This scale assigns a value of 1 to the household head, 0.5 to each additional adult member and 0.3 to each child. HG110, the variable code for the sum of the available income for the household as referenced in Turkstat questionnaires, is then divided by this OECD scale and the household adjusted income is obtained.

First, using the cross sectional data at hand for 2011,2012 and 2013, the material deprivation rate will be analyzed. For the purposes of analysis, from now on the association between the item numbers and deprivation areas will be as follows (the code for the associated survey variable is given in parenthesis),

- Item 1: affording due payments, (HE010, HE020, HE030)
- Item 2: affording a telephone/cell phone, (HH150, HH160)
- Item 3: affording a color TV, (HH170)
- Item 4: affording a washing machine, (HH200)
- Item 5: affording a car, (HH240)
- Item 6: affording a one week holiday, (HE080)
- Item 7: affording meat/ chicken/vegetarian equivalent, (HE090)

- Item 8: affording unexpected expenses, (HE100)
- Item 9: keeping the house warm. (HE110)

The numbers presented in Table 3 are calculated using the cross section data for 2011, 2012 and 2013 and they are all inline with the overall severe material deprivation percentage numbers published officially by Turkstat. In addition to the overall severe material deprivation rate, the deprivation rates item wise have also been calculated in the table. Since the overall rates are in line with Turkstat, this consistency allows us to further utilize the calculation method to find item-wise deprivation rates.

When the percentage change between 2012 to 2011 and 2013 to 2012 are compared, it is clearly visible that the rates of the decrease have more than doubled from the first to the latter for those questions that have been subjected to change, which are item 6,7,8 and 9. For example, the percentage drop in item 6 has surged from -0.57% to -7.39%, item 7 from -4.04% to -10.05% and item 8 from -5.82% to -12.78. There was a percentage rise in the materially deprived with respect to item 9 between 2011 and 2012, whereas it has switched to a fall of -7.97% between 2012 and 2013. On the other hand for questions that have not been modified, a distinctive change cannot be observed. For example, the percentage change in item 1 has been from -2.32% in the 2011-2012 period to -2.63% in the 2012 to 2013 period. Similarly, when the comparison is done over the two cross sections comparison pairs, that is, respectively 2011-2012 and 2012-2013, the change in item 2 has been from -0.24% to -0.23%, in item 3 from -0.08% to -0.03%, in item 4 from -0.59% to -1.48% and in item 5 from -2.77% to -2.43%

It is important to note that those questions that have been subject to the change in the questionnaire are also the ones where the highest ratio of deprivation is

reached among households. That is to say, the largest changes are solely drops from 2012 to 2013 as compared to 2011 to 2012 for those items for which the question wording has been modified. Further analysis will be done using panel data and the same calculation method.

Table 3. Material Deprivation Rate Calculations Using the Cross-Section Data

	2011	2012	% Change 2012-2011	2013	%Change 2013-2012
Item 1	51.63	49.31	-2.32	46.68	-2.63
Item 2	1.05	0.81	-0.24	0.58	-0.23
Item 3	0.8	0.72	-0.08	0.69	-0.03
Item 4	4.91	4.32	-0.59	2.84	-1.48
Item 5	56.63	53.86	-2.77	51.43	-2.43
Item 6*	86.49	85.92	-0.57	78.53	-7.39
Item 7*	60.18	56.14	-4.04	46.09	-10.05
Item 8*	67.59	61.77	-5.82	48.99	-12.78
Item 9*	35.44	37.23	1.79	29.26	-7.97
OverallDepRate	57.92	55	-2.92	43.8	-11.2

The reason we will use panel data majorly in the analysis is that, using panel data allows for controlling for individual heterogeneity. In general, panel data suggests that individuals, firms, states or countries are heterogeneous and using time-series or cross-section studies without controlling for this heterogeneity runs the risk of obtaining biased results (Baltagi, 2005).

Before elaborating on the method of using the panel data at hand in the modeled regression, the structure of the panel data and the associated subsamples at hand are being detailed in Table 4.

As indicated before; the panel data of Turkstat complies with the standard integrated design of Eurostat. Each new additional person and household is followed up for four years. If a person moves, they are followed up to their new location for up to the time their panel remains in the survey. This design yields a cross sectional data

for each year from the same common set of units with the longitudinal samples of various durations. Therefore, the panel data that we will be using for each of the 2011, 2012 and 2013 panels are used to construct the data for which the cross-section calculations have been done in Table 3.

In Table 4, cohorts are shown for all the panels alongside the years in which they exist. In the table for 2013 panel, it can be seen that cohort 7 has been in the panel since 2010, cohort 8 since 2011, cohort 9 since 2012 and cohort 10 for 2013. Similar tables are represented for panel 2010, 2011 and 2012.

The areas that are highlighted in all four panels show the cohorts and the years for which they are parts of in the associated panel. The structure of the cross sections can also be seen in Table 4. For example the 2013 cross section is obtained from the 2013 column that involves cohorts, 7,8,9 and 10.

One thing to note about the creation process of the subsamples is that, when creating the sample of cohorts, if a cohort has not been in any of the panels for the duration of its four, three or two year life cycles within the panel, then it is dropped. For example, if a household from the four-year cohort, that is cohort 7 of the 2013 panel, has not responded for any of the years of 2010,2011,2012, or 2013, it is not in the selected sample. This would allow us to avoid an inconsistency created by a change in the material deprivation status for the year the member cohort is absent from the panel. In other words in order to eliminate any doubts that the status of the cohort is prone to fickleness we are concentrating on those that have stayed under the radar over the course of the period in question. While doing so, the number of households dropped in the whole 2010 panel are 947 out of 9,820, in the 2011 panel 951 out of 10,034, in the 2012 panel 1,020 out of 12,701 and in the 2013 panel 1,333 out of 15,321 are for all years.

Table 4. The Year Structure of the Cohorts

2013 Panel							2012 Panel						
Cohorts							Cohorts						
4	4	4	4				4	4	4	4			
	5	5	5	5				5	5	5	5		
		6	6	6	6				6	6	6	6	
			7	7	7	7				7	7	7	7
				8	8	8					8	8	8
					9	9						9	9
						10							10
2007	2008	2009	2010	2011	2012	2013	2007	2008	2009	2010	2011	2012	2013
2011 Panel							2010 Panel						
Cohorts							Cohorts						
4	4	4	4				4	4	4	4			
	5	5	5	5				5	5	5	5		
		6	6	6	6				6	6	6	6	
			7	7	7	7				7	7	7	7
				8	8	8					8	8	8
					9	9						9	9
						10							10
2007	2008	2009	2010	2011	2012	2013	2007	2008	2009	2010	2011	2012	2013

The description of the data over the panels, that is the percentage point changes over the years in each panel with respect to household characteristics and head of household characteristics for all cohorts in the available sample of the panels is presented in Table 5. It can be seen that there is not a distinct pattern of a fluctuation of adjusted income, number of household members, number of employed people in the house, number of children, number of chronically ill people of the household and number of old people in the household for the 2013 panel. The changes that can be seen in the 2013 panel are also seen in the previous panels. So we cannot say that something changed in the 2013 panel, especially for the 2012-2013 or 2011-2012 period that separates them from the previous periods. The adjusted income, which in many studies has been found to be correlated with the material deprivation status of the household, is especially showing similar increases in the previous panels.

