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Abstract

Economic inequality and poverty have been extensively analyzed in monetary terms and the ability to reach a certain income level has been regarded as an important dimension of poverty. However, other aspects of poverty, such as education, health, environment and standards of living are important factors that are also essential for human well-being. Using a host of non-monetary aspects of poverty, this paper sheds light on the geographical distribution of multidimensional poverty in Turkey. Results from survey data highlight that the regional distribution non-monetary dimensions of poverty is conspicuously different than that of monetary poverty in Turkey.

Keywords: Alkire-Foster framework; mpi; poverty; Turkey.
JEL Classifications: I3; I32; D63; O.

1 Introduction

Identifying the poor and challenging different approaches for poverty measurement is a long-standing phenomenon (Sen, 1976). Different approaches gain insight as monetary and non-monetary ways of measuring poverty are discussed among scholars and policy makers. One strand of literature uses monetary indicators such as income or consumption expenditures to measure poverty (Townsend, 1954). Alternatively, poverty can be better explained by examining the deprivation level of individuals using a host of non-monetary items (Sen, 1982; Ravallion, 1996). These discussions recently enter to the realm of Bourguignon and Chakravarty (2003) and Atkinson (2003), where non-monetary dimensions (i.e. education, health, living conditions etc.) are used to capture the multidimensional nature of poverty.

While the measurement of unidimensional monetary poverty using income is straightforward, the use of non-monetary indicators yields a more accurate and realistic identification of the poor. Moreover, considering more than one dimension to measure poverty makes things even more complicated, as determining the individual poverty thresholds for and assigning importance (weights) to different dimensions is subjective. Alkire and Foster (2011a,b) offer a comprehensive method to deal with these concerns and propose a multidimensional poverty index (MPI).

Motivated by different ways of measuring poverty, the objective of this research is to use individual-level, non-monetary factors in order to measure multidimensional poverty for Turkey at the regional level. Even though poverty reduction starts to receive more interest on policy side, heavy reliance on monetary social transfers potentially hides to extent of deprivation for disadvantageous individuals. While monetary motivated policies influence poor individuals' certain daily needs, access to better education, health, public services and standard of living are mostly neglected dimensions through out poverty reduction. Besides policy implementations are inevitably shaped by the centralized nature of Turkey, leaving very limited room for considering local priorities to combat with poverty. Therefore we approach to poverty issue from a non-monetary and multidimensional way by also taking

into account the possible spatial variability. Additionally, we aim to carry out a decomposition analysis to evaluate the contribution of different factors to multidimensional poverty. Following this, we also consider certain demographic characteristics of the population (i.e. age, gender etc.). This gives hints on the sources of poverty in Turkey and help shape local policies aimed at reducing poverty. Finally, we conduct a sensitivity analysis to check the sensitivity of poverty measurement to the essential parameters of the MPI measurement.

Section 2 reviews the related literature; section 3 lays out our data source, the sampling design, the nature of our data and introduces the methodological aspects of the Alkire-Foster (AF) framework; section 4 tabulates and maps the MPI estimates; conducts a sensitivity and a decomposition analysis at the regional level and section 5 concludes.

2 Literature Review

Poverty is a multidimensional concept that embeds not only monetary indicators but also non-monetary factors that are supposed to influence the capabilities and deprivation of individuals (Atkinson, 2003). Monetary indicators such as income or consumption have been liberally used in applied studies. Identifying the poor and constructing a poverty index is a two-step unidimensional method once a monetary indicator is preferred to measure poverty (Sen, 1976). After having identified the poor, basic indices such as headcount index or poverty gap can be calculated in order to calculate poverty at the country level. Since a unidimensional monetary poverty measure will have a single indicator and a cutoff level to identify the poor, it is relatively less complex compared to a multidimensional perspective (Alkire and Foster, 2011b). Moreover, monetary indicators are also preferable in cross-country studies due to the availability of comparable income data across countries. A drawback is that poverty measures that rely solely on monetary indicators fail in controlling for non-monetary characteristics of individuals that are likely to influence the deprivation level and thus poverty (Sen, 1982). Both deprivation in certain dimensions as well as the

inability to meet certain capabilities are crucial elements of poverty. Failure to control for these factors can be waived by following a multidimensional perspective (Sen, 1982, 1985).

The ability of individuals to meet certain achievement levels, known as the individual capabilities approach (Sen, 1992, 2005), led the pathway to a number of studies that examined the multidimensional nature of poverty in which individuals' characteristics are not limited to income-based monetary factors (Tsui, 2002; Atkinson, 2003; Bourguignon and Chakravarty, 2003; Ravallion, 2011). Therefore, additional characteristics of individuals are considered (health, education, living conditions etc.). This paradigm shift has brought additional measurement issues due to the multiplicity of dimensions that are of non-monetary nature and has matured the identification of the poor.

Based on Foster et al. (1984) and Atkinson (2003), Alkire and Foster (2011a,b) propose a new approach (Alkire-Foster or AF approach) by challenging the identification and aggregation procedures of the previous studies on poverty measurement. The AF approach relies on four major steps to identify poverty: (i) Deprivation cutoff determination, (ii) deprivation counts, (iii) poverty cutoff determination, and (iv) identification function. Since deprivation and poverty are determined in two steps, the approach is also labeled as the "dual-cutoff methodology". The AF approach first measures the deprivation in each dimension by using the deprivation cutoffs; then constructs the poverty by referring to overall poverty which has been measured as a weighted combination of each dimension. An important property of the AF approach is the perfect decomposability of the MPI for each dimension as well as for some other characteristics of survey sample (age cohorts, gender, geography etc.).

Based on recent advances in measuring multidimensional poverty, a prolific empirical studies literature investigates intra-country and cross-country differences in poverty and examines the extent of multidimensional poverty for selected African countries (Klasen, 2000; Duclos et al., 2006; Adeoti, 2014), selected EU countries (Deutsch and Silber, 2005; Nolan and Whelan, 2010), Nepal (Waglé, 2005), the US (Waglé, 2008), Brazil (Guedes et al., 2012), Italy (Coromaldi and Zoli, 2012), and selected Latin-American countries (Battiston et al.,

2013). Recently, Berenger (2019) consider the multidimensional poverty for selected South African countries. While these studies focus on individual characteristics of poverty at the country-level, others examine a set of countries and construct MPI in order to make cross-country poverty comparison (Alkire and Santos, 2014). In the MENA region, a number of studies examines cross-country differences in monetary poverty, without taking into account others dimensions (Adams Jr and Page, 2003; Ncube et al., 2014); while others consider multidimensional poverty in Egypt and Tunisia (Bibi, 2004), Egypt (Berenger, 2010) and selected MENA countries (Collicelli and Valerii, 2000).

As much as the empirical literature is dominated by country-level studies to measure multidimensional poverty, regional dimension should not be neglected (Ravallion, 1996). Examples include Bidani and Ravallion (1993) among the Indonesian regions and Ningaye et al. (2011) in Cameroon. These regional studies confirm the existence of substantial poverty variation at the regional level.

Considering the literature in Turkey, poverty is linked with both monetary factors such as income but also related with gender, age and education (Morçöl, 1997). Similarly, there is a necessity to consider other dimensions that are supposed to influence poverty in Turkey (i.e. health) (Saatci and Akpinar, 2007). It is noteworthy to highlight that poverty is a socioeconomic problem in Turkey, creating various channels across an array of social and economic fundamentals of the society (Buğra and Keyder, 2003; Kalaycioglu, 2006). Recently, a number of studies followed the AF approach to understand multidimensional poverty in Turkey (Acar, 2014; Karadağ and Saraçoğlu, 2015; Uğur, 2015; Limanli, 2016). However, none of these studies focus on the sources of poverty by carrying out a detailed regional decomposition analysis by demographics (i.e. age, gender) or dimensional levels (i.e. education, health etc.) or more generally aim at the spatial dimension of poverty. Clearly, there is a lack of knowledge on the regional distribution of multidimensional poverty in Turkey.

Our screening of the literature highlights a number of important contributions of our research. First, even though the literature examining the multidimensional poverty is growing,

our knowledge from the MENA region and specifically from Turkey is limited. There are a number of attempts; yet the coverage of these studies in terms of the time period and the level of analysis (spatial disaggregation) is insufficient in order to have a comprehensive view of the regionalal structure of multidimensional poverty. Moreover, decomposition of poverty is vital for policies dealing with poverty reduction; however, a detailed decomposition analysis along with demographic stratification of regions has not been carried out. This stands as a contribution not only to the empirical literature in MENA and specifically in Turkey, but also to the international literature. To our knowledge, calculating MPI at the regional level and analyzing the sources through various decomposition analyses have not been carried out.

3 Empirical Strategy

3.1 Data

In order to account for non-monetary factors that influence poverty, we use individual and household-level data that comes from the Income and Living Conditions Survey (ILCS) administered by the Turkish Statistical Office (TurkStat) since 2006 (ILCS-Turkstat, 2017). The survey keeps track of a detailed account of information on housing, economic situation, social exclusion, real estate ownership, education, demography, health status, labor status and income status on individuals above the age of 15. The survey uses a two-stage stratified cluster sampling method based on Address-based Population Registry System. The primary sampling units consist of clusters (blocks) of approximately 100 dwelling addresses and are defined as the sampling frame of EU-ILCS. The secondary sampling units consist of 10 clusters from each of the rural and urban residential areas. The only information about the ILCS design is the sampling weights, which are based on recent population projections.

Individual and household-level data on the cross-sectional ILCS are available for the 2011-2017 period and produces reliable estimates for the entire county and at the NUTS I level (12 regions). Starting on 2014, the sample size has been gradually increased in order

to produce reliable estimates at the NUTS II level (26 regions). Throughout our analyses, we focus on the geographical dimension of poverty and use the ILCS for the years 2014 to 2017 to produce reliable estimates at the NUTS II level (See Figure 1).

ILCS enables us to account for a number of variables on household and individual-level non-monetary factors. Household-level variables in the ILCS include the type of residence, (property) ownership, heating and residential facilities, while the individual-level variables include age, gender, schooling, marital status, overall health status, employment status and other economic activity. The ILCS data is recoded to make it compatible with the AF methodology, such that a total of 4 domains (housing, environment, education and health) and a total of 16 binary dimensions have been identified to be used in the AF approach. The individual is considered deprived (not deprived) in each of the 16 dimensions if the dimension takes the values of 1 (0).

The ILCS sample consists of 58,744, 57,942, 59,662 and 60,525 individuals, respectively for each sample year from 2014 to 2017 for a total of 236,873 observations. **Domain I: Housing** and **Domain II: Environment** respectively consist of 7 and 4 dimensions that were recoded using the household-level data; and **Domain III: Education** and **Domain IV: Health** respectively consist of 2 and 3 dimensions that were recoded using the individual-level data. Table 1 shows the domains, the dimensions under each domain, the coding of the variables used in the analysis, the descriptive statistics for the 2014-2017 period and individual weights of each dimension for the MPI calculations.

Our survey enables us to consider a number of individual and household demographic characteristics. Our analyses also focus on age and gender at the regional level as generational effects can be crucial (Vijaya et al., 2014; Klasen and Lahoti, 2016; Espinoza-Delgado and Silber, 2018). The follow-up of a given generation thoughout the sample period would be an insightful exercise. However, for the fact that our survey data is cross-sectional and does not keep track of the same individual through time, it proves not possible to trace the same individual in a given generation. Another alternative would be to group individuals in a

given generation and track the multidimensional poverty of that specific generation (i.e. a comparison of MPI of the individuals within the 15-18 age cohort in 2014 with those within the 18-21 age cohort in 2017). Given the short time dimension of our survey data, we opt to conduct a decomposition analysis for a given age cohort at different periods in our sample in lieu of following the evolution of MPI for a given generation. We leave the alternative analyses of generational effects for a subsequent research where we aim to use NUTS I level or country-level data in return for a longer time period.

