



Sosyal Bilimler
Enstitüsü

T.C.
MARMARA ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT (İNGİLİZCE) BİLİM DALI

**A STUDY ON MEASUREMENT AND PROXIMATE CAUSES OF
POVERTY: THE CASE OF TÜRKİYE**

Doktora Tezi

GİZEM ACET DÖNMEZ

İSTANBUL, 2023

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Danışman: DOÇ. DR. BİLGE ERİŞ DERELİ

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ABSTRACT

A STUDY ON MEASUREMENT AND PROXIMATE CAUSES OF POVERTY: THE CASE OF TÜRKİYE

Poverty has been one of the foremost economic, social, and political challenges worldwide for centuries. This study aims to measure poverty in Türkiye as precisely as possible, and then reveal potential reasons for poverty. Chapter two estimates poverty in the country for the 2010-2021 period by applying five different approaches and compares these measures to unearth which poverty concept can more accurately capture the actual poverty in the country. Findings reveal that while poverty rates had a decreasing tendency, they have started to rise recently. South-eastern and Eastern Anatolia have the highest poverty rates no matter which methodology is applied. Finally, multidimensional poverty -comprised of education, health, housing conditions, material deprivation, and social exclusion- is proposed as the measurement that reflects actual poverty best. Chapter three investigates the link between household characteristics and multidimensional poverty and concludes that vulnerable households to multidimensional poverty are extended families, those who have an old household head, do not have income from real estate or securities, have fewer earners, have more children, and have a female household head. Chapter four seeks for regional factors explaining multidimensional poverty through the Bayesian Model Averaging approach, and finds that GDP per capita from industry, services, and agriculture sectors, unemployment rate, quality of education, early motherhood rate, social assistance, and income inequality are major factors explaining multidimensional poverty. Lastly, considering the heterogeneity within the country, regions are clustered into three poverty convergence clubs through the PS approach, and the same analyses are separately conducted for these clubs.

Keywords: Poverty measurement, multidimensional poverty, regional poverty, reasons for poverty, Bayesian model averaging, poverty convergence

ÖZET

YOKSULLUK ÖLÇÜMLERİ VE YOKSULLUĞUN POTANSİYEL NEDENLERİ ÜZERİNE BİR ÇALIŞMA: TÜRKİYE ÖRNEĞİ

Yoksulluk yüzyıllardır dünya genelinde en önemli ekonomik, sosyal ve siyasi sorunlardan biridir. Bu çalışmanın temel amacı Türkiye’deki yoksulluğu mümkün oldukça doğru bir şekilde ölçmek ve ardından yoksulluğun potansiyel nedenlerini ortaya çıkarmaktır. İkinci bölümde 2010-2021 dönemi için beş farklı yöntemle yoksulluk ölçümleri yapılmış ve bu ölçümler karşılaştırılarak hangi yoksulluk tanımının ülkedeki yoksulluğu daha doğru şekilde ölçtüğü bulunmaya çalışılmıştır. Sonuçlara göre, yoksulluk oranları dönem genelinde düşme eğiliminde olmasına rağmen son yıllarda bu eğilim tersine dönmüştür. Güneydoğu ve Doğu Anadolu bölgeleri yöntem fark etmeksizin tüm ölçümlerde en yoksul bölgeler olarak bulunmuştur. Eğitim, sağlık, oturlan evin koşulları, maddi yoksunluk ve sosyal dışlanma boyutlarından oluşan çok boyutlu yoksulluk, gerek iki ekstrem grubun ortasında seyretmesi gerekse yoksulluğun parasal ve parasal olmayan yanlarını bir arada ele alması nedeniyle en iyi ölçüm olarak önerilmiştir. Daha sonra, çok boyutlu yoksulluğun potansiyel nedenleri hem mikroekonometrik tekniklerle hem de bölgesel panel veri analizi ile irdelenmiştir. Üçüncü bölümde uygulanan mikroekonometrik analizlerde, geniş aileler, ileri yaşta bir hanehalkı reisine sahip olan haneler, gayrimenkul veya menkul kıymet geliri olmayanlar, daha az sayıda çalışana sahip haneler, çok çocuklu haneler ve hanehalkı reisi kadın olan hanelerin yoksulluk riskinin daha yüksek olduğu ortaya çıkmıştır. Dördüncü bölümde Bayesci Model Ortalaması yöntemiyle çok boyutlu yoksulluğu etkileyen bölgesel faktörler irdelenmiş ve kişi başına düşen GSYİH, işsizlik oranı, eğitimin kalitesi, erken yaşta annelik oranı, sosyal yardımlar ve gelir eşitsizliği gibi faktörlerin çok boyutlu yoksulluğu açıklamada önemli bir rol oynadığı sonucuna ulaşılmıştır. Son olarak bölgeler PS yakınsama kümleleri yaklaşımı ile kümelere ayrılmış ve aynı analiz bu kümleler için ayrı ayrı yapılmıştır.

Anahtar Kelimeler: Yoksulluk ölçümleri, çok boyutlu yoksulluk, bölgesel yoksulluk, yoksulluğun nedenleri, Bayesci model ortalaması, yoksulluk yakınsaması

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TABLE OF CONTENTS

ABSTRACT	i
ÖZET	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF GRAPHS	ix
LIST OF ABBREVIATIONS	x
1. INTRODUCTION	1
2. MEASUREMENT OF POVERTY	6
2.1. Welfare Indicators	8
2.1.1 Monetary Indicators of Welfare	8
2.1.2 Non-monetary Indicators of Welfare	10
2.2. Various Concepts of Poverty	12
2.2.1 Absolute Poverty	12
2.2.2 Relative Poverty	13
2.2.3 Material Deprivation	15
2.2.4 Multidimensional Poverty	16
2.2.5 Subjective Poverty	18
2.3. Literature Review on Poverty Measurement	19
2.3.1 Literature on Poverty Measurement	19
2.3.2 Literature on Poverty Measurement in Türkiye	26
2.4. Dataset and Methodology	35

2.4.1 Dataset	35
2.4.2 Methodology	39
2.5. Findings	48
2.5.1 Absolute Consumption Poverty	48
2.5.2 Absolute Income Poverty	50
2.5.3 Absolute Income Poverty (via The Poverty Line of TURK-IS)	54
2.5.4 Subjective Poverty	55
2.5.5 Multidimensional Poverty	57
2.6. Comparison	73
2.7. Conclusion	76
3. HOUSEHOLD LEVEL EXPLANATIONS FOR POVERTY	81
3.1. Literature Review on the Reasons for Poverty	82
3.1.1 Poverty Attributions	82
3.1.2 Unemployment	85
3.1.3 Reasons for in-work Poverty	87
3.1.4 Education and Intergenerational Mobility	90
3.1.5 Financial Exclusion	92
3.1.6 Literature on Türkiye	94
3.2. Empirical Analysis	96
3.2.1 Dataset and Empirical Specification	96
3.2.2 Descriptive Analysis	98
3.2.3 Findings	102
3.2.4 Robustness Checks	108
3.3. Conclusion	111
4. REGIONAL EXPLANATIONS FOR POVERTY	114

4.1. Literature Review	114
4.1.1 Economic Growth and Inequality.....	114
4.1.2 Inflation	117
4.1.3 Trade Liberalization	119
4.1.4 Financial Development.....	120
4.1.5 The Role of State	122
4.1.6 Education.....	125
4.1.7 Fertility	126
4.1.8 Rural Underdevelopment.....	128
4.1.9 Other Factors	128
4.1.10 Literature on Türkiye.....	130
4.2. Empirical Analysis	131
4.2.1 Methodology	131
4.2.2 Dataset and Empirical Specification	137
4.2.3 Descriptive Analysis.....	140
4.2.4 Findings.....	147
4.2.4.1 Baseline Model.....	147
4.2.4.2 Convergence Clubs.....	151
4.3. Conclusion.....	159
5. CONCLUDING REMARKS	161
REFERENCES.....	166
APPENDIX A: TABLES	181
APPENDIX B: FIGURES.....	197

LIST OF TABLES

Table 1. International Poverty Lines	21
Table 2. Global MPI and Country-Specific MPIs	23
Table 3. Percentage of Poor Individuals in Türkiye %	27
Table 4. MPIs for Türkiye.....	30
Table 5. Poverty Measurement Approaches.....	35
Table 6. Updated Absolute Poverty Lines (Monthly) in TL	36
Table 7. Adult Equivalised Poverty Lines of TURK-IS (in TL).....	38
Table 8. Absolute Consumption Poverty	49
Table 9. Absolute Income Poverty.....	51
Table 10. Absolute Poverty Rates % Based on The Poverty Line of TURK-IS	54
Table 11. Subjective Poverty Rates %	56
Table 12. National MPI for Türkiye.....	58
Table 13. Summary of MPI Indicators	63
Table 14. Multidimensional Poverty Estimations	65
Table 15. Contribution of Each Dimension.....	66
Table 16. Contribution of Each Indicator.....	66
Table 17. Identification of Poor Households through Different Definitions.....	76
Table 18. Definition of The Variables.....	97
Table 19. Summary Statistics	98
Table 20. Estimation Results of The Logit Model	103
Table 21. Average Marginal Effects from Logit Model.....	106
Table 22. Estimation Results of the Logit Models ($\frac{1}{2}$ and $\frac{1}{4}$ cut-offs)	108
Table 23. AME from Logit Model ($\frac{1}{2}$ and $\frac{1}{4}$ cut-offs)	110
Table 24. Definition of the Variables.....	138
Table 25. Summary Statistics	139
Table 26. Full Sample Model	148
Table 27. Convergence Clubs	152
Table 28. BMA (Club 1)	154
Table 29. BMA (Club 2)	156
Table 30. BMA (Club 3)	158

LIST OF FIGURES

Figure 1. Absolute Income Poverty Rates (Average of 2013-2020) %.....	53
Figure 2. Absolute Poverty Rates via TURK-IS' Poverty line (Average of 2013-2020) %	55
Figure 3. Subjective Poverty Rates (Average of 2013-2020) %	57
Figure 4. Regional Multidimensional Poverty Rates % (Average of 2014-2021) .	68
Figure 5. Regional Multidimensional Poverty Index % (Average of 2014-2021) .	68
Figure 6. AME from Household Type (w.r.t. “couple with child”)	107
Figure 7. AME from Age Group of Household Head (w.r.t. “under 30”).....	107
Figure 8. Model Prior Comparison (t).....	150
Figure 9. Model Prior Comparison (t-1)	150
Figure 10. Model Prior Comparison (t-5).....	151
Figure 11. Convergence Clubs	153

LIST OF GRAPHS

Graph 1. Changes in Consumption and Income Poverty Rates (Δ HCR) %.....	52
Graph 2. Regional Contribution of Each Dimension in 2014	69
Graph 3. Regional Contribution of Each Dimension in 2021	70
Graph 4. Regional MPI by Dimensional Contributions in 2014.....	71
Graph 5. Regional MPI by Dimensional Contributions in 2021	71
Graph 6. Regional Multidimensional Poverty Rates in 2014 vs. 2021	72
Graph 7. Trends in Poverty Rates by Definition%.....	74
Graph 8. Multidimensional Poverty Rates by Household Type.....	99
Graph 9. Multidimensional Poverty Rates by Age Group of Household Head....	100
Graph 10. Multidimensional Poverty Rates by Having Real Estate Income.....	100
Graph 11. Multidimensional Poverty Rates by Having Income from Securities .	101
Graph 12. Multidimensional Poverty Rates by Number of Children	101
Graph 13. Multidimensional Poverty Rates by Gender of Household Head.....	102
Graph 14. MPI and GDP per capita (Industry).....	140
Graph 15. MPI and GDP per capita (Services)	141
Graph 16. MPI and GDP per capita (Agriculture)	142
Graph 17. MPI and Gini	142
Graph 18. MPI and Unemployment Rate	143
Graph 19. MPI and Per Capita Social Assistance	143
Graph 20. MPI and Credits per Adult	144
Graph 21. MPI and Early Motherhood Rate	144
Graph 22. MPI and Net Migration Rate	145
Graph 23. MPI and Inflation	145
Graph 24. MPI and Exports/GDP.....	146
Graph 25. MPI and Imports/GDP.....	146
Graph 26. MPI and Student per Teacher	147

LIST OF ABBREVIATIONS

AF	Alkire-Foster
AME	Average Marginal Effects
AROPE	At Risk of Poverty or Social Exclusion
BMA	Bayesian Model Averaging
COVID	Coronavirus Disease
CPI	Consumer Price Index
EU	European Union
FDE	First Difference Estimator
FE	Fixed Effects
FGT	Foster-Greer-Thorbecke
HCR	Headcount ratio
HDI	Human Development Index
HHH	Household Head
HPI	Human Poverty Index
MDGs	Millennium Development Goals
MPI	Multidimensional Poverty Index
MPPN	Multidimensional Poverty Peer Network
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
OPHI	Oxford Poverty and Human Development Initiative
PGR	Poverty Gap Ratio

PIP	Posterior Inclusion Probability
PMP	Posterior Model Probability
PPP	Purchasing Power Parity
PS	Phillips and Sul
SDGs	Sustainable Development Goals
SPG	Squared Poverty Gap
TGMP	Türkiye Grameen Microcredit Programme
TL	Turkish Lira
TURK-IS	Confederation of Turkish Trade Unions
TurkStat	Turkish Statistical Institute
UIP	Unit Information Prior
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
US	United States
WB	World Bank
2SLS	Two-Stage Least-Squares

1. INTRODUCTION

“Overcoming poverty is not a gesture of charity. It is the protection of a fundamental human right, the right to dignity and a decent life. While poverty persists, there is no true freedom.”¹

Nelson Mandela

Poverty has been one of the foremost economic, social, and political challenges worldwide for centuries. Besides the lack of economic and material resources, it is often considered a violation of human rights. It might impair economic and social rights including access to food and clean water, the right to health, the right to education, and even civil and political rights. Countries where poverty is prevalent are faced with lower economic productivity, more health problems, lower welfare among children, and more crime and suicide (Brady, 2009).

Poverty has been a widely studied phenomenon for decades in the literature of many fields such as economics, sociology, anthropology, psychology, and history. Several definitions of poverty exist in social sciences. According to Ravallion (1992), a society has poverty if at least one individual cannot attain a reasonable minimum level of material well-being concerning the standards of that society. Spicker (2006)

¹ From Nelson Mandela’s famous speech at the Make Poverty History in London in 2005.

defines poverty in three categories; poverty as severe material conditions, poverty as an economic problem, and poverty as a social position.² Various definitions of poverty often overlap, but sometimes have conceptually different meanings, therefore poverty needs to be considered as a composite concept.

At the Copenhagen World Summit on Social Development in 1995, 117 countries pledged to eradicate absolute poverty -defined as severe deprivation of basic needs- and to reduce overall poverty including not only unmet basic human needs, but also lack of participation in civil, social, political, and cultural life (United Nations, 1995). Similarly, 189 member states of the United Nations (UN) committed at the Millennium Summit in 2000 to halve extreme poverty by 2015. According to the Millennium Development Goals (MDGs) Report 2015, the MDGs helped to lift more than a billion individuals out of extreme poverty (United Nations, 2015). Indeed, the number of extremely poor people worldwide fell from 1.9 billion in 1990 to 836 million in 2015, and most of the progress was realized after 2000. However, the report concludes that despite the significant achievements, millions of people are still left behind. In 2015, members of the UN adopted the *2030 Agenda for Sustainable Development* including *17 Sustainable Development Goals* (SDGs). The first goal, *to end poverty in all its forms everywhere*, consists of the following targets:

² The first category focuses on the lack of material goods and services, limited resources, and pattern of deprivation. The second category addresses the standard of living, inequality, and economic position, and the third category concentrates on lack of entitlement, lack of social security, exclusion, dependency, and social class.

to eradicate extreme poverty; to halve poverty in its all dimensions; to implement social protection; to ensure equal rights; to reduce vulnerability.

According to a World Bank report, extreme poverty decreased globally on average by around 1% per year between 1990 and 2015 (World Bank Group, 2020). However, the rate of poverty reduction slowed to 0.6% from 2013 to 2015, and to 0.5% from 2015 to 2017. This decelerating trend has put the goal of ending global extreme poverty by 2030 at risk. Moreover, the recent shocks (i.e., the COVID-19 pandemic, climate change, and armed conflict) have increased global poverty, and have reversed the gains in poverty alleviation experienced for over a quarter century.³ Similarly, a recent United Nations (2022) report notes that COVID-19 has erased four years of progress against poverty.

It seems that despite the great efforts made by governments and non-governmental organizations, poverty is still one of the biggest challenges faced by many countries today. Moreover, the progress in poverty reduction is quite vulnerable to shocks as the recent crises have shown. To cope with poverty, the primary step is to measure it as accurately as possible. Then

This study aims to extend our information set about the phenomenon of poverty using Türkiye as a case study. The main research questions of the study are as

³ The report states that job losses due to the pandemic have mostly hit the already-poor people and those who were vulnerable, and the pandemic has created millions of new poor. According to the estimations of the report, the pandemic has pushed around 100 million individuals into extreme poverty in 2020. Similarly, climate change may cause 132 million people to fall into poverty by 2030.

follows. Do poverty rates considerably differ depending on the definition of poverty? If there is a notable variation, which poverty concept can more accurately reflect the actual poverty in the country? How do poverty trends evolve over time? Which groups and regions are poorer? Which dimension of multidimensional poverty is worse in the country? Why some households/regions are poor and which factors can explain poverty? What kind of policies can be generated for poverty alleviation? To answer these questions, the study conducts various poverty estimates and empirically investigates the underlying reasons for poverty.

Chapter two estimates poverty in Türkiye through five different approaches using the Surveys of Income and Living Conditions (SILC) and Household Budget Surveys (HBS). By comparing various approaches, this chapter aims to find out which poverty definition better captures the actual poverty in the country. Also, sub-national measurements are conducted to observe the regional disparities in poverty. Chapter three and Chapter four aim to reveal proximate reasons for poverty in Türkiye. From a policy perspective, not only the measurement of poverty but also some further analyses are required to figure out the sources of poverty. Empirical analyses aiming at revealing the determinants of poverty can be classified as micro regressions and macro regressions (Alkire et al., 2015). While the former examines household characteristics influencing poverty, the latter focuses on region or country-level factors. This study applies both microeconomic regressions and also Bayesian Model Averaging (BMA) method using regional data. The BMA framework deals with the model uncertainty about which regressors need to be included. It takes into account all candidate models and combines the estimations

using the posterior probabilities of these models. Moreover, to deal with the within-country heterogeneity, a convergence club analysis is applied by following the Phillips and Sul (2007, 2009) approach. This method allows for local convergence possibility to multiple equilibria which can be very useful in the case of clustering behaviour in the data. Chapter five concludes to the study by evaluating the poverty statistics measured in Chapter two and the potential drivers of poverty found in Chapter three and Chapter four. It also proposes some poverty alleviation strategies based on the empirical evidence.

2. MEASUREMENT OF POVERTY

Poverty statistics are among the most crucial economic and social indicators. They allow us to monitor how economic development evolves over time. Poverty comparisons can reveal which groups, regions and countries are poorer. Poverty measurement is therefore a useful tool to support the coordination of social policies, target the poorest individuals or groups, and allocate social budgets. Poverty statistics can raise public awareness and motivate politicians to tackle this challenge because the existence of poverty implies policy failure (Atkinson, 2019, pp. 32-56). For example, the introduction of unemployment insurance and labour exchanges in Britain at the beginning of the 20th century, the War on Poverty in the United States (US) during the 1960s, the European Action Programme to fight against poverty in the 1980s, and national anti-poverty strategies of many countries took place thanks to the quantitative evidence provided by the poverty statistics.

Although the primary step in poverty eradication is to measure it as precisely as possible, there is no consensus on how to do this and poverty estimations may considerably differ depending on how we define poverty (Atkinson, 1987). Measurement of poverty has always been a challenging task because it is usually sensitive to how the welfare level is evaluated, how the poverty line is established, and how the summary statistic is obtained. For instance, an improper poverty line may lead to underestimation or overestimation of poverty, and thereby undermine poverty alleviation policies.

The first controversy in poverty measurement results from the choice of the welfare indicator. Monetary and/or non-monetary indicators can be used for this purpose. Consumption and income levels of households are well-known examples of monetary welfare indicators, whereas factors such as education level, health status, and housing conditions are among the most widely used non-monetary indicators of welfare. Another distinction arises from the choice of the poverty line. If welfare is measured through a monetary indicator, it is usual to employ an absolute or relative poverty line. There is an old but lively debate on whether absolute or relative poverty lines are more appropriate for poverty measurement. More recently, multidimensional poverty measurements have come to the fore. Furthermore, poverty can also be measured using self-evaluations of individuals, but these subjective measures pose some limitations. Deaton (2018, p. 165) states that a robustness check is necessary for any measure of poverty because poverty lines can always be arbitrary or ill-defined.