After this analysis, the changes in the item wise material deprivation status are presented in Table 6 for all panels. Even though the sample in question is not the main sample we will use in the analysis after doing certain eliminations that will be discussed, there is a distinctive fall in the material deprivation item wise statuses for questions 6,7,8 and 9 in the 2013 panel between 2011-2012 and 2012 and 2013 with respect to the previous panels.

For example, item 6 has in the previous panels have almost shown no change, whereas in the 2013 panel it has dropped by 5 and 6 percentage points for all cohorts. The percentage point drop in item 7 has increased in the 2012 and 2013 panels both for 2011-2012 and 2012-2013 periods. Item 8 has shown the most change with a fall of 6 percentage points in the 2010 and 2011 panels for the 2007-2008 and 2008-2009 periods previously whereas in the 2012 and 2013 panels, the fall has risen up to 11 percentage points and item 9 has shown the most drop in its history in the 2013 panel by 7 percentage points for the 2012-13 period.

When looking at the drop in the 2012 panel in the last year for some of the questions, which were announced to be changed in 2013 by Turkstat, an increase in the magnitude of the drop is observed in Table 6. Based on this, when the questionnaires for 2010, 2011 and 2012 panels are separately reviewed, it is seen that the question for item 7 (HE090) was already changed in the 2012 questionnaire, to the 2013 version. The question related to affordability of meat, chicken or fish in 2011 was, “Do you have the economical means to afford the consumption of red meat, chicken or fish (or vegetarian equivalents) at least three times in a week?” whereas in the 2012 questionnaire, prior to the announcement of the change in 2013, the question was “Is your household able to afford the consumption of red meat, chicken or fish (or vegetarian equivalents) every other day?”.

Table 5.Changes of Household Characteristics of the Sample

	Panel 2010						Panel 2011					
	Coh. 4			Coh. 5		Coh. 6	Coh. 5			Coh. 6		Coh. 7
	07/08	08/09	09/10	08/09	09/10	09/10	08/09	09/10	10/11	09/10	10/11	10/11
Year												
AdjInc	0.06	0.11	0.04	0.06	0.07	0.04	0.06	0.07	0.06	0.03	0.10	0.09
#HMembers	0.05	0.01	0.00	0.06	0.00	0.05	0.06	0.00	0.08	0.05	0.04	0.05
#Employed	0.01	0.04	-0.01	0.05	-0.01	0.00	0.06	-0.01	0.01	-0.01	0.01	0.01
#Children	0.01	-0.03	-0.03	0.00	-0.01	-0.01	0.01	-0.03	0.01	0.00	0.01	0.00
#Aged65+	0.14	0.06	0.03	0.08	0.04	0.11	0.08	0.04	0.14	0.11	0.10	0.10
#ChronicIll	0.02	0.00	-0.01	0.01	-0.01	0.00	0.05	-0.03	0.05	0.01	0.02	0.00
HH Age	0.02	0.00	0.01	0.02	0.01	0.02	0.02	0.01	0.03	0.02	0.02	0.02
HH PrimaryS	0.00	-0.01	-0.01	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HH MiddleS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HH College	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01	0.00	0.00	0.00
HH Unempl.	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
HH Female	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HH Married	0.00	-0.01	-0.01	0.00	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00
HH Illiterate	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Panel 2012						Panel 2013					
	Coh. 6			Coh. 7		Coh. 8	Coh.7			Coh. 8		Coh. 9
	09/10	10/11	11/12	10/11	11/12	11/12	10/11	11/12	12/13	11/12	12/13	12/13
Year												
AdjInc	0.04	0.10	0.03	0.09	0.06	0.08	0.08	0.07	0.07	0.08	0.09	0.10
#HMembers	0.05	0.04	0.03	0.04	0.04	0.05	0.04	0.04	0.03	0.05	0.04	0.05
#Employed	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.01	-0.02	0.02	0.02	0.03
#Children	0.00	0.01	-0.01	-0.01	-0.01	0.01	-0.01	0.00	-0.01	0.01	0.00	0.00
#Aged65+	0.10	0.06	0.09	0.10	0.09	0.10	0.10	0.09	0.08	0.10	0.06	0.10
#ChronicIll	0.01	-0.01	0.03	-0.01	0.02	0.00	0.03	-0.01	0.02	0.01	0.01	0.02
HH Age	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02
HH PrimaryS	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-0.01	0.00	0.00	0.00	0.00
HH MiddleS	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00
HH College	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
HH Unempl.	0.00	-0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
HH Female	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HH Married	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00
HH Illiterate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

A study to refer to here is the one done by Stankovicova, Vlačuha and Ivančíková, (2014) which aimed at measuring the differences created by the proposed new material deprivation indicator by the ‘Europe 2020 Strategy’ with the one accepted at the June 2010 ‘Lisbon Strategy’ for Slovak Republic.

Table 6. Changes in the Severe Material Deprivation Statuses of the Sample

	Panel 2010						Panel 2011					
	Coh. 4			Coh. 5		Coh. 6	Coh. 5			Coh. 6		Coh. 7
	07/08	08/09	09/10	08/09	09/10	09/10	08/09	09/10	10/11	09/10	10/11	10/11
Item 1	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	-0.01	0.00	-0.01
Item 2	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Item 3	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00	-0.01	0.00
Item 4	-0.03	-0.01	-0.01	-0.03	-0.01	-0.01	-0.03	-0.01	-0.01	-0.01	-0.02	-0.01
Item 5	-0.02	-0.01	0.02	-0.02	-0.02	-0.03	-0.02	-0.02	-0.01	-0.03	-0.02	-0.01
Item 6	0.01	-0.02	0.01	-0.01	0.00	0.00	-0.01	0.00	-0.01	0.00	-0.02	0.00
Item 7	-0.06	0.03	0.02	0.02	0.01	0.04	0.02	0.02	-0.04	0.04	-0.03	-0.03
Item 8	-0.01	-0.10	0.05	-0.06	0.01	0.03	-0.06	0.01	0.03	0.03	0.00	0.02
Item 9	-0.01	-0.05	-0.01	-0.05	-0.02	-0.02	-0.06	-0.01	0.00	-0.02	-0.02	-0.01
OverallDepr	-0.02	-0.03	0.02	-0.04	0.00	0.01	-0.04	0.00	0.00	0.01	-0.02	-0.01
	Panel 2012						Panel 2013					
	Coh. 6			Coh. 7		Coh. 8	Coh. 5			Coh. 6		Coh. 7
	09/10	10/11	11/12	10/11	11/12	11/12	10/11	11/12	12/13	11/12	12/13	12/13
Item 1	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00
Item 2	0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Item 3	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
Item 4	-0.01	-0.02	-0.01	-0.02	-0.01	-0.01	-0.02	-0.01	-0.02	-0.01	-0.01	-0.02
Item 5	-0.03	-0.02	0.00	-0.01	-0.04	-0.04	0.00	-0.04	-0.02	-0.04	-0.01	-0.02
Item 6	0.00	-0.02	0.00	-0.01	0.00	0.01	-0.01	0.00	-0.06	0.00	-0.06	-0.05
Item 7	0.03	-0.03	-0.06	-0.03	-0.06	-0.03	-0.03	-0.07	-0.05	-0.02	-0.08	-0.07
Item 8	0.03	0.00	-0.05	0.02	-0.08	-0.06	0.01	-0.07	-0.09	-0.05	-0.11	-0.10
Item 9	-0.01	-0.03	0.02	-0.01	0.00	0.00	-0.01	0.00	-0.04	-0.01	-0.06	-0.07
OverallDepr	0.02	-0.03	-0.03	-0.01	-0.04	-0.03	-0.02	-0.05	-0.08	-0.03	-0.09	-0.10