3.2 Methodology

We start-off by calculating a regional MPI using the AF methodology of Alkire and Foster (2011a,b), built upon the Foster-Greer-Thorbecke index of poverty of Foster et al. (1984). Let N be the sample size, D be the number of deprivation indicators, Y be a $N \times D$ matrix with elements y_{ij} denoting the level of indicator j for individual i, $\mathbf{z}$ be a $1 \times D$ vector of deprivation cutoffs used to determine if a person is deprived in each of the D dimensions and $\mathbf{w}$ be a $1 \times D$ vector of weights to assess the relative importance of each indicator, such that $\sum_{j=1}^{D} w_j = 1$. Individual i is said to be deprived in indicator j when $y_{ij} < z_j$.

Two aspects of multidimensional poverty in the AF framework are the incidence of poverty (H) and the breadth of simultaneous deprivation (A):

$$H = \frac{q}{N} \tag{1}$$

$$A = \frac{\mid g^0(k) \mid}{q} \tag{2}$$

where q the number of individuals identified to be poor, k is the poverty cutoff where $0 < k < 1$, $\mathbf{g}^0(k)$ is a $N \times D$ matrix, called the censored deprivation matrix whose entries are given by $g^0_{ij} = w_j$ if $y_{ij} < z_j$ and 0 otherwise and $\mid g^0(k) \mid$ is the sum of all elements of the deprivation matrix, $g^0(k)$. The row sum of $\mathbf{g}^0$ becomes the minimum number of

weighted indicators that the individual must be deprived from in order to be defined as multidimensionally poor, $c_i = \sum_{j=1}^{D} g_{ij}^0$. The joint use of weights, $\mathbf{w}$, to assign the importance of each indicators and the poverty cutoff, k, to assign who is to be treated as poor is known as the "dual cutoff approach" of the AF methodology on MPI.

The Alkire-Foster multidimensional poverty measure accounts for both the incidence of poverty and the breadth of deprivation:

$$M_0 = \frac{\mid \mathbf{g}^0(k) \mid}{N} = H \times A \tag{3}$$

An important property of M_0 is the perfect decomposability, that is, M_0 can be obtained as the weighted average of MPIs for the subgroups (e.g. by gender, race, age or geographic location), $M_{0,g}$ where the weights correspond to the ratio of the subgroup population size, N_g to total population size, N:

$$M_0 = \sum_{g=1}^{G} \frac{N_g}{N} M_{0,g} \tag{4}$$

As long as the groups are mutually exclusive and collectively exhaustive, the percentage of contribution of group g to the overall MPI is therefore:

$$C_{0,g} = \left(\frac{N_g}{N}\right)\left(\frac{M_{0,g}}{M_0}\right) \tag{5}$$

Perfect decomposability also ensures that the AF measure of multidimensional poverty can be decomposed by indicators of deprivation as well. Let $\mid \mathbf{g}_j^0(k) \mid$ be the sum of elements of the j^{th} column of $\mathbf{g}^0(k)$. Then, the AF multidimensional poverty measure can be written as:

$$M_0 = \sum_{j=1}^{D} \frac{\mid \mathbf{g}_j^0(k) \mid}{N} \tag{6}$$

The percentage of contribution of indicator j to the overall MPI is therefore[1]:

$$CI_{0,j} = \frac{\mid \mathbf{g}_j^0(k) \mid}{N \times M_0} \tag{7}$$

The choice of the dimensions (D) to calculate M_0 and the indicators to be included under each dimension hinges upon data availability. Regarding the unit of observation, the MPI should ideally use the individual to allow intra-household inequalities and to decompose poverty by age and gender (Alkire and Santos, 2014). When the diversity of individual-level dimensions is not entirely inclusive, we use household-level dimensions complementarily. Upon the inspection of the dataset structure of the ILCS for the year 2014 throughout 2017, the available individual-level domains are education and health. Since the ILCS also includes information on households, two additional domains at the household-level are housing and environmental exposure.

Together with individual information on gender and age, our methodology also enables to decompose poverty by gender and age or age groups or by the indicators used under each domain to assess the primary drivers of multidimensional poverty in Turkey.

4 Results

4.1 Benchmark Results

Panel A of Table 2 reports the national MPI estimates. First, the cutoff criteria concerns dimension-based deprivations where we use a binary coding (See Table 1). Second, in order to decide whether an individual is poor or not, we use a cutoff level of 0.5 in our benchmark analyses (i.e. the individual is deprived in half of the dimensions in order to be identified as poor). As discussed in Alkire and Foster (2011b) choosing the cutoff level contains some level of arbitrariness and should be subject to robustness and sensitivity analyses. Therefore, we carry out a sensitivity analysis using alternative cutoff levels in Section 4.2.

[1]See Pacifico and Poege (2017) for details.

During the 2014-2017 period, there was a slight decline in the MPI and the proportion of individuals deprived (H) based on our selected cut-off criteria of 0.50. A second important finding is the contribution of different factors to multidimensional poverty. In Panel B of Table 2, we provide the contribution of each domain to the national MPI calculations. Results show that each domains' contribution is persistent between 2014 and 2017. However, education and health deprivations dominate the MPI construction. Domain III: Education and Domain IV: Health respectively contributes to the MPI by 41 and 28 percent, on average. On the other hand, Domain I: Housing and Domain II: Environment have limited impact around 14 and 18 percent on average, respectively. In Panel B of Table 2, we further investigate the contribution of each individual dimension to the overall MPI construction. The most important dimensions are found to be the fuel type for heating and hot water system under Domain I. Housing infrastructure under Domain II, mandatory schooling under Domain III and chronic illness under Domain IV are the largest contributors to MPI.

All these elements of the MPI construction can be further investigated by decomposing the MPI, based on a host of demographics of the population (e.g. gender, age, employment status). Our choice for the demographic characteristics are primarily motivated from gender based disparities in Turkey. We complement this first pillar by age and employment status as both age structure of population as well as labor market conditions are two evolving lines that deserve additional elaboration. While for the gender, inevitable expectation is on the relatively disadvantageous positions of females within the society, for age we consider both young and old population as two specific candidates for higher deprivations. For the employment status, while we do not directly impose an expectation; unemployed, retired, old and disabled individuals are likely to be influenced from higher levels of poverty and deprivation. As an initial exercise, we carry out a decomposition analysis at the country level. Later on in subsection 4.3 we further investigate decomposition for selected characteristics at local level. Initial results, given in Panel C of Table 2, highlight that females are more deprived relative to males. While MPI is declining for both gender, deprivation levels for

females are higher throughout the sample period. The decomposition of the MPI, based on age groups, shows that oldest individuals exhibit the highest deprivation levels. One possible explanation is the weight assigned to health-based deprivations. Finally, for the employment status, the old and disabled individuals exhibit the highest contribution to the MPI, followed by those engaged in housework.

For the fact that we are primarily interested in the topography of multidimensional poverty, we calculate a MPI for each of the 26 NUTS II regions. Figure 2 and Figure 3 respectively show the geographical distribution of MPI and the proportion of deprived individuals. The share of deprived individuals and the MPI decline during the 2014-2017 period. However, the spatial dimension of poverty is extremely persistent. For all years considered, the MPI and the headcount ratio are higher among the eastern regions. This pattern closely mimics the historical duality across the Turkish geography (Dogruel and Dogruel, 2003; Karahasan and Bilgel, 2018). There is a belt extending from Northwestern regions towards Central Anatolia that realize the lowest multidimensional poverty. On the contrary, eastern and specifically southeastern regions suffer from multidimensional poverty to a great extent. Northeastern as well as southern regions realize a multidimensional poverty above the country average. During this short period, we found no evidence for a reshuffling of poverty across the Turkish regions.

In line with our analyses on the contribution of domains/dimensions, we further investigate the regional dimension of each domains' contribution and its spatial distribution in Figure 4 where the domain contributions and their spatial distributions are color-coordinated. We first focus on the average contributions of each domain for the sample period. Figure 4a shows that domains III and IV have the largest impact on multidimensional poverty for almost all regions while the impact of domains I and II are rather limited. These results highlight that education and health are the largest contributors to multidimensional poverty but the impact of housing and the environment are relatively limited. This finding confirms that the contribution of each domain is of similar magnitude once country-level and regional

MPI are considered.

Even though the relative importance of each domain in a given region is similar, its impact may be spatially varying across the geography. The spatial distribution of each domain is plotted in Figure 4b. Interestingly, a uniform pattern does not exist. Domain I: Housing exhibits the largest impact on Eastern regions, albeit there are exceptions and Domain II: Environment exhibits the largest impact over metropolitan urban areas such as Istanbul, Ankara and Izmir, followed by Eastern regions. On the other hand, the results are mixed for Domain III: Education and Domain IV: Health. The largest contributions of Domain III (Domain IV) are observed for Northern and Eastern (Central Anatolian) regions.

An important aspect of our analyses is the comparability of MPI calculations against official monetary poverty statistics. We consider the poverty rate based on the percentage of individuals below the 60 percent of the median income in each region. Table 3 reports the major descriptive statistics. One common finding of both poverty measures is the observed decline in poverty during the 2014-2017 period. However, an important difference lies behind the spatial equality of poverty measures. For instance, the spatial disparities in MPI become more visible in terms of standard deviation, coefficient of variation and the range of the distribution. Above all, monetary poverty distribution is spatially random compared to non-monetary poverty measures.[2] For both MPI and headcount ratio, poverty exhibits a statistically significant spatial dependence throughout the sample period. These descriptive comparisons point out that regional disparities in poverty becomes more visible once non-monetary dimensions are included.

The spatial distribution of the poverty rate for 2014-2017 period is given in Figure 5. Vis-à-vis Figure 2, the difference in the spatial distribution of monetary and non-monetary poverty measures is staggering. Additionally, we check the rank correlation between monetary and non-monetary poverty indicators and end up with statistically insignificant rela-

[2]The Moran's I spatial autocorrelation statistic is used to test for spatial randomness. $I = (n/s)(\sum_i w_{ij}(x_i - \bar{x})(x_j - \bar{x})/\sum (x_i - \bar{x})^2)$where n is the number of cross-sections, s is the summation of all the elements w_{ij} of the weight matrix $\mathbf{W}$ of provinces i and j where $\mathbf{W}$ is defined as an inverse distance weight matrix.

tionships (Spearman's ρ [p-value] are 0.1703 [0.41], 0.1181 [0.57], 0.0992 [0.63], -0.1329 [0.52] from 2014 to 2017 respectively.). Focusing on monetary measures and trying to evaluate the path and the geography of poverty can be misleading for the Turkish case as there are other dimensions that have to be considered before reaching a consensus on policies to combat poverty. Our results suggest that these dimensions are not monetary.

4.2 Sensitivity Analysis

An important input of MPI calculation is the cutoff determination. Therefore, it is crucial to test whether MPI calculation is sensitive to the selected cutoff level. We perform a sensitivity analysis based on two different cutoff levels (0.30 and 0.70) to test the geographical sensitivity of our results to the constraints imposed on the deprivation level of individuals.

We first perform a sensitivity analysis at country level. Results are reported in Table 4. Similar to earlier analyses and regardless of the selected cutoff levels (0.3 and 0.70), MPI and headcount ratio fall during the sample period. Additionally, the contribution of domains to MPI is insensitive to the chosen cutoff level.

Education and health-based human capital deprivations have the highest influence on the formation of MPI during the sample period. Second, contribution of dimensions is similar as before, suggesting that the cutoff level has an influence on the size of deprivation and MPI but not the contribution of background factors.

The spatial distribution of MPI is given in Figures 6a and 6b for a cutoff of 0.3 and 0.7, respectively. Compared to benchmark results with a cutoff of 0.5 shown in Figure 2, the spatial distribution is insensitive to changes in the cutoff level. However, the range of the regional MPI is larger for the 0.3 cutoff and smaller for the 0.7 cutoff compared to our benchmark estimates, with severer multidimensional poverty prevailing in the historically underdeveloped and Kurdish-populated Eastern Anatolia, notwithstanding the spatial distributions of regional MPI are similar.

While our results give a rough idea about the spatial sensitivity, a related concern could

be the sensitivity of the historical evolution of the distribution. For each year of our sample, we implement a basic transition analysis using cutoff levels from 0.3 to 0.7 in 0.05 increments to assess whether each NUTS II region in our sample shifts across quantiles, following small increases in the level of the cutoff. The complete results of this analysis are provided in Section A.3 of the Appendix,

Using different cutoff levels does not change the distributional clustering of regions. There are, however, minor changes as some regions switch to adjacent poverty classes for certain cutoff levels. These transitions seem to be extremely limited and have a negligible effect. Overall, these findings support the argument that our baseline choice for the cutoff does not impinge upon our benchmark results.