Poverty measurement is a very challenging task also because of the possible errors in the datasets. For instance, it is harder to interview itinerant people or those living in remote areas (Ravallion, 1992). Similarly, household surveys do not cover homeless individuals. There are also inevitable value judgements in poverty measurements. Therefore, even if we use the term “measurement” throughout the study, poverty can only be estimated because it is not possible to measure it at one hundred per cent accuracy.

This chapter aims to reveal if poverty rates considerably differ depending on the definition. Using two micro datasets from Türkiye, it measures and compares various

definitions of poverty. Whether different approaches broadly detect the same households as poor is investigated. If they do, it can be concluded that theoretical variations are not that important for poverty estimates. Otherwise, we will try to figure out which definition more accurately captures the actual poverty in the country. As far as datasets allow, estimations are conducted at the regional level to observe the regional disparities in poverty. The next sections discuss the welfare indicators and various poverty concepts followed by the literature review on poverty measurement. Afterwards, the estimation results of various poverty measures are presented and discussed.

2.1. Welfare Indicators

Poverty lines are required to distinguish the people in poverty from the non-poor. A poverty line is the minimum welfare level required to be deemed out of poverty. For a poverty measurement, therefore, we first need a welfare indicator. There are basically two types of welfare indicators: Monetary and non-monetary indicators.

2.1.1 Monetary Indicators of Welfare

Poverty measures usually rely on monetary indicators since insufficient money is an obvious and easily measurable deprivation. Also, individuals with inadequate monetary resources tend to have other concerns associated with poverty but hard to measure. The most widely used monetary indicators of welfare are consumption expenditures and income level of individuals/households. Although households' consumption expenditures are primarily determined by their income, they may differ because of the saving and borrowing opportunities.

The opportunities approach argues that the aim is not to measure the actual consumption, but the household's opportunity for consumption (Ravallion, 1992). According to the opportunities approach, if savings are positive, income is considered a better indicator of opportunity for consumption than actual consumption, and vice versa in the case of negative savings. Hence, this approach does not offer a certain attitude to choose consumption or income as a welfare indicator.

Consumption data has some advantages in measuring well-being. Firstly, while current income is highly affected by transitory income, consumption is regarded as a function of permanent income. As it was stated by the life cycle and permanent income hypotheses of Modigliani and Brumberg (1954) and Friedman (1957), individuals smooth their consumption during their lifetime even if their income levels rise and fall from time to time. Consequently, consumption does not vary over time as much as income does. The Nobel laureates Banerjee and Duflo (2012, pp. 135-136) argue that most of the poor people are employed in either the agricultural sector as farmers or non-agricultural businesses as casual workers, and therefore, their income levels have a substantial amount of volatility. They contend that "*the poorer the country, the greater the volatility in earnings*". Since consumption data allows for reducing temporary trends and focusing on long-term welfare, it can be a better welfare indicator for poverty measurement compared to income. Furthermore, the collection of income data may be problematic if informal employment, agricultural or self-employment are prevalent (World Bank, 2005). Another limitation of income surveys is the tendency to declare an income level lower than

the actual level (Deaton, 2018, p. 29). Respondents in household surveys might be more willing to report what they spent than what they earned. Unwillingness to share full income levels with neighbours or tax collectors is quite possible.

On the other hand, although both income and consumption data suffer from recall bias, it is usually more difficult for households to remember what they spent compared to what they earned. In addition, since consumption data is monthly collected, seasonality and purchase of durable goods limit its ability to reflect the general welfare level. Consumption from own production is another challenging issue (Deaton, 2018, p. 28).

2.1.2 Non-monetary Indicators of Welfare

As mentioned in the previous sub-section, monetary welfare indicators may have some limitations. In this case, these indicators need to be complemented by non-monetary ones. The collection of monetary data suffers from measurement error more probably than that of non-monetary indicators of welfare such as educational degree or having an indoor toilet.

According to Amartya Sen's (1983, 1985, 1993) capability approach, the right focus for evaluating the standard of living is neither commodities, nor utility, but individual's capability. The capability set consists of a menu of opportunities. Sen argues that even though a grumbling wealthy man may be less happy than a cheerful peasant, he has a higher living standard than the peasant because the living standard is not something about utility, but the ability to do a variety of things by using goods or features. The capabilities approach has broadened the way of considering well-

being. Indeed, the relative poverty approach, influenced by this view, addresses poverty as the inability to participate in society. The multidimensional poverty approach has also been affected by the capabilities approach since capabilities are intrinsically multidimensional.

Even if monetary resources enable access to plenty of market goods, they may not help access to non-market goods such as health services or education (Ravallion, 2012a). For instance, the family income of a child who does not attend school might be above the monetary poverty line (Limanlı, 2016). Therefore, monetary resources might lack to reflect well-being, and deprivation forms other than economic hardship can be important for poverty measurement (Smeeding, 2016). Non-monetary indicators of welfare are useful for comprehending the multifaceted structure of poverty.

To address the interrelated ingredients of poverty, Shipler (2005, p.13) states that “*a run-down apartment can exacerbate a child’s asthma, which leads to a call for an ambulance, which generates a medical bill that cannot be paid, which ruins a credit record, which hikes the interest rate on an auto loan, which forces the purchase of an unreliable used car, which jeopardizes a mother’s punctuality at work, which limits her promotions and earning capacity, which confines her to poor housing*”. Accordingly, Kuş, Whelan, and Nolan (2016) state that a mixed approach, combining both qualitative and quantitative aspects, needs to be adopted to comprehend the multifaceted structure of poverty.

2.2. Various Concepts of Poverty

Various poverty concepts including absolute poverty, relative poverty, material deprivation, multidimensional poverty, and subjective poverty are discussed in this section.

2.2.1 Absolute Poverty

The absolute poverty concept -also called the *basic needs approach*- defines poverty as the inability to satisfy basic needs such as food, clothing, shelter, healthcare, and education. An absolute poverty line is the monetary cost of a bundle of goods and services to meet a minimum welfare level acceptable. These poverty lines serve to identify those in absolute need of intervention.

Absolute poverty lines consist of food and non-food needs. Food poverty is sometimes called extreme poverty. A food poverty line is the cost of a food bundle providing a minimum nutritional requirement for a person. The minimum requirement ranges from 2,000 kilocalories (kcal) to 3,500 kcal per person per day, and some countries use multiple thresholds by distinguishing the food poverty lines for different age groups, genders, or rural and urban areas. According to Banerjee and Duflo (2012, pp. 19-40), food poverty and a nutrition-based poverty trap barely exist in our time, but a micronutrient deficiency prevails instead.⁴

⁴ Still, according to the World Food Programme (2022), 18% of the population in Türkiye - corresponding to 14.8 million individuals- suffer from insufficient food consumption.

Absolute poverty lines also include non-food basic needs. There are two approaches for specifying non-food basic needs. Firstly, the cost of essential non-food basic needs can be detected directly. Alternatively, the cost of non-food expenditures can be determined using the ratio of non-food expenditures in total consumption expenditures of the households whose food consumption expenditures are around the food poverty line. For example, Turkish Statistical Institute (TurkStat) follows the latter approach to detect the cost of non-food basic needs.

2.2.2 Relative Poverty

Townsend (1979) puts forward the concept of relative poverty for the first time and describes the poor as those whose resources are so lower than the average individual in the population that they are excluded from ordinary living patterns and activities. He criticizes absolute poverty lines because they are not redefined periodically, and thereby, cannot capture the changes in needs and customs. Relative poverty lines are a constant proportion of median income or consumption level (e.g., 50% or 60% of median income). They are indicators of social exclusion in which the living standards of individuals are compared with those of others living in the same society.

Sen (1983) criticizes the relative poverty approach by stating that to refine the concept of poverty from the old-fashioned criteria of Booth or Rowntree (discussed in the next section), the essential characteristic of poverty is abandoned and replaced with an imperfect representation of inequality. He argues that *"there is an irreducible absolutist core in the idea of poverty. ... the fact that some people have a lower standard of living than others is certainly proof of inequality, but by itself it cannot be a proof of poverty..."* (Sen, 1983, p. 159). He further asserts that *"... poverty is an*

absolute notion in the space of capabilities but very often it will take a relative form in the space of commodities or characteristics." According to him, the relative poverty approach might be plausible because resource requirements to satisfy the same absolute need vary from time to time or from community to community. For instance, resource requirements of the same capability usually increase with the average prosperity of countries. Still, in his view, poverty has an absolute basis in terms of deprivation and capabilities.

Similarly, Ray (1998, p. 213) addresses the importance of absolute poverty lines because, for example, if all the income levels in society are scaled down by the same proportion due to a famine, there would be no change in relative poverty.⁵ Likewise, Spicker (2006) argues that a decrease in the resources of the non-poor might lead to a reduction in relative poverty, even if there is no improvement in the situation of the poor.

On the other hand, for cross-national comparisons, relative poverty lines are usually preferred because of the difficulties of purchasing power parity (PPP) in converting an absolute measure to country currency (Smeeding, 2016, p. 28). The European Union (EU) defines income poverty as "*at risk of poverty*" where at risk of poverty rate is the share of individuals living with an income below 60% of the median disposable income in each member state. However, since this concept is rather a

⁵ For example, Sen (1983) states that a poverty measure must be able to reflect the "Dutch hunger winter" in 1944-45 during the times of acute and widespread starvation.

measure of inequality, some part of society is always considered poor by this definition, as long as inequality exists.

The relative poverty approach is used mostly in developed countries where absolute poverty is not prevalent anymore (Şenses, 2019, p. 92). Deaton (2019) addresses that in developed countries almost nobody considers herself/himself as poor, and thereby using a poverty threshold below the median income is quite usual. However, since a great deal of the population in developing countries lives below the subsistence level, it is vital to measure also absolute poverty there (Şengül, 2003). Furthermore, as Demir Şeker and Jenkins (2013) argue, the usage of relative poverty lines in developing countries experiencing rapid economic changes may lead to some non-intuitive results.

2.2.3 Material Deprivation

Material deprivation is another concept related to poverty and it refers to lack of resources. Instead of a purposeful choice, it is regarded as an inability to afford some items which are considered necessary by most people. For example, Eurostat defines severe material deprivation as the inability to afford at least four out of the following nine materials: unexpected expenditures; vacation for a week; housing rent, mortgage, bills, debts; heating the house; eating meat/chicken/fish (or equivalent for vegetarians) once in every two days; washing machine; TV; telephone; automobile.⁶

⁶https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Material_deprivation

There are debates on whether low income or material deprivation is a direct measure of poverty. There may be a mismatch between income poverty and material deprivation (Berthoud and Bryan, 2011; Hick, 2014). For instance, the ratio of people at risk of poverty in Greece decreased between 2010 and 2019 because the median income substantially decreased over this time, but it gives contradictory results with the material deprivation in the country (see for example Milotay et al., 2022). Likewise, Karadağ (2015) finds that even if extreme material deprivation is much more prevalent in Hungary than that in Spain, Hungary has much lower relative income poverty rates than Spain. This controversy results from that income distribution in Hungary is better than in Spain.

2.2.4 Multidimensional Poverty

Some studies argue that poverty is a multifaceted phenomenon which is intrinsically multidimensional (Alkire and Foster, 2007, 2011; Nolan and Whelan, 2010, 2014; Alkire *et al.* 2015). To focus only on lack of income or non-monetary deprivations may not be sufficient to measure poverty. Poverty is sometimes a lack of food; sometimes psychological issues (e.g., humiliation, voicelessness, dependency, powerlessness); and sometimes a lack of access to basic infrastructure like clean water and transportation (Alkire *et al.*, 2015, pp. 1-23).

By comparing country trajectories in satisfying the Millennium Development Goals and reductions in income poverty, Alkire et al. (2015) conclude that trends in income poverty do not always match with non-income deprivations, and therefore monetary poverty measures should be complemented by other dimensions of poverty. They also state that no single non-monetary deprivation represents all the other

deprivations. Therefore, a multidimensional measure must reflect highly differentiated dimensions of deprivations.

In this context, the Human Development Index (HDI), a summary measure of education, health, and a decent living standard, has been estimated by the United Nations Development Programme (UNDP) since 1990. Moreover, the Human Poverty Index (HPI) used for international poverty comparisons was introduced by the UNDP in 1997. This index, which has different definitions for developing countries and high-income OECD group, consists of three dimensions; a long and healthy life⁷, knowledge (measured by illiteracy rates), and a decent standard of living⁸. The HPI was replaced by the global MPI in 2010. An MPI can reflect highly differentiated deprivations of the people in poverty. It considers overlapping or simultaneous deprivations that individuals experience. Taking various components of welfare into account allows for analysing the phenomenon of poverty comprehensively beyond the lack of monetary resources.

Recently, the European Commission has also introduced a multidimensional definition of poverty: *At risk of poverty or social exclusion* (AROPE) which has three

⁷ It is measured by the percentage of individuals who are not expected to survive sixty years in high-income OECD countries and forty years in developing countries.

⁸ Standard of living is measured by the percentage of individuals whose disposable income is lower than 50% of the median income in high-income OECD countries, and by the percentage of the population without an improved water source and under-weight kids in developing countries. There is also a social exclusion component for the former group indicated by long-term unemployment.

dimensions; severe material and social deprivation⁹; very low work intensity in the household (i.e., if the adults in the household worked 20 per cent or less of their potential worktime during the last year); and income poverty (living below 60% of equivalised median income).¹⁰ These indicators reflect poverty, exclusion, and inequality, and households are considered at risk of poverty or social exclusion if they are associated with at least one of these three indicators. The EU2030 target on poverty and social inclusion is “*to reduce the number of individuals at risk of poverty or social exclusion by at least 15 million by 2030*”, and this target is monitored via the AROPE.

2.2.5 Subjective Poverty

The subjective poverty concept measures poverty by relying on survey responses. In this concept, survey participants are asked the minimum level of income to deem themselves non-poor. It can be also asked people to evaluate their poverty status on an ordinal scale. However, this approach is not widely used in the literature because subjective poverty measures often suffer from bias (Ravallion, 2012a). A high

⁹ Severe material and social deprivation is defined as the inability to afford at least 7 out of the following 13 items; unexpected expenditures; vacation for a week; rent, mortgage, bills, debts; heating the house; eating meat/chicken/fish (or equivalent for vegetarians) once in every two days; internet connection; automobile; replacing worn-out furniture; replacing worn-out clothes; two pairs of shoes; spending some money on him/herself weekly; regular leisure activities; getting together with family/friends for a meal/drink once a month.

¹⁰ EUROSTAT, Glossary: At Risk of Poverty or Social Exclusion (AROPE), [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At_risk_of_poverty_or_social_exclusion_\(AROPE\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:At_risk_of_poverty_or_social_exclusion_(AROPE)) (16th February 2023)

degree of variability is possible in subjective data. Similar answers may not be obtained under similar circumstances. Self-assessments are very likely to be influenced by personality traits and reference groups. For example, in the less-affluent regions, people might adapt to the low levels of welfare leading to a downward bias in the subjective poverty line, whereas rising aspirations might cause an upward bias in the subjective poverty line in the affluent regions (Atkinson, 2019, p. 66). Therefore, poverty trends should not be monitored solely by subjective measures. An objective criterion needs to be established for a reliable poverty measurement.

2.3. Literature Review on Poverty Measurement

2.3.1 Literature on Poverty Measurement

Studies on poverty measurement date back to the end of the 19th century in England. Rodrik (2017: p. 85) states that poverty was a norm for everybody except for a privileged minority before the Industrial Revolution. Industrial capitalism in the late 19th century caused low-paid work, harsh working conditions, and financial panic (O'Connor, 2016). Hence, it is not a coincidence that initial studies on poverty started in a period when the market revolution led to visible disparities. Indeed, Booth's (1895) measurements of poverty in London between 1889 and 1893 through poverty lines for the first time in the literature; Atwater's (1894) measurement of calories as

an indicator for basic subsistence level; and Rowntree's (1901) investigation of social conditions of the workers in York correspond to this period.¹¹

Afterwards, as discussed in the previous section, there has been a serious debate about whether poverty is an absolute or relative concept (e.g., Townsend, 1979; Sen, 1983). Since the 1990s, the World Bank (WB) has been estimating global extreme poverty with international poverty lines. Table 1 shows some examples of international poverty lines used for this purpose. Ravallion, Datt, and Walle (1991) generated the "*dollar-a-day*" poverty line by examining the national poverty lines of the six poorest countries. According to their definition, an international poverty line is the cost of a bundle of goods recognized as the absolute minimum by international standards. Purchasing power parity (PPP) exchange rates are utilized in these international comparisons to ensure that the same quantity of goods and services are priced equivalently across countries. By updating the old international poverty lines with a global poverty line of 1.90\$/day (PPP) per person, Ferreira et al. (2015) estimated that 12.7 per cent of the global population was extremely poor in 2011.¹² 3.20\$ and 5.50\$ per day per person are suggested poverty lines by World Bank for lower-middle income and upper-middle income countries, successively.

¹¹ Through a poverty line of 21 shillings per week (i.e., the income required for food, rent, and other essentials by Rowntree's definition), 30.7 per cent of the population was found poor in London by Booth, and 27.8 per cent of the population in York was found poor by Rowntree.

¹² In this estimation, Sub-Saharan Africa was found as the poorest region followed by South Asia and East Asia and the Pacific.

Table 1. International Poverty Lines

Poverty Line	Definition
1\$/day	In 1990, the national poverty line of the six poorest countries was found about \$1 per day per person.
1.25\$/day	Average of the national poverty lines for the poorest 15 countries in 2005
1.90 \$/day	2011 PPP (extreme poverty threshold)
3.20\$/day	Suggested for lower middle-income countries by WB
5.50\$/day	Suggested for upper middle-income countries by WB

Source: World Bank¹³

Although these lines are useful for international comparisons, national poverty lines are employed for measuring official poverty rates in a lot of countries. For instance, the official poverty line of the United States (aka Orshansky line) developed by Mollie Orshansky (1965) consists of the cost of a minimum food diet multiplied by three to represent other required expenses of households. On the other hand, poverty studies in Europe mostly focus on relative poverty and social exclusion concepts (e.g., Townsend, 1979; Walker and Walker, 1997; Gordon *et al.*, 2000). For example, The Poverty and Social Exclusion Survey of Britain defines four dimensions of social exclusion; *exclusion from sufficient income/resources, labour market exclusion, exclusion from social relations, and service exclusion*.

More recently, the Supplemental Poverty Measure¹⁴ in the US has extended the previous poverty measures in the country since 2011. It provides a more complex statistic because it considers the geographic variations in housing costs, and also

¹³ <https://blogs.worldbank.org/developmenttalk/richer-array-international-poverty-lines>

¹⁴ <https://www.census.gov/topics/income-poverty/supplemental-poverty-measure.html>

incorporates work expenses and tax payments. Similarly, the Social Metrics Commission Reports¹⁵ have improved poverty measurements in the United Kingdom (UK) since 2018. This new metric in the UK accounts for inescapable costs including childcare and the needs of disabled persons. It also considers liquid assets like savings and includes homeless people. These new measures provide a more detailed picture of poverty.

Besides, Oxford Poverty and Human Development Initiative (OPHI) and UNDP measure the global Multidimensional Poverty Index (MPI) for more than 100 countries. The global MPI consists of three dimensions; health, education, and living standards. Lately, several developing countries have generated official and national (i.e., country-specific) MPIs by considering the characteristics of the country. A national MPI allows for monitoring progress in multidimensional poverty, coordination of policies, budget allocations and planning, guiding policy interventions, targeting, and impact evaluation. Table 2 presents information about both global MPI and some examples of these national MPIs.