In the study, it is found that one week annual holiday away from home, facing unexpected expenses and a meal with meat, chicken, fish or vegetarian equivalent every second day are the major ones affecting overall material deprivation. The same study also indicates that the enforced lack of a washing machine, TV and telephone did not have significant impact on the proportion of people deprived in most EU states. Nolan and Whelan (2011) used 6 of the items currently used in the EU 9 item severe material deprivation scale, again omitting the phone, washing machine and the TV items and included the enforced lack of a PC as an addition to

the scale and found that this index had a satisfactory level of statistical reliability. When Table 6 is reviewed and the changed questions are considered, the changed questions involve those that are related to holiday, heating, diet and affording unexpected expenses and are the ones for which the major drop is observed in the 2013 panel. These are thus critical questions that reflect the overall material deprivation status the most. The drop in the overall deprivation status is thus strongly linked to the answers to these questions and surprisingly these are the questions for which the wording has been changed.

As stated previously, this is not the sample we will run the analysis on, it nevertheless gives an idea of a general pattern change for the 2012 and 2013 panels, mainly for the 2011-2012 and 2012-2013 periods in comparison to the previous periods of the previous panels. As one last measure of analysis regarding this sample, a subsample is created that represents all cohorts for which observations exist for the last two years of the panel. Table 7 represents the switch of the overall material deprivation status for each panel. For the last two years of each panel, i.e. from 2012 to 2013 for the 2013 panel, the 'Not Deprived' column represents the percentage of the observations that existed in 2012 and 2013 which were not overall materially deprived for both years, the 'Deprived' column represents those which were materially deprived for both years, the 'Improve' column represents those which have switched from being materially deprived to not and the 'Deteriorate' column represents which have fallen into overall material deprivation status in the last year of the panel.

As seen in Table 7, panel 2013 is the best performer among all in terms of the improvement of the material deprivation status of the observations.

Table 7. Percentage of the Sample Observations and their Overall Material Deprivation Statuses

	# Obs	Deprived	NotDeprived	Improve	Deteriorate
Panel 2010	8,415	55%	23%	11%	12%
Panel 2011	8,637	55%	23%	12%	10%
Panel 2012	11,150	52%	25%	13%	10%
Panel 2013	13,524	46%	31%	16%	7%

CHAPTER 4

METHODOLOGY

Given four panels and four cohorts in each of them, we see in Table 6 that although there is not a clear-cut trend in the item-wise deprivation rates, the drops in them are more vivid between 2011-2012 and 2012-2013 in the 2012 and 2013 panels.

However, we believe that using the whole sample in the analysis will not allow us to come up with a certain conclusion with respect to a distinctive change in the period of 2011-2013. The reason is that the whole panel contains households that may have experienced fluctuations in the material deprivation status over the years. That is, a household may have fallen into the materially deprived category in year 1 and thus be the representative of the materially deprived percentage in year 1, but may have changed the status in year 2 to not materially deprived and back to materially deprived in year 3. Thus, the household may be representing the not materially deprived percentage in year 2 and materially deprived percentage in year 3. However, in order to come up with a conclusion with respect to a change in the pattern or trend of the material deprivation status, we need consistency in the observations. That is, we need to find out if a consistently materially deprived household has suddenly changed status after the change in questions. For this identification purpose we have determined a selection process that will be described in the section 4.1. We also want to make sure that the change in the material deprivation status of the identified households, if there is any change in the third year, is not stemming from a change in the income status of the household. That is, we want to include those households in our analysis who have been consistently

having the same level of income. Thus, we will be eliminating some observations to create a subsample that fits this criterion. After that we will talk about the probit model used and discuss the results of the probit regression.

4.1 Selection criteria of the main subsample

The main subsamples are created from all 4 panels, such that the 3-year cohorts are kept for whom certain characteristics related to income and material deprivation status have stayed the same. The reason we have chosen a benchmark of three years is that in all of the four panels, if we were to use the four-year cohort (there exists only one four year cohort in each of the four panels) and if we were to go through the elimination that will be described, the sample size that results in each panel is fairly small and that sample size is not sufficient to deduct an inference. Thus, we have chosen to go along with the three-year cohort group, which consists of two cohorts and more observations.

The way the creation of the subsamples out of the three-year cohorts is done depends on the continuity of their income statuses for all of the three years and item-wise material deprivation statuses for the first two years within their panels.

4.1.1 Income criteria in the selection process: Relative poverty and food poverty

We pay particular attention to the change in income when doing the analysis, since as indicated in the literature review, income deprivation and material deprivation indicators have proven to be amounting to similar conclusions in the long run and in many studies in the short run as well. Hence, to isolate the impact of the change in

questions we will attempt to keep the income status of households the same across the periods. To do that, when creating the subsamples we will be using the combination of relative income poverty and food poverty lines for Turkey. The calculation methodology of the food poverty threshold was developed within the framework of the Social Risk Mitigation Project, which was financially supported by the World Bank (2005) in accordance with the agreement signed on 14 September 2001 and published in the Official Gazette on 28 November 2001, together with World Bank and Turkstat. The methodology considers 2100 kcal per day per equivalised household person as the food poverty threshold. Relative poverty threshold as defined by Eurostat guidelines is set as 60% of the median household equivalised income. The amount of the food and relative poverty thresholds used is depicted in Table 8.

During the calculation, for each of these poverty lines, if the household observation has an OECD adjusted or equivalised household income, which is under the poverty line, then the associated income variable for the household takes the value 1 and it takes the value 0 if this value is above the poverty line. Based on this the created subsamples have observations for which the relative and food poverty statuses have not changed over the course of their existence in the panel. By applying this criterion we aim to eliminate the effect of a possible changed status of income on the changed status of material deprivation, since according to literature, income and material deprivation status have been found to be highly correlated. If the income status of the household is kept the same over the analysis, and if there is a change in the material deprivation status, the attribution of the change could to a degree be better cleared from the effect of the change in the income status.

One thing to note here is that, the persistent at-risk-of-poverty rate published by Turkstat, and used among the income poverty measurement methods for Turkey, shows the percentage of the population living in households where the OECD adjusted disposable income has been below the at-risk-of-poverty threshold set at 60% of median OECD adjusted household income for the current year and at least two out of the preceding three years. Thus, when we create the subsample from consistent poverty line statuses, we would have accounted for those who have remained above and below this relative income poverty threshold as well.