4.3 Decomposition Analysis

The decomposition analysis of Section 4.1 shows that the realization of poverty within specific segments of the society might be different. We are therefore interested in the degree of this variation across the NUTS II regions and perform a decomposition analysis by gender and age cohorts using the baseline cutoff level of 0.5.

The spatial distribution of MPI by gender is given in Figures 7a and 7a respectively for males and females throughout the sample period with a fixed quantile thresholds as before in order to provide both an interregional and an intertemporal comparison. First, the spatial pattern of MPI by both genders almost perfectly mimics the spatio-temporal evolution of overall regional MPI. Eastern regions are clustered of highly deprived individuals who suffer from different aspects of poverty. Notice that the spatial distribution of MPI depicts a very similar geographical composition across genders with higher MPI values reigning in the eastern and southeastern geography and an overall diminishing MPI throughout the sample period; yet the absolute values of the MPI differ to a significant extent, with severer multidimensional poverty among females compared to males for all quantiles. Comparison of gender decomposition with the overall MPI figures highlights that the spatial distribution

of MPI is neutral to gender decomposition. However size of MPI is extremely sensitive to gender decomposition.

For space concerns, we only report the MPI among the youth (15-25 years of age) whose spatial distribution is given in Figure 8.[3] Our analysis was not able to yield a MPI for the TRC3 (Mardin subregion) due to lack of observations in the corresponding age cohort. Findings highlight once again that eastern and specifically southeastern regions are composed of young individuals that suffer severely from multidimensional poverty.

5 Conclusion

Poverty is an important element of social exclusion and economic development. However, poverty is mostly challenged on monetary grounds leaving other social dimensions relatively underinvestigated. This research focuses on the non-monetary dimension of poverty for a developing country, Turkey. Given persistent regional disparities and continuous polarization, we investigate different dimensions of poverty at the regional level.

Findings on the non-monetary dimensions of poverty show that individuals' level of deprivation is influenced mostly from human capital-based deprivations. Education and health act as important contributors to multidimensional poverty. Additionally, preliminary analyses from decomposition of multidimensional poverty highlight that demography of the population matters. Females' deprivation level is higher on average compared to males. Additionally, non-monetary poverty among the elderly is higher while the middle-age population realizes the lowest multidimensional poverty. Finally, findings show that old, disabled individuals and individuals engaged in housework are deprived more compare to the rest of the labor market.

These results are complemented by those regarding the spatial dimension of poverty. While regional distribution of MPI is skewed disproportionally towards the eastern geog-

[3]The results for the remaining age cohorts are available from the authors upon request. A similar analysis could be conducted by employment status. To conserve space, these results are not reported; however are available upon request.

raphy, the contribution of individual domains and dimensions also highlight a polarized structure. Results on the spatial dimension of poverty becomes more remarkable upon a comparative analysis of monetary and non-monetary poverty. Results point out the differences between standard measures of poverty (monetary poverty rate) and multidimensional poverty (non-monetary poverty). There is a fall in poverty during the sample period for both poverty measures. However, regional dimension of poverty shows that non-monetary dimensions matter. Eastern regions form a cluster composed of poor/deprived individuals once non-monetary factors are considered. On the contrary, poverty rate is spatially random showing less signs of clustering at certain locations. Overall our combined results show that, poverty measured by monetary factors does not necessarily define the real deprivation well thus the poverty level of regions. However, incorporating other non-monetary factors suggest a more clustered pattern for poverty that mimics the dual regional structure of Turkish economy.

The results of this study leads to interesting pathways for local policies to combat poverty and inequality. Turkish economy and regional administrative system is shaped by a highly centralized structure, restricting policy implementation capabilities of local authorities. Even though the regional disaggregation level of our research (NUTS II) forms the economic areas composed of Regional Development Agencies (RDAs), still, the centralized nature of development agency's framework prevents the consideration of regional differences in policy implementations. However, considering regional analyses of poverty and specifically the spatial variation in the factors' influence on multidimensional poverty, some room for variation in policy making becomes essential. One-size fits all approach of a centralized administrative and bureaucratic system might be incapable of fighting against poverty at such a multidimensional level.

Finally, an additional dimension that provides quasi-policy implications is the potential impact of immigration. The sizable influx of immigrants and their mobility in Turkey is a vital and intriguing aspect of multidimensional poverty. At this stage, our survey data does

not allow us to make a detailed analytical examination; yet we consider the immigration-poverty nexus as an important avenue for further research.

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Tables

Table 1: Descriptive statistics and the coding of variables, ILCS 2014-2017

Domains and dimensions	Coding	mean (s.d)	weight
Domain I: Housing			
1. Fuel type for heating	=1 if coal, firewood, LPG, turd, other; =0 if natural gas, fuel oil, electricity	0.589 (0.492)	0.04
2. Type of bath/shower	=1 if shared or none; =0 if private	0.036 (0.185)	0.04
3. Type of toilet	=1 if shared or none; =0 if private	0.089 (0.285)	0.04
4. Independent kitchen	=1 if no; =0 if yes	0.017 (0.128)	0.04
5. Hot water system	=1 if no; =0 if yes	0.134 (0.341)	0.04
6. Washing machine	=1 if no; =0 if yes	0.024 (0.152)	0.04
7. Refrigerator	=1 if no; =0 if yes	0.009 (0.096)	0.04
Domain II: Environment			
1. Housing infrastructure problem	=1 if yes; =0 if no	0.376 (0.484)	0.06
2. Noise pollution	=1 if yes; =0 if no	0.141 (0.348)	0.06
3. Environmental pollution	=1 if yes; =0 if no	0.228 (0.420)	0.06
4. Neighborhood Crime	=1 if yes; =0 if no	0.088 (0.284)	0.06
Domain III: Education			
1. Education degree	=1 if illiterate, no school; = 0 otherwise	0.187 (0.39)	0.13
2. Mandatory schooling	=1 if $<$ 8 years; =0 otherwise	0.505 (0.500)	0.13
Domain IV: Health			
1. Self-rated health	=1 if poor, very poor; =0 if average, good, very good	0.119 (0.324)	0.08
2. Chronic illness	=1 if yes; =0 if no	0.356 (0.479)	0.08
3. Unmet healthcare needs	=1 if yes; =0 if no	0.104 (0.306)	0.08

Notes: N= 236,873. The individual is considered deprived (not deprived) if the dimension takes the value of 1 (0).

Table 2: Country-level MPI

	2014	2015	2016	2017
Panel A: Multidimensional poverty measures				
MPI	0.054	0.048	0.036	0.032
Headcount Ratio (H)	0.091	0.082	0.063	0.057
Breadth of deprivation (A)	0.590	0.584	0.576	0.568
Number of observations	60525	59655	57938	58730
Panel B: Domain and dimension contributions				
Domain I: Housing	**0.149**	**0.138**	**0.133**	**0.126**
Fuel type for heating	0.057	0.056	0.057	0.057
Bath/shower	0.013	0.012	0.011	0.01
Toilet	0.023	0.021	0.020	0.019
Kitchen	0.008	0.007	0.005	0.004
Hot water system	0.033	0.031	0.027	0.025
Washing machine	0.011	0.008	0.009	0.008
Refrigerator	0.004	0.004	0.004	0.004
Domain II: Environment	**0.174**	**0.181**	**0.181**	**0.183**
Housing infrastructure problem	0.087	0.089	0.092	0.094
Noise pollution	0.025	0.027	0.025	0.024
Environmental pollution	0.044	0.045	0.044	0.045
Neighborhood crime	0.017	0.020	0.021	0.021
Domain III: Education	**0.393**	**0.400**	**0.410**	**0.418**
Education degree	0.182	0.186	0.194	0.199
Mandatory schooling	0.211	0.213	0.216	0.219
Domain IV: Health	**0.283**	**0.281**	**0.275**	**0.273**
SRH	0.094	0.096	0.096	0.100
Chronic illness	0.123	0.127	0.129	0.134
Unmet healthcare needs	0.067	0.058	0.049	0.039
Panel C: Demographic decomposition				
Gender				
Male	0.035	0.030	0.022	0.018
Female	0.071	0.065	0.050	0.046
Age				
15-25	0.016	0.014	0.01	0.008
26-35	0.026	0.024	0.014	0.015
36-65	0.055	0.048	0.034	0.029
66+	0.182	0.165	0.136	0.123
Employment status				
Employed	0.017	0.014	0.01	0.007
Employer/Self-employed	0.052	0.042	0.031	0.026
Unemployed	0.040	0.028	0.019	0.016
Trainee	0.001	0.000	0.000	0.000
Retired	0.037	0.050	0.037	0.032
Old/disabled	0.278	0.269	0.248	0.241
Housework	0.066	0.065	0.054	0.050
Other inactive	0.018	0.025	0.006	0.009

Table 3: Comparison of monetary and non-monetary poverty

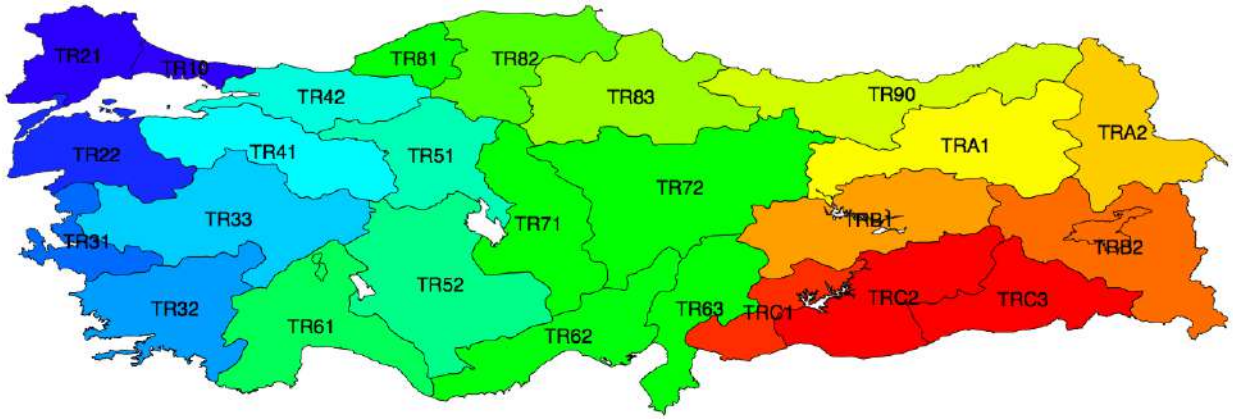
	mean (s.d)	min	max	range	CoV	Moran's I [s.e]
2014						
Poverty Rate	0.172 (0.027)	0.130	0.235	0.105	0.159	-0.046 [0.039]
Headcount Ratio	0.095 (0.064)	0.020	0.269	0.249	0.669	0.259***[0.037]
MPI	0.056 (0.039)	0.011	0.164	0.153	0.700	0.254***[0.037]
2015						
Poverty Rate	0.173 (0.029)	0.103	0.237	0.134	0.169	-0.098*[0.038]
Headcount Ratio	0.086 (0.057)	0.015	0.242	0.227	0.668	0.215***[0.037]
MPI	0.050 (0.035)	0.008	0.146	0.138	0.697	0.210***[0.037]
2016						
Poverty Rate	0.174 (0.027)	0.105	0.226	0.121	0.154	-0.057*[0.038]
Headcount Ratio	0.068 (0.049)	0.009	0.211	0.202	0.733	0.182***[0.036]
MPI	0.039 (0.029)	0.005	0.126	0.121	0.757	0.176***[0.036]
2017						
Poverty Rate	0.160 (0.025)	0.117	0.199	0.082	0.156	-0.026 [0.039]
Headcount Ratio	0.060 (0.042)	0.007	0.187	0.180	0.693	0.219***[0.037]
MPI	0.034 (0.024)	0.004	0.110	0.106	0.715	0.209***[0.036]