¹⁵ <https://socialmetricscommission.org.uk/>

Table 2. Global MPI and Country-Specific MPIs

Country	Since	Dimensions	Indicators
Global MPI¹⁶	2010	Health (1/3)	Nutrition (1/6), child mortality (1/6)
		Education (1/3)	Years of schooling (1/6), school attendance (1/6)
		Living standards (1/3)	Cooking fuel (1/18), sanitation (1/18), drinking water (1/18), electricity (1/18), housing (1/18), assets (1/18)
Mexico	2009	Income	Current per capita income
		Social rights	Education, health, social security, housing, basic services, food
Colombia	2011	Education (1/5)	Educational achievement (1/10), literacy (1/10)
		Childhood & youth (1/5)	School attendance (1/20), no school lag (1/20), access to childcare services (1/20), children not working (1/20)
		Employment (1/5)	No long-term unemployment (1/10), formal employment (1/10)
		Health (1/5)	Health insurance (1/10), access to health (1/10)
		Public services & housing (1/5)	Water source (1/25), sewerage (1/25), floors (1/25), external walls (1/25), overcrowding (1/25)
Vietnam	2015	Health (1/5)	Nutrition (1/10), child mortality (1/10)
		Education (1/5)	Adult education (1/10), children education (1/10)
		Housing /1/5)	Housing area per person (1/10), housing quality (1/10)
		Living standards (1/5)	Water (1/10), sanitation (1/10)
		Access information (1/5)	Usage of telecom services (1/10) and assets for accessing information (1/10)
El Salvador	2015	Education	Years of schooling, school attendance, schooling lag, childcare
		Housing	Roof materials, walls and floor, overcrowding, land ownership
		Employment	Underemployment, unemployment, social security, child labour
		Health, services, food security	Access to health services, drinking water, sanitation, food security
		Habitat	Public space for leisure, crime, safety, environmental risks
Chile	2015	Education (22.5%)	Years of schooling, school attendance, schooling lag

¹⁶ This is the new version of the global MPI revised in 2018 by UNDP and OPHI.

		Health (22.5%)	Children's malnutrition, health insurance, access to healthcare
		Employment & social security (22.5%)	Employment, social security, retirement
		Housing & local environment (22.5%)	Habitability, basic services, environment
		Networks & social cohesion (10%)	Social participation, discrimination, physical safety
Armenia	2016	Basic needs	Food, clothing, dependency on humanitarian aid or remittances
		Housing	Housing conditions, overcrowding, heating, water system, hot water, quality of public services, access to transportation
		Education	Secondary education, enrolment rate, education services
		Labour	Labour market participation, long-term unemployment, decent jobs, underemployment
		Health	Termination of usual activity, affordability of health services, access to and quality of health services
Panama	2017	Education (1/5)	School attendance, school failure, educational achievement
		Housing (1/5)	Dwelling materials, overcrowding, electricity, internet access
		Environment & sanitation (1/5)	Environmental hazards, roads, garbage treatment, sanitation
		Work (1/5)	Unemployed or unpaid family worker, job precarity, inadequate earnings
		Health & food security (1/5)	Access to health services, drinkable water, pregnancy control
Afghanistan	2019	Health (1/5)	Food security (1/10), antenatal care (1/10)
		Education (1/5)	School attendance (1/10), female schooling (1/20), male schooling (1/20)
		Living standards (1/5)	Access to water (1/30), sanitation (1/30), electricity (1/30), cooking fuel (1/30), roof/floor/walls (1/30), asset ownership (1/30)
		Work	Dependency ¹⁷ (1/20), unemployment (1/20), underemployment (1/20), youth NEET ¹⁸ (1/20)

¹⁷ Dependency means that less than one household member works for every six people.

¹⁸ NEET refers to the youth not in employment, education, or training.

		Shocks	Shocks related to production (agriculture and livestock) (1/20), income (1/20), security (1/20)
Thailand	2019	Education (1/4)	Years of education (1/12), late attendance (1/12), living with parents (1/12)
		Health (1/4)	Drinking water (1/12), taking care of yourself (1/12), food poverty (1/12)
		Living conditions (1/4)	Garbage disposal (1/12), internet access (1/12), asset owner (1/12)
		Financial security (1/4)	Savings (1/12), financial burden ¹⁹ (1/12), pensions (1/12)
Palestine	2020	Education	School enrolment (3.3%), repetition (3.3%), educational attainment (3.3%)
		Health	Disability (3.3%), chronic disease (3.3%), health insurance (3.3%), health access (3.3%)
		Employment	Unemployment (3.3%), employment benefits (3.3%), quality of work (3.3%), youth NEET (3.3%)
		Housing	Piped water (3.3%), water and electricity disruptions (3.3%), ventilation problems (3.3%), overcrowding (3.3%)
		Safety & use of assets	Theft or damage to property (4.4%), ownership and use of assets (4.4%), interpersonal or state violence (4.4%)
		Personal freedom	Freedom of movement (6.6%), control of women's income or participation in the labour market (6.6%)
		Monetary resources	Monetary resources (national poverty line) (20%)
India	2021	Health (1/3)	Nutrition (1/6), child & adolescent mortality (1/12), antenatal care (1/12)
		Education (1/3)	Years of schooling (1/6), school attendance (1/6)
		Standard of living (1/3)	Cooking fuel (1/21), sanitation (1/21), drinking water (1/21), electricity (1/21), housing (1/21), assets (1/21), bank account (1/21)

Source: Prepared by the author based on the information at the website of Multidimensional Poverty Peer Network (MPPN) (<https://mppn.org/multidimensional-poverty/who-uses/>)

Note: Weights of each indicator/dimension are given in parentheses.

¹⁹ The financial burden here refers to the households that had difficulty in paying house rent or bills in the past 12 months.

2.3.2 Literature on Poverty Measurement in Türkiye

In Türkiye, TurkStat measured absolute poverty rates from 2002 to 2009 (see Table 3). Afterwards, it has not estimated absolute poverty and the relative poverty concept has become the official poverty approach in the country. Even if the Eleventh Development Plan of Türkiye²⁰ declares that absolute poverty has been eradicated during the Tenth Development Plan period (2014-2018), there is no evidence regarding the eradication of absolute poverty. Table 3 demonstrates that absolute poverty rates significantly reduced between 2003 and 2008, while relative poverty rates remained almost stable throughout the period. As Demir Şeker and Jenkins (2013) argue, the usage of relative poverty lines in developing countries experiencing rapid economic changes may lead to some non-intuitive results. For example, the median income level rises in times of rapid economic growth, but relative poverty rates may not fall despite the improvements in absolute poverty. Since relative poverty is rather an inequality measure, it may not accurately reflect actual poverty. More importantly, in 2009, when TurkStat estimated absolute poverty for the last time, the absolute poverty rate (18%) was even higher than the relative poverty rate (15%). Hence, measuring absolute poverty in Türkiye may still matter. Declining GDP per capita (\$) and rising inflationary pressures during recent years might have increased poverty in the country, and relative poverty estimates might not capture this change.

²⁰ https://www.sbb.gov.tr/wp-content/uploads/2022/07/On_Birinci_Kalkinma_Plani-2019-2023.pdf

Table 3. Percentage of Poor Individuals in Türkiye %

	2002	2003	2004	2005	2006	2007	2008	2009
<i>Food poverty</i>	1.35	1.29	1.29	0.87	0.74	0.48	0.54	0.48
<i>Absolute poverty (food + non-food)</i>	26.96	28.12	25.60	20.50	17.81	17.79	17.11	18.08
<i>Relative poverty</i> ²¹	14.74	15.51	14.18	16.16	14.50	14.70	15.06	15.12

Source: TurkStat

Even if absolute poverty in Türkiye has not been measured for more than a decade, there are some absolute poverty studies for the previous period. For example, using HBS 1994, Şengül (2003) followed the cost of basic needs approach and found that 26.9% of Turkish households were living in absolute poverty. Coşkun (2012) employed an absolute poverty line which is the cost of a minimum consumption bundle satisfying 2,450 kcal per day and a relative poverty line of 50% of median income to measure poverty in Türkiye for the years 1994 and 2001. He found that relative poverty rates were around 15% and absolute poverty rates were around 5%.

Demir Şeker and Jenkins (2013) investigated the poverty trends in Türkiye from 2003 to 2011. They used the absolute poverty lines of TurkStat for the years 2003 and 2009, and deflated household consumption data through the consumer price index (CPI) to 2011 prices. They also used a relative poverty line of 60% of the median income, for reference. They found that absolute poverty rapidly reduced from 2003 to 2008 but decreased only slightly from 2008 to 2011. Relative poverty changed negligibly during the period. They addressed that median consumption

²¹ These relative poverty rates are based on the poverty line of 50% of equivalised median consumption expenditure.

increased by around 63% from 2003 to 2008 leading relative poverty to increase despite the improvements in the average living standards of the households. Consequently, they strongly recommended using absolute poverty lines for poverty analyses in developing countries, like Türkiye, where rapid economic changes were experienced.

Gürsel, Anıl, and Acar (2013) measured poverty in Türkiye via three different poverty lines. Using a national relative poverty line of 60% of median income, they expressed that national poverty slightly decreased from 2005 to 2009. However, poverty rates in Istanbul were underestimated, whereas poverty rates in the South-eastern region were overestimated because they did not consider regional price level differences. Afterwards, they examined the regional poverty through the poverty threshold of 60% of median income in each region and found a similar decrease in poverty over time, but poverty rates in the Eastern and South-eastern regions of Türkiye were found too low this time. Prevalent poverty in those regions led median income, and thereby relative poverty lines, to be low, so that poverty rates were underestimated. They also found that the material deprivation rate decreased from 29% to 21% between 2006 and 2010. In another study, using SILC 2007-2011, Acar, Anıl, and Gürsel (2017) emphasized that there was a considerable mismatch between relative poverty and material deprivation in Türkiye.

The global MPI was measured for Türkiye by the OPHI and UNDP for the year 2003 and it was found that 6.6% of the population was in multidimensional poverty (Alkire *et al.*, 2011). In the sub-national estimations, they found that multidimensional poverty rate was 20.6% in the East, whereas it was only 2.2% in

the West. Lack of school attendance (with a contribution rate of 33%) and child mortality (with a contribution rate of 30%) constituted the largest parts of multidimensional poverty in Türkiye. However, for developing countries like Türkiye, creating a national MPI considering country characteristics would be more suitable because, as Acar (2014) states, the global MPI is more appropriate for underdeveloped countries. As mentioned in the previous sub-section, although many developing countries have generated country-specific MPIs and employed them as their official poverty measure, there is no official MPI for Türkiye. Still, there are some studies on multidimensional poverty in Türkiye in the literature.

For example, through the integrated fuzzy and relative approach, Karadağ (2010) estimated both monetary and non-monetary poverty in Türkiye using seven dimensions and 29 indicators for the years 2006 and 2007. He found that basic living standards (i.e., ability to eat meat/chicken/fish, heating home, vacation, and sufficient income) and health were the most striking dimensions of poverty. He further revealed that housing conditions and health were the main problems of the rural population, whereas the urban population mostly suffered from the environment and basic living standards.

Karadağ (2015) examined the period of 2006-2012 and found that multidimensional poverty rates were much higher than income poverty. Besides, 40% of the multidimensional poor were not monetary poor, and 39% of the monetary poor were not multidimensionally poor. He, therefore, concluded that it is important to use monetary and multidimensional poverty measures as complementary rather than substitute.

Karadağ and Saraçoğlu (2015) found that multidimensional poverty in Türkiye was remarkably higher than the EU average. Indeed, Türkiye was found as the poorest European country, and education and material deprivation constituted the most striking parts of this poverty. For example, while 52.4% of the population aged over 15 in Türkiye was in material deprivation, this ratio was lower than 31% even in the worst performing countries in this dimension in the EU (for example, 30.6% in Malta, 26.9% in Romania, 25.4% in Latvia, 25.1% in Greece, and 24.3% in Hungary).

Table 4 provides the indicators and dimensions applied by some multidimensional poverty studies on Türkiye. It was usually concluded that multidimensional poverty in Türkiye has been decreasing over time, and education was the most contributing part to this poverty.

Table 4. MPIs for Türkiye

Study	Period	Dimensions	Indicators
<i>Acar, (2014)</i> ²²	A. 2007-2010	Health	At least one household member has a chronic disease (12.5%) or has a limitation in daily activities due to a health problem (12.5%)
		Labour market	At least one household member is unemployed (12.5%), or informally employed (12.5%)
		Housing	Being unable to pay housing debts (6.25%), other debts (6.25%), do not have a bath or shower in the dwelling (6.25%), indoor toilet (6.25%)
		Living standards	No access to hot water (4%), washing machine (4%), dishwasher (4%), cannot afford unexpected expenses (4%), clothing (4%), heating (4%), a meal with meat (4%)

²² In addition to the equal weights approach, this study also uses weights based on a Polychoric principal component analysis.

<i>Limanlı, Ö. (2016)</i> ²³	2006-2012	Income (1/5)	Household income lower than 60% of median income (1/5)
		Education (1/5)	At least one household member is illiterate or literate but not attending school (1/5)
		Health (1/5)	At least one household member without social insurance (1/10), at least one household member cannot access health care services (1/10)
		Environment (1/5)	Noise pollution (1/15), environmental pollution (1/15), crime/violence/vandalism (1/15)
		Time (1/5)	At least one household member is unable to meet medical examination due to lack of time (1/5)
<i>Karadağ & Saraçoğlu (2015)</i> ²⁴	2006-2012	Income (1/6)	Per adult equivalent income lower than 60% of the median income
		Extreme material deprivation (1/6)	Deprivation in four out of nine (meeting unexpected expenditures; vacation; paying rent, credits, bills; eating meat/chicken/fish in each two days; heating home; washing machine; TV; phone; automobile)
		Intensity of work (1/6)	If the ratio of the total number of months worked to the months that could potentially be worked is lower than 0.2
		Education (1/6)	Less than primary education
		Health (1/6)	Self-rated health (1/24), chronic diseases (1/24), access to healthcare (1/24), limited daily activity (1/24)
		Environment (1/6)	Problems in walls, windows, or roof (1/24), noise (1/24), environmental pollution (1/24), crime/violence (1/24)
<i>Giovanis & Özdamar (2021)</i> ²⁵	2006-2015	Material deprivation (1/6)	Vehicle ownership (1/24), electronic devices (radio, TV, telephone) (1/24), housing appliances (refrigerator, cooker, washing machine, and iron) (1/24), other assets (computer, heater, and water heater) (1/24)
		Environment (1/6)	Noise (1/24), shortage of space (1/24), air pollution (1/24), crime/violence/vandalism (1/24)

²³ This study has also another description of multidimensional poverty for panel data. That version covers housing conditions such as problems in the floor, walls, windows, or roof; inability to keep the house warm; and lack of indoor toilet, bath/shower, kitchen, plumbing, or fridge.

²⁴ This study measures poverty among the population aged fifteen-year-old and older.

²⁵ This study measures poverty among the population over twenty-four-year-old belonging to the working age group.

Karahasan & Bilgel (2021) ²⁶	2014- 2017	Housing (1/6)	Source of energy (1/24), electricity (1/24), water (1/24), toilet (1/24)
		Working (1/6)	Labour force participation (1/12), unemployment (1/12)
		Health (1/16)	Long-standing diseases (1/24), daily limitations (1/24), health status (1/24), access to healthcare (1/24)
		Education (1/6)	Deprived if the youngster is illiterate (1/12), deprived if s/he completed only up to primary school (1/12)
		Housing (1/4)	Heating (3.6%), bath/shower (3.6%), toilet (3.6%), kitchen (3.6), hot water (3.6%), washing machine (3.6%), refrigerator (3.6%)
		Environment (1/4)	Housing infrastructure (6.3%), noise pollution (6.3%), environmental pollution (6.3%), neighbourhood crime (6.3%)
		Education (1/4)	Education degree (12.5%), mandatory schooling (12.5%)
		Health (1/4)	Self-rated health (8.3%), chronic diseases (8.3%), access to healthcare (8.3%)

Note: Weights of each indicator/dimension are given in the parentheses.

Finally, in May 2023, TurkStat has published AROPE estimations for Türkiye for the first time. It has estimated that the ratio of *people who are at risk of poverty or social exclusion* decreased from 34% in 2015 to 32.6% in 2022.

This study differs from the previous studies as follows. Firstly, it measures absolute poverty in Türkiye, which has not been estimated for over a decade. For this purpose, it updates the old absolute poverty lines of TurkStat through inflation and employs both household income and consumption data as welfare indicators. It also estimates absolute poverty using the poverty line of the Confederation of Turkish Trade Unions (TURK-IS) and this measure is conducted for the first time in the literature.

²⁶ This study measures poverty among the population aged fifteen-year-old and older.

Besides, subjective poverty is measured to compare it with different estimates, even if it has some limitations. The study also generates an MPI for Türkiye. Compared to the previous MPIs in the literature, this MPI brings out a new dimension (social exclusion) and some new indicators such as overcrowding and internet access. Moreover, while most previous studies estimate multidimensional poverty among the population over 14 years old, the MPI constructed here accounts for the whole population. Finally, although the definition of AROPE -the very recent poverty estimation of TurkStat- is quite similar to the material deprivation and social exclusion dimensions of our MPI, our index also includes other dimensions of poverty such as education, health, and housing conditions.

These measurements are conducted at the sub-national level because it is often shown in the literature that regional differences have been prevalent in Türkiye (see for example Erkal, 1978). Dansuk, Özmen, and Erdoğan (2007) showed that income and social classes were unequally distributed among regions in Türkiye. Many studies concluded that there is a considerable disparity between the Eastern and Western parts of Türkiye in terms of wages (Taştan and Akar, 2013), incomes (Filiztekin and Çelik, 2010), economic activity and poor access to education and health facilities (Karaman and Doğruel, 2011), and market potential (Karahasan, Doğruel, Doğruel, 2016). Moreover, some studies found that poverty in Türkiye was spatially clustered in South-eastern and Eastern Anatolia (Karadağ, 2010; Coşkun,

2012; Duran, 2015; Karadağ, 2015; Limanlı, 2016;²⁷ Karahasan and Bilgel, 2021). These studies usually argued that regional concentration of poverty was not a temporary issue changing over time, but a structural problem. Therefore, it is important to consider the regional disparities and conduct this analysis at the regional level. It has been also previously observed that rural regions of Türkiye are poorer than urban areas (e.g., Şengül, 2003; Karadağ, 2010; Alkire et al., 2011; Coşkun, 2012; Limanlı, 2016; Giovanis and Özdamar, 2021).²⁸ However, the present datasets do not allow for urban-rural distinction.²⁹ Furthermore, as Deaton and Dupriez (2011) state, there may be significant spatial price differences within large countries and national poverty estimates require intra-national price indexes. This study differentiates absolute poverty lines by regions considering regional price disparities and estimates poverty rates at the NUTS-2 level as much as the datasets allow.

²⁷ Limanlı (2016) categorized three regions in terms of multidimensional poverty: Marmara, Aegean, Western and Central Anatolia as the low-poverty group; Black Sea and Mediterranean as the middle-poverty group; and Eastern regions as the high-poverty group.

²⁸ It was also demonstrated by TurkStat's statistics that absolute and relative poverty rates were much higher in the rural parts of Türkiye compared to the urban areas.

²⁹ The urban/rural definition of TurkStat lost its meaning with the Law on Metropolitan Municipalities in 2012 (Karadağ, 2015). Most of the villages have been attached to metropolitan municipalities so they are no longer considered rural areas. According to TurkStat, more than 90 per cent of the population seems as if living in urban areas, and thereby urban-rural distinction does not make sense anymore.

2.4. Dataset and Methodology

2.4.1 Dataset

Table 5 indicates the poverty measurement approaches employed in this study. Absolute poverty is estimated through both consumption and income data. Also, subjective poverty is measured using a survey question in the SILC dataset. Finally, this study develops an MPI to capture the multifaceted structure of poverty.

Table 5. Poverty Measurement Approaches

Approach	Poverty line	Data	Period
i) Absolute consumption poverty	TurkStat's updated absolute poverty line	HBS	2010-2019
ii) Absolute income poverty	TurkStat's updated absolute poverty line	SILC	2010-2020
iii) Absolute income poverty	TURK-IS' absolute poverty line	SILC	2013-2020
iv) Subjective income poverty	Subjective poverty line	SILC	2013-2020
v) Multidimensional poverty	Multidimensional poverty line	SILC	2014-2021

For these measurements, HBS and SILC micro datasets are used. Consumption data in the HBS dataset covers purchases as well as consumption from own production, gifts, and aids. Household disposable income in the SILC dataset covers not only earnings, but also imputed rent, social allowances, and agricultural production for own consumption, and excludes regular taxes. It is a one-year lagged variable which means that income poverty in 2020 is estimated by utilizing the SILC 2021, for example. The SILC dataset also includes many non-monetary indicators of welfare allowing for measuring multidimensional poverty. Summary statistics for consumption data in the HBS and income data in the SILC can be found in Table A.1 and Table A.2 in the annexe. These surveys are population-weighted surveys which means that they allow for estimating the whole population. The SILC dataset allows for regional estimations because it includes information about the regions

where households live at the NUTS-1 level and since 2014 NUTS-2 level (see Table A.3 for information about these regions).

