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Cultural Differences and Measurement of Material Deprivation: EU-SILC questionnaire revision in Turkey

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Abstract

Material deprivation rate, estimated since 2005 in Turkey, dropped sharply in 2013 following wording and content changes in the Survey. Changes aimed to achieve a better assessment of deprivation by taking into account cultural traits of the population regarding holidays and meat consumption. The paper investigates effect of the change in these questions on deprivation rates as well as its association with household characteristics using panel data for the years 2011 to 2014 from Turkey. Random effects logit estimations are performed to compare the deprivation rates before and after the change, and the household characteristics that these are associated with. We find that the new questions led to a significant drop in deprivation highly associated with the household size and number of children in both questions and relative income poverty only in meat consumption question. Larger households were less likely to be deprived and those with more children more likely. The connection of deprivation to relative income poverty became stronger.

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1. Introduction

Material deprivation concept has been 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 poverty theory, "people's needs, even for food, are conditioned by the society to which they belong" (p.38), thus the material deprivation has been determined by the necessities that the majority of population deems as basic needs. Ringen (1988) claimed 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 the EU, since 2009, material deprivation index calculated from the European Union Statistics on Income and Living Conditions (EU-SILC) data has been among the agreed social indicators. The index is based on the answers to nine questions regarding availability of food and non-food items, such as clothing, leisure activity, a meal with meat or a vegetarian alternative for the intake of protein, adequate home heating etc. Turkey has followed the EU definition and has calculated severe material deprivation rate since 2005. While the rate was above 50 percent until 2012, it dropped sharply to 43.8 percent in 2013 and to 29.3 percent in 2014. In the same time period, relative poverty indicators based on different proportions of median income stayed stable. The change was due to revision in the survey questionnaire where four questions relevant for material deprivation calculations had been subject to significant changes. This work focuses on two of those questions for which the changes have likely addressed the supposed inability to reflect cultural traits of the population.

The criticisms against material deprivation measures have claimed that the 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. EU-SILC has not been a harmonized survey across all countries and 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). Experience has 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 (Boarini & d'Ercole, 2006). Turkish case provides an opportunity to assess the importance of the way the questions are asked with the measurement of deprivation. It also is of importance for countries in the Middle East where regular measurement of material deprivation is largely lacking but is of utmost importance to fight with poverty.[1]

In a more general framework, Choi and Pak (2005) reviewed the literature on bias in questionnaires due to design and they identified 48 types of biases, categorized into three sources which were either stemming from the way the question was designed, the way the questionnaire was designed or the way the questionnaire was administered. According to their classification, we have analyzed the changes in the wording and the way the questions have

[1] Arab Multidimensional Poverty Report prepared with the collaboration of the League of Arab States' Council of Arab Ministers for Social Affairs, the Economic and Social Commission for Western Asia, the United Nations Children's Fund, and Oxford Poverty and Human Development Initiative in 2017 provides a discussion of multidimensional poverty measures adapted to the needs of Arab region and notes the lack of data in most countries.

been designed. Schuman and Presser (1977) claimed that those affected from the wording of a survey question were unlikely a random subsample of all respondents, and the effects of the change in the wording were some sort of self-selection. They claimed that better educated respondents would more likely better interpret what was being asked in the question and would give a corresponding response. It has thus been of interest, how the changes in Turkish questionnaire are associated with the household characteristics.

To analyze the issue, we have used panel data where households were surveyed each year from 2011 to 2014. With a random effects logit analysis, we have estimated how the coefficients for household characteristics, which has showed association of household characteristics and deprivation in the relevant item, changed in 2013 and 2014, following the change in questionnaire, relative to earlier years.

Next section provides information on material deprivation estimation in Turkey and changes in questions. Then we present the empirical model and present the results. Conclusion and discussion follows.

2. Material deprivation index and changes in Turkey

Severe material deprivation has been calculated in Turkey since 2005, following Eurostat methodology from the EU-SILC. It is defined as the proportion of people living in households that cannot afford at least four of the following items (corresponding variable names in SILC Survey in parenthesis):

- affording due payments, (HE010, HE020, HE030)
- affording a telephone/cell phone, (HH150, HH160)
- affording a color TV, (HH170)
- affording a washing machine, (HH200)
- affording a car, (HH240)
- affording a one-week holiday away from home, (HE080)
- affording a meal with meat/ chicken/vegetarian equivalent, (HE090)
- affording unexpected financial expenses, (HE100)
- affording heating to keep the home sufficiently warm. (HE110)

As seen in Table I, the rate dropped significantly in 2013 from 55 percent to 43.8 percent, and then again in 2014 to 29.3 percent following changes in questionnaire. The rate has stayed rather stable around 20 percent since then.