Table 4: Sensitivity Analysis

	Cut-off: 0.30				**Cut-off: 0.70**			
	2014	2015	2016	2017	2014	2015	2016	2017
Panel A: MP measures								
MPI	0.146	0.138	0.117	0.114	0.007	0.005	0.003	0.001
Headcount Ratio (H)	0.329	0.315	0.274	0.269	0.009	0.007	0.004	0.002
Breadth of deprivation (A)	0.443	0.438	0.428	0.422	0.754	0.748	0.744	0.737
Panel B: Contributions								
Domain I: Housing	**0.139**	**0.126**	**0.119**	**0.113**	**0.188**	**0.173**	**0.166**	**0.165**
Fuel type for heating	0.069	0.067	0.068	0.067	0.047	0.047	0.047	0.047
Bath/shower	0.009	0.007	0.007	0.005	0.023	0.022	0.022	0.02
Toilet	0.019	0.016	0.014	0.013	0.033	0.028	0.027	0.023
Kitchen	0.005	0.004	0.003	0.002	0.018	0.015	0.011	0.012
How water system	0.028	0.025	0.021	0.02	0.039	0.036	0.033	0.033
Washing machine	0.007	0.005	0.005	0.004	0.019	0.016	0.015	0.017
Refrigerator	0.002	0.002	0.002	0.002	0.009	0.007	0.011	0.014
Domain II: Environment	**0.181**	**0.188**	**0.191**	**0.187**	**0.185**	**0.207**	**0.211**	**0.218**
Housing infrastructure	0.088	0.091	0.095	0.094	0.078	0.081	0.082	0.082
Noise pollution	0.027	0.029	0.028	0.027	0.031	0.035	0.036	0.042
Environmental pollution	0.047	0.047	0.048	0.047	0.051	0.058	0.056	0.056
Neighborhood Crime	0.018	0.021	0.02	0.02	0.025	0.033	0.037	0.037
Domain III: Education	**0.426**	**0.431**	**0.450**	**0.456**	**0.329**	**0.332**	**0.336**	**0.339**
Education degree	0.16	0.162	0.171	0.174	0.163	0.165	0.167	0.17
Mandatory schooling	0.266	0.269	0.279	0.282	0.166	0.167	0.168	0.17
Domain IV: Health	**0.254**	**0.255**	**0.239**	**0.244**	**0.298**	**0.288**	**0.288**	**0.287**
SRH	0.067	0.069	0.064	0.065	0.1	0.098	0.094	0.1
Chronic illness	0.131	0.138	0.14	0.148	0.109	0.108	0.11	0.112
Unmet healthcare needs	0.056	0.047	0.036	0.03	0.089	0.082	0.083	0.066

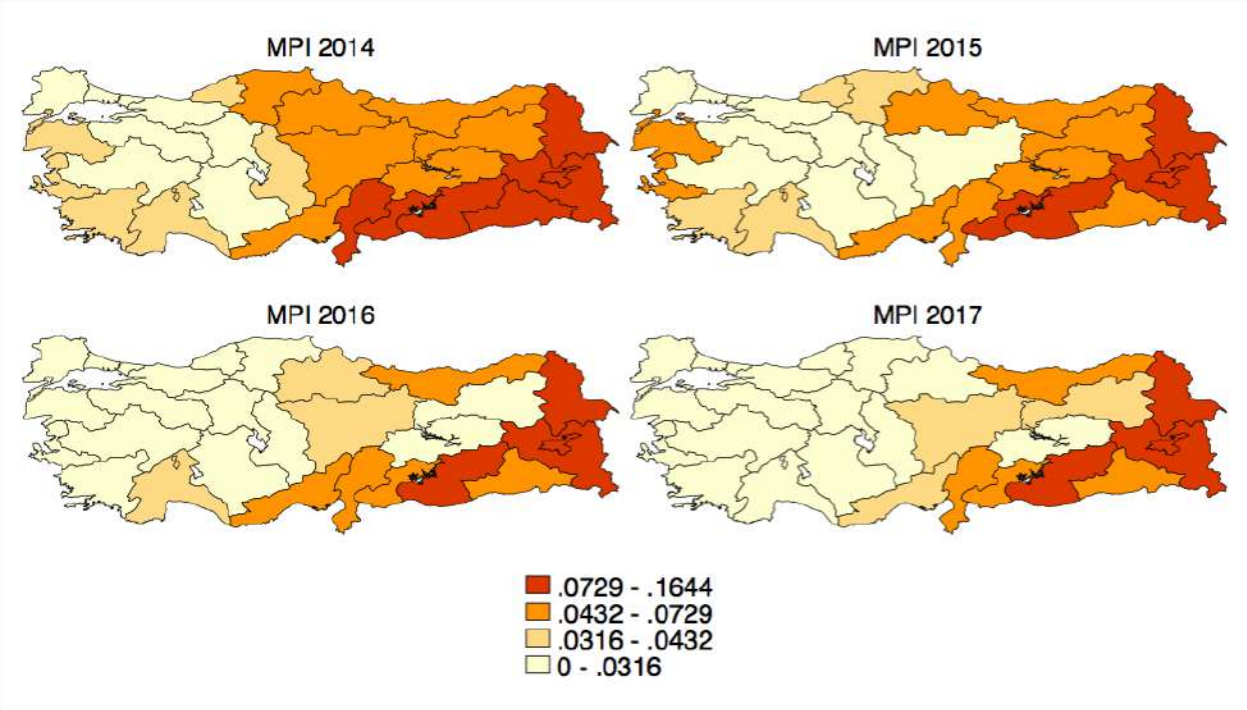
Figures

Figure 1: NUTS II Regions of Turkey



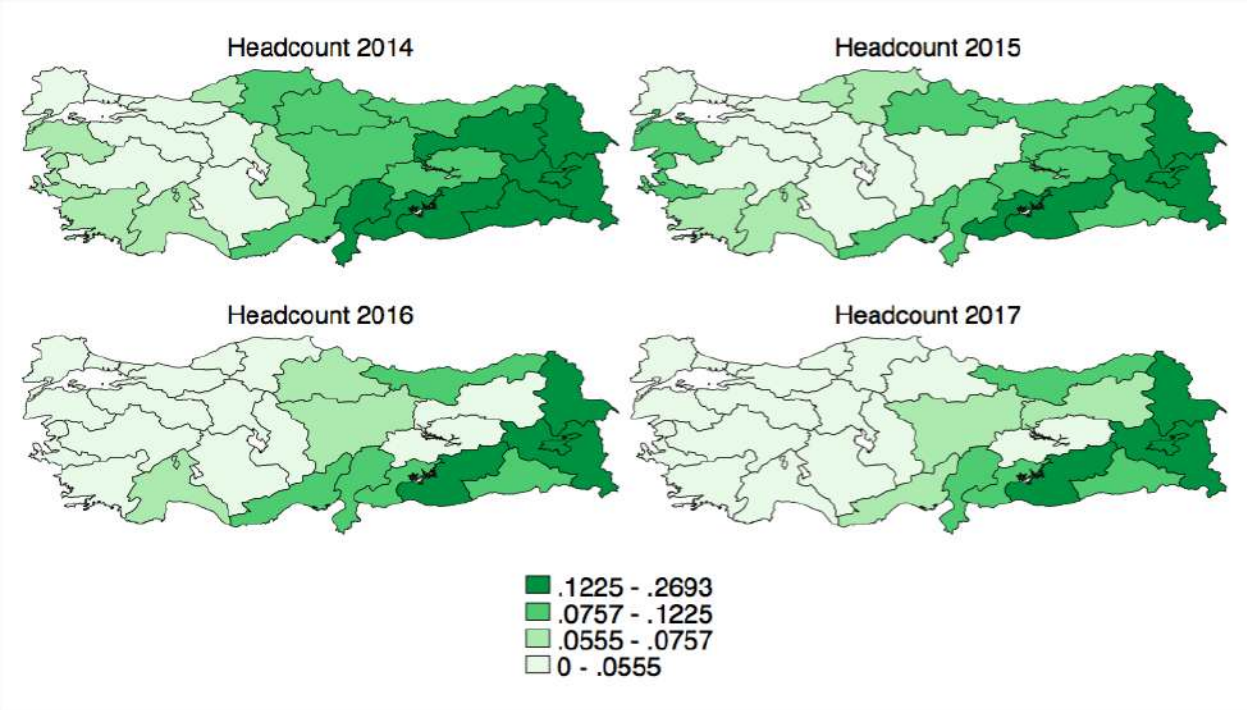
TR10: Istanbul subregion
TR21: Tekirdağ subregion
TR22: Balıkesir subregion
TR31: Izmir subregion
TR32: Aydın subregion
TR33: Manisa subregion
TR41: Bursa subregion
TR42: Kocaeli subregion
TR51: Ankara subregion
TR52: Konya subregion
TR61: Antalya subregion
TR62: Adana subregion
TR63: Hatay subregion
TR71: Kırıkkale subregion
TR72: Kayseri subregion
TR81: Zonguldak subregion
TR82: Kastamonu subregion
TR83: Samsun subregion
TR90: Trabzon subregion
TRA1:Erzurum subregion
TRA2: Ağrı subregion
TRB1: Malatya subregion
TRB2: Van subregion
TRC1: Gaziantep subregion
TRC2: Şanlıurfa subregion
TRC3: Mardin subregion

Figure 2: Spatial Distribution of Multidimensional Poverty Index (cut-off: 0.5)



Notes: The legend shows fixed quantile thresholds of the year 2014. Higher MPI values indicate severer multidimensional poverty. Source: ILCS-Turkstat (2017), authors' own calculations.

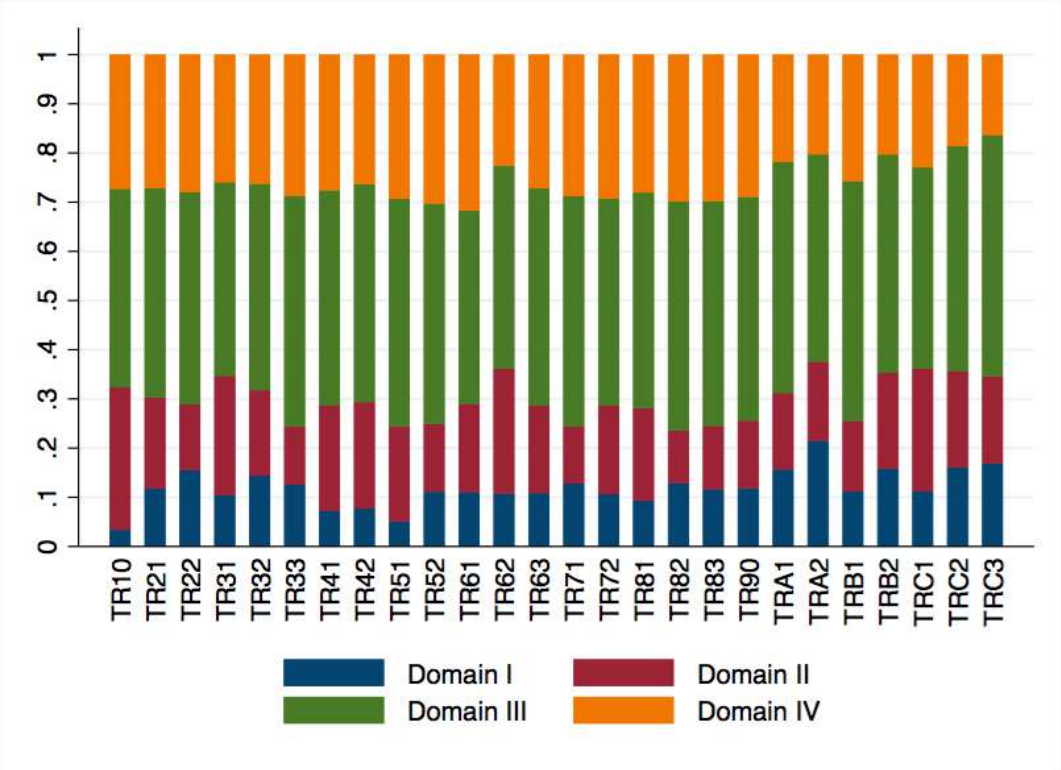
Figure 3: Spatial Distribution of Headcount Ratio (cut-off: 0.5)