Absolute poverty is measured using two different poverty lines: the absolute poverty lines of TurkStat and TURK-IS. Both of them include the cost of food and non-food needs. In TurkStat's poverty line, the food component is the monetary cost of a minimum food bundle satisfying a daily 2,100 kcal. TurkStat calculates the non-food component by using the share of non-food expenditures in the total expenditures of the households whose total expenditures are just above the food poverty line. This poverty line is available until 2010. By inflating through the CPI, this study updates the last absolute poverty line of TurkStat for the following years. These inflation-adjusted monthly absolute poverty lines for each household size in Turkish Liras (TL) can be seen in Table 6.

Table 6. Updated Absolute Poverty Lines (Monthly) in TL

HH size	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	422	460	494	538	579	624	693	807	929	1,043
2	638	695	747	813	875	944	1,049	1,220	1,405	1,577
3	808	880	946	1,030	1,109	1,195	1,328	1,545	1,779	1,997
4	954	1,039	1,116	1,215	1,308	1,410	1,567	1,823	2,100	2,357
5	1,091	1,188	1,277	1,391	1,497	1,614	1,793	2,086	2,403	2,698
6	1,214	1,322	1,421	1,547	1,665	1,795	1,995	2,321	2,673	3,000
7	1,333	1,452	1,560	1,698	1,829	1,971	2,190	2,548	2,935	3,295
8	1,446	1,575	1,693	1,843	1,984	2,138	2,377	2,765	3,184	3,575
9	1,545	1,682	1,808	1,968	2,119	2,284	2,538	2,953	3,401	3,818
10	1,645	1,791	1,926	2,096	2,257	2,432	2,703	3,145	3,622	4,066

Source: Author's update of TurkStat's absolute poverty lines

Absolute poverty using consumption data is estimated at the national level because the HBS dataset does not provide regional information. For absolute income poverty

estimations, regional poverty lines are constructed using regional PPP for the base year and regional CPIs for the following years. The modified OECD adult equivalence scale³⁰ is applied to properly compare different-sized households. These updated lines can be called *anchored absolute poverty lines* because they are fixed in terms of consumption and adjusted over time only in line with the price changes (Atkinson, 2019, p. 87). It is acknowledged that these inflation-adjusted lines do not reflect the changes in consumption habits over time. Additionally, CPI might not perfectly represent the price changes in the goods and services existing in the original poverty line. However, using a constant absolute poverty line just by inflating via the price changes would allow for tracing a particular living standard for many years, and therefore the effects of social policies on poverty alleviation can be assessed (Ravallion, 1992).

Other absolute poverty line used in the study is TURK-IS' poverty line. TURK-IS generates a food poverty line for a household composed of four people living in TR51 (Ankara). It assumes that the daily calorie requirement is 3,500 kcal, 2,300 kcal, 3,200 kcal, and 1,600 kcal for an adult male, an adult female, a 15–19-year-old young, and a child, respectively. For the food plus non-food poverty line, it uses the share of food expenditures in total consumption expenditures, which is 30.7%. In this study, these poverty lines are divided by the OECD equivalent scale, which

³⁰ In the modified OECD scale, the first adult takes one, other members aged 14 or older take 0.5, and younger ones take 0.3.

seems the most proper scale to convert them into adult equivalent terms.³¹ These monthly poverty lines are given in Table 7.

Table 7. Adult Equivalised Poverty Lines of TURK-IS (in TL)

Year	2013	2014	2015	2016	2017	2018	2019	2020
<i>Poverty line</i>	1,172	1,321	1,510	1,563	1,722	2,022	2,434	2,834

To take the regional price level differences into account, the regional price level in TR51 (Ankara) is normalised to one. Then, regional price level indices in each year are applied to obtain the poverty lines for the other regions. This measurement begins in 2013 because the NUTS-2 level data has been available since then. There is also another absolute poverty line produced by BISAM³², but this study does not employ it because its time length is too short.

This study also measures subjective poverty based on a survey question (whose code is HE050) in the SILC. Survey participants are asked about the minimum monthly net income level required for subsistence and households whose income levels are lower than this required level are counted as poor. The last poverty estimation approach of the study is multidimensional poverty. Details of the multidimensional poverty approach are explained in the relevant section.

³¹ TURK-IS also publishes the poverty line per single worker and when we divide the line for four people to the OECD scale (i.e., 1 for the first adult, 0.7 for other adults, and 0.5 for each child), they almost match each other. This is why we apply the OECD equivalence scale rather than the modified scale.

³² BISAM is an organization of DISK (The Confederation of Progressive Trade Unions of Türkiye). It measures food and food plus non-food poverty lines only since 2018.

2.4.2 Methodology

There are various methods for poverty assessment such as the dashboard approach, Venn diagrams, dominance approach, statistical methods, or axiomatic approaches (Alkire et al., 2015, pp. 70-122). The dashboard approach provides some descriptive statistics such as the percentage of households with poor housing conditions. Venn diagrams consist of circles or ellipses that intersect, include, or exclude one another where intersections represent the people who are jointly deprived in various measures. It is very difficult to interpret Venn diagrams in the case of more than four measures. The dominance approach compares poverty in two countries or regions at a given time or across two time periods of a country. It allows for determining whether a region/country is indisputably poorer than another with respect to several measures. If poverty comparisons do not differ depending on the choice of measure, their credibility can barely be contested. The disadvantage of these approaches is that they cannot provide a summary measure. There are also descriptive methods (e.g., cluster analysis, principal component analysis) and model-based statistical methods (e.g., factor analysis, latent class analysis) used to construct a poverty index. These methods can hardly offer an intuitive interpretation, and minor methodological changes can easily alter the results. Another method for poverty measurement is the fuzzy set approach in which individuals are not defined as either poor or not. Rather, a poverty band is chosen to predicate the poor individuals by addressing the vagueness of being poor. However, this approach does not satisfy some axioms and subgroup decomposability.

For monetary poverty, this study uses Foster-Greer-Thorbecke (1984) (FGT) indexes (i.e., headcount ratio, poverty gap ratio, and squared poverty gap) since they are the foremost poverty measures thanks to their capacity of intuition and simplicity.³³ Decomposability property of these indexes allows for measuring poverty across subgroups. The general form of the FGT indices is as follows.

$$FGT_{\alpha} = \frac{1}{N} \sum_{i=1}^M \left(\frac{z_i - c_i}{c_i} \right)^{\alpha} I n_i$$

where N is the total population, M is the total number of households, z_i is the poverty line, c_i is the equivalised consumption or income level of the household, and n_i is the number of people in each household.

$$I=1 \quad \text{if } c_i < z_i,$$

$$I=0 \quad \text{if } c_i \geq z_i.$$

The definition of “I” means that only the households whose equivalised consumption or income levels are below the poverty line are counted. In the case of a sampling based on random stratification, like the sample used in this study, population weights are included in the measurement as well. If α is zero (i.e., FGT_0), the FGT index is called as headcount ratio (HCR); while FGT_1 is the poverty gap ratio; and FGT_2 is the squared poverty gap. Headcount ratio, the most widely used poverty measure, is

³³ There are also other poverty indexes such as the Watts index, Sen index, and time to exit.

the ratio of a population whose equivalised income or consumption level is lower than the poverty line. It can simply be denoted as below.

$$HCR = \frac{1}{N} \sum_{i=1}^M I n_i$$

It shows the level of poverty. HCR is the simplest and most immediate method of gauging poverty and informing the public and policymakers. On the other hand, it reflects no change in poverty when a poor person becomes poorer, or less poor. In other words, it does not satisfy the transfer axiom³⁴ and the monotonicity axiom³⁵. Another criticism of HCR arises from that policymakers might focus simply on the persons just below the poverty line to reduce the poverty rate without too much effort. Then, if policymakers focus on reducing poverty measured by HCR, priority would probably be given to the least poor. Although HCR is not the best guide in terms of resource allocation, it is still descriptively very useful and the most popular poverty measure by far. For example, the Millennium Development Goals directly aim to reduce the headcount poverty rate.

Another FGT index, the poverty gap ratio (PGR), can be shown in the form below.

$$PGR = \frac{1}{N} \sum_{i=1}^M \left(\frac{z_i - c_i}{c_i} \right) I n_i$$

³⁴ Transfer axiom states that taking money from a poor individual and giving it to a less poor individual should increase poverty, and vice versa.

³⁵ According to the monotonicity axiom, the poverty measure should increase when a poor individual's income falls, *ceteris paribus*.

PGR measures the gap between the poverty line and the equivalised consumption or income level of the poor, and it reflects the depth of poverty. It fails to meet transfer axiom like HCR. To satisfy the transfer axiom, the gains for the poorer people should be weighted more than the gains for the less poor. Still, the poverty gap gives very useful information on how much should be spent to end poverty via perfectly targeted transfers. The other FGT index, the squared poverty gap (SPG), measures the severity of poverty and its formula is as follows.

$$\text{Squared poverty gap} = \frac{1}{N} \sum_{i=1}^M \left(\frac{z_i - c_i}{c_i} \right)^2 I n_i$$

It gives more weight to the improvements in the situation of the poorest individuals, as their initial poverty gap is the largest. Therefore, it satisfies the transfer axiom. But the transfer sensitivity axiom³⁶ is valid for FGT indices only with alfa higher than two. The SPG helps policymakers eliminate extreme poverty by giving higher weight to the consumption or income shortfalls of the very poor.

For multidimensional poverty measurement, this study follows the Alkire-Foster (AF) (2007, 2011) methodology. It not only satisfies many desirable axioms but also has intuitive power. Its practical and technical advantages make it quite attractive to informing policy. It employs the Adjusted Headcount Ratio as the multidimensional

³⁶ Transfer sensitivity axiom says that a transfer from a poor person to a poorer person reduces poverty, but poverty reduction becomes greater if the situation of the poorer person is worse. The poorer the one gets the transfer, the greater the decrease in poverty.

poverty index reflecting both the incidence and intensity of poverty. The steps of this methodology are as follows (Alkire et al., 2015, pp. 145-147).

i) Set of indicators needs to be defined. Data for all units of identification (i.e., individuals or households) should be available for all units.

ii) Deprivation cut-offs (i.e., thresholds considered sufficient to be non-deprived) for each indicator need to be set.

iii) Cut-offs are applied to determine whether each individual/household is deprived or not in terms of each indicator.

iv) Weights for each indicator are selected such that their sum is equal to one.

v) Weighted sum of deprivations is generated for each individual/household, and it is called "deprivation score" for each unit.

vi) A poverty cut-off is detected which is a deprivation score to be considered as multidimensionally poor. Then, each individual/household is identified as multidimensionally poor or not.

vii) Deprivations of the non-poor are censored, and the ratio of multidimensionally poor people is computed. This ratio gives us the headcount ratio (H) of multidimensional poverty.

viii) Deprivation scores of the poor are added up and divided by the total number of the poor to compute the average intensity of multidimensional poverty (A). This rate is also known as the breadth of poverty.

iv) Adjusted headcount ratio (M) is measured as the product of headcount ratio (H) and average intensity (A).

$$M=H \times A$$

Adjusted headcount ratio is the rate of weighted deprivations of the poor out of the total number of deprivations that could have been experienced if all individuals in the society were poor and deprived in all dimensions.

In this methodology, all the deprivations of the non-poor are censored, thereby they are not included in the measure. This characteristic of the AF methodology is consistent with poverty focus and allows for satisfying the property that a poverty measure should be independent of the acquisitions of the non-poor. The AF method follows a dual cut-off approach: i) a set of deprivation cut-offs identifying if an individual/household is deprived in each indicator, ii) a poverty cut-off identifying if an individual/household is multidimensionally poor or not.

The AF methodology carries information on multiple deprivations. It is easy to compute and valid for ordinal data. The AF methodology is also decomposable which means that an MPI can be broken down by subgroups of the population (e.g., by regions, genders, age groups, ethnicity, etc.). This study benefits from subgroup decomposability and measures multidimensional poverty across regions of Türkiye. Another attractive characteristic of the AF methodology is that it allows for dimensional breakdown, and therefore deprivations contributing to poverty at most can be revealed. It also satisfies dimensional monotonicity, so that if a poor individual/household ends to be deprived in a dimension, the poverty measure

reduces. The standard headcount ratio (H) does not satisfy dimensional breakdown and dimensional monotonicity, but the adjusted headcount ratio (M) does.

Assuming that poverty is assessed utilizing d number of dimensions where $d \in \mathbb{N}$, and total population is n where $n \in \mathbb{N}$, we can express the formation of multidimensional poverty measure using the $n \times d$ dimensional achievement matrix X below. Achievement of person i in dimension j is denoted by x_{ij} where $x_{ij} \in \mathbb{R}_+$ for all $i=1, \dots, n$ and $j=1, \dots, d$. Higher achievements are assumed as preferable to lower ones.

$$\begin{array}{c} \text{dimensions} \\ X = \begin{bmatrix} x_{11} & \cdots & x_{1d} \\ \vdots & \ddots & \vdots \\ x_{n1} & \cdots & x_{nd} \end{bmatrix} \begin{array}{c} \text{people} \end{array} \end{array}$$

A weight is assigned to each dimension according to its relative importance and the vector of weights is $w = (w_1, \dots, w_d)$. In this study, the normalized-weights approach³⁷ is followed in which the sum of the weights is one, and it is assumed that each dimension has equal weights. This approach is the most-widely used and accepted one in the literature unless there is a proof of disparities in the relative importance of dimensions.

³⁷ Another approach is to use non-normalized or numbered weights in which deprivation scores lie between 0 and d.

The deprivation cut-off in dimension j is denoted as z_j . The vector of deprivation cut-offs for all dimensions is $z = (z_1, \dots, z_d)$ where $z \in \mathbb{R}^{d++}$. If $x_{ij} < z_j$, individual i is considered deprived in dimension j and non-deprived otherwise. By using achievement matrix X and the vector of deprivation cut-offs we get a deprivation matrix g^0 where $g^0_{ij} = 1$ whenever $x_{ij} < z_j$ and $g^0_{ij} = 0$ otherwise for all $j = 1, \dots, d$, and for all $i = 1, \dots, n$. In other words, $g^0(X)$ matrix shows the deprivation status of all persons in all dimensions in the matrix X . A deprivation score c_i is generated by the matrix g^0 such that:

$$c_i = \sum_{j=1}^d w_j g^0_{ij}$$

where c_i represents the sum of weighted deprivations of person i , and w_j is the weight of the dimension j . The deprivation score rises as the number of deprivations of person i increases and reaches its maximum if the person i is deprived in all dimensions. The vector of deprivation scores of all individuals/households is $c = (c_1, \dots, c_n)$. In the AF methodology, a person deprived in a dimension is not necessarily considered poor. An identification function p_k is used such that:

$$p_k(x_i; z) = \begin{cases} 1, & \text{if } c_i \geq k \\ 0, & \text{otherwise} \end{cases}$$

where k is the poverty cut-off. $p_k(x_i; z) = 1$ counts person i as poor. The criteria for identifying the poor ranges from *union* to *intersection* approach. While the former identifies a person as poor if s/he is deprived in any dimension, the latter identifies a person as poor only if s/he is deprived in all the dimensions. While the union approach usually identifies a very high portion of the population as poor, the

intersection approach identifies a very low share of the population as poor. The AF method uses an intermediate criterion between these two extremes.

After the identification approach is selected, the aggregation step requires choosing a poverty index summarizing the information obtained. This step of the AF methodology relies on the FGT indexes. Adjusted Headcount Ratio (M_0) is the average of the censored deprivation score vector:

$$M_0 = \mu(c(k)) = \frac{1}{n} \times \sum_{i=1}^n c_i(k)$$

Alternatively, the Adjusted Headcount Ratio can be calculated as: $M_0 = H \times A$. Headcount ratio (H) = $H(X; z)$ where $H = q/n$, and q is the number of poor individuals according to the dual cut-off approach. The intensity of poverty (A) is the average deprivation score of poor individuals:

$$A = \sum_{i=1}^q c_i(k) / q$$

Individuals or households are often used as the unit of identification in poverty measures. The choice is usually confined by data. All national multidimensional poverty measures -except for Mexico- use households as the unit of identification. Even if the unit of identification is households, it is very normal to report data as a percentage of individuals who are identified as poor instead of a percentage of households. To report results as a percentage of individuals is critical since poor households usually tend to have large sizes. In this study, while the unit of identification is households due to data constraints, the unit of analysis (i.e., how the results are reported) is individuals. Consumption expenditures in the HBS and income level in the SILC are available at the household level. Hence, monetary

poverty is estimated at the household level, and then considering the household sizes, the results are reported as a percentage of individuals. For multidimensional poverty, information about education, health, and four indicators of social exclusion is available for people aged 15 or older. Therefore, we transform these data as “*if there is a household member with limitation in daily activity due to physical or mental health problem*”, for example. This approach allows us to measure poverty for the whole country. Even if this approach cannot capture the intra-household inequalities³⁸, it allows us to measure poverty among the whole population rather than just among the population aged 15 or older.

2.5. Findings

This section presents the results of poverty estimations.

2.5.1 Absolute Consumption Poverty

In this estimation, the adult equivalised level of household consumption expenditures (as the welfare indicator) and the updated absolute poverty lines are utilized. It is found that the consumption poverty rate decreased from 22.6 per cent in 2010 to 16.6 per cent in 2019 (see Table 8). More than 16 million individuals were living in absolute poverty at the beginning of the period. This number decreased to 11.2 million in 2018 but increased again to 13.4 million in the next year. Similar

³⁸ Some factors such as gender, age, job status, etc. may lead to disparities in bargaining power among household members, and thus intra-household inequalities (see for example, Haddad and Kanbur, 1990; Jenkins, 1991). Still, considering the prevalent child poverty, it is decided to estimate poverty for the whole population at the expense of missing out the intrahousehold inequalities.

movements are observed in the poverty gap and squared poverty gap. The decrease in the squared poverty gap looks more salient implying that the situation of the poorest poor was amended more.

Table 8. Absolute Consumption Poverty

Year	Number of poor	HCR (%)		PGR (%)		SPG (%)	
		Est.	Conf. Inter.	Est.	Conf. Inter.	Est.	Conf. Inter.
2010	16,102,108	22.57 (.006)	21.47- 23.67	6.82 (.002)	6.37- 7.28	2.98 (.001)	2.71- 3.25
2011	14,876,377	20.55 (.006)	19.48- 21.63	5.98 (.002)	5.55- 6.41	2.54 (.001)	2.30- 2.78
2012	14,548,676	19.77 (.006)	18.68- 20.85	5.61 (.002)	5.20- 6.02	2.34 (.001)	2.12- 2.56
2013	13,447,843	18.06 (.005)	17.04- 19.09	4.95 (.002)	4.59- 5.31	2.02 (.001)	1.84- 2.21
2014	12,529,736	16.55 (.005)	15.49- 17.62	4.45 (.002)	4.07- 4.83	1.75 (.001)	1.57- 1.94
2015	13,511,863	17.69 (.006)	16.61- 18.78	4.78 (.002)	4.39- 5.17	1.90 (.001)	1.70- 2.11
2016	12,202,093	15.82 (.005)	14.84- 16.81	4.06 (.002)	3.74- 4.38	1.54 (.001)	1.39- 1.70
2017	11,295,132	14.32 (.005)	13.38- 15.27	3.68 (.001)	3.38- 3.98	1.39 (.001)	1.25- 1.53
2018	11,167,653	14.00 (.005)	13.02- 14.99	3.35 (.001)	3.07- 3.63	1.21 (.001)	1.08- 1.33
2019	13,422,678	16.63 (.006)	15.54 -17.73	4.43 (.002)	4.04- 4.82	1.78 (.001)	1.57- 1.98

Note: Standard errors are in parentheses. Obs, Est., and Conf. Ind. refer to the number of observations, estimation, and confidence intervals, respectively.

A limitation of this estimation is that it does not consider the regional price disparities because the dataset does not involve information about the regions where households live. It means that poverty in the cheaper regions (e.g., South-eastern and Eastern Anatolia) is probably overestimated and that in the expensive regions such as Istanbul is underestimated.