Table I: Severe material deprivation rate in Turkey (2006-2015)

	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17
Material depr. rate	60.4	58.8	57.7	56.7	59.3	57.9	55.0	43.8	29.3	30.3	32.9	28.7

Source: Eurostat (ilc_mddd11), Turkstat.

The questions on holiday and meat consumption has been changed as follows in 2013 (changes indicated in bold letters):[2]

[2] See annex for the questions in Turkish.

- Question 32.1.a:
  Earlier version: "Do **you** have the economical means to afford a one-week holiday away from home for all **household members** (holiday camp, motel or hotel)?"

  New version: "Does **your household** have the economical means to afford a one week holiday **expense** away from home for the **entire household** (holiday camp, hotel, motel, **summerhouse that belongs to the household, a relative's home or an institutional or governmental camp**)?"

- Question 32.1.b:
  Earlier version: "Do **you** have the economical means to afford the meals that include red meat, chicken or fish **at least three times in a week** (equivalent food for vegetarians)?"

  New version: "Does **your household** have economical means to afford **the cost of the** meals that include red meat, chicken or fish **every other day** (equivalent food for vegetarians)?"

A common change to both questions is the use of 'your household' instead of 'you' in the questions. This is likely to avoid a misunderstanding in the survey and to emphasize that the question is about the household's ability to afford rather than the person who is surveyed. Other wording changes are the use of 'entire household' rather than 'all the household members' in the question regarding holiday expenses and 'every other day' rather than 'three times a week' in the question regarding meat consumption.

Most importantly there are material changes to reflect cultural habits of households in Turkey. In the holiday question, summerhouse that belongs to the household, a relative's home or an institutional or governmental camp are added as alternatives and these are likely to make a considerable change in the survey since these are common ways of vacationing in Turkey. A survey by the Ministry of Family and Social Policies in 2011 has found that 25.4 percent of households spent their vacation at the village or town they have originally are from (MoFSP, 2011).

As to the question regarding meat consumption, new wording emphasizes, by including the word 'cost', that actual consumption is not inquired but only the ability to afford it. This is possibly to reflect Mediterranean type of diets which are more heavily based on vegetables. Omurtag et al. (2013) stated that consumption patterns varied widely across regions in Turkey, and Sengul and Sengul (2006) pointed to differences between Turkey and EU in meat consumption. Also notable is seasonal changes in consumption habits during the Ramadan and the feast of sacrifice which may affect the answer to that question in its earlier form.

3. Data and methodology

Study makes use of Turkstat's SILC survey microdata for the years 2011, 2012, 2013 and 2014. Turkstat employs rotational design in its panel survey where approximately 25% of the households exit the survey each year allowing us to follow households for four years during the time period considered in the study.

We have first calculated material deprivation rates for each year using the cohort that has been surveyed in all of the four years. Table II presents deprivation rate for the two items for the

years 2011, 2012, 2013 and 2014.

Table II. Deprivation rates for each item (2011-2014) and annual changes

	Ratio of deprived (percent)					Change (percent. points)		
	2011	**2012**	**2013**	**2014**		**2011-2012**	**2012-2013**	**2013-2014**
One week holiday	85.28	85.25	78.26	66.77		-0.03	-6.99	-11.49
Meat consumption	58.39	56.11	46.64	31.12		-2.28	-9.47	-15.52

Source: Authors' calculation from SILC Panel 2014, micro-level data, except for the last row which is obtained from Turkstat.

The change in the ratios starting from 2013 is clear in questions that have been altered. For example, the annual percentage point drop in inability to afford a holiday was 6.99 percentage points and 11.49 percentage points in 2013 and 2014 respectively compared to the earlier year. Inability to afford meat consumption decreased by 24.99 percentage points.

We should note that the change have occured gradually. Turkstat announced the change in 2013 and did not mention any gradual change in the coverage of new questions, neither further changes in 2014. Our analysis with the data using sub-groups, such as different cohorts, has not indicated a systemic gradual phase-out of the questions. It might, however, be the case that questions were randomly phased out. It might also have taken time for the households to notice the change or surveyors to emphasize the changes.