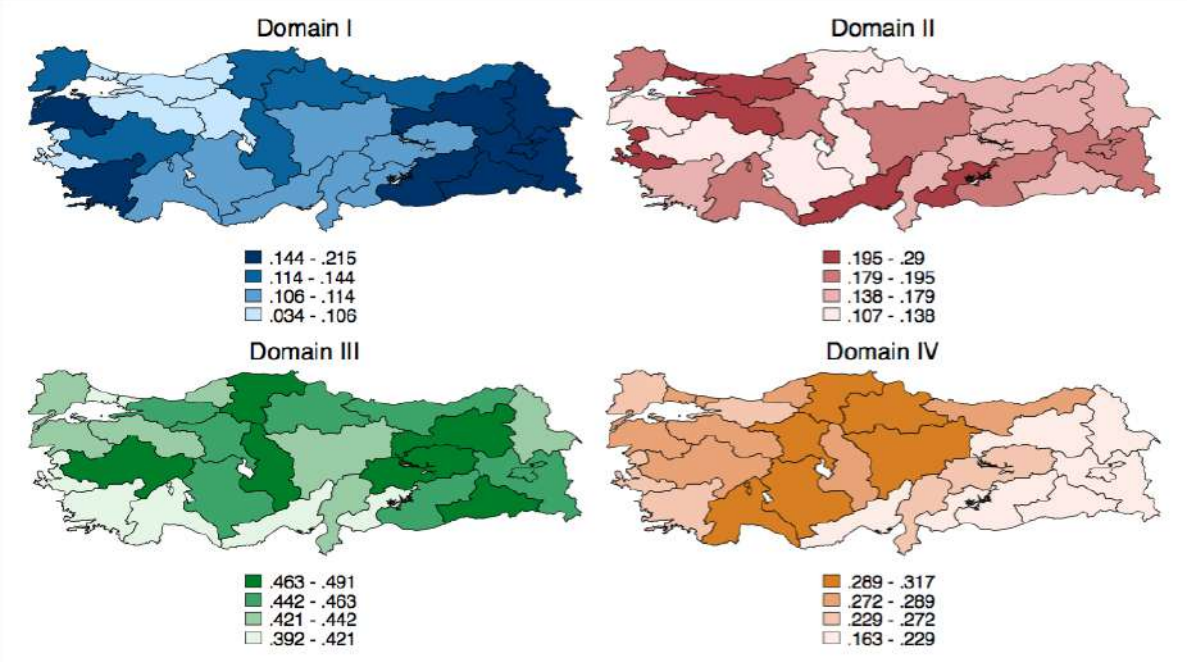
Notes: The legend shows fixed quantile thresholds of the year 2014.
Source: ILCS-Turkstat (2017), authors' own calculations.

Figure 4: Domain contributions (2014-2017 averages)

(a) Regional share

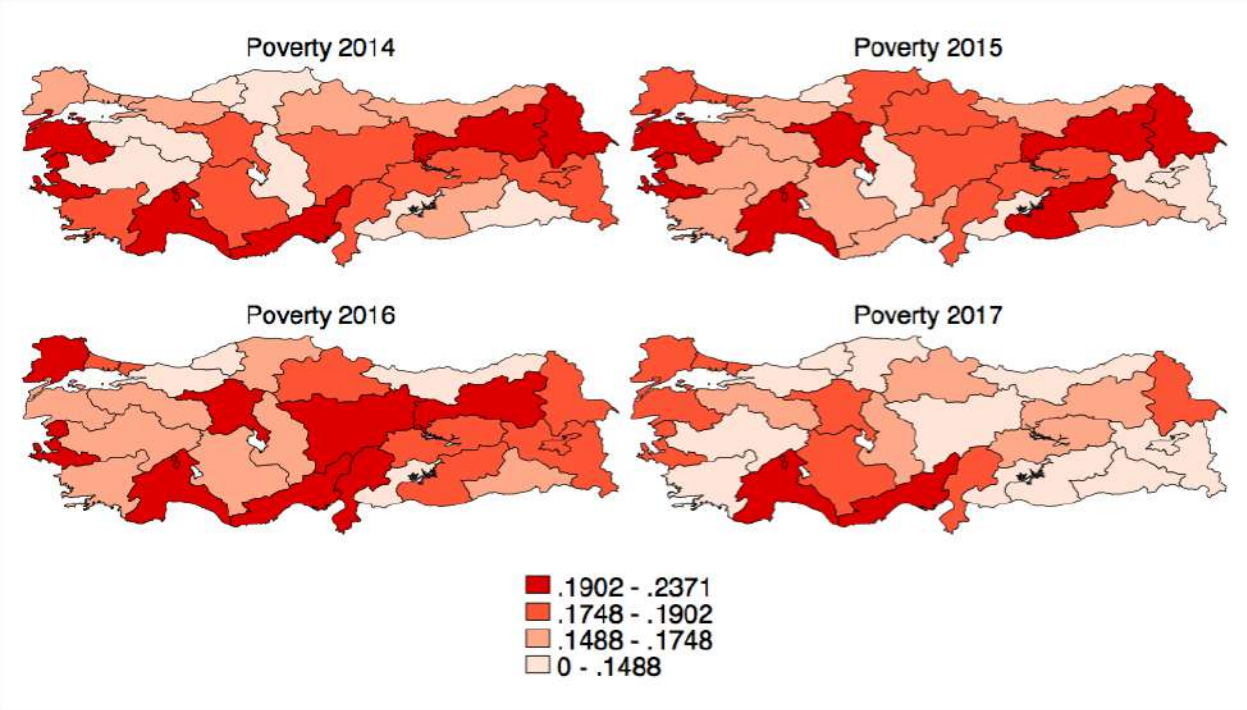


(b) Spatial distribution



Source: ILCS-Turkstat (2017), authors' own calculations.

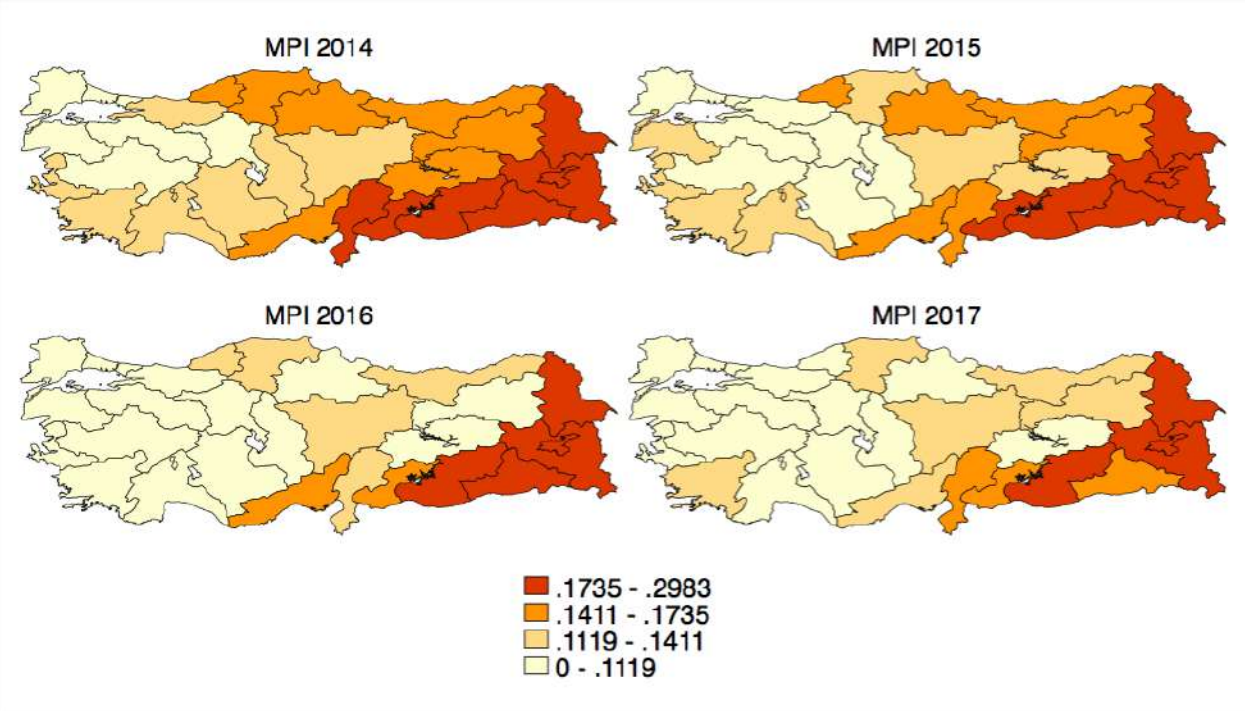
Figure 5: Spatial Distribution of Monetary poverty rate



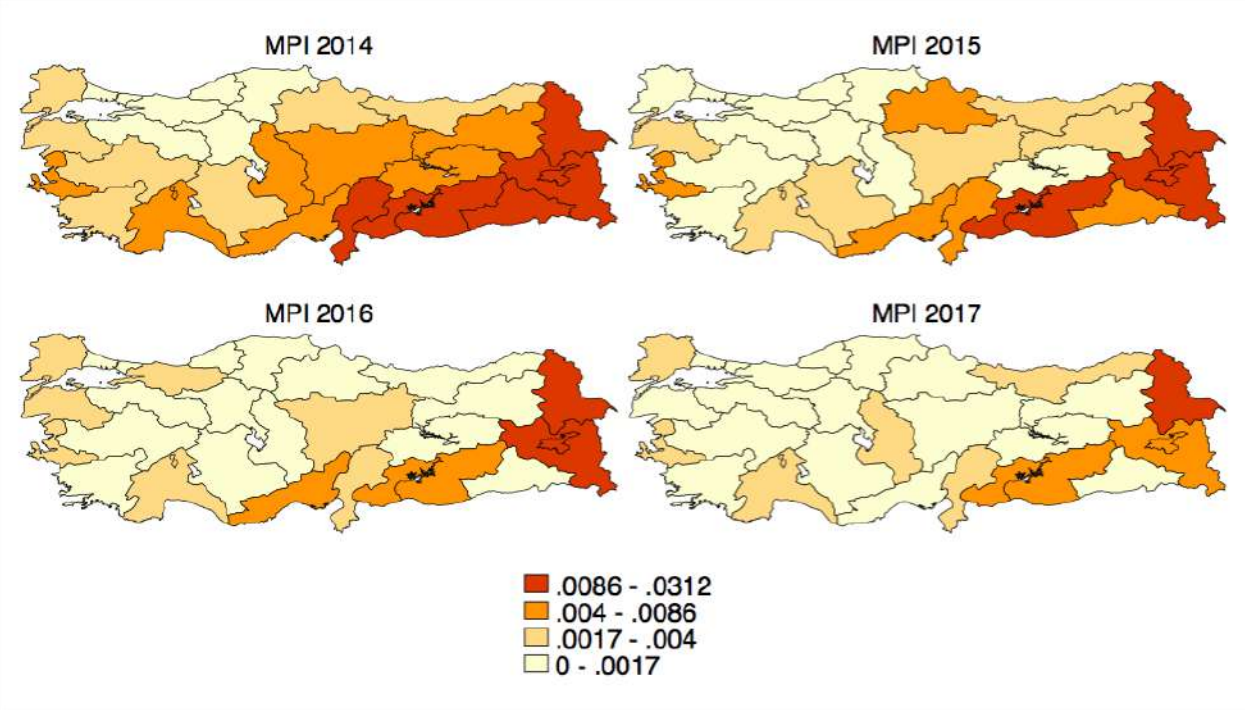
Notes: The legend shows fixed quantile thresholds of the year 2014. Higher values indicate severer monetary poverty. Source: ILCS-Turkstat (2017).