2.5.2 Absolute Income Poverty

In this estimation, absolute poverty is measured using income data and the updated poverty lines. This estimation is conducted at the regional level, then national poverty is measured by aggregating the sub-national estimates. We update and convert the absolute poverty lines of Turkstat into the regional absolute poverty lines as follows:

- Take the most recent absolute poverty line of TurkStat which is for the year 2010.
- Convert this poverty line into regional poverty lines through regional price level indices of TurkStat.³⁹
- The converted regional absolute poverty lines for the year 2010 are inflated by regional inflation rates (CPI) from 2011 onwards.⁴⁰

Table 9 presents the aggregated income poverty estimations at the national level. Since a particular poverty line is attributed to each region by considering regional price disparities, this estimation is more reliable than the previous one. Still, absolute poverty rates based on consumption and income data are found close to each other.

³⁹ Regional price level indices are available at the NUTS-2 level. For the estimations in 2011 and 2012, we convert them to the NUTS-1 level by using averages.

⁴⁰ Regional inflation data is available at the NUTS-2 level too. Hence, we utilize it only for the NUTS-2 level analysis starting from 2013 (based on SILC 2014). For the years 2011 and 2012, we inflate the absolute poverty line of TurkStat for the year 2010 through the national inflation rate and then convert it into regional lines using regional price level indices. Therefore, estimations since 2013 are more accurate.

Absolute income poverty perpetually decreased from beginning to 2016. While poverty rate decreased almost by half during this period, an interruption in this movement was monitored afterwards. Indeed, poverty reduction has become unstable since 2017 when poverty rate increased to 13.72%. Despite the fall in poverty rate in 2018, absolute income poverty has tended to rise since 2019.

Table 9. Absolute Income Poverty

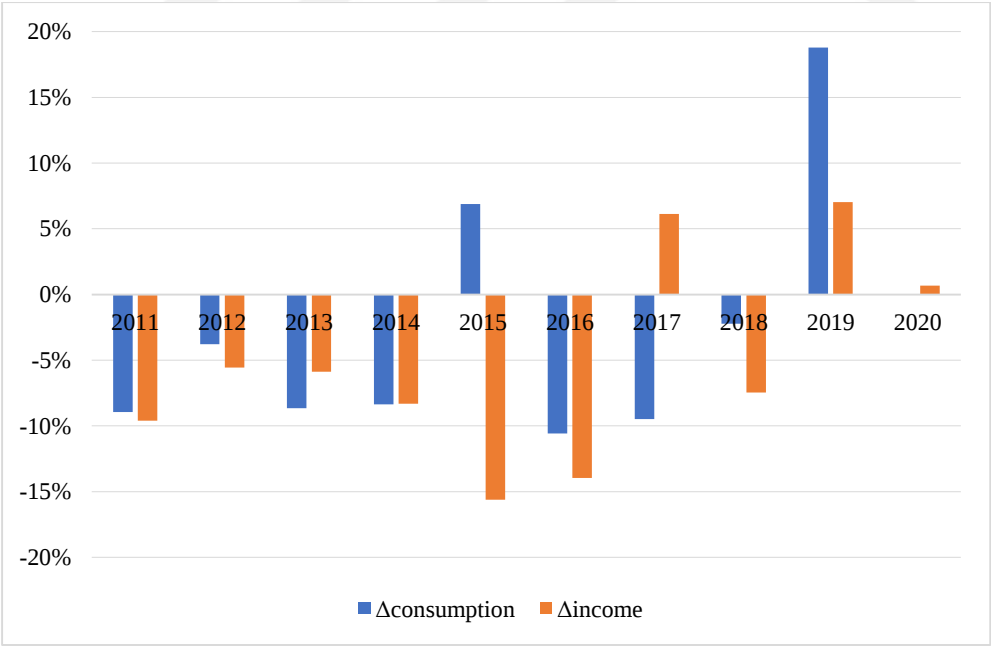
Year	Number of poor	HCR (%)		PGR (%)		SPG (%)	
		Est.	Conf. Inter.	Est.	Conf. Inter.	Est.	Conf. Inter.
2010	17,424,866	24.08 (.005)	23.16- 24.99	7.44 (.002)	7.06- 7.82	3.36 (.001)	3.13- 3.58
2011	16,020,006	21.77 (.004)	20.92- 22.61	6.77 (.002)	6.42- 7.11	3.03 (.001)	2.82- 3.24
2012	15,312,221	20.56 (.004)	19.78- 21.35	5.92 (.002)	5.62- 6.21	2.55 (.001)	2.38- 2.72
2013	14,647,082	19.35 (.004)	18.61- 20.09	5.39 (.001)	5.11- 5.66	2.23 (.001)	2.08- 2.37
2014	13,546,076	17.74 (.004)	17.00- 18.47	5.02 (.001)	4.75- 4.30	2.14 (.001)	1.99- 2.30
2015	11,546,169	14.97 (.004)	14.25- 15.70	4.07 (.001)	3.79- 4.35	1.68 (.001)	1.51- 1.85
2016	10,161,015	12.88 (.003)	12.22- 13.54	3.36 (.001)	3.13- 3.58	1.37 (.001)	1.24- 1.49
2017	10,940,620	13.72 (.003)	13.06- 14.38	3.57 (.001)	3.35- 3.79	1.45 (.001)	1.33- 1.57
2018	10,207,636	12.65 (.003)	12.04- 13.25	3.37 (.001)	3.17- 3.57	1.39 (.001)	1.28- 1.50
2019	11,082,313	13.54 (.003)	12.96- 14.11	3.87 (.001)	3.67- 4.06	1.71 (.001)	1.60- 1.82
2020	11,282,077	13.63 (.003)	13.03- 14.21	3.91 (.001)	3.7- 4.12	1.07 (.001)	1.59- 1.83

Note: Standard errors are in parentheses. Obs, Est., and Conf. Ind. refer to number of observations, estimation, and confidence intervals, respectively.

Graph 1 shows the percentage changes in consumption and income poverty rates. The changes in income and consumption poverty traced similar patterns until 2014.

However, in 2015, the most remarkable fall in income poverty (by 15.6%) coincides to a 6.9 percentage point increase in consumption poverty. In 2017, while consumption poverty fell by 9.5%, income poverty rose by 6.1%. Both consumption and income poverty rates increased in 2019, but the rise in the former was much more striking. In sum, even if income and consumption poverty rates tend to be close to each other, there are deviations in their patterns in some years.

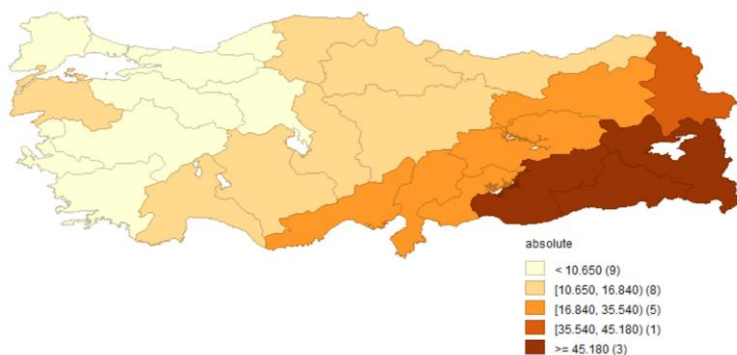
Graph 1. Changes in Consumption and Income Poverty Rates (Δ HCR) %



Detailed results of absolute income poverty at the regional level can be found in the tables between Table A.4 and Table A.11 in the annexe (i.e., headcount ratios, number of poor people, poverty gap ratios, and squared poverty gap ratios in each region). Figure 1 presents the average regional poverty rates for the 2013-2020

period. It indicates natural breaks of average absolute poverty rates at regional level. All regional maps from now on show natural breaks. The figure shows that there are considerable disparities in absolute poverty rates between regions. Absolute poverty concentrates in the South-eastern and Eastern parts of the country, while the Western regions have much lower poverty rates. These imbalances do not vary considerably from year to year. For example, in 2020, absolute income poverty rates in TRC2, TRB2, and TRC3 were, successively, 48.41%, 44.97%, and 41.52%, while it was only 2.45% in the capital, TR51.

Figure 1. Absolute Income Poverty Rates (Average of 2013-2020) %



Regional relative poverty estimates of TurkStat are given in Figure B.1 in the annexe. It gives a completely different picture compared to our estimations. It fails to capture the regional disparities between the Eastern and Western parts of the country. Moreover, poverty rates are much lower than our estimations. Indeed, even the poorest region has a poverty rate of only 15%. This controversy can be explained by the fact that the median income level is very low in South-eastern and Eastern Anatolia (see Figure B.2), and thereby, relative poverty lines are too low to afford

basic needs. Therefore, relative poverty rates underestimate the deprivations in the regions where the median income level is very low because of the prevalent poverty.

2.5.3 Absolute Income Poverty (via The Poverty Line of TURK-IS)

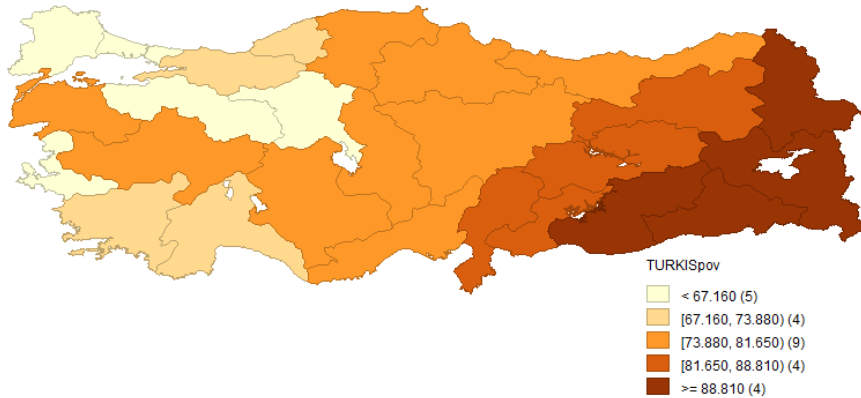
This sub-section utilizes the absolute poverty lines of TURK-IS. Once poverty is measured through this poverty line, more than two third of the population is counted as poor throughout the period (see Table 10). Even though the poverty rate in Türkiye decreased from 76.92% in 2013 to 67.43% in 2018, it rose again to 69.73% in 2019 and to 74.11% in 2020. Poverty rates might be overestimated through this poverty line, but poverty is again concentrated in the South-eastern and Eastern regions similar to the previous estimation (see Figure 2).

Table 10. Absolute Poverty Rates % Based on The Poverty Line of TURK-IS

Region	2013	2014	2015	2016	2017	2018	2019	2020	average
<i>TR</i>	76.92	76.72	77.14	70.04	72.62	67.43	69.73	74.11	73.09
<i>TR10</i>	69.50	70.36	70.44	61.32	62.59	57.85	59.95	66.97	64.87
<i>TR21</i>	72.05	72.57	63.54	57.31	60.30	57.83	62.39	64.74	63.84
<i>TR22</i>	76.01	77.06	79.04	73.42	73.82	69.13	70.22	72.62	73.92
<i>TR31</i>	69.33	69.64	68.46	59.93	60.28	55.69	59.58	61.78	63.09
<i>TR32</i>	73.19	73.48	74.36	69.03	70.71	63.16	64.60	66.53	69.38
<i>TR33</i>	75.83	77.14	80.66	74.06	73.76	69.91	70.71	75.62	74.71
<i>TR41</i>	69.65	70.25	69.18	58.71	63.28	57.10	59.99	66.69	64.36
<i>TR42</i>	76.53	72.50	76.91	64.10	69.69	65.75	68.56	71.24	70.66
<i>TR51</i>	62.56	63.47	63.99	58.76	63.46	53.67	56.03	60.69	60.33
<i>TR52</i>	75.38	76.02	75.98	69.12	75.79	70.27	71.39	77.08	73.88
<i>TR61</i>	69.54	67.89	73.35	62.88	67.60	62.24	63.99	69.79	67.16
<i>TR62</i>	80.98	78.24	76.96	69.99	72.90	68.95	73.06	79.88	75.12
<i>TR63</i>	85.41	84.29	84.55	80.00	82.16	80.52	82.85	86.54	83.29
<i>TR71</i>	82.98	81.46	82.48	71.74	76.28	67.66	71.24	75.81	76.21
<i>TR72</i>	76.45	77.99	81.86	76.13	80.00	70.66	76.06	80.13	77.41
<i>TR81</i>	71.95	73.91	74.51	67.04	73.53	60.61	66.75	73.19	70.19
<i>TR82</i>	81.76	80.67	83.13	71.94	73.34	66.31	67.55	70.35	74.38

<i>TR83</i>	83.88	82.88	81.77	71.70	76.56	70.74	75.86	76.99	77.55
<i>TR90</i>	78.72	80.05	80.05	76.63	77.91	70.97	71.85	75.04	76.40
<i>TRA1</i>	84.02	84.90	82.30	79.29	82.28	78.64	80.89	83.70	82.00
<i>TRA2</i>	92.61	89.32	90.33	85.96	88.00	85.88	88.68	89.73	88.81
<i>TRB1</i>	87.25	85.99	84.58	75.90	79.76	75.80	79.98	83.97	81.65
<i>TRB2</i>	94.35	92.69	90.85	92.50	94.78	91.06	92.78	94.74	92.97
<i>TRC1</i>	91.22	89.85	91.07	86.03	87.00	83.36	82.84	85.31	87.09
<i>TRC2</i>	94.72	94.33	95.19	92.91	93.54	89.62	90.48	93.26	93.01
<i>TRC3</i>	94.64	93.93	95.01	92.90	93.88	93.04	90.26	93.05	93.34

Figure 2. Absolute Poverty Rates via TURK-IS' Poverty line (Average of 2013-2020) %



2.5.4 Subjective Poverty

Subjective poverty is estimated through a survey question in the SILC dataset for the whole population using household sizes and population weights. Households whose income levels are lower than what they consider necessary for subsistence are counted as subjectively poor. Estimation results are presented in Table 11. Even though the general picture of the East-West distinction remains similar (see Figure 3), subjective income poverty rates are much higher compared to the absolute

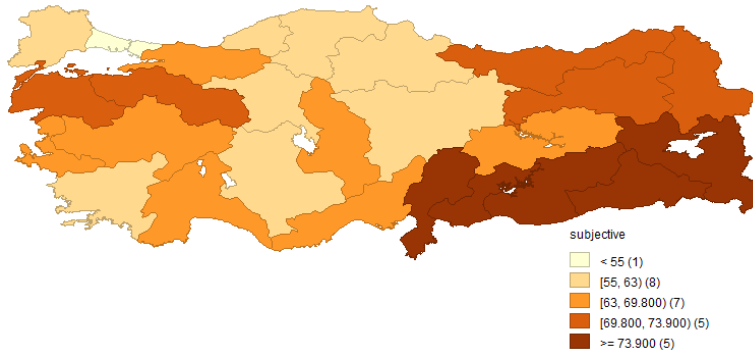
income poverty estimated through the updated lines of TurkStat. It implies that according to most households, an income level corresponding to the inflation-adjusted absolute poverty lines of TurkStat is not sufficient to be out of poverty. Still, subjective measures need to be treated with caution since individuals may tend to consider themselves as poor even if they are not poor based on objective criteria. These high subjective poverty rates may also be explained by the inflationary structure of the Turkish economy. While the information on the household income is the average of the last 12 months, the minimum income level required for subsistence declared by the survey participants is for the time of the survey. Therefore, due to the high inflation rates in the country, it is very usual that the current minimum required income is higher than last year's average monthly income.

Table 11. Subjective Poverty Rates %

Region	2013	2014	2015	2016	2017	2018	2019	2020	average
<i>TR</i>	62.1	63.2	63.7	65.9	64.4	62.1	61.3	62.6	63.2
<i>TR10</i>	54	50.9	51.7	53.1	44	43.4	46.5	52	49.5
<i>TR21</i>	45.8	55	60.4	53.4	59	62.8	62.2	63.8	57.8
<i>TR22</i>	70.1	68.5	77.3	79	77.2	72.7	66.5	66.1	72.2
<i>TR31</i>	71.6	73.2	64.2	70.7	68.8	69.4	60.8	57.5	67.0
<i>TR32</i>	51.9	56	69.2	63.3	64.4	59.6	57.6	54.2	59.5
<i>TR33</i>	76.8	68.9	56.4	64.7	69.8	72.1	70.8	66.6	68.3
<i>TR41</i>	60.5	68.8	68.4	71.2	78.2	78.2	74	68.1	70.9
<i>TR42</i>	63	50	65.9	71.9	71.5	64	64.1	68.5	64.9
<i>TR51</i>	61.1	58.9	54.4	67.2	59.3	49.3	46.4	49.9	55.8
<i>TR52</i>	60.5	55.9	60	60.8	58.5	57.9	56	58.5	58.5
<i>TR61</i>	55.1	64.1	69	68.7	68.3	64.1	56.7	57.8	63.0
<i>TR62</i>	62.2	65	68	67.4	73.2	66	68.3	71.3	67.7
<i>TR63</i>	68.1	76.9	75.4	75.8	68.5	76.1	76.9	77.6	74.4
<i>TR71</i>	64.3	66.2	62.7	62.4	65.7	62	63.8	70.6	64.7
<i>TR72</i>	54.1	60.9	60.6	53.1	54.2	59	60.3	58.9	57.6
<i>TR81</i>	52.6	60.6	60	59.9	64	64.2	61.3	64.4	60.9

TR82	55.6	60.3	56.9	57.2	62.4	61.3	58.1	58.0	58.7
TR83	52.9	56.9	53.9	57.4	49.4	56.6	57.5	55.6	55.0
TR90	58.8	65.8	70.7	73.7	84.4	74.9	73.2	67.7	71.2
TRA1	76.8	77.3	65.9	69.7	74.4	73.3	62.6	69.6	71.2
TRA2	70.8	69	64.9	64	76.2	68.6	73.2	72.0	69.8
TRB1	55.1	56.8	63.5	73.8	75.9	68.1	70.1	70.8	66.8
TRB2	77.9	72.4	66.4	75.2	88.1	80.9	70.5	76.4	76.0
TRC1	81.3	81.4	82.2	81.8	76.1	77	71.4	71.9	77.9
TRC2	72.5	81.8	80.6	76.7	73.5	65.5	72.1	75	74.7
TRC3	69.9	78.4	79.6	79	69.7	69.6	72.7	72	73.9

Figure 3. Subjective Poverty Rates (Average of 2013-2020) %



2.5.5 Multidimensional Poverty

Considering the global MPI, national MPIs of other developing countries, and previous MPIs in the literature, this study generates a national MPI for Türkiye. Its dimensions and indicators can be seen in Table 12. It has five dimensions (i.e., education, health, housing conditions, material deprivation, and social exclusion) and 22 indicators. All indicators are binary variables which take either zero (for non-deprived) or one (for deprived).

Table 12. National MPI for Türkiye

Dimension	Indicator	SILC code
<i>Education</i> (1/5)	E1: If the average years of schooling among household members aged 15 or older is less than 8 years (1/10)	FE030
	E2: If a household member aged 15 or above is illiterate (1/10)	FE030
<i>Health</i> (1/5)	H1: If a household member has a physical or mental health problem limiting daily activity (1/15)	FS030
	H2: If a household member is unable to access health services (1/15)	FS050
	H3: Lack of micronutrients: inability to afford a meal with meat, chicken, or fish (or equivalent for vegetarians) once every two days (1/15)	HE090
<i>Housing conditions</i> (1/5)	HC1: Problems in walls, floor, and roof (1/30)	HS010
	HC2: Lack of indoor toilet or bathroom (1/30)	HH100 and HH110
	HC3: Overcrowding: 2.5 or more persons share a bedroom (1/30)	HH060
	HC4: Environmental problems in the neighbourhood such as air or environmental pollution due to traffic or industry (1/30)	HS060
	HC5: Crime and violence in the neighbourhood (1/30)	HS070
	HC6: Heating problem due to lack of isolation (1/30)	HS020
<i>Material deprivation</i> (1/5)	M1: Lack of at least 3 out of 5 assets (mobile phone, TV, computer, dishwasher, and automobile) due to financial limitations (1/25)	HH160, 170, 180, 220, 240
	M2: Inability to pay housing rent, mortgage credit, or loan on interest two or more times in the last 12 months (1/25)	HE010
	M3: Inability to pay bills (electricity, water, or gas) two or more times in the last 12 months (1/25)	HE020
	M4: Inability to repay a credit card debt or other debts two or more times in the last 12 months (1/25)	HE030
	M5: Inability to meet an unexpected but compulsory expenditure ⁴¹ (1/25)	HE100
<i>Social exclusion</i> (1/5)	S1: If there is an unemployed ⁴² household member (1/30)	FI010
	S2: If there is a household member who does not have social security in his/her main job (1/30)	FI190
	S3: Inability to eat -or drink- out or at home with family or friends at least twice a month due to financial difficulty (1/30)	FY050
	S4: Inability to participate in activities such as sports, cinema, or concerts at least twice a month due to financial difficulty (1/30)	FY060

⁴¹ This expenditure costs approximately 1,079 TL in 2021, for example.