4.1.2 Material deprivation item criteria in the selection process

In addition to the income criteria mentioned in the previous section, the main subsample contains 3-year cohort households, for which the material deprivation status based on the individual items have not changed for the 2nd and 3rd years of the panel (i.e. for the first and second years used in the study). Since the 4th year is the target year of the questionnaire change for the 2013 panel, keeping the items unchanged for the first 2 years would prevent a change in the item wise material deprivation status up until the third year.

There is another alternative subsample we create in which the overall material deprivation rate for the 2nd and 3rd years of the panel (in the life of the three year cohort, this is the 1st and 2nd year of the cohort) are kept the same along with the combined income poverty line criteria. The reason for doing so is to increase the number of observations in the subsample after the elimination, since keeping the status of seven material deprivation items constant over two years decreases the number of observations more than keeping only the overall status constant.

Table 8. Food Poverty and Relative Poverty Thresholds for Turkey

Poverty thresholds			
Food poverty (yearly)		% Change	
2005	Used for 2006 in data	1,008	
2006	Used for 2007 in data	1,092	8.00%
2007	Used for 2008 in data	1,260	14.30%
2008	Used for 2009 in data	1,464	15.00%
2009	Used for 2010 in data	1,524	4.00%
2010	Used for 2011 in data	1,692	10.50%
2011	Used for 2012 in data	1,788	5.50%
2012	Used for 2013 in data	1,944	8.40%
Relative poverty %60 (yearly)			
2005	Used for 2006 in data	2,821	
2006	Used for 2007 in data	3,649	25.70%
2007	Used for 2008 in data	3,897	6.60%
2008	Used for 2009 in data	4,227	8.10%
2009	Used for 2010 in data	4,457	5.30%
2010	Used for 2011 in data	4,883	9.10%
2011	Used for 2012 in data	5,418	10.40%
2012	Used for 2013 in data	6,012	10.40%

4.2 The model

The regression analysis is done using a probit model. In constructing the right hand side independent variables, previous study findings as to what determines the poverty or the social exclusion status of a household are referenced. Thus, variables related to the head of household, whether he/she is jobless, illiterate, graduate of high school, female, married are included. In addition, household characteristics such as the age composition of the household, the number of dependent children, number of members aged above 65, the number of people who are chronically ill in the household, the OECD adjusted income of the household as well as the employment status and the ownership of the household are all used as explanatory variables. Furthermore, dummy variables for years and interaction variables that are equal to the multiplication of the year dummy and the independent variables are created. The dependent variable is the change in the material deprivation status. If the status

changed from materially deprived in year 1 to not in year 2, the dependent variable takes on the value 1. The right-hand side variables are coming from the attributes of the household that were present in year 1. Thus, the objective is to find the probability of the year 1 attributes affecting the positive status change in the item wise material deprivation status. In order to do this however, only those who are materially deprived in year 1 are used in the regression. This is because, the coefficients of the attributes would better reflect the effect of those attributes on the probability of an improvement if the sample on which the regression is run only consists of those who were initially deprived.

The model is expressed as :

$$P(Y=1) = F(\beta_0 + \beta_1 D11 + \beta_2 D12 + \beta_3 D13 + \beta_4 D11 * X_k + \beta_5 D12 * X_k + \beta_6 D13 * X_k + \alpha_k X_k) \text{ where:}$$

Y: Change in material deprivation status from materially deprived to not

D11,D12,D13: Dummies indicating the year of the panel

X_k : Head of household attributes and household attributes: age, gender, employment status, education and marital status of the head of household. The household attributes are the OECD adjusted income, the number of household members, being the owner of the house, the number of dependent children, the number of employed people, the number of people above 65 and the number of chronically ill people in the household. $D11 * X_k$, $D12 * X_k$ and $D13 * X_k$ are the interaction variables created by multiplying the attribute variables with the year dummies.

CHAPTER 5

RESULTS AND CONCLUSION

5.1 Descriptive results for the main subsample

In order to analyze the given data within the panels and using the three-year cohorts as the main subsample, we have used the income criteria and the item wise material deprivation selection criteria as prescribed in section 4.1. That is, we have created subsamples such that the income statuses for being below or above the food poverty threshold and relative income poverty threshold have not changed over the years of the panel. In addition to that we have imposed that all of the item wise material deprivation statuses, have stayed constant for the two of the three years in question in all of the associated panels. Thus, the resulting subsamples do have both the material deprivation status and the constraints of income imposed on them.

Table 9 shows a summary of the results of the four panels. Since we are keeping the income criteria intact for three years and material deprivation item wise status criteria intact for the first two years, the resulting panels do only have meaning for comparison for the last two years of the panel. That is, for example in the 2013 panel we have kept the income statuses the same for 2011, 2012 and 2013 and the material deprivation item wise statuses the same for 2011 and 2012; it would only be meaningful to compare the resulting changes in the material deprivation statuses item wise for 2012 and 2013. This change is given as percentage points in the last column for all panels.

Table 9.Descriptive Statistics for the Main Subsample

Year	PANEL 2010				PANEL 2011				PANEL 2012				PANEL 2013			
	2008	2009	2010		2009	2010	2011		2010	2011	2012		2011	2012	2013	
AdjInc	12,513	13,671	14,155		13,321	14,075	14,997		15,718	17,140	17,447		16,940	18,185	19,738	
#HMembers	3.37	3.46	3.46		3.34	3.43	3.61		3.26	3.36	3.46		3.25	3.37	3.49	
#Employed	1.16	1.2	1.19		1.17	1.17	1.17		1.14	1.13	1.17		1.21	1.24	1.23	
#Children	0.71	0.71	0.69		0.67	0.66	0.67		0.65	0.65	0.63		0.64	0.64	0.65	
#Aged65+	0.27	0.3	0.31		0.25	0.27	0.31		0.29	0.31	0.34		0.26	0.29	0.31	
#ChronicIll	0.83	0.82	0.79		0.85	0.85	0.89		0.88	0.88	0.87		0.85	0.85	0.84	
HH Age	47.25	47.94	48.34		47.14	47.94	49.02		48.96	49.83	50.83		48.53	49.36	50.36	
HH PrimaryS	0.47	0.47	0.46		0.46	0.46	0.46		0.46	0.46	0.46		0.45	0.45	0.45	
HH MiddleS	0.28	0.28	0.28		0.29	0.29	0.29		0.26	0.25	0.25		0.25	0.26	0.25	
HH College	0.19	0.18	0.18		0.19	0.19	0.19		0.2	0.2	0.2		0.22	0.22	0.22	
HH Unempl.	0.03	0.02	0.03		0.04	0.03	0.04		0.03	0.03	0.02		0.02	0.02	0.02	
HH Female	0.12	0.12	0.12		0.13	0.13	0.13		0.14	0.14	0.14		0.14	0.13	0.13	
HH Married	0.86	0.85	0.85		0.87	0.88	0.87		0.85	0.85	0.85		0.85	0.85	0.85	
HH Illiterate	0.07	0.07	0.06		0.06	0.06	0.06		0.08	0.08	0.08		0.07	0.07	0.07	
				%pntCh				%pntCh				%pntCh				%pntCh
Item 1	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Item 2	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.00	-0.01
Item 3	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01
Item 4	0.05	0.05	0.05	0.00	0.05	0.05	0.04	-0.01	0.05	0.05	0.05	0.00	0.03	0.03	0.02	-0.01
Item 5	0.49	0.49	0.46	-0.03	0.51	0.51	0.48	-0.03	0.46	0.46	0.44	-0.02	0.42	0.42	0.40	-0.02
Item 6	0.73	0.73	0.75	0.02	0.74	0.74	0.75	0.01	0.70	0.70	0.73	0.03	0.67	0.67	0.64	-0.03
Item 7	0.52	0.52	0.53	0.01	0.57	0.57	0.53	-0.04	0.54	0.54	0.46	-0.08	0.48	0.48	0.38	-0.10
Item 8	0.58	0.58	0.56	-0.02	0.57	0.57	0.58	0.01	0.57	0.57	0.51	-0.06	0.52	0.52	0.42	-0.10
Item 9	0.30	0.30	0.29	-0.01	0.30	0.30	0.30	0.00	0.28	0.28	0.28	0.00	0.25	0.25	0.21	-0.04
OverallDepr	0.56	0.56	0.55	-0.01	0.57	0.57	0.57	0.00	0.56	0.56	0.51	-0.05	0.51	0.51	0.41	-0.10
Observations	962	962	962		1,191	1,191	1,191		1,211	1,211	1,211		1,774	1,774	1,774	