To analyze the association between household characteristics and the change in survey questions, we have performed random effects logit analysis. Random effect model captures unobserved heterogeneity.[3]

We restrict the analysis to households that have been observed in all of the four years, a total of 5024 households in each year. Dependent variable is a dummy that takes value one if household is materially deprived with respect to that question and 0 otherwise. The model is:

$$P(Y_{it}=1) = F(\beta_0 + \beta_1 D12_{it} + \beta_2 D13_{it} + \beta_3 D14_{it} + \beta_4 D12_{it} X_{it} + \beta_5 D13_{it} * X_{it} + \beta_6 D14_{it} * X_{it} + \beta_7 * X_{it} + \varepsilon_i)$$

where:

i stands for the household and *t* stands for the year of the observation.

Y: Dummy variable indicating adverse condition with respect to the relevant question-holiday or meat consumption (1 if failing the criteria)

D12, D13, D14: Dummies indicating the year of observation

X_i: Household attributes: age, gender, employment status, education and marital status of the

[3] We have also estimated random effects probit models and results of the estimation (available from authors upon request) did not change.

head of household, …

ε_i: Unobserved heterogeneity

As independent variables we have considered household characteristics and their interaction with the year dummies. Household characteristics are gender, marital status, employment and education level of the head of household, the age composition of the household (the number of dependent children, number of members aged above 65), and the number of people who are chronically ill in the household.

We have also used a dummy variable that takes value one if the household's income level is below relative poverty thresholds. For that we have first calculated adjusted household income using the OECD modified equivalence scale (specifically we divide household income by the scale) in line with Turkstat practice in calculation of relative poverty. To create the dummy variables, we have made use of relative poverty thresholds set by Turkstat for the relevant year. Specifically, we have used relative poverty thresholds that are equal to 40% and 70% of the median income. Table III provides the summary statistics for these variables in each year.

Table III. Mean values and standard deviation of independent variables by survey year

	2011	**2012**	**2013**	**2014**
Number of household members	3.84 (2.04)	4.01 (2.16)	3.99 (2.16)	3.97 (2.17)
Number of children	1.11 (1.42)	1.11 (1.41)	1.08 (1.40)	1.04 (1.36)
Number of members older than 65 years	0.29 (0.59)	0.32 (0.62)	0.33 (0.62)	0.35 (0.64)
Number of chronically ill	0.96 (0.90)	0.96 (0.91)	0.95 (0.90)	0.92 (0.88)
Household head has middle school degree	0.11 (0.31)	0.11 (0.31)	0.10 (0.31)	0.10 (0.30)
Household head has high school degree	0.14 (0.35)	0.14 (0.35)	0.14 (0.35)	0.14 (0.35)
Household head has college degree	0.12 (0.33)	0.12 (0.33)	0.13 (0.33)	0.12 (0.33)
Household head unemployed	0.03 (0.17)	0.03 (0.17)	0.03 (0.17)	0.03 (0.16)
Household head female	0.14 (0.34)	0.14 (0.34)	0.14 (0.34)	0.13 (0.34)
Household head married	0.84 (0.37)	0.84 (0.37)	0.83 (0.37)	0.82 (0.38)
Household income below 40% of median income	0.10 (0.30)	0.10 (0.30)	0.08 (0.28)	0.08 (0.27)
Household income below 70% of median income	0.29 (0.45)	0.29 (0.46)	0.28 (0.45)	0.27 (0.44)

Standard deviation in parenthesis.

It can be seen that household characteristics are rather stable across the years and there is not a distinct pattern across years.

4. Results

Tables IV and V show marginal effects from random effects logit estimation for the two questions that have been changed. For each item, the first column is the estimated coefficients for the year 2011 and following columns show the change in relevant coefficient in 2012, 2013, and 2014 relative to 2011.