⁴² If a household member is looking for a job it takes one, and zero otherwise.

	S5: No access to the internet due to financial limitations (1/30)	HH190
	S6: If household adult equivalised income is less than 60% of median per adult equivalent income (1/30)	HG110

Note: Weights of each indicator are given in the parentheses.

The education dimension is comprised of two indicators: average years of schooling and illiteracy. Households are considered deprived in E1 if the average years of schooling of the household members who are aged 15 or older are less than 8 years. Considering that the legally compulsory education period in Türkiye has been 8 years since 1997 and 12 years since 2012, households whose average education degree is below the compulsory education are deprived in this indicator. Another indicator for education deprivation is illiteracy: If a household member aged 15 or above is illiterate, the household is considered as deprived in E2.

The health dimension consists of three indicators: Limited daily activity (a household is deprived if a member aged 15 or above has limitation in daily activities at least for six months due to a physical or mental health problem); inability to access to health services (a household is deprived if at least a member aged 15 or above is unable to access health services in the last 12 months); lack of micronutrients (a household is deprived if it cannot afford to eat meat/chicken/fish -or equivalent for vegetarians- once every two days). Rather than food poverty, micronutrient deficiency is a widespread problem at present (Banerjee and Duflo, 2012), and the lack of micronutrients implies to bad health. This index does not include chronic diseases as an indicator of health because chronic diseases have a quite wide scale. Otherwise, we would have accepted all chronic diseases equally although each of them does not affect daily life evenly. The self-rated health situation is not included

in the analysis either because it is a very subjective indicator, and this MPI attempts to focus on more objective indicators.

The dimension of housing conditions consists of six indicators: Problems in walls/floor/roof; lack of indoor bathroom and toilet; overcrowding; environmental problems; crime/violence in the neighbourhood; and problems with heating the house. While the other five indicators are similar to those used in the other MPIs in the literature, overcrowding is an indicator used in an MPI for Türkiye for the first time to the best of our knowledge. It is used in the national MPIs of other developing countries such as Chile and Mexico where households are considered overcrowded if 2.5 or more people share a bedroom. Similarly, the national MPIs of Palestine and Colombia refer to overcrowding if more than three persons share a bedroom, and Armenia defines a household as overcrowded if housing floor space is lower than 20 sq. meters per person adult equivalent. In this study, following the approach of Chile and Mexico, households are assumed as overcrowded if 2.5 or more persons share a bedroom. The SILC dataset also provides a piece of subjective information about overcrowding where survey participants are asked whether the housing space is sufficient.⁴³ However, this subjective indicator is not preferred here due to the objectivity aim.

⁴³ For example, 4,046 households in the survey declared that their housing space was insufficient in 2020, while the number of households in which 2.5 or more members share a bedroom was 3,345. The subjective indicator counts more people as deprived than the objective one does, as expected.

The dimension of material deprivation is somewhat similar to the definition of Eurostat which describes material deprivation as the situation of people who have financial problems. Material deprivation dimension in this study consists of a lack of assets, inability to pay housing rent, mortgage, loans on interest, bills, credit card debts, other debts, and inability to afford an unexpected but compulsory expenditure.

The social exclusion dimension covers unemployment; lack of social security; inability to eat/drink with friends/relatives at least once a month due to financial limitation; inability to participate in leisure activities because of financial hardship; a lack of access to the internet due to financial limitation; and relative income poverty. Some other developing countries such as Chile, Mexico, and Panama adopt similar indicators of social exclusion in their national MPIs. Social exclusion is a concept in which individuals experience problems with participating in the society where they live. Limited monetary resources inhibit individuals from feeling just like the other people in society. Being out of employment or social security usually results in exclusion from society. Paid work does not only provide monetary resources, but also it is an important arena of social interaction and contact. Hence, people out of employment are at risk of being socially excluded (Gordon et al., 2000, p. 54). The Human Poverty Index of UNDP was also using long-term unemployment as an indicator of social exclusion. Lack of social security mostly leads to exclusion from healthcare services. Furthermore, individuals without social security would probably be non-pensioner jobless people in old age. Lack of participation in social activities such as eating/drinking with friends/family or leisure activities due to lack of money are other indicators of social exclusion. The absence of internet access

because of financial limitations can also be considered an indicator of social exclusion in this digital age. Last but not least indicator of social exclusion is relative income poverty. Households are considered in relative income poverty if their equivalised income level is less than 60 per cent of the median equivalised income. Relative income poverty is the most widely used indicator of social exclusion in the literature.

A multidimensional poverty measure does not allow any missing value. Since data on two indicators of social exclusion -S3 and S4- are available only after 2013, multidimensional poverty measurement is conducted between 2013 and 2021. As mentioned earlier, although the unit of identification is households due to data constraints, the results are reported at the individual level by using household sizes.

Since all the indicators used in this MPI are binary variables taking the values of zero or one, all the deprivation cut-offs are equal to one. If an indicator takes the value of one, it means that the household is deprived in that indicator. Following the AF methodology, we adopt the equal-weight approach which is the most widely used and accepted one in the literature.⁴⁴ This approach gives equal importance to all dimensions because it is barely acceptable to give, for example, higher importance to education than health, or housing conditions. Additionally, indicators in each dimension are equally weighted as well. As for the poverty cut-off, we follow the

⁴⁴ Other approaches to determine the weights of indicators and dimensions are factor analysis, principal components analysis, inverse incidence rate, subjective assessment of individuals, or normative choices by specialists.

standard AF poverty cut-off of 1/3 which means that households who are deprived in at least 33.3% of the weighted indicators are considered multidimensionally poor. This poverty cut-off is not only the standard AF cut-off but also is quite close to the cut-offs used in the other national MPIs. For example, a household is counted multidimensionally poor if its weighted deprivation score is at least 25% in Armenia, 26% in Paraguay, 30% in Panama, 33% in Vietnam, and 40% in Afghanistan. Still, poverty cut-offs of 1/2 and 1/4 are also applied in this study for a robustness check. Table 13 shows very high deprivation rates in E1, H1, H3, HC1, HC6, M5, and S2. The table also indicates that considerable improvements (i.e., a fall in deprivation rates) have been seen in most of the indicators from 2013 to 2021. Still, deprivation rates in some indicators, such as H1, HC4, HC5, M2, and S6, have remained relatively stable. On the other hand, the deprivation rate in S1 has increased in this period. It means that ratio of households with at least one unemployed member has increased over time.⁴⁵ Deterioration in H2 (access to health services) in 2021 can be explained by the COVID-19 pandemic.

Table 13. Summary of MPI Indicators

Indicator	Weight	Percentage of individuals deprived %								
<u>Education</u>		2013	2014	2015	2016	2017	2018	2019	2020	2021
<i>E1</i>	0.1	62.02	61.69	58.93	57.97	56.56	54.71	53.11	50.33	47.75
<i>E2</i>	0.1	27.77	28.29	27.41	26.35	24.95	23.79	22.84	21.46	20.00
<u>Health</u>										
<i>H1</i>	0.07	44.85	45.46	50.12	39.35	45.38	47.77	47.47	42.35	43.07

⁴⁵ This is probably because unemployment is more likely and rapidly to be influenced by the economic conjuncture.

H2	0.07	29.78	27.56	23.77	15.77	14.10	15.01	14.97	8.48	19.30
H3	0.07	46.09	33.64	35.81	37.74	33.97	31.95	33.56	37.29	38.32
<u>Housing conditions</u>										
HC1	0.03	39.73	37.18	39.01	38.09	36.62	35.91	36.88	34.72	33.89
HC2	0.03	9.24	7.97	6.82	5.49	4.80	4.28	3.99	3.79	3.41
HC3	0.03	27.67	28.81	27.40	25.99	24.84	23.15	22.36	21.67	14.42
HC4	0.03	24.28	24.38	24.19	24.51	22.94	24.83	26.10	22.60	23.40
HC5	0.03	9.71	10.57	11.26	10.66	11.33	11.18	10.87	9.79	9.98
HC6	0.03	42.21	38.66	43.04	42.20	40.77	39.39	39.31	36.73	34.28
<u>Material deprivation</u>										
M1	0.04	17.20	14.22	13.15	10.42	7.58	6.12	6.11	6.17	6.50
M2	0.04	8.56	9.03	9.06	8.60	7.84	7.05	9.18	7.79	8.89
M3	0.04	33.64	31.02	28.52	24.31	21.48	18.16	22.47	18.40	19.52
M4	0.04	22.46	21.70	21.76	18.90	17.80	15.31	19.42	13.89	16.98
M5	0.04	48.99	29.05	32.64	34.43	31.74	30.17	29.69	32.23	33.43
<u>Social Exclusion</u>										
S1	0.03	12.11	12.69	13.76	13.62	14.98	14.64	17.66	20.70	17.92
S2	0.03	41.43	38.61	36.40	34.14	33.11	32.86	32.46	28.06	28.94
S3	0.03	35.98	24.40	22.47	14.04	12.11	12.82	13.19	13.66	15.28
S4	0.03	38.08	27.21	29.61	20.29	16.98	17.54	19.58	18.14	19.82
S5	0.03	32.40	28.25	25.39	18.06	10.08	7.20	6.53	6.35	4.80
S6	0.03	24.59	24.01	24.39	23.78	23.13	22.89	23.45	23.59	23.31

Note: Deprived refers to the individuals whose indicator values are below the threshold.

Table 14 shows the multidimensional poverty estimations. While 49.2% of the population -corresponding to around 36.6 million individuals- were multidimensionally poor in 2013, this rate decreased to 31.5% (i.e., more than 26 million individuals) in 2021. Furthermore, the average poor person had 51.6% (46.5%) of deprivations and poor individuals experienced 25.4% (14.6%) of all possible deprivations for all persons in 2013 (2021). In the last survey, although the ratio of multidimensional poor individuals (H) fell, the number of poor, average deprivation score (A), and multidimensional poverty index (M) slightly increased. Probably, the households just below the poverty line in 2020 got out of poverty in

2021, so that the ratio of the poor decreased. However, average deprivation went worse implying that poorer households became even more deprived.

Table 14. Multidimensional Poverty Estimations

Year	Number of poor	H (%)	A (%)	M (%)
2013	36,632,625	49.2 (.005)	51.6 (.002)	25.4 (.003)
2014	32,699,498	43.2 0.005	50.4 0.002	21.8 0.003
2015	33,220,503	43.5 (.005)	49.7 (.002)	21.6 (.003)
2016	29,764,250	38.6 0.005	48.2 0.002	18.6 0.002
2017	28,074,940	35.6 (.005)	47.4 (.002)	16.9 (.002)
2018	27,039,299	33.9 (.005)	47.1 (.002)	16 (.002)
2019	28,167,434	34.9 (.004)	47.1 (.002)	16.4 (.002)
2020	25,871,753	31.6 (.004)	46.2 (.002)	14.6 (.002)
2021	26,083,059	31.5 (.004)	46.5 (.002)	14.6 (.002)

Note: Standard errors are in parentheses. *H* is the headcount ratio, *A* is the average deprivation score of the poor, and *M* is the adjusted headcount ratio (aka multidimensional poverty index).

Multidimensional poverty is also estimated through various poverty cut-offs (see Table A.12). Compared to the original estimation (using the 1/3 cut-off), higher poverty rates are found through the 1/4 cut-off, whereas much lower poverty rates are observed through the 1/2 cut-off. While the former can be considered as at risk of poverty, the latter can be regarded as extreme poverty. Still, very high correlation rates are found between these estimations, and the contribution rankings of the dimensions and regional disparities remain unchanged.

Table 15 presents the contribution rate of each dimension to the MPI. Education emerges as the most contributing dimension in all years. Indeed, it constitutes around 30 per cent of the MPI alone. It is followed by the health dimension which makes up around 23 per cent of the index. The rise in the contribution rate of health dimension in 2021 most probably results from the pandemic. Contributions of housing conditions, material deprivation, and social exclusion are around 15 per cent per dimension.

Table 15. Contribution of Each Dimension

Dimension	2013	2014	2015	2016	2017	2018	2019	2020	2021
<i>Education</i>	.270	.291	.291	.309	.316	.313	.303	.309	.294
<i>Health</i>	.237	.231	.233	.221	.226	.237	.238	.230	.253
<i>Housing conditions</i>	.144	.153	.157	.164	.167	.167	.164	.163	.151
<i>Material deprivation</i>	.159	.146	.146	.147	.144	.135	.145	.141	.147
<i>Social exclusion</i>	.190	.179	.173	.158	.148	.148	.151	.157	.155

Contribution rate of each indicator is given in Table 16, and it is observed that low years of schooling, illiteracy, lack of micronutrients, and health problems limiting daily activity emerge as the most contributing indicators to the MPI.

Table 16. Contribution of Each Indicator

Indicator	2013	2014	2015	2016	2017	2018	2019	2020	2021
<u><i>Education</i></u>									
<i>E1</i>	.173	.182	.182	.192	.194	.192	.189	.191	.184
<i>E2</i>	.097	.110	.109	.118	.122	.121	.114	.119	.110
<u><i>Health</i></u>									
<i>H1</i>	.083	.089	.095	.087	.100	.105	.104	.100	.098
<i>H2</i>	.060	.061	.053	.041	.034	.040	.041	.026	.050
<i>H3</i>	.094	.081	.085	.094	.092	.092	.092	.103	.105
<u><i>Housing conditions</i></u>									
<i>HC1</i>	.039	.039	.041	.044	.045	.045	.045	.046	.044
<i>HC2</i>	.011	.011	.009	.009	.008	.008	.007	.007	.006
<i>HC3</i>	.030	.034	.032	.034	.035	.034	.032	.033	.025

<i>HC4</i>	.018	.020	.020	.022	.022	.022	.023	.021	.022
<i>HC5</i>	.008	.009	.010	.010	.010	.010	.010	.009	.010
<i>HC6</i>	.039	.039	.044	.046	.047	.048	.047	.047	.044
<u><i>Material deprivation</i></u>									
<i>M1</i>	.026	.024	.023	.021	.017	.014	.014	.015	.016
<i>M2</i>	.010	.012	.012	.012	.013	.012	.015	.013	.015
<i>M3</i>	.040	.041	.038	.036	.035	.032	.037	.034	.034
<i>M4</i>	.026	.028	.027	.027	.028	.025	.029	.023	.027
<i>M5</i>	.056	.040	.046	.051	.051	.052	.050	.055	.054
<u><i>Social exclusion</i></u>									
<i>S1</i>	.011	.013	.014	.015	.016	.017	.020	.024	.022
<i>S2</i>	.038	.037	.036	.037	.037	.037	.036	.033	.034
<i>S3</i>	.038	.031	.027	.020	.019	.021	.021	.024	.025
<i>S4</i>	.038	.031	.033	.025	.023	.025	.027	.027	.028
<i>S5</i>	.036	.035	.032	.026	.017	.013	.012	.012	.009
<i>S6</i>	.029	.031	.032	.033	.035	.035	.035	.037	.037

Multidimensional poverty estimations at the NUTS-2 level can be found in Table A.13 and A.14. Also, the NUTS-1 level multidimensional poverty estimation for the year 2013 is available in Table A.15. The average HCRs and average MPIs during the 2014-2021 period are presented here as natural break maps in Figure 4 and Figure 5. They show that there are obvious poverty clusters in the country and poverty concentrates again in the South-Eastern and Eastern regions similar to the previous estimates.

Figure 4. Regional Multidimensional Poverty Rates % (Average of 2014-2021)

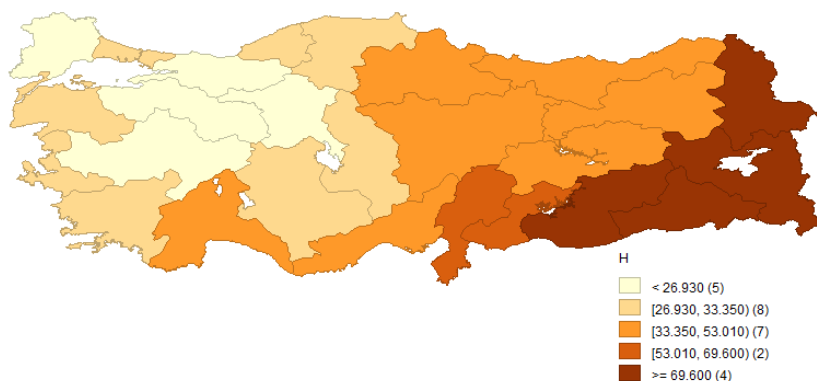
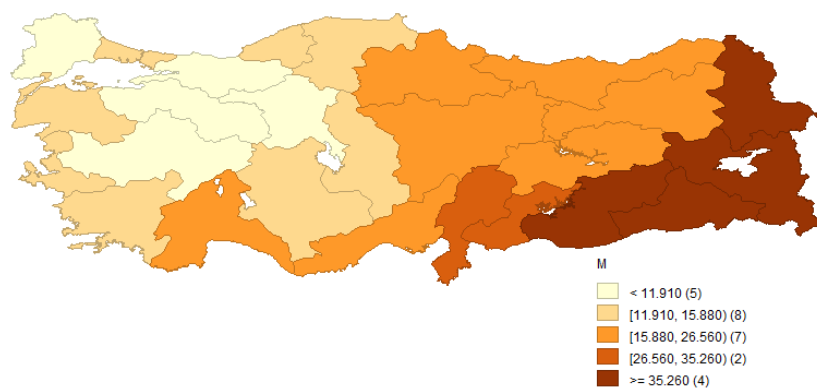


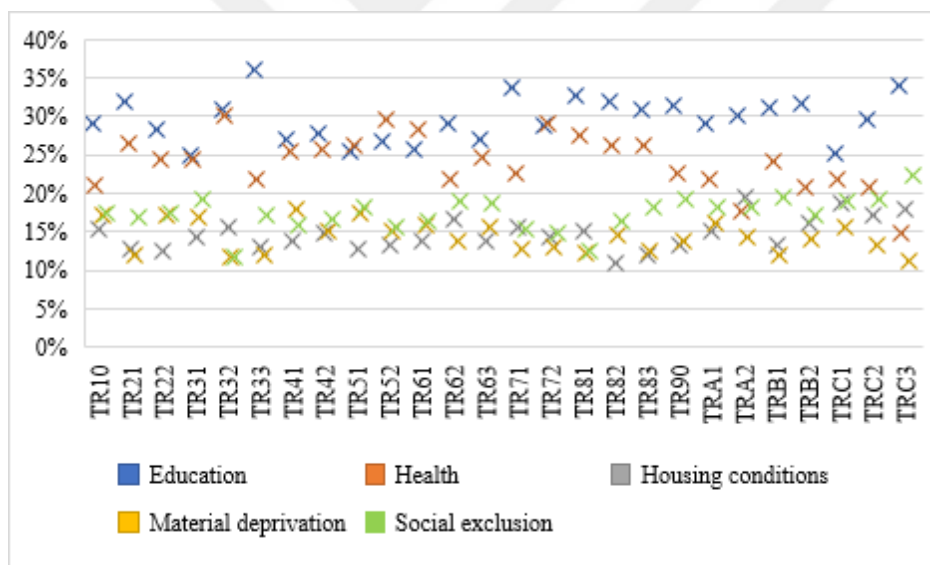
Figure 5. Regional Multidimensional Poverty Index % (Average of 2014-2021)



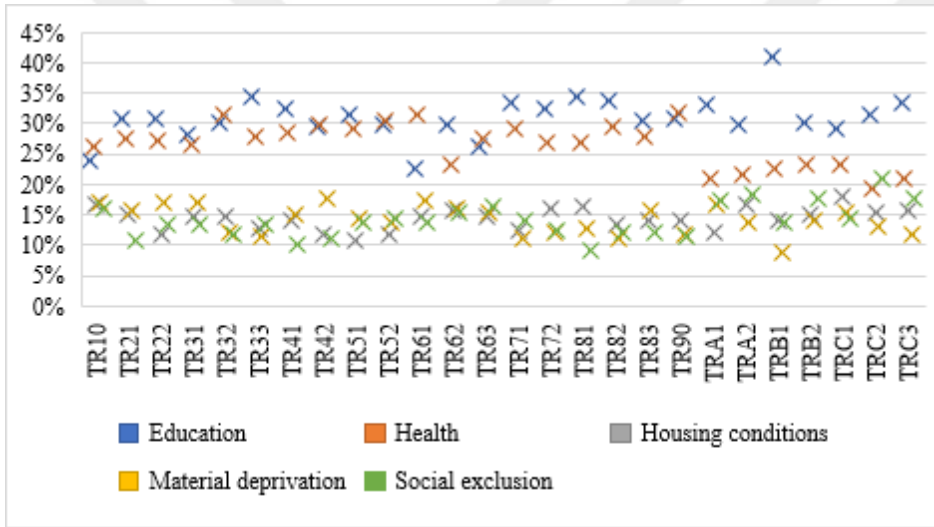
Graph 2 and Graph 3 demonstrate the dimensional contributions to the MPI at the regional level in 2014 and 2021. It seems that education has the highest contribution to multidimensional poverty in almost all regions. Still, health has higher contribution rates in a few regions such as TR51, TR52, TR61, and TR72. The

number of regions where health is the most salient deprivation rose in 2021 probably due to the pandemic.