When the summary statistics of the main subsample are reviewed in Table 9, the percentage point changes in all material deprivation items show considerable fall for year 2013 in the 2013 panel. The fall for the items, individually show percentage point changes between 3 and -4 at most for the 2010 and 2011 panels. For the 2013 panel there only exists drops in the rates down to -11 percentage points. The panel for 2012 also shows considerable drops. One thing to remind at this point is that the exact introduction of the survey question changes to the questionnaire is not known, since for Item 7, the change has been found in the 2012 panel questionnaire. Given these statistics of the panel, probit will be run on them to further understand the marginal effects of each household or household head characteristics on the status of the material deprivation item to see if certain groups are more affected by the changes in the questionnaire.

5.2 Regression results for the main subsample

The probit regression is run on those who were materially deprived in year 1. In the main sample, for the 2010 panel, number of people with materially deprived status in year 1 is 540, for the 2011 panel it is 674, for the 2012 panel it is 676 and for the 2013 panel it is 907.

To run the probit regression we are pooling the main sample of all panels into one sample. This way using the interaction variables, we will be able to see through them, whether certain attributes of the household or head of household have become significant in affecting the probability of an improved material deprivation status. Table 10 and Table 11 show the coefficients for the item wise and overall change in the probability of an improved material deprivation status.

Table 10 shows the first part of the coefficients of the regression and Table 11 shows the second part.

Table 10. First Part of the Coefficients of the Probit Regression of the Main Subsample

	Item6	Item7	Item8	Item9	Overall
D11	4.383	0.17	1.316	-0.162	0.26
D12	5.144	1.550*	2.242**	-0.634	1.672*
D13	4.089	1.435*	2.657***	-0.413	1.565*
Constant	-7.16	-2.142***	-3.266***	-0.845	-2.480***
AdjInc	-0.00596	0.0544**	0.0604**	0.0405*	0.0528*
#HMembers	-0.00723	0.0862	0.101	0.00585	0.216**
HomeOwner	-0.251	-0.0283	-0.0132	0.0119	-0.0455
#Children	-4	-0.141	0.0407	0.0795	-0.277*
#Employed	-0.485	0.000966	0.0567	0.0226	-0.00402
#Aged65+	-0.511	0.127	-0.135	0.324*	0.195
#ChronicIll	0.0844	-0.144	-0.138	-0.169	-0.263**
HH Age	0.0289	0.0111	0.0167*	-0.0140*	0.00714
HH PrimaryS	-1.108	-0.0333	0.629	0.758*	0.108
HH MiddleS	-0.134	0.301	0.685	0.721	0.359
HH Unempl.	-3.055	-0.145	-0.656	-0.0428	-0.546
HH Female	5.124	-0.00691	0.0547	-0.500*	0.0627
HH Married	0.377	-0.0781	0.218	-0.0804	0.302
HH Illiterate	-4.611	-0.581	0.314	0.647	-0.555
D11*AdjInc	0.0457	0.0152	-0.0338	-0.0384	0.00977
D11*#HMembers	-0.251	-0.0251	-0.259**	0.0231	-0.300**
D11*HomeOwner	0.839	0.162	0.21	0.028	0.219
D11*#Children	4.088	0.0529	0.0647	-0.0976	0.231
D11*#Employed	0.799*	-0.0292	0.097	0.00322	0.233
D11*#Aged65+	0.165	-0.102	0.131	-0.381*	-0.14
D11*#ChronicIll	-0.0465	0.166	0.039	0.202	0.173
D11*HH Age	-0.0207	-0.0167	-0.00991	0.00484	0.00427
D11*HH PrimaryS	0.665	0.724	-0.669	-0.517	-0.557
D11*HH MiddleS	-0.259	0.5	-0.671	-0.32	-0.557
D11*HH Unempl.	0	0	0.481	0.094	-0.0399
D11*HH Female	-4.785	-0.271	0.531	0.512	0.316
D11*HH Married	0.147	-0.141	-0.167	0.168	-0.297
D11*HH Illiterate	3.959	0.835	-0.387	-0.414	-0.018

Since these are the coefficients of the probit regression, they do not show the marginal effects of the variables. However, it can be seen from the year dummies D12 and D13 that being an observation in the 2012 or 2013 panel, that is representing the switch in the material deprivation status between 2011 and 2012 or 2012 and 2013, has increased the probability of an improved material deprivation status. However, the coefficients of the dummies are not attributable to a specific characteristic of the household or head of household that is listed among the independent variables.

The coefficient of the dummy variables in all four panels represent the randomized effects of the questionnaire change on the observations.