Figure 6: Sensitivity Analysis: Spatial Distribution of Multidimensional Poverty Index

(a) Cutoff: 0.3



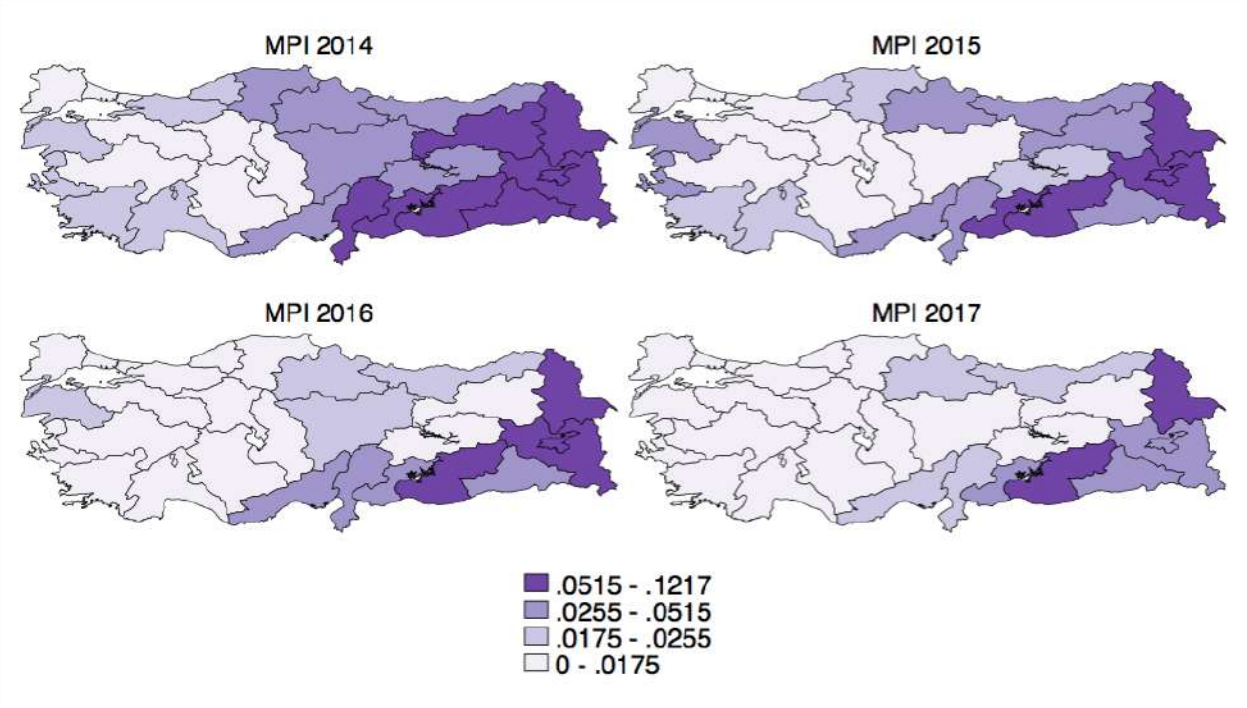
(b) Cutoff: 0.7



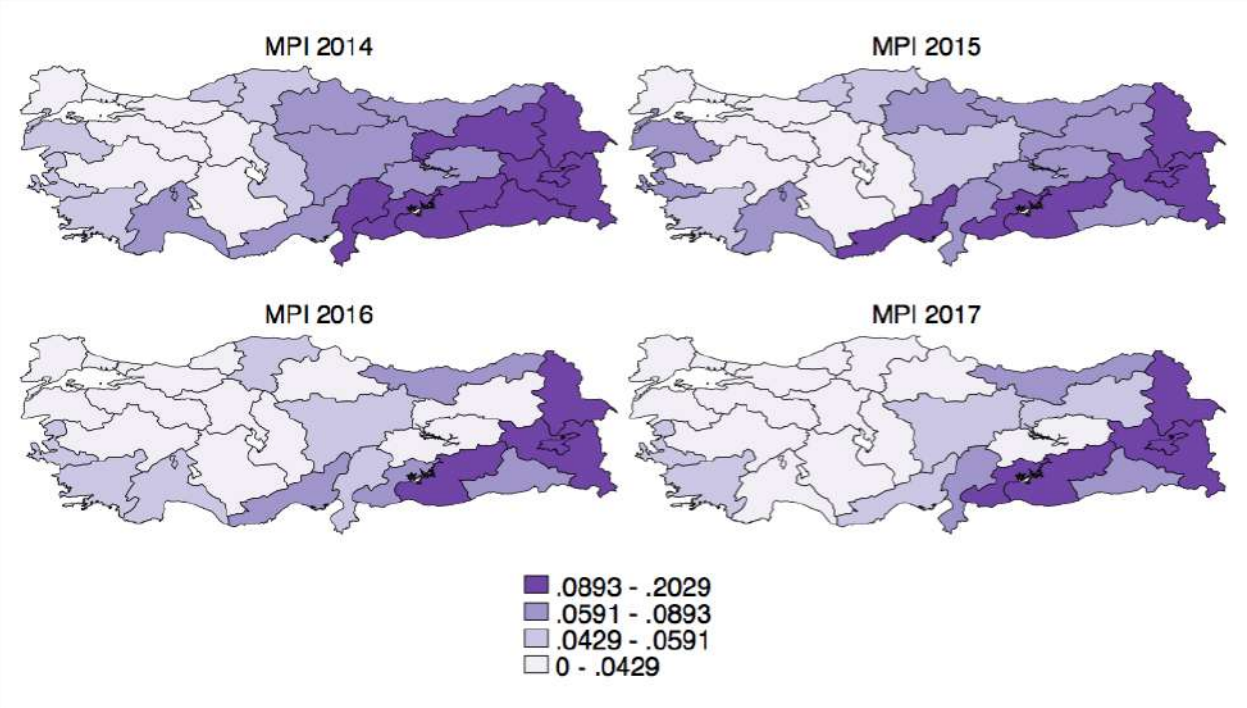
Notes: The legend shows fixed quantile thresholds of the year 2014. Higher MPI values indicate severer multidimensional poverty. Source: ILCS-Turkstat (2017), authors' own calculations.

Figure 7: Decomposition Analysis: Spatial Distribution of Multidimensional Poverty Index by Gender

(a) Males

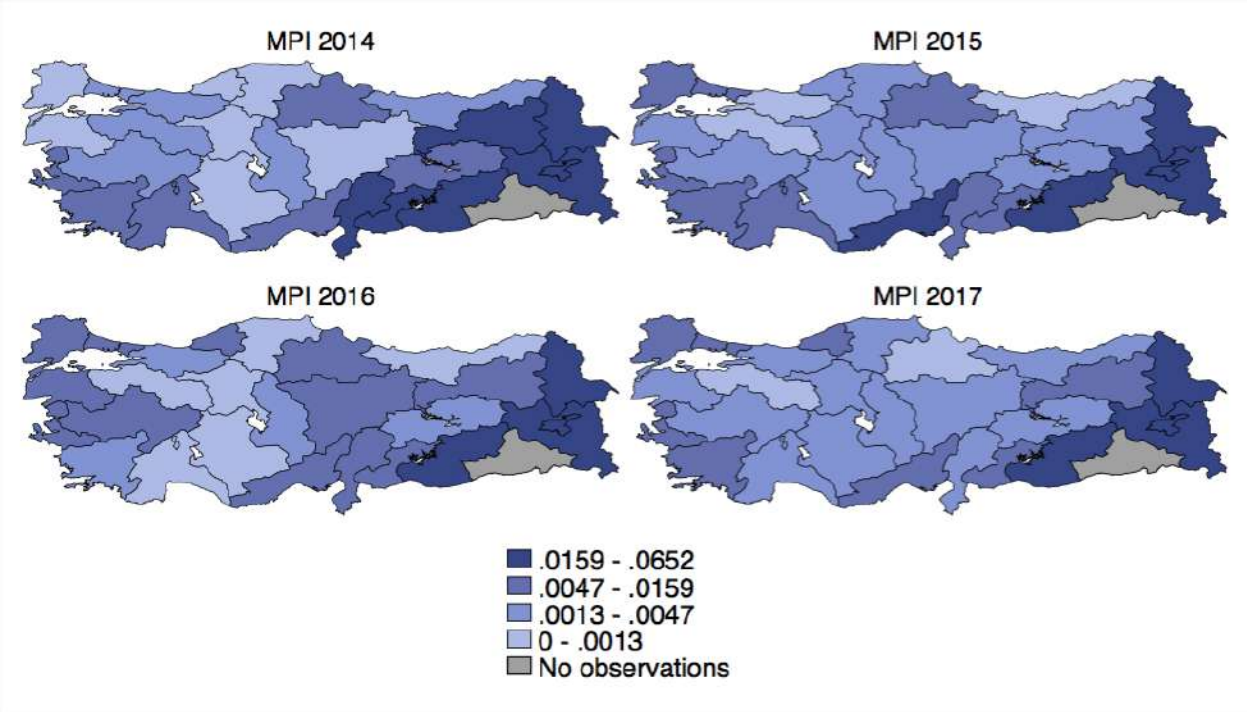


(b) Females



Notes: The legend shows fixed quantile thresholds of the year 2014. Higher MPI values indicate severer multidimensional poverty. Source: ILCS-Turkstat (2017), authors' own calculations.

Figure 8: Decomposition Analysis: Spatial Distribution of Multidimensional Poverty Index among the Youth (15-25 years of age)



Notes: The legend shows fixed quantile thresholds of the year 2014. Higher values indicate severer multidimensional poverty. Source: ILCS-Turkstat (2017), authors' own calculations.

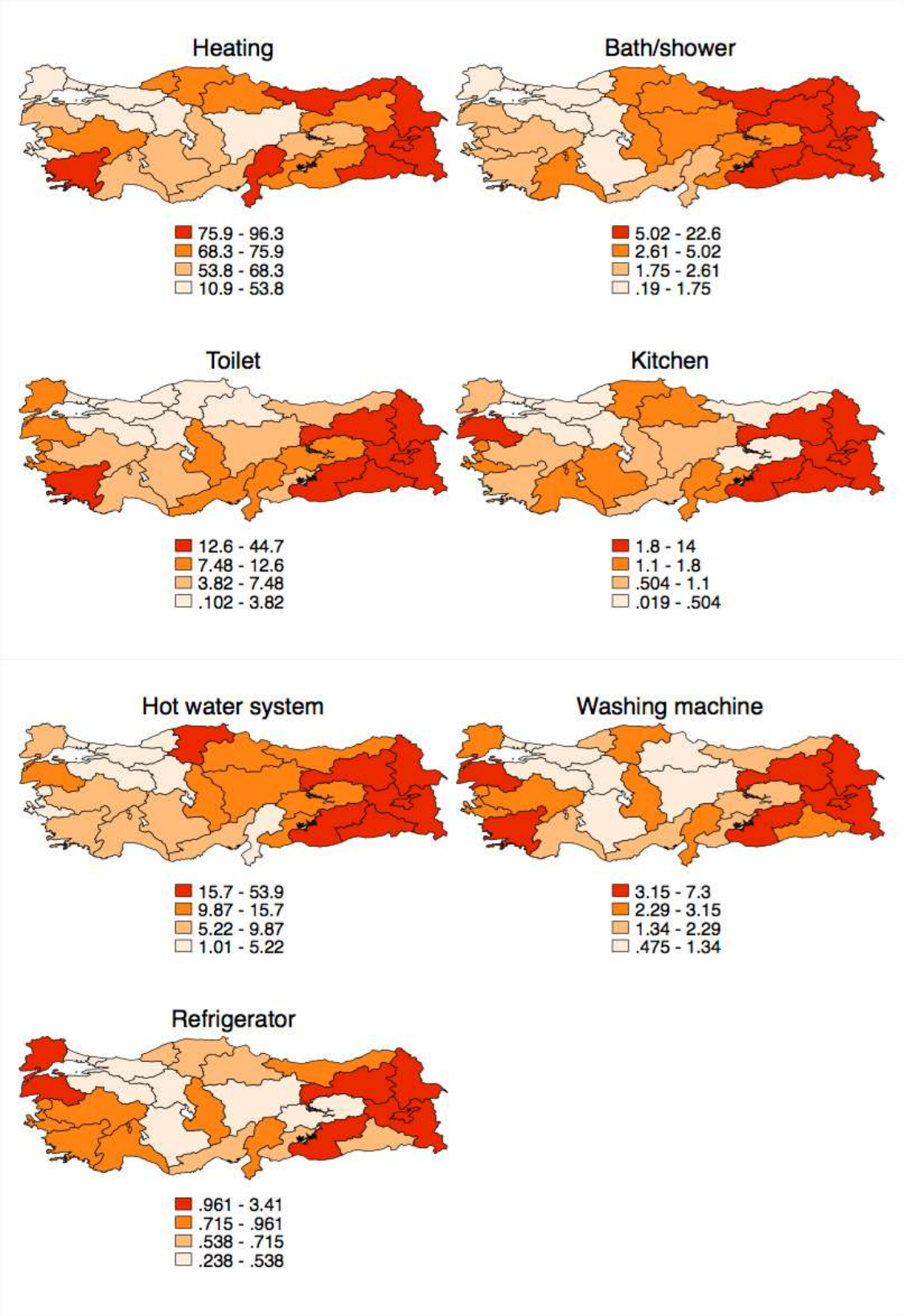
Appendix: The topography and sources of multidimensional poverty in Turkey

This appendix accompanies the paper. Section A.1 discusses the regional distribution of the average percentage deprived under each dimension; Section A.2 displays the spatial evolution of each dimensions' contribution and finally Section A.3 reports the complete results of the sensitivity analysis to assess the extent to which the NUTS II regions shift between quantiles upon incremental changes in the cutoff levels.