Graph 2. Regional Contribution of Each Dimension in 2014



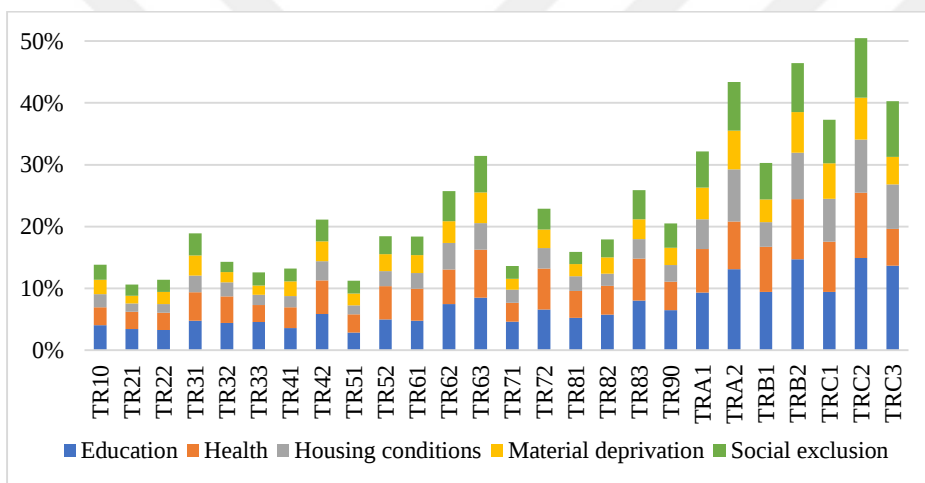
Graph 3. Regional Contribution of Each Dimension in 2021



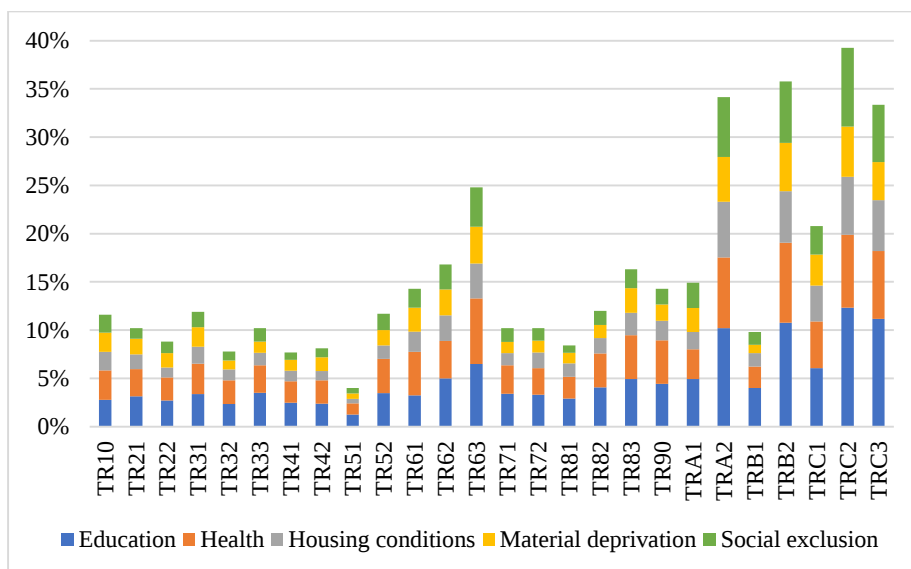
Graph 4 and Graph 5 indicate the regional MPIs and their decompositions by dimensions in 2014 and 2021.⁴⁶ It seems that education and health need to be improved in all regions. While people living in the South-eastern and Eastern regions also suffer from the other dimensions, these deprivations rarely exist in the other regions. This finding implies that regional social policies can be more effective in poverty alleviation compared to nationwide policies, as suggested by Karahasan and Bilgel (2021).

⁴⁶ To reveal the decomposition of the MPI, the MPI of each region is multiplied by the contribution rate of each dimension.

Graph 4. Regional MPI by Dimensional Contributions in 2014

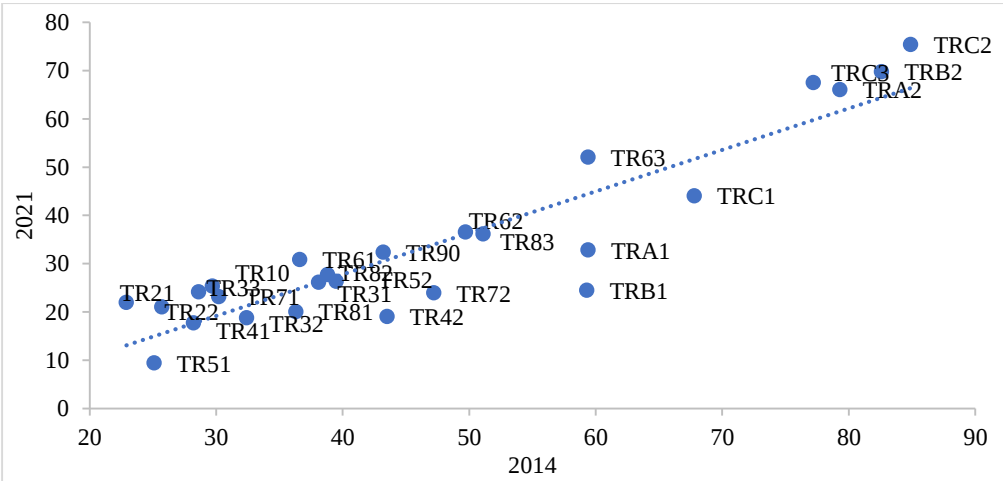


Graph 5. Regional MPI by Dimensional Contributions in 2021



Graph 6 compares the regional multidimensional poverty rates in 2021 with that in 2014. It shows that multidimensional poverty rates are lower in 2021 than in 2014 in all regions without exception. It seems that the regions with the highest rates of poverty in 2014 are still the poorest regions in 2021, implying to persistency of poverty. Poverty rates in some regions decreased only slightly: for example, it decreased by only 0.9 points in TR21. On the other hand, pretty high reductions in multidimensional poverty rates are observed in TRB1 (34.8 percentage points) followed by TRA1 (26.5 points), TR42 (24.4 points), and TRC1 (23.7 points). It would be helpful for policymakers to carefully examine these regions to figure out how poverty can be alleviated also in other regions.

Graph 6. Regional Multidimensional Poverty Rates in 2014 vs. 2021



2.6. Comparison

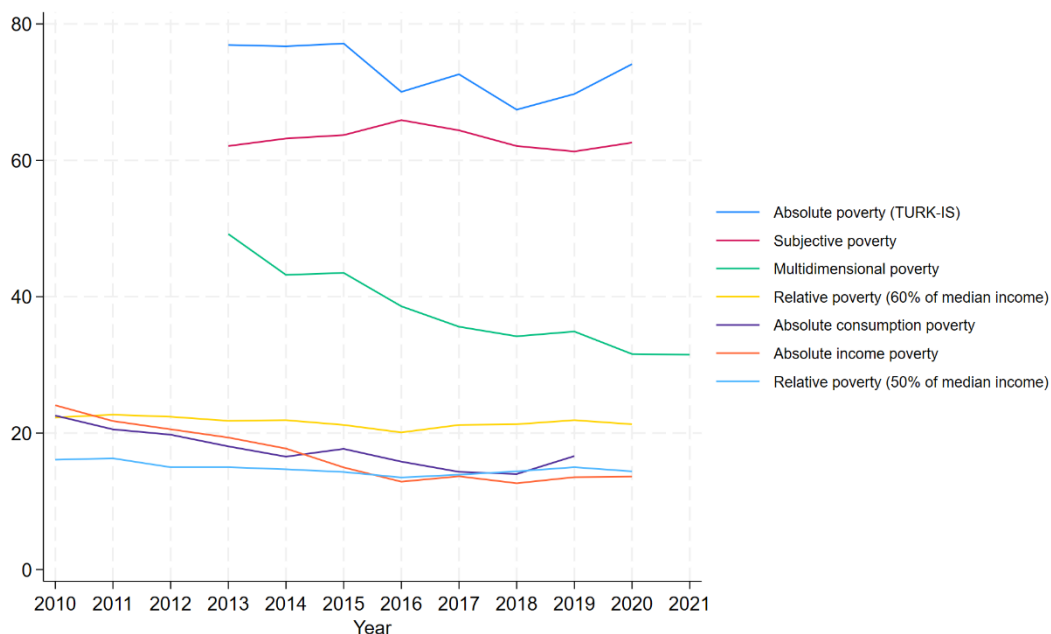
The poverty rates measured in this chapter and also the relative poverty rates of TurkStat are presented in Graph 7. Until recently, poverty rates in the country had a decreasing tendency except for relative and subjective poverty, which remained almost unchanged during the period. However, estimations based on the latest surveys show that poverty rates increased recently. Relative poverty rates do not capture this change. Even if the multidimensional poverty rate decreased in 2021, the number of multidimensional poor and average deprivation score increased this year. These findings may be explained by the recent fall in GDP per capita (\$) and rising inflationary pressures in the country. Also, the pandemic very likely played a role in the increase in poverty in 2020. These poverty trends support the Poverty and Equity brief of the World Bank (2022) arguing that although poverty rates in Türkiye decreased since the 2000s, this trend has reversed since 2019.

The absolute poverty rates based on consumption and income data measured via the updated absolute poverty lines of TurkStat (light blue and green lines) look very similar. In fact, household income and consumption data used in the study are very close to each other because we convert yearly income into monthly income and thereby eliminate the volatility during a year. Still, consumption and income poverty may not broadly detect similar households as poor because consumption data do not consider regional price disparities, and the overestimation in the cheaper regions is possibly tolerated by the underestimation in the more expensive regions.

The relative poverty rates of TurkStat remain almost stable during the period. Absolute poverty rates estimated via the updated line are found similar to the relative

poverty rates. This finding is surprising because the other countries that left to estimate absolute poverty mostly did so since absolute poverty barely exists in those countries compared to relative poverty. In the sub-national analysis, the relative poverty approach finds low rates of poverty in the regions where absolute, subjective, and multidimensional poverty rates are quite high. This contradiction stems from that these regions have low levels of median income, and thereby, the relative poverty lines are not adequate to satisfy basic needs.

Graph 7. Trends in Poverty Rates by Definition%



Source: Relative poverty rates are obtained from TurkStat. The rest is author's estimations. Subjective poverty and absolute poverty based on the poverty line of TURK-IS show very high rates compared to the other estimates. Subjective poverty rates are more

than 60% throughout the period, and these high rates are not surprising considering that individuals tend to find their income inadequate. Subjective poverty rates seem quite stable during the period, implying that some part of the population always perceives their income levels as inadequate. When we employ the poverty line of TURK-IS, around 70% of the population is counted as poor. These high rates are not very surprising considering that TURK-IS is a labour union defending the rights of employees. This union plays a significant role in the negotiations on minimum wage each year. Therefore, poverty rates based on the subjective poverty line and absolute line of TURK-IS very likely overestimate poverty in Türkiye. On the other hand, it seems that absolute poverty (estimated via the updated lines) and relative poverty underestimate poverty due to the following reasons. First, the updated absolute poverty lines of TurkStat cannot consider the changes in needs over time. Second, old poverty lines are updated by CPI, but food prices -which constitute a high share of expenditures of the poor- rose more than CPI during the period. There are also heated arguments that TurkStat might underestimate inflation in the country.⁴⁷ In this case, our updated absolute poverty lines might be underestimated as well. As for the relative poverty measure, if the median income level in the country is low, it is very normal to find low rates of relative poverty.

Multidimensional poverty rates are found among these two extreme groups. Moreover, the MPI accounts for not only monetary but also non-monetary aspects

⁴⁷ For example, in 2021, while the annual CPI increased by 36.08% according to TurkStat, it increased by 82.81% according to ENAGrup (<https://enagrup.org/>).

of poverty. Hence, this chapter proposes it as the estimation that reflects actual poverty best.

Table 17 shows how the identification of poor households is sensitive to the definition of poverty using the SILC 2021 dataset. Plenty of households who are not counted as poor in terms of absolute or relative poverty are multidimensionally poor. Only 8.63% of the households are counted poor by both absolute and multidimensional definitions and only 14.13% of the households are counted poor by both relative and multidimensional definitions. These low ratios reveal the sensitivity of poverty measures to the methodology applied.

Table 17. Identification of Poor Households through Different Definitions

Multi-dimensional poverty	Absolute poverty ⁴⁸		Relative poverty ⁴⁹		
	non-poor	poor	non-poor	poor	
	non-poor	68.45%	2.81%	64.7%	6.56%
	poor	20.14%	8.63%	14.61%	14.13%

2.7. Conclusion

This chapter aims to reveal how poverty rates differ by definition and which poverty concept can more accurately capture poverty in Türkiye. Findings show that relative poverty measures are not sufficient to reflect the actual poverty. In particular, if the

⁴⁸ Absolute poverty here refers to absolute income poverty measured through the updated poverty line of TurkStat.

⁴⁹ Relative poverty here measured through the poverty line of 60% of the median equivalised income in SILC 2021.

median income level in a country is low, the relative poverty approach would underestimate the existing poverty. While the estimations of relative and absolute poverty (via the updated absolute line of TurkStat) find less than 20 per cent of the population as poor, more than 60 per cent of the population is counted poor once it is estimated through the subjective poverty line and the absolute poverty line of TURK-IS. A limitation of the absolute poverty measures in this study is that while the updated absolute poverty line of TurkStat is probably underestimated, the TURK-IS' absolute line is overestimated because of the reasons discussed earlier. A more accurate absolute poverty line might have produced similar results to the multidimensional poverty rates. The extremely high rates of subjective poverty found in the study can explain why self-assessed poverty measures are considered unreliable.

This chapter concludes that even if all poverty definitions have some arbitrariness, multidimensional poverty estimation better reflects actual poverty in the country. It outperforms other approaches mostly because multidimensional poverty rates are found among the two extreme groups of poverty rates. Furthermore, the multidimensional poverty concept accounts for both monetary and non-monetary aspects of poverty together. Still, the notable lack of overlaps between various estimations and the inevitable arbitrariness in MPIs (see Ravallion (2011) for a critique of these indices) imply that it would be better for policymakers to consider

various poverty definitions instead of focusing only on a single type of poverty estimation.⁵⁰

Once the poverty trends are examined, it is observed that poverty rates tend to decrease, but the estimations based on the latest surveys detect an increase in poverty rates. Indeed, poverty rates in some regions increased so high that a nontrivial part of the previous achievements melted away. This finding is in line with the recent deterioration in the other economic indicators in the country and implies that even though poverty rates reduce over time, they can easily start to rise again.

Multidimensional poverty estimations reveal that lack of education, followed by health problems, is the sharpest deprivation in general (similar to the findings of Karadağ and Saraçoğlu (2015), Karadağ (2015), Limanlı (2016), and Karahasan and Bilgel (2021)). Even though eight years of education has been compulsory by law since 1997, almost half of the population lives in a household whose average years of schooling among members aged 15 or older are less than eight years in 2021. However, improvements in both average years of schooling in households and literacy rates over time imply that education deprivation will be a less striking problem in Türkiye in the future. Still, the quality of education is open to debate.

⁵⁰ In addition, the multidimensional poverty rates are found higher than that in Karahasan and Bilgel (2021) and Giovanis and Özdamar (2021) probably because those studies investigated the population older than 15 years old and 24 years old, successively. Since the MPI in the current study covers all age groups and child poverty is prevalent in the country, higher rates of multidimensional poverty rates are found here.

Moreover, a notable clustering of poverty is observed in the sub-national estimations. The highest poverty rates are found in South-eastern and Eastern Anatolia no matter which methodology is applied. These findings comply with the previous studies (e.g., Duran, 2015; Karadağ and Saraçoğlu, 2015; Karadağ, 2015; Limanlı, 2016; and Karahasan and Bilgel, 2021). It can be concluded that more public resources need to be allocated for the South-eastern and Eastern regions for poverty alleviation. In the long run, this would not only alleviate poverty in these regions but also help to reduce the huge migration waves from East to West and ameliorate the irregular urbanization and urban poverty in Western cities.⁵¹ It is particularly important considering that millions of poor individuals live in some Western regions (e.g., Istanbul and Izmir), even if poverty rates in these regions are relatively low. The number and the ratio of the poor population need to be evaluated very carefully.

This study suggests that Türkiye requires a more rigorous poverty measurement strategy. The old absolute poverty line of TurkStat needs to be updated because it cannot capture the changes in needs over time even after inflation adjustment. Besides, monetary poverty statistics need to be complemented by multidimensional

⁵¹ As stated by the State Planning Organization of Türkiye (2003, p. 47), there had been an intense migration including capital and young labour force from the least developed regions to the developed regions of Türkiye. Similarly, Karaman and Doğruel (2011) argue that people living in the Eastern regions of Türkiye often migrate to the Western provinces because of the low level of economic activity and poor access to education and health facilities in their regions. These migration flows cause a vicious cycle of underdevelopment, so that government intervention is necessary to break this cycle.

measures. As many other developing countries did, an official and national MPI tailored to the characteristics of Türkiye can be produced similar to the one generated in this study.

Intrahousehold variations cannot be captured in the estimations of this chapter since the unit of identification is households due to data constraints. In addition, even if poverty lines in this study are adjusted by adult equivalence scales and regional price disparities, there might be differences in basic needs even among households of equal size and residing in the same region. Considering the heterogeneity of households and geographic differences, a new poverty measurement approach can be developed similar to the Supplemental Poverty Measure in the US and the Social Metrics Commission in the UK. An elaborative and country-specific poverty measure would provide a vital guide for the allocation of public resources and poverty alleviation strategies.

The next two chapters aim to deepen our knowledge about the determinants of multidimensional poverty. Using micro and macro level datasets, household characteristics and regional factors influencing poverty are investigated, successively.

3. HOUSEHOLD LEVEL EXPLANATIONS FOR POVERTY

As discussed in the previous chapter, poverty measures play a significant role in the fight against poverty. However, measurement of poverty is a necessary but not sufficient condition for the generation of poverty reduction policies. Effective poverty alleviation strategies cannot be developed unless the underlying reasons for poverty are uncovered. Analysing the characteristics of people in poverty can provide some noteworthy implications in this regard.

The aim of this and the next chapter is to find out why some households and regions are poor. While this chapter employs the SILC micro dataset to examine household characteristics influencing poverty, Chapter four uses macro-level data to reveal regional factors in this context. Both chapters use multidimensional poverty as dependent variable since it is suggested as a better poverty measure for Türkiye in the previous chapter.

The findings of these chapters need to be considered as correlates of poverty rather than exact determinants of it. As Haughton and Khandker (2009: 146-147) state, finding the fundamental reasons for poverty is the weakest part of a poverty analysis.⁵² Therefore, findings of the regression analyses need to be interpreted as

⁵² For example, suppose that it is found that unemployment increases the risk of poverty. This finding cannot easily explain why some individuals are unemployed.

proximate causes of poverty instead of deep causes, as Alkire et al. (2015: 296) suggest.

3.1. Literature Review on the Reasons for Poverty

There is a great deal of variation in the explanations for poverty in the literature. This section reviews the previous studies on the causes of poverty, especially those focusing on individuals or households.

3.1.1 Poverty Attributions

Some studies investigate the perceptions about the reasons for poverty. Feagin's (1972 and 1975) three categories of the causes of poverty elicit the most widely accepted beliefs about poverty. These categories are i) individualistic beliefs (lack of effort, lack of thrift, and loose morals); ii) structural beliefs (low wages, failure to provide enough good schools and enough jobs); iii) fatalistic beliefs (bad luck, destiny, sickness, and physical obstacles). Since Feagin's pioneering study, several surveys in many countries have investigated what people believe about the reasons for poverty, and people's beliefs about the causes of poverty can differ from country to country.