Table 11. Second Part of the Coefficients of the Probit Regression of the Main Subsample

	Item6	Item7	Item8	Item9	Overall
D12*AdjInc	0.0538	-0.0245	-0.0196	-0.0332	-0.0038
D12*#HMembers	0.224	-0.0316	0.0386	0.0381	-0.220*
D12*HomeOwner	0.213	0.0667	0.00123	0.0321	0.254
D12*#Children	3.637	0.0294	-0.227	-0.135	0.16
D12*#Employed	0.277	-0.205	-0.158	0.0034	-0.103
D12*#Aged65+	0.713	-0.116	0.328	-0.267	0.0384
D12*#ChronicIll	-0.0637	0.252*	0.208	0.209	0.365**
D12*HH Age	-0.0292	-0.00706	-0.0182	0.0152	-0.00761
D12*HH PrimaryS	0.188	-0.397	-1.070*	-0.478	-0.712
D12*HH MiddleS	-0.368	-0.575	-1.070*	-0.295	-0.8
D12*HH Unempl.	3.363	-0.153	0.431	-0.432	0.46
D12*HH Female	-5	-0.188	-0.0855	0.302	-0.0837
D12*HH Married	-0.0662	-0.00205	-0.348	0.0501	-0.435
D12*HH Illiterate	0	-0.897	-1.219*	-0.294	-0.597
D13*AdjInc	0.0367	-0.0576*	-0.0713**	-0.0708**	-0.0288
D13*#HMembers	0.158	-0.0274	-0.038	0.121	-0.125
D13*HomeOwner	0.324	0.0628	0.243	-0.078	0.291
D13*#Children	3.727	0.0175	-0.222	-0.193	0.0352
D13*#Employed	0.562	0.0784	0.0059	-0.0704	0.0381
D13*#Aged65+	0.303	-0.0455	0.161	-0.552**	-0.172
D13*#ChronicIll	-0.241	0.0339	0.03	0.0766	0.205
D13*HH Age	-0.0114	-0.00782	-0.016	0.0210*	-0.00328
D13*HH PrimaryS	0.437	-0.199	-1.241*	-0.497	-0.613
D13*HH MiddleS	-0.522	-0.571	-1.241*	-0.504	-0.867
D13*HH Unempl.	0	0.062	0.491	0.143	0.281
D13*HH Female	-4.348	0.0472	0.451	0.362	0.0788
D13*HH Married	0.167	0.0607	0.144	-0.137	-0.172
D13*HH Illiterate	3.706	-0.0517	-1.632**	-0.403	-0.627

For 2010 and 2011 none of the interaction variables related to education have been significant, but for 2012 and 2013 panels the interaction variables related to education have become negative and significant for Item 8. These variables are negative for houses with a head who is either illiterate, primary or high school graduate. This indicates that for households with a college educated head; the probability of an improvement in the material deprivation status is higher. Also, the effect of adjusted income has become significant and negative for items 7,8 and 9 in the 2013 panels, meaning poorer households were more likely to respond positively in 2013.

5.3 Descriptive results for the alternative subsample

The summary statistics in Table 12 are for the subsample of three-year cohorts in each of the panels, where the relative and food poverty line statuses for the cohorts have stayed constant for the whole three years and the overall material deprivation status has stayed constant for the first two years. As can be seen the number of observations have dramatically increased which would make an inference more meaningful. The reason for the increase in the sample size is because now we are not restricting the material deprivation status to be constant item by item for all items, but rather making sure that the overall material deprivation status has stayed constant for all the observations for the first two years.

5.4 Descriptive statistics for left-out observations

Since we are now dealing with a larger subsample created out of the available 3-year cohorts, the observations that have been eliminated from the probit regression of the alternative sample is represented in Table 13.

It can be observed that the only distinguishable difference in the statistics is the mean OECD adjusted income of the left out observations. These left out observations are left out as stated previously due to a change in either their income statuses over the course of the three years that they are in the panel or because their overall material deprivation statuses changed over the course of the first two years that they are in the panel. Given that the relative income poverty threshold has been 3,897 for 2008, 4,227 for 2009, 4,457 for 2010, 4,883 for 2011, 5,418 for 2012 and 6,012 for 2013, the mean income is above this relative poverty threshold.

Table 12. Descriptive Statistics for the Alternative Subsample

Year	PANEL 2010				PANEL 2011				PANEL 2012				PANEL 2013			
	2008	2009	2010	%pntChg	2009	2010	2011	%pntChg	2010	2011	2012	%pntChg	2011	2012	2013	%pntChg
AdjInc	10,370	11,266	11,820		11,400	12,021	12,926		12,838	14,031	14,628		13,884	14,803	16,112	
#HMembers	3.4	3.51	3.52		3.34	3.43	3.61		3.31	3.43	3.54		3.3	3.43	3.55	
#Employed	1.17	1.2	1.2		1.18	1.18	1.19		1.16	1.17	1.19		1.18	1.19	1.2	
#Children	0.7	0.71	0.7		0.65	0.65	0.66		0.64	0.64	0.63		0.66	0.66	0.67	
#Aged65+	0.29	0.31	0.32		0.27	0.29	0.33		0.3	0.33	0.36		0.3	0.32	0.35	
#ChronicIll	0.84	0.84	0.84		0.87	0.86	0.88		0.9	0.91	0.92		0.88	0.9	0.91	
HH Age	47.35	47.92	48.43		47.64	48.37	49.45		49.47	50.21	51.21		49.02	49.92	50.91	
HH PrimaryS	0.51	0.5	0.5		0.49	0.49	0.49		0.5	0.49	0.49		0.49	0.49	0.49	
HH MiddleS	0.28	0.28	0.28		0.28	0.28	0.28		0.26	0.26	0.26		0.26	0.26	0.26	
HH College	0.14	0.14	0.13		0.14	0.14	0.14		0.15	0.15	0.15		0.16	0.16	0.16	
HH Unempl.	0.04	0.03	0.03		0.04	0.03	0.03		0.02	0.03	0.03		0.02	0.02	0.02	
HH Female	0.13	0.12	0.12		0.15	0.15	0.15		0.17	0.17	0.17		0.14	0.14	0.14	
HH Married	0.86	0.85	0.84		0.85	0.85	0.85		0.83	0.83	0.82		0.84	0.83	0.84	
HH Illiterate	0.08	0.07	0.07		0.08	0.08	0.09		0.09	0.09	0.09		0.08	0.08	0.08	
Item 1	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0
Item 2	0.02	0.01	0.01	0	0.02	0.02	0.02	0	0.02	0.02	0.02	0	0.01	0.01	0.01	0
Item 3	0.02	0.01	0.01	0	0.02	0.01	0.01	0	0.02	0.01	0.01	0	0.01	0.01	0.01	0
Item 4	0.09	0.07	0.06	-0.01	0.07	0.06	0.05	-0.01	0.07	0.06	0.05	-0.01	0.05	0.04	0.03	-0.01
Item 5	0.54	0.55	0.52	-0.03	0.56	0.54	0.52	-0.02	0.52	0.52	0.5	-0.02	0.52	0.49	0.47	-0.02
Item 6	0.83	0.83	0.83	0	0.82	0.82	0.81	-0.01	0.81	0.8	0.8	0	0.78	0.79	0.73	-0.06
Item 7	0.54	0.58	0.58	0	0.58	0.59	0.56	-0.03	0.58	0.56	0.49	-0.07	0.54	0.52	0.44	-0.08
Item 8	0.67	0.61	0.62	0.01	0.61	0.62	0.63	0.01	0.62	0.64	0.56	-0.08	0.62	0.57	0.47	-0.1
Item 9	0.37	0.34	0.31	-0.03	0.35	0.33	0.31	-0.02	0.33	0.32	0.31	-0.01	0.31	0.31	0.25	-0.06
OverallDepr	0.65	0.65	0.62	-0.03	0.64	0.64	0.62	-0.02	0.64	0.64	0.57	-0.07	0.6	0.6	0.48	-0.12
Observations	3,031	3,031	3,031		3,347	3,347	3,347		3,398	3,398	3,398		4,864	4,864	4,864	

This means that most of the observations that are left out are switching through the three years between being below or above the relative poverty threshold.