A.1 Regional Distribution of Deprivation

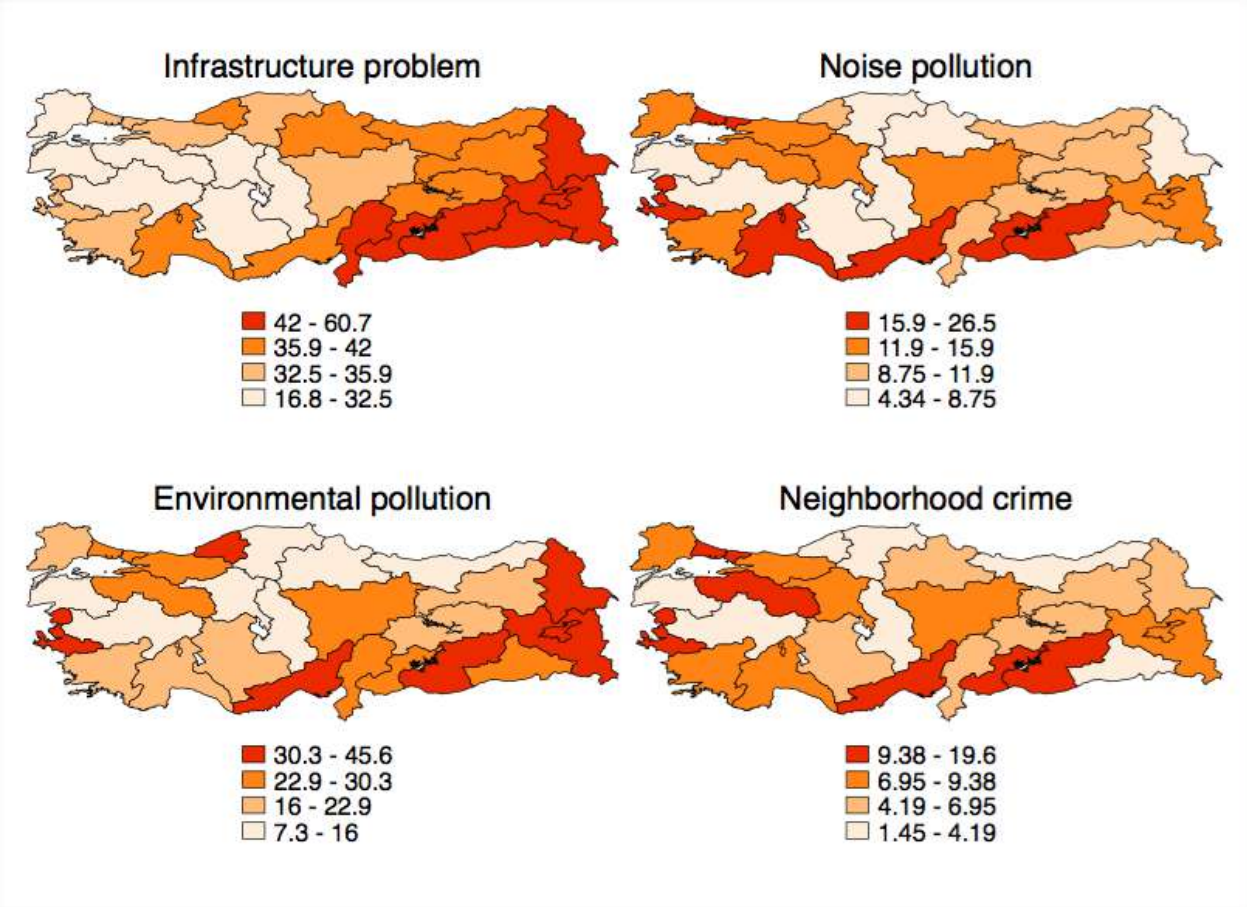
The overall picture in Table 1 of the manuscript does not inform us about the regional distribution of the average percentage deprived under each dimension. We therefore report the regional distribution of the percentage deprived for each domain at the NUTS II level throughout the 2014-2017 period in Figures A.1 through A.4. Under Domain I: Housing, there is a clear clustering of high values in the South-, Middle- and North-eastern Anatolia in terms of the average percentage of individuals who are considered deprived of basic housing needs (Figure A.1). A similar clustering exists in these regions in terms of infrastructure problems and environmental pollution under Domain II: Environment (Figure A.2). On the other hand, noise pollution and neighborhood crime prevail in the most-developed and populated cities across Turkey (e.g Istanbul, Izmir, Bursa, Adana).

Figure A.1: Avg. % deprived by NUTS II regions, ILCS 2014-2017: Domain I: Housing



Source: ILCS-Turkstat (2017). Authors' own calculations.

Figure A.2: Avg. % deprived by NUTS II regions, ILCS 2014-2017: Domain II: Environment

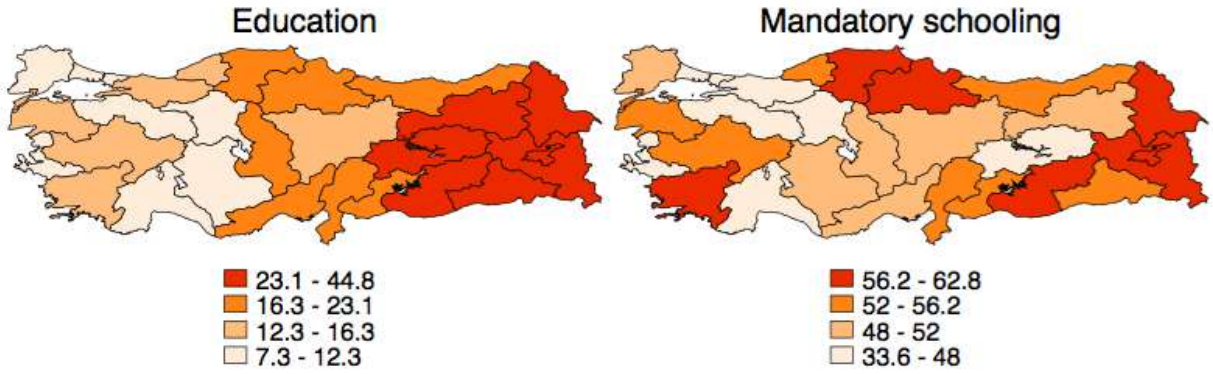


Source: ILCS-Turkstat (2017). Authors' own calculations.

The first dimension under Domain III: Education, considers an individual deprived if he/she has either no education or is illiterate. The regional distribution of this dimension is given in the left panel of Figure A.3 where the average percentage deprived in the education dimension shows a gradient that intensifies from West to East. However, for the second dimension under Domain III, the regional distribution shows two additional clusters of high percentage of deprived, located in the Aegean and the West Black Sea region in terms of a mandatory schooling of 8 years. The regional distribution of the average percentage deprived in terms of self-rated health (SRH), chronic illness and unmet healthcare needs are given in Figure A.4. The spatial distribution of the percentage of individuals with poor and very poor SRH exhibits a high share of deprived individuals along the Black sea coast and in

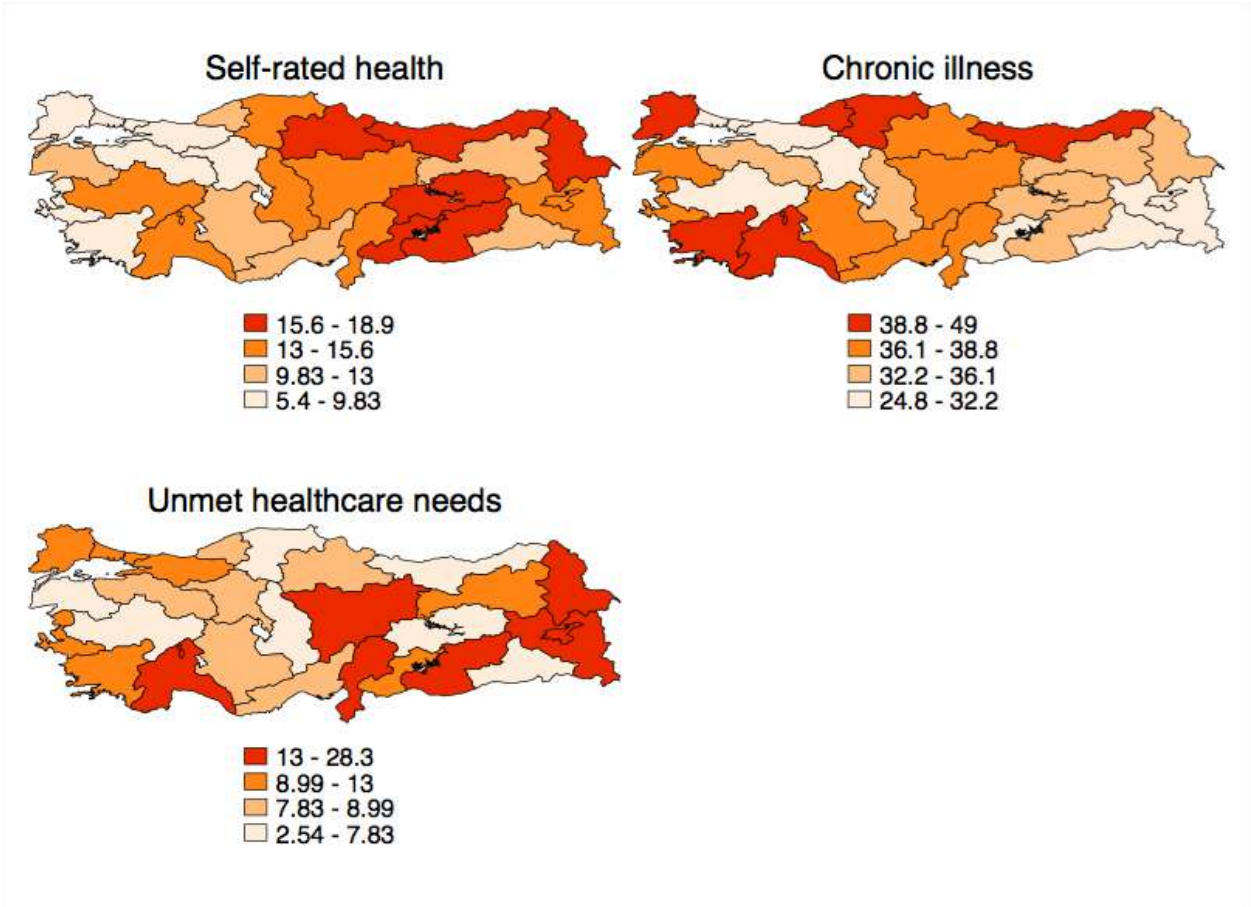
parts of the South- and Middle-eastern Anatolia.