Table IV. Failing to afford a week long holiday - marginal effects from random effects logit model

	Base		Interact. with 2012		Interact. with 2013		Interact. with 2014	
#HMembers	0.165	**	0.012		-0.354	***	-0.324	***
	(0.066)		(0.080)		(0.074)		(0.072)	
#Children	0.109		0.019		0.278	**	0.238	**
	(0.093)		(0.113)		(0.107)		(0.105)	
#Aged65+	-0.246	**	-0.085		0.082		0.027	
	(0.121)		(0.145)		(0.140)		(0.135)	
#ChronicIll	0.298	***	0.020		-0.111		-0.050	
	(0.084)		(0.111)		(0.104)		(0.102)	
HH Middle school	-0.640	***	0.351		0.324		-0.122	
	(0.221)		(0.270)		(0.254)		(0.242)	
HH Highschool	-1.583	***	0.365	*	0.387	*	0.253	
	(0.181)		(0.214)		(0.205)		(0.199)	
HH college	-3.315	***	0.258		-0.013		0.179	
	(0.183)		(0.205)		(0.200)		(0.205)	
HH Unempl.	0.846		0.514		-0.775		0.026	
	(0.575)		(0.898)		(0.701)		(0.687)	
HH Female	0.266		0.110		-0.223		-0.242	
	(0.287)		(0.354)		(0.329)		(0.316)	
HH Married	-0.354		-0.275		0.272		0.203	
	(0.262)		(0.332)		(0.306)		(0.293)	
Rel.poverty (40%)	0.359		1.979		0.831		0.406	
	(0.645)		(1.235)		(0.882)		(0.736)	
Rel.poverty (70%)	2.320	***	-0.511		0.224		0.075	
	(0.331)		(0.418)		(0.404)		(0.368)	
Constant			0.027		0.067		-1.137	***
			(0.376)		(0.348)		(0.331)	

Standard errors in parenthesis. *, **, and *** indicate statistical significance at 10 percent, 5 percent and 1 percent, respectively.

Regarding inability to afford a holiday, base results show that household size, number of

chronically ill, and income below 70 percent of the median income increases the probability of inability to afford holiday spending; whereas education and number of elderly decreases it. Number of children and employment status of household head are insignificant variables. There is no significant difference in coefficients in 2012 other than the one for the dummy for household head being high school graduate. In 2013 and 2014, with the change in the question, we find a significantly negative effect of household size. Impact of number of children is significantly higher in later years with the change in questions. In addition to these, in 2014 there is a significant drop in probability unrelated to characteristics controlled in the study. Although the coefficient for the household head with high school degree is positive and significant in 2013, it is equal to the one in 2012, indicating that there has not been a change with the new question.

Table V. Failing to afford meat - marginal effects from random effects logit model

	Base		Interact. with 2012		Interact. with 2013		Interact. with 2014	
#HMembers	-0.039	***	0.011		-0.045	***	-0.049	***
	(0.009)		(0.011)		(0.011)		(0.012)	
#Children	0.051	***	-0.009		0.040	**	0.058	***
	(0.014)		(0.017)		(0.017)		(0.018)	
#Aged65+	-0.044	**	0.004		0.037		0.031	
	(0.020)		(0.024)		(0.024)		(0.025)	
#ChronicIll	0.043	***	0.011		0.006		0.004	
	(0.013)		(0.018)		(0.018)		(0.019)	
HH Middle school	-0.136	***	-0.001		0.082	*	0.044	
	(0.033)		(0.043)		(0.043)		(0.045)	
HH Highschool	-0.228	***	-0.013		0.012		-0.027	
	(0.027)		(0.039)		(0.040)		(0.043)	
HH college	-0.481	***	-0.025		-0.003		0.111	*
	(0.015)		(0.049)		(0.052)		(0.057)	
HH Unempl.	0.132	*	0.208	**	-0.135		-0.020	
	(0.071)		(0.097)		(0.086)		(0.096)	
HH Female	0.068		-0.020		-0.107	*	-0.044	
	(0.049)		(0.060)		(0.056)		(0.059)	
HH Married	0.030		-0.042		-0.076		-0.087	
	(0.046)		(0.057)		(0.055)		(0.055)	
Rel.poverty (40%)	0.187	***	0.057		0.040		0.113	*
	(0.049)		(0.072)		(0.073)		(0.067)	
Rel.poverty (70%)	0.343	***	-0.041		0.133	***	0.090	**
	(0.026)		(0.040)		(0.039)		(0.039)	
Constant			-0.047		-0.006		-0.265	***
			(0.063)		(0.062)		(0.053)	

Standard errors in parenthesis. *, **, and *** indicate statistical significance at 10 percent, 5 percent and 1 percent, respectively.