By examining several studies on this issue in many countries, Hunt and Bullock (2016) conclude that individualistic beliefs predominate structuralist beliefs in the US, whereas structuralist beliefs are regarded as a much more important explanation of poverty in Europe (including Russia, Türkiye, and Iran). They further argue that while the dominance of individualism causes a fall in the support for redistributive

policies, system-challenging beliefs like structuralism raise the support for redistributive policies.

According to Gilens (1999), American people tend to have individualistic beliefs. They support antipoverty policies only for the "deserving" poor and reject the welfare state for "undeserving" persons. Indeed, poverty alleviation strategies in the US primarily involve targeted, means-tested, and special purpose policies focusing on eligibility criteria to distinguish deserving poor from their underserving counterparts instead of universally available programs such as medical care, childcare or employment assistance (Lein et al., 2016).

There are similar studies conducted in Türkiye as well. For instance, Morçöl (1997) tests the validity of Feagin's causes of poverty in Türkiye by applying a factor analysis based on a survey of 550 participants in 1992. He finds that according to both non-poor and poor individuals in Türkiye, the explanations for poverty are mostly based on structural reasons rather than individualistic factors. This study shows that the perception of Turkish people about the reasons for poverty contrasts with those of US people, but is in line with Italians, French, and French-speaking Canadians.

Another study -following Feagin's poverty attributions approach- aims to explore subjective explanations for poverty in Türkiye conducting a survey of 1,110 participants living in the cities Istanbul, Ankara, and Izmir in 2011 (Özpınar and Akdede, 2022). Findings reveal that the most frequently mentioned explanation for poverty is income inequality followed by lack of basic services, according to the survey participants. It means that the participants tend to prefer the structuralist

approach to explain poverty. Furthermore, respondents who have higher levels of education mostly explain poverty with structural causes, while those who have lower levels of education tend to explain it through the fatalistic view. As for the political position, right-wing participants tend to explain poverty with individualistic factors, while left-wing respondents prefer structural explanations. The best policies for reducing poverty are better income distribution, free education and health services, job creation, and guaranteed minimum income according to the respondents with a structuralist view; association and foundation aid, coal aid, and community aid according to the people believing the fatalistic view; job creation and vocational courses according to the participants with an individualistic view.

Likewise, Açıkalın (2003) conducts a field study on working urban poverty in Istanbul and Gaziantep in 2001. She applies a survey of 100 poor households living in slums in each city. The slums are chosen as the regions where the former peasants migrated from their villages. Findings reveal that 86% of the survey participants believe that the main reason for poverty is the lack of employment opportunities. The second and third reason for poverty is regarded as labour exploitation and corruption, respectively. Moreover, the creation of new jobs is found as the main solution for poverty eradication, followed by promoting educational opportunities. The study addresses that these slum-dwellers are mostly employed in the informal sector and constitute a cheap labour force for precarious and risky jobs. Since child labour is prevalent among these families, upward social mobility for these children seems barely possible.

To examine urban poverty, a survey of 225 households living in the poorest districts of Ankara was conducted in 2003 (Erdem, 2003). According to the survey participants, the most frequent reasons for their poverty are unemployment, low earnings, illness, lack of education, and loneliness, respectively. Moreover, when it is asked survey participants how they can get rid of poverty, 29% of them replied that if they find a job, 17% of them suggest the help of the state, and 7.6% of them suggest the help of philanthropists, while more than 25% of them believe that it is impossible to get out of poverty.

Research on Poverty Perception in Türkiye by Cansuyu Assistance and Solidarity Association (2010) surveyed 1,212 poor individuals and 1,201 philanthropists in 12 cities. According to the survey participants who are in poverty, the main reason for poverty is unemployment (64.8%), low wage (19.9%), low education (10.6%), and having too many kids (2.8%). The philanthropist group states that unemployment (33.1%), economic and social policies of the government (22.8%), low education (17.7%), low wages (16.9%), personal factors (4%), and migration (2.4%) are the main reasons of poverty. Moreover, the poor survey participants state that the main solution for poverty is finding a job (42%), financial assistance (29.8%), credit support to start a business (8.6%), housing assistance (8.5%), vocational education (6%), and social security (4.1%).

3.1.2 Unemployment

Unemployment is often regarded as one of the most prominent reasons for poverty. According to the earliest studies on poverty, unemployment (and also illnesses) were the main reasons for poverty in England (Booth, 1895; Rowntree, 1901).

Unemployment exacerbates the likelihood of poverty not only for the unemployed but also indirectly for the workers through lowering wages (Ricardo, 1931, pp. 81-82). Unemployment causes income poverty by preventing the attainment of financial sources and also leads to multidimensional poverty by adversely affecting the social life of the unemployed. There is a vicious cycle between unemployment and poverty (Gündoğan, 2003). On the one hand, unemployment emerges as a main source of poverty. On the other hand, poverty deteriorates the production-consumption balance, then reduces investments and increases unemployment. Therefore, unemployment can be considered as a both micro and macro-level determinant of poverty. Besides, poverty prevents poor people from accessing education. Therefore, it reduces their employability and increases unemployment risks. Reducing the unemployment rate (Tobin, 1994) and generating employment opportunities for the poor (Freeman, 1991) are considered as the greatest priority to alleviate poverty. Compared to income from social assistance or donation, income from work also supports individual dignity. Karnani (2009) contends that employment provides not only income but also abilities, skills, and self-respect. He stresses the importance of steady employment with reasonable earnings for poverty alleviation.

Hyman Minsky (2013) put forward that poverty is mainly an employment problem. According to him, the reasons for poverty are unemployment, inadequate hours of work, and low wages. He criticizes the War on Poverty in the US⁵³ because it aimed

⁵³ The War on Poverty that started in 1964 was a national strategy for poverty elimination in the US. Later, Ronald Reagan expressed that “*In the sixties, we waged a war on poverty, and poverty won.*”

to change people to eradicate poverty instead of changing the economy. He proposes *tight full employment* as a solution for ending poverty because it would not only eradicate poverty resulting from unemployment but also raise low wages faster than high wages which in turn reduce poverty resulting from low earnings. For this purpose, he suggests the government to be the *employer of last resort* by providing jobs at minimum wage to individuals who desire and are able to work. Expansion of the labour force (i.e., drawing more workers into the labour force to have multiple earners in households) and a welfare system for those who could not work are also other measures against poverty offered by him.

3.1.3 Reasons for in-work Poverty

Even though poverty sometimes results from inadequate employment opportunities, having a job is not always a guarantee to get rid of poverty. According to ILO (2016), low earnings, underemployment, insecure jobs, and unsafe working conditions may lead to in-work poverty, and a decent work is a necessary but not sufficient condition for ending poverty. The poor very often work in vulnerable jobs with irregular earnings, low-skilled occupations, and without social protection (ILO, 2016). Besides, two-thirds of these jobs are in the agricultural sector with low productivity. Therefore, a transformation of jobs is crucial for eradicating poverty.

According to ILOSTAT (2019), 21 per cent of the employed persons in the world were living in households with a per capita income under 3.1\$ (PPP) per day in 2018. The report shows that working poverty rates have a declining tendency over time, but the progress has recently slowed down. After comparing the poverty rates with

the working poverty rates, the report states that *"Employed persons are just as vulnerable to poverty as everyone else."*

Shipliter (2005, p.7) states that *"While the United States has enjoyed unprecedented affluence, low-wage employees have been testing the American doctrine that hard work cures poverty"*. He draws attention to the working poor in the US and contends that it may be more difficult to handle poverty in a wealthy country compared to being poor in an impoverished country. Peña-Casas and Latta (2004) argue that growing precarious work patterns and the rising polarisation between low and high-skilled jobs have generated new risks for in-work poverty. Therefore, the phenomenon of working poverty beginning in the US in the 1970s and 80s has also spread to the EU. They argue that even if low pay increases poverty risks, it may not always give rise to poverty. Being poor or not also depends on whether the worker is the sole earner in the household; or whether the household has children, for example. Especially, single parenting aggravates the risk of in-work poverty. They contend that household context is the predominant factor influencing in-work poverty in EU countries.

Sissons, Green, and Lee (2018) empirically test the linkage between household poverty and sectoral employment structure in the UK and find that the employment sector of the main and also second earner in the household significantly affects the probability of being poor or not. For example, working in accommodation and food services is highly associated with in-work poverty compared to working in the manufacturing sector. Dual-earning households are less likely to be poor in all sectors compared to single-adult households or dual-adult but single-earner

households. Furthermore, poverty rates decrease with age but increase with having kids.

Bodea and Herman (2014) find that precarity and employment vulnerability are the factors behind in-work poverty in Romania whose working poverty rate is the highest in the EU. They address that high shares of agricultural employment and self-employment (particularly, *contributing family workers and own-account workers*) and low levels of labour productivity contribute to employment vulnerability, and thereby adversely affect in-work poverty.

Alisjahbana and Manning (2006) apply a logit model to investigate the relationship between poverty and the labour market status of household heads in Indonesia for the year 2002. They find that fully employed formal sector workers in the non-agricultural sector; professional, managerial, and clerical employees are less likely to be poor, while underemployed household heads in the agricultural sector are very likely to be poor. Being outside the workforce, being unemployed/underemployed, or working in the agricultural sector are associated with a higher probability of poverty. Moreover, as the number of employed household members increases, the probability of poverty declines.

Crettaz (2011) states that low hourly earnings, low labour force participation, and high dependency rates in households are three basic working poverty mechanisms. He argues that working women are less likely to be poor compared to working men because they usually have a full-time working husband while a full-time working man often has a wife who has only a low-wage or no income.

According to Milotay et al. (2022), the labour share of national income (i.e., the share of wages in national income) plays a significant role in poverty and inequality dynamics. They argue that people employed at non-standard jobs (i.e., low-paying, part-time, temporary employment according to the Eurofound definition⁵⁴) and self-employed individuals are among vulnerable groups. Particularly, the rise of precarious employment substantially increased wage inequalities and made these workers prone in case of shocks such as the COVID-19 pandemic. In Türkiye, while the share of wages in national income was 34.4% in 2017, it decreased to 26.5% in 2022.⁵⁵ The fall in the labour share of income sharpens the risks of in-work poverty in Türkiye.

3.1.4 Education and Intergenerational Mobility

While education is a dimension of poverty according to the multidimensional poverty approach, some studies propound that lack of education is a determinant of poverty. According to Case (2006), education not only generates income but also improves health status and reduces fertility rates. It can prevent the intergenerational transmission of poverty. Black and Devereux (2011) state that the intergenerational persistence of poverty can be broken through education policy reforms such as extending the length of compulsory schooling and promoting equal opportunities.

⁵⁴ <https://www.eurofound.europa.eu/topic/non-standard-employment>

⁵⁵ <https://data.tuik.gov.tr/Bulten/Index?p=Donemsel-Gayrisafi-Yurt-Ici-Hasila-IV.-Ceyrek:-Ekim---Aralik,-2022-49664>

Furthermore, Brady, Blome, and Kleider (2016) argue that vocational training/education and apprenticeship are associated with lower poverty because they provide an opportunity to work for individuals who do not have a college degree. They are quite useful in reducing unemployment and thereby poverty.

Poverty and income inequality can easily go hand-in-hand in the case of a lack of intergenerational mobility (Milotay et al., 2022). For example, the share of white-collar children who do not have any white-collar parent is quite low in Eastern and South-eastern European countries. It implies to low intergenerational mobility. According to Esping-Andersen (2004), intergenerational mobility is very prevalent in Nordic countries because they have universal and high-quality childcare. Wealth is a factor helping be out of poverty and it is very dependent on intergenerational transmissions (e.g., by inheritance). Wealth distribution is more unequal than income distribution in the world. Unequal wealth distribution can be an obstacle to getting out of poverty.

Jenkins and Siedler (2007) survey many studies on the connection between childhood poverty and later-life outcomes in industrialised countries and conclude that poverty can easily be transmitted across generations. Parental poverty during childhood is negatively associated with later life chances. As well as parental poverty, other family background characteristics such as schooling and employment of the parents, single parenting, number of siblings, or neighbourhood characteristics can influence the future poverty of the children.

3.1.5 Financial Exclusion

Financial accounts allow their owners to safely store, receive, and send money for daily needs, emergencies, and productive investments (Demirgüç-Kunt, et al. 2021). Financial services and products (e.g., savings, credit, debit cards, etc.) can improve the economic and social development of individuals (Alvarez-Gamboa, et al. 2021). They can facilitate the lives of households and allow them to plan for long-term goals. They can improve the quality of life by allowing for starting or enhancing a business, investing in education or health, and so on.

Financial exclusion causes loss of potential savings, wealth accumulation, and investable funds. Financial inclusion ensures that households and firms have access to resources required for sustaining consumption and investment. It also helps withstand unexpected shocks. Low-income households are the least prepared people against shocks even though they are very often prone to shocks (Moore, et al., 2019). Since poor people usually run farms or small businesses or work at daily jobs without assurance of regular employment, they are quite vulnerable to risks (Banerjee and Duflo, 2012). The land of the small farmers usually is not irrigated, and thereby is dependent on the weather. Bad weather conditions can easily harm their yield and cut their income. Even in “normal” years, agricultural earnings considerably vary from time to time. Therefore, the earnings of people in poverty are frequently volatile in the case of the lack of insurance.

Poor people are also usually faced with health shocks. Gertler and Gruber (2002) state that health shocks such as major illness are very sizable and unpredictable shocks in developing countries. They lead to not only medical care spending but also

loss of income because of the reduced labour supply. By applying a panel data analysis in Indonesia, Gertler and Gruber (2002) show that the consumption level of households decreases by 20 per cent once a household member becomes severely ill. Insurance and other financial products and services can strengthen the resilience of poor households by preparing them for potential risks. By reviewing many randomized controlled trials, Moore et al. (2019) conclude that businesses and households that are included in the financial system are more able to cope with financial shocks.

Microcredits are regarded as one of the key tools in the fight against poverty. The poor are less likely to access formal financial tools as they do not have collateral and do have larger credit risks. Microfinance supports the entrepreneurship of the poor and thereby is regarded as an effective instrument for poverty alleviation. Morduch and Haley (2002) examine many studies on the role of microfinance in poverty reduction and conclude that microfinance increases income and reduces the vulnerability of the poor. Still, they address that microfinance is not good for everyone: Entrepreneurship is key for a successful microenterprise, but ill people, for example, may not be good candidates. Direct assistance would be more useful in this case. Furthermore, they argue that to boost poverty alleviation, microfinance program fundings need to be specifically targeted to the poorest groups rather than those just below the poverty line. They also state that microfinance institutions that focus more on credit than savings are more effective in poverty reduction. According to Banerjee and Duflo (2012), microfinance works for poverty alleviation, but it is not a miracle. It has some limitations: every poor individual is not willing to start a

business even if they can borrow; group members are sometimes reluctant to include other people in their groups whom they do not know well; joint liability may discriminate against those who desire to take risks, and so on.

3.1.6 Literature on Türkiye

Şengül (2003) examines the profile of households in absolute poverty in Türkiye in 1994 and reveals that poor households usually have high household sizes, household heads with a low level of education and working at daily jobs. Another study using HBS 2003 finds that living in a rural area, being employed in the private sector rather than the public sector, employment in the agricultural, forestry, or fisheries sector, having a female household head, a larger household size, a younger household head, and lower level of education are associated with a higher probability of poverty (Akçakaya, 2009).

Kaya (2012) uses HBS 2009 and measures absolute poverty in Türkiye through the poverty line of 4\$ per day suggested by the World Bank for Eastern European countries. Then, probit model results show that education reduces the probability of being poor and marriage is associated with a higher risk of poverty. The second finding might result from not using a control variable such as the number of children, household size, or dependency rate.

Acar (2014) examines the period of 2007-2010 and reveals that homeownership, rental/asset income, and more education reduce the probability of being poor, whereas agricultural employment, to get social welfare income, and large household size increase it. Bayar and Değirmenci (2014) examine the connection between

employment and relative income poverty in Türkiye through a logistic regression using SILC for the years 2006, 2009, and 2011. They find that being employed decreases the probability of poverty and vice versa. Limanlı (2016) investigates the possible determinants of multidimensional poverty in Türkiye using panel data through probit, Heckman, and Stewart models and concludes that being poor in the previous period, being a divorced woman, inability to work -due to illness, disability, or old age- escalate the probability of poverty. While education diminishes poverty risk as expected, household size first increases and after some degree lessens this risk.

By utilizing the Household Budget Survey 2018, Doğan, Madaleno, and Taşkın (2022) investigate the nexus between financial inclusion and poverty in Türkiye. They use the poverty lines suggested by the World Bank, and employ having savings, insurance, credit card usage, and online shopping as indicators of financial inclusion. By applying logistic regression and the two-stage least-squares (2SLS) model -where access to the nearest bank is used as an instrument for financial inclusion-, they find that financial inclusion is a very important policy tool for poverty alleviation in Türkiye.

According to the 2021 annual report of Türkiye Grameen Microcredit Programme (TGMP), TGMP has provided microcredits for more than 200,000 female micro-entrepreneurs in Türkiye since 2003. The impact analysis reveals that microcredits helped women as follows: they increased purchasing power, extended social environment, improved family relations, boosted self-respect, enhanced financial literacy and social life quality.

3.2. Empirical Analysis

This section empirically tests the connections between some household characteristics and multidimensional poverty. Microeconomic techniques are used for this purpose where the unit of analysis is households.

3.2.1 Dataset and Empirical Specification

For this empirical analysis, the SILC micro dataset for the year 2021 is used. Alkire et al. (2015) argue that there is a potential endogeneity risk in micro regressions examining the determinants of multidimensional poverty. They state that although some variables such as education, health-related variables, or unemployment are usually employed as exogenous regressors in the models where the dependent variable is monetary poverty, these variables lead to endogeneity in the case of multidimensional poverty. In other words, using explanatory variables that are also utilized directly to construct the MPI would result in endogeneity. Therefore, we need to restrict the set of regressors to variables that are not directly used in the MPI, such as demographic variables or socioeconomic properties of households. Since multidimensional poverty is suggested as a better poverty estimation in the previous chapter, it is utilized as the dependent variable here. This dependent variable, *poor*, is a binary indicator taking the value one if the household is multidimensionally poor, and zero otherwise. The Bernoulli distribution is appropriate for describing this variable and thereby a logistic model as follows is estimated.

$$\Pr(\text{poor}_i) = \alpha_0 + \sum_{j=1}^5 \alpha_j \text{household type}_{ij} + \sum_{j=6}^9 \alpha_j \text{age group}_{ij} + \alpha_{10} \text{real estate}_i + \alpha_{11} \text{securities}_i + \alpha_{12} \text{number of earners}_i + \alpha_{13} \text{female}_i + \alpha_{14} \text{number of children}_i + u_i$$

Details of the variables are shown in Table 18. All variables are binary variables taking values zero and one, except for the number of children and the number of earners. Reference group in the household type is determined according to within-group poverty rates and the number of observations. The reference group, couple with child, has moderate rates of poverty compared to other groups and a sufficiently large number of observations. Income received from real estate and securities are used as a proxy for wealth. The region of residence of the households is also controlled at the NUTS-2 level. Summary statistics of the variables are provided in Table 19.

Table 18. Definition of The Variables

Variable	Definition
<i>Poor</i>	A binary variable where non-poor households take zero and poor households take one. Poverty here refers to multidimensional poverty estimated in Chapter two.
<i>Household type</i>	Households are grouped as single person, couple with child, couple without child, single parent family (i.e., lone parent with at least one child), extended family ⁵⁶ , and multi-person no-family. The reference household type is <i>couple with child</i> .
<i>Age group of household head (HHH)</i>	Age of household heads are grouped as follows: Under 30-year-old, between 30-40, between 41-50, between 51-60, and above 60. The reference category is <i>under 30-year-old</i> since it is the youngest group.
<i>Real estate</i>	Takes one if the household has income received from rental of assets or lands in the last year, and zero otherwise.
<i>Securities</i>	Takes one if the household has income received from securities in the last year, and zero otherwise.
<i>Number of earners</i>	Number of individuals in the household who have a job at the survey time

⁵⁶ Extended families are households consisting of at least a nuclear family and other individuals.

<i>Female</i>	Female-headed households take one and male-headed households take zero.
<i>Number of children</i>	Number of children in the household
<i>Region</i>	Binary variables taking one if the household lives in that region at the NUTS-2 level. The reference region is TR10.

Table 19. Summary Statistics