The remaining observations are eliminated for having overall material deprivation statuses that have not stayed consistent for the first two years.

Table 13. Descriptive Statistics of the Observations Left out of the Alternative Subsample

	PANEL 2010			PANEL 2011			PANEL 2012			PANEL 2013		
Year	2008	2009	2010	2009	2010	2011	2010	2011	2012	2011	2012	2013
AdjInc	7,198	7,757	8,309	7,675	8,012	8,726	8,366	9,148	9,638	8,899	9,804	10,373
#HMembers	3.82	3.97	3.93	3.83	3.92	4.18	3.77	3.94	4.11	3.78	3.99	4.14
#Employed	1.24	1.32	1.3	1.31	1.29	1.29	1.3	1.3	1.31	1.31	1.33	1.32
#Children	0.89	0.86	0.84	0.88	0.86	0.86	0.83	0.83	0.83	0.85	0.85	0.83
#Aged65+	0.28	0.31	0.31	0.29	0.31	0.35	0.31	0.34	0.37	0.32	0.34	0.37
#ChronicIll	0.91	0.91	0.89	0.94	0.94	0.98	0.94	0.94	0.98	0.97	0.99	1
HH Age	47.28	47.75	47.93	47.86	48.43	49.6	48.97	49.9	50.89	49.05	49.89	50.92
HH PrimaryS	0.6	0.59	0.59	0.59	0.59	0.59	0.57	0.57	0.57	0.59	0.59	0.59
HH MiddleS	0.24	0.24	0.23	0.24	0.24	0.24	0.25	0.24	0.24	0.24	0.23	0.24
HH College	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07	0.07
HH Unempl.	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04
HH Female	0.12	0.12	0.11	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.13
HH Married	0.88	0.87	0.86	0.85	0.85	0.85	0.84	0.84	0.85	0.84	0.84	0.84
HH Illiterate	0.1	0.1	0.09	0.11	0.11	0.11	0.12	0.11	0.11	0.1	0.11	0.1

5.5 Regression results for the alternative subsample

The summary statistics represented in Table 12 for the alternative subsample gives similar results to the main subsample. Even though the food and relative poverty statuses for the observations have stayed the same as well as the overall material deprivation status for year 1 and 2, there are substantial drops in the item wise material deprivation statuses from year 2012 to 2013 in the 2013 panel compared to the 2010 and 2011 panels. The main comparison is that of the 2010 and 2011 panels with the 2013 panel, since as discussed before, the exact year of the introduction of

the changes in the questionnaire is not known. In addition to this, the demographic attributes of the main subsample and the alternative subsample are not drastically different.

To run the probit regression the alternative subsamples of all panels are pooled into one subsample. The probit regression will be run on those whose material deprivation statuses were equal to one in year 1. In the alternative subsample, for the 2010 panel, number of people with materially deprived status in year 1 is 1,958, for the 2011 panel it is 2,146, for the 2012 panel it is 2,160 and for the 2013 panel it is 2,925.

It is important to note that the panel 2010 part of the data contains only observations that represent the deprivation status changes from 2009 to 2010, panel 2011 part contains the observations that represent the status changes from 2010 to 2011, panel 2012 contains those observations that represent the status changes from 2011 to 2012 and finally panel 2013 part contains the observations that represent the status changes from 2012 to 2013.

Table 14 and Table 15 show the coefficients for the item wise and overall changes in the probability of improved material deprivation statuses..

As is seen in Table 14, the coefficient of the dummy for panel 2012 is positive and significant for item 7. Likewise, the coefficient of the dummy for panel 2013 is also both positive and significant for both item 7 and item 8. As previously discussed when the 2012 panel questionnaire was reviewed, it was found that the question for item 7 had already been changed in the 2012 panel questionnaire, so item 7 gaining significance for the 2012 panel dummy is in line with this change.

Table 14. First Part of the Coefficients of the Probit Regression of the Alternative Subsample

	Item6	Item7	Item8	Item9	Overall
D11	-0.908	0.0780	0.234	-0.0684	-0.0800
D12	-0.777	0.993*	0.708	-0.430	0.485
D13	-0.305	0.901*	0.940*	0.00165	1.068**
Constant	-1.565***	-1.826***	-1.809***	-0.724**	-1.842***
AdjInc	0.0611***	0.0461***	0.0468***	0.00287	0.0707***
#HMembers	0.0431	0.106**	0.0117	-0.0419	0.0729
HomeOwner	0.225	0.150	-0.00727	0.117	0.0459
#Children	-0.202	-0.0969	0.0144	0.0206	-0.0866
#Employed	-0.00398	0.0366	0.0882*	0.000198	0.0798
#Aged65+	0.164	0.125	0.0913	0.00216	0.149*
#ChronicIll	-0.0451	-0.105*	-0.0370	-0.0710	-0.0720
HH Age	-0.00855	0.00148	0.000677	-0.00282	0.0000316
HH PrimaryS	-0.480	-0.136	0.308	0.356*	0.0803
HH MiddleS	-0.232	0.106	0.336	0.283	0.304
HH Unempl.	-3.598	-0.124	-0.177	-0.256	-0.209
HH Married	-0.349	0.0225	0.0362	0.000679	-0.230
HH Female	-0.143	0.195	-0.00852	0.203	-0.0332
HH Illiterate	-0.617	-0.250	0.139	0.312	-0.0469
D11*AdjInc	0.00534	0.0214	0.00338	0.0152	0.00265
D11*#HMembers	-0.0829	-0.0648	-0.0322	0.0703	-0.0394
D11*HomeOwner	-0.184	-0.149	0.170	-0.227*	-0.00144
D11*#Children	0.210	0.0628	-0.0532	-0.00429	0.0220
D11*#Employed	0.139	0.0260	0.0720	0.0234	0.0131
D11*#Aged65+	-0.121	-0.0747	-0.0237	0.0274	-0.136
D11*#ChronicIll	-0.0549	0.0886	-0.0559	0.00674	-0.00754
D11*HH Age	0.0103	-0.00190	0.00259	0.00304	0.00715
D11*HH PrimaryS	0.481	0.243	-0.552*	-0.383	-0.463
D11*HH MiddleS	0.261	0.107	-0.581*	-0.216	-0.563*
D11*HH Unempl.	0	-0.331	0.0647	0.186	-0.238
D11*HH Married	0.422	-0.0226	0.0123	-0.0579	0.414*
D11*HH Female	-0.101	-0.172	-0.0480	-0.176	-0.0287
D11*HH Illiterate	0.611	0.212	-0.486	-0.414	-0.478

The coefficient of the panel 2011 interaction variable for the head of household being primary school or middle school graduate is negative and significant for item 8, which means that in 2011, households headed by a college graduate are more likely to do better than households headed by primary school or middle school graduates in terms of item 8. However, there is no significance associated with the coefficient of the interaction variable for households headed by illiterates in the 2011 panel.