Regarding affordability of meat consumption, in the base year, crowded households and those with elderly members are less likely to be deprived but those with more children or chronically ill members are more likely. The probability of deprivation decreases with education level of the household head. Income poverty is significantly associated with deprivation. With the new question, larger households are even less likely to be deprived and households with more children are even more likely to be deprived. The association between income poverty and deprivation is stronger with the new questions. Furthermore, in 2014 there was a significant overall drop in the rate relative to 2011 unrelated to the characteristics of households.

5. Discussion and conclusion

Following the change in survey questionnaire in 2013 material deprivation rates dropped sharply in Turkey. Our analysis using panel micro data shows that changes in the content and wording of questions have contributed to the drop and that it has been highly correlated with household size and composition, and to some extent with income poverty indicators.

Results show strong sensitivity to the questions. In case of deprivation indicators this is of utmost importance since the aim is to evaluate one's conditions compared to the normal way of life of their community. If spending a holiday at original hometown at no cost is the standard in a community, asking for a paid vacation clearly misses the point. Similarly, in its original form the question on meat consumption may be largely misleading if it is directed to households around the feast of sacrifice or the Ramadan.

It could be argued that the estimated differences result from an overall improvement in deprivation status of the households, independent of the question change. To shed a light on that concern, Table VI, below, presents the ratio of deprived households in two other categories, ability to pay debts and ability to afford a car, for which there have been no changes in questions.[4] In the case of ability to pay bills, a regular decrease is observed. In the case of car ownership, there were sharp drops in 2012 and 2014 but no change in 2013. The changes observed in these two questions have been smaller relative to the change in questions subject to change and have not been not similar in their timing.

Table VI. Deprivation rates for items with no question change (2011-2014) and annual changes

	Ratio of deprived (percent)					**Change (percent. points)**		
	2011	**2012**	**2013**	**2014**		**2011-2012**	**2012-2013**	**2013-2014**
Unable to pay bills	49.38	44.78	41.18	36.60		-4.6	-3.6	-4.58
Unable to afford a car	55.25	50.64	49.84	45.12		-4.61	-0.8	-4.72

It is important to note the increasing association between income poverty and deprivation index with the change in the question on meat consumption. Turkish severe material deprivation rates have earlier been about two to three times the relative and absolute poverty measures and earlier studies have showed the disconnect between the two measures (e.g. Acar et al., 2017). With the

[4] In other deprivation questions the base rates are very low or questions are subject to minor changes.

newly formatted questions, material deprivation has been lower and its association with income poverty has been stronger. Yet, we've found the two groups, materially deprived and income poor, do not coincide perfectly and hence material deprivation does still measure a different aspect of poverty compared to income poverty measures.

Relation with the household size and number of children could be interpreted as the reflection of cultural traits. Turkey has been transforming from a traditional and rural to a modern and urban society (Sunar and Fisek, 2005). Urban households are often nuclear and have fewer children. Their preferences regarding vacationing and eating habits also differ from more traditional and crowded households. As such, it is not a surprise that when more traditional means of vacationing has been allowed in the questions deprivation has become less correlated with household size and composition. We do not observe an association between the education level of the household head and the response to new questions. This shows that processing and comprehending the question is not an issue with deprivation questions even though some of the changes are clearly in wording of the question.

Stankovicova, Vlačuha and Ivančíková, (2014), for Slovak Republic, 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 were the major questions affecting overall material deprivation. The same study also indicated 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. In Turkish case the change has occurred in questions deemed to be most relevant ones and as a result we have found a significant drop in severe material deprivation.

We have to note that changes had many aspects, incorporating wording as well as content differences, making it impossible to identify which part of the change has affected the rates. The survey has not indicated which household member answered the question on deprivation items. If it were the one with limited contribution to household income, the switch in questions from using "you" to "your household" might have been the main reason for the change. Yet, the fact that we do not find education level to be significant in the change suggests that wording has played a less important role as this kind of an error may be expected to occur more often among households with less education. This being said, higher prevalence of the change among more crowded households may be due to wording changes as with more crowded households the questions are more likely to be directed at household members other than the household head.

To conclude, it is evident that the ideal case for the study would be to randomize the available households into a treatment and a control group and administer the old questionnaire to the former and the changed one to the latter. Lacking this kind of setting, our work displays the significant change from revised questions and leaves more thorough analysis to further work.

Appendix: Questions that have been changed in Turkish

Before the change:

- 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)

After the change:

- 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 yakının 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)

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