Figure A.3: Avg. % deprived by NUTS II regions, ILCS 2014-2017: Domain III: Education



Source: ILCS-Turkstat (2017). Authors' own calculations.

Figure A.4: Avg. % deprived by NUTS II regions, ILCS 2014-2017: Domain IV: Health



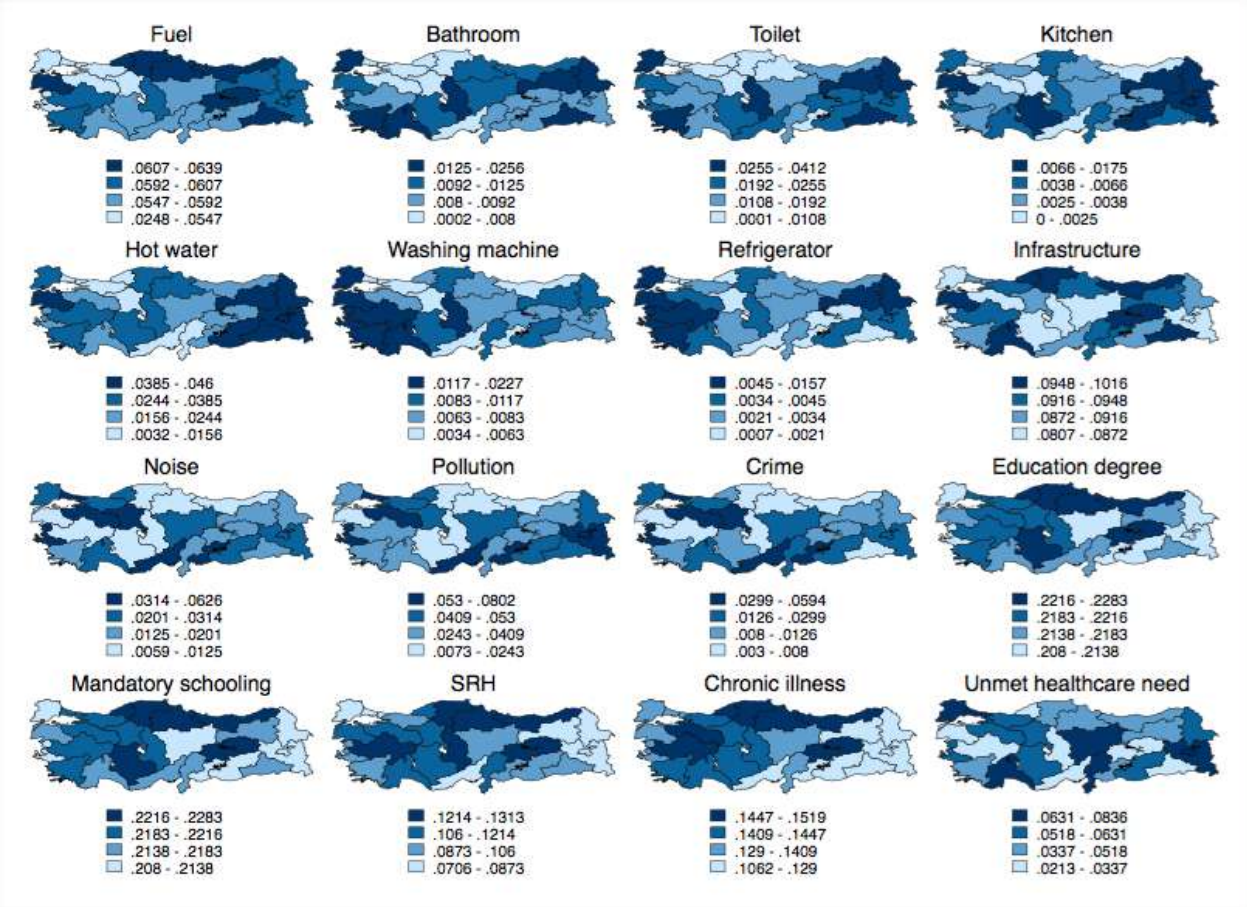
Source: ILCS-Turkstat (2017). Authors' own calculations.

The dimensions with the highest percentage deprived throughout the 2014-2017 period consist of heating (59 percent) under Domain I, infrastructure (38 percent) under Domain II, mandatory schooling (50 percent) under Domain III and chronic illness (36 percent) under Domain IV.

A.2 Spatial Distribution of Dimension Contributions

The spatial evolution of each dimensions' contribution is given in Figure A.5. Even though the contribution of dimensions is spatially random in general, there are exceptions. Considering a number of housing dimensions (whether there exists an independent bath/shower, toilet or kitchen) the geographical pattern is more or less similar; eastern regions' deprivation level is higher compared to the rest of Turkey. This pattern becomes more clustered for the availability of a hot water system. Expectedly, noise pollution, environmental pollution and neighborhood crime greatly contributes to the overall MPI in urbanized areas such as Izmir, Istanbul and Ankara. Finally, dimensions of education and health largely contributes to the overall regional MPI in the Northern and Eastern regions compared to the rest of the country.

Figure A.5: Spatial distribution of dimension contributions (2014-2017 averages)



Source: ILCS-Turkstat (2017). Authors' own calculations.

A.3 Sensitivity Analysis: Complete Results

The following tables show the shifts in the quantile distribution of MPI by year and by NUTS II regions upon 0.05 increments in the cutoff levels, from 0.3 to 0.7. See Section 4.2 of the manuscript for the related discussion.

Table A.1: Sensitivity Analysis 2014: Quantile Distribution of MPI

	Cutoff								
	0.3	**0.35**	**0.4**	**0.45**	**0.5**	**0.55**	**0.6**	**0.65**	**0.7**
TR10	1	1	1	1	1	1	1	1	1
TR21	1	1	1	1	1	1	1	1	1
TR22	1	1	2	2	2	2	2	2	2
TR31	2	2	2	2	2	2	2	2	2
TR32	2	2	2	2	2	2	2	2	2
TR33	1	1	1	1	1	1	1	1	1
TR41	1	1	1	1	1	1	1	1	1
TR42	2	2	2	2	1	1	1	2	1
TR51	1	1	1	1	1	1	1	1	1
TR52	1	1	1	1	1	1	1	2	1
TR61	2	2	3	3	2	2	2	3	3
TR62	3	3	3	3	3	3	3	3	3
TR63	4	3	4	3	4	3	3	4	4
TR71	2	2	1	1	2	2	2	2	2
TR72	2	3	3	3	3	3	3	3	3
TR81	3	2	2	2	2	2	1	1	1
TR82	3	3	2	2	2	3	2	1	1
TR83	3	3	3	3	3	3	3	3	1
TR90	3	3	3	3	3	3	3	3	2
TRA1	3	4	3	3	3	4	4	3	3
TRA2	4	4	4	4	4	4	4	4	4
TRB1	3	3	3	3	3	3	3	3	2
TRB2	4	4	4	4	4	4	4	4	4
TRC1	4	4	4	4	4	4	4	4	4
TRC2	4	4	4	4	4	4	4	4	4
TRC3	4	4	4	4	4	4	4	3	3

Table A.2: Sensitivity Analysis 2015: Quantile Distribution of MPI

	Cutoff								
	0.3	**0.35**	**0.4**	**0.45**	**0.5**	**0.55**	**0.6**	**0.65**	**0.7**
TR10	1	1	1	1	1	1	1	1	1
TR21	1	1	1	1	1	1	1	2	2
TR22	2	2	3	2	3	3	3	3	3
TR31	3	3	3	3	3	3	3	3	3
TR32	2	2	2	2	2	2	2	3	1
TR33	1	2	2	2	2	2	1	1	2
TR41	1	1	1	1	1	1	1	1	1
TR42	1	1	1	1	1	1	2	1	1
TR51	1	1	1	1	1	1	1	1	1
TR52	1	1	1	1	1	1	1	2	2
TR61	2	2	2	3	2	3	3	3	3
TR62	4	4	4	4	4	4	4	4	4
TR63	3	3	3	3	3	3	3	3	3
TR71	2	1	1	1	1	1	1	1	1
TR72	2	2	2	2	2	2	2	2	2
TR81	3	3	2	2	2	2	1	1	1
TR82	2	2	2	2	2	2	1	1	1
TR83	3	3	3	3	3	3	3	3	3
TR90	3	3	3	3	3	3	2	1	2
TRA1	3	3	3	3	3	3	3	3	3
TRA2	4	4	4	4	4	4	4	4	4
TRB1	3	3	3	3	3	2	3	2	1
TRB2	4	4	4	4	4	4	4	4	4
TRC1	4	4	4	4	4	4	4	4	4
TRC2	4	4	4	4	4	4	4	4	4
TRC3	4	4	4	4	4	4	4	4	4

Table A.3: Sensitivity Analysis 2016: Quantile Distribution of MPI

	Cutoff								
	0.3	**0.35**	**0.4**	**0.45**	**0.5**	**0.55**	**0.6**	**0.65**	**0.7**
TR10	1	1	1	1	1	1	1	1	1
TR21	2	1	1	1	1	2	2	3	3
TR22	1	1	2	2	2	3	3	2	3
TR31	2	2	2	2	2	3	3	3	3
TR32	2	2	2	2	2	2	2	2	1
TR33	1	1	1	1	1	2	2	2	1
TR41	1	1	1	1	1	1	1	1	1
TR42	1	1	1	1	1	1	2	2	3
TR51	1	1	1	1	1	1	1	1	1
TR52	1	1	1	1	1	1	1	1	1
TR61	2	2	2	3	3	3	3	3	4
TR62	4	3	4	4	3	4	4	4	4
TR63	3	3	3	3	3	3	3	3	3
TR71	2	2	2	2	2	2	2	2	1
TR72	3	3	3	3	3	3	4	4	3
TR81	3	3	3	3	2	1	1	1	1
TR82	3	3	3	3	2	2	1	1	1
TR83	3	3	3	3	3	3	1	1	1
TR90	3	3	3	3	3	3	3	2	3
TRA1	3	2	3	2	2	2	2	2	1
TRA2	4	4	4	4	4	4	4	4	4
TRB1	2	3	2	2	2	1	1	1	1
TRB2	4	4	4	4	4	4	4	4	4
TRC1	4	4	4	4	4	4	4	4	4
TRC2	4	4	4	4	4	4	4	4	4
TRC3	4	4	4	4	4	4	3	3	1

Table A.4: Sensitivity Analysis 2017: Quantile Distribution of MPI

	Cutoff								
	0.3	**0.35**	**0.4**	**0.45**	**0.5**	**0.55**	**0.6**	**0.65**	**0.7**
TR10	1	1	1	1	1	1	2	1	2
TR21	2	2	1	2	2	2	3	4	4
TR22	1	1	1	1	1	2	2	1	2
TR31	2	2	2	2	3	3	4	3	3
TR32	3	3	3	3	3	3	2	3	2
TR33	1	1	2	2	2	2	2	2	2
TR41	1	1	1	1	1	1	2	2	1
TR42	1	1	1	1	1	1	1	1	1
TR51	1	1	1	1	1	1	1	1	1
TR52	1	1	1	1	1	1	1	1	1
TR61	2	2	2	2	2	3	3	3	3
TR62	3	3	3	3	3	3	3	2	3
TR63	4	4	4	3	4	4	3	3	3
TR71	2	2	2	2	1	2	3	3	3
TR72	3	3	3	3	3	3	3	4	2
TR81	2	2	2	1	1	1	1	1	1
TR82	3	3	3	3	2	2	1	1	1
TR83	3	3	2	3	3	1	1	2	1
TR90	3	3	3	4	3	3	2	3	3
TRA1	3	3	3	3	3	3	3	2	1
TRA2	4	4	4	4	4	4	4	4	4
TRB1	2	2	3	2	2	2	1	1	1
TRB2	4	4	4	4	4	4	4	4	4
TRC1	4	4	4	4	4	4	4	4	4
TRC2	4	4	4	4	4	4	4	4	4
TRC3	4	4	4	4	4	4	4	3	2

References

ILCS-Turkstat (2017): Income Living Conditions Survey. *Turkish Statistics Office (at https://biruni.tuik.gov.tr/yayin/views/visitorPages/index.zul).*