When the interaction variable coefficients of the 2013 and 2012 panels are reviewed, it can be seen that households headed by college graduates are more likely to experience an improvement in the material deprivation statuses both for item 8 and overall over those households who are headed by primary school graduates,

middle school graduates and in addition over households headed by illiterates. The adjusted income interaction variable has also become significant and negative for the overall material deprivation regression in the 2013 panel, indicating that poorer households are more likely to experience an improvement in their material deprivation status from 2012 to 2013.

Table 15. Second Part of the Coefficients of the Probit Regression of the Alternative Subsample

	Item6	Item7	Item8	Item9	Overall
D12*AdjInc	-0.00439	0.00123	0.00811	0.0107	-0.00107
D12*#HMembers	-0.0442	-0.0481	0.0516	0.0952*	-0.0386
D12*HomeOwner	-0.231	-0.0962	0.0621	-0.121	0.119
D12*#Children	0.220	0.0521	-0.0279	-0.0425	0.0864
D12*#Employed	-0.0541	-0.121*	-0.0912	0.0362	-0.127*
D12*#Aged65+	-0.172	-0.124	0.00920	-0.0859	-0.0632
D12*#ChronicIll	0.0492	0.0821	0.0460	0.0933	0.0446
D12*HH Age	0.0178*	0.00244	-0.00158	0.00499	0.00450
D12*HH PrimaryS	-0.111	-0.290	-0.655**	-0.389	-0.550*
D12*HH MiddleS	-0.136	-0.444	-0.618*	-0.344	-0.652**
D12*HH Unempl.	3.922	0.307	0.111	-0.0207	0.197
D12*HH Married	0.491	-0.144	-0.0949	0.0131	0.218
D12*HH Female	0.286	-0.317	-0.155	-0.0368	-0.0988
D12*HH Illiterate	-0.604	-0.542	-0.811**	-0.488	-0.935**
D13*AdjInc	-0.0260	-0.0193	-0.0195	0.0191	-0.0308**
D13*#HMembers	0.0815	0.00835	0.104*	0.105**	0.0481
D13*HomeOwner	-0.300	-0.222*	-0.00687	-0.123	-0.00852
D13*#Children	-0.0379	-0.0153	-0.178**	-0.0169	-0.0734
D13*#Employed	0.0769	-0.0107	-0.0679	-0.0731	-0.0708
D13*#Aged65+	-0.207	-0.0536	-0.127	-0.0985	-0.134
D13*#ChronicIll	-0.0579	0.0168	-0.0850	0.0769	-0.0466
D13*HH Age	0.0168*	0.000113	0.000984	0.00167	0.00295
D13*HH PrimaryS	-0.106	-0.0439	-0.544*	-0.466*	-0.586*
D13*HH MiddleS	-0.282	-0.295	-0.489*	-0.424	-0.725**
D13*HH Unempl.	3.532	-0.0147	-0.0692	0.113	-0.128
D13*HH Married	0.386	-0.0604	0.0480	-0.0660	0.162
D13*HH Female	0.410	-0.172	0.0897	-0.284	0.0335
D13*HH Illiterate	-0.409	-0.367	-0.774**	-0.418	-0.866**

5.6 Conclusion

Within the limitations of this study, and working with secondary data with observations from Turkstat, we have attempted to identify the usual trend in the change in the material deprivation statuses of the observations for which the relative poverty and food poverty statuses have stayed constant. Given that we do not know which year and how gradual the change in questions were imposed into the survey, we have attempted to impose constraints with respect to the consistency in item wise

(for the main subsample) and overall (for the alternative subsample) material deprivation statuses on top of the income constraints to observe the changes.

The results of the item wise and overall drops for the selected samples indicate that a drop out of the ordinary is observed for observations that have had consistent income wise and material deprivation wise statuses for the periods in question.

When the probit regressions are run, we first observe that the dummy variables for the 2012 and 2013 panels that capture the random attributes of households who have improved with respect to material deprivation statuses both overall and with respect to item 7 and 8 have become significant and positive. Pointing out that the constants in both the alternative and main sample probit regressions are in most cases significant and negative, this suggests that the attributes we have listed as independent variables in the regression are not capturing the attributes of households the statuses of which have improved in the 2012 panel and 2013 panels. This brings to mind the literature covered related to questionnaire biases and that wording changes in surveys can create inconsistent outcomes. Considering the length of the household survey administered the changes may have created random response effects.

In addition to these random effects, we can see that, education of the head of household has become significant for more interaction variables in 2012 and 2013 both for the main and alternative samples. This is inline with Schuman's 1977 study that claims that more educated respondents may better interpret the survey questions. Another interaction variable that has become significant in the 2013 panel is the adjusted income becoming significant for the overall material deprivation regression and negatively affecting the probability of an improved material deprivation status.

This may suggest that poorer households have benefited from the increase in the probability of a positive answer that has been implemented with the change in the questionnaire. For example allowing debt in affording unexpected expenses in 2013 may have broadened the possibility for poorer households to answer positively to Item 8.

In coming to a conclusion with respect to this study, it is important to note that the ideal case for the study would be to randomize the available households in the sample into a treatment and a control group and administer the old questionnaire to the former and the changed one to the latter. A control on the questionnaire administered and randomizing the sample to which the questions are applied could create a more conclusive remark.

APPENDIX
ORIGINAL QUESTIONS

First version of the questions in Turkish:

- 32.a) Ekonomik olarak; tüm hane halkı fertlerinin evden uzakta bir haftalık tatil masrafını karşılayabilecek durumda mısınız (Tatil köyü, otel, pansiyonda)?"
- 32.1.b)Ekonomik olarak; haftada en az 3 gün et, tavuk ya da balık içeren yemeği karşılayabilecek durumda mısınız?(Vejetaryenler için eşdeğer yiyecekler)"
- 32.1.c)Ekonomik olarak; beklenmedik (yaklaşık 445 TL'lik) bir harcama olduğunda karşılayabiliyor musunuz?"
- 32.1.d)Ekonomik olarak; evinizin ısınma ihtiyacını yeterince karşılayabiliyor musunuz?"

Revised version of the questions in Turkish:

- 32.a) Haneniz ekonomik olarak; tüm hane halkının evden uzakta bir haftalık tatil masrafını karşılayabilecek durumda mı? (Tatil köyü, otel, pansiyon, haneye ait yazlık, bir yakınımın evi, kurum/devlete ait kamplar vb. yerlerde yapılan tatiller dahil edilecektir.)"
- 32.1.b)Haneniz ekonomik olarak; iki günde bir et, tavuk ya da balık içeren yemek masrafını karşılayabilecek durumda mı? (Vejetaryenler için eşdeğer yiyecekler)"
- 32.1.c) Haneniz ekonomik olarak; beklenmedik bir harcamayı(yaklaşık 410 TL'lik), kendi imkanları ile karşılayabilecek durumda mı? (Borç alınarak karşılanan harcamalar için 'Evet' şıkkı işaretlenecektir.)"
- 32.1.d)Haneniz ekonomik olarak; evinizin ısınma ihtiyacını karşılayabilecek durumda mı?"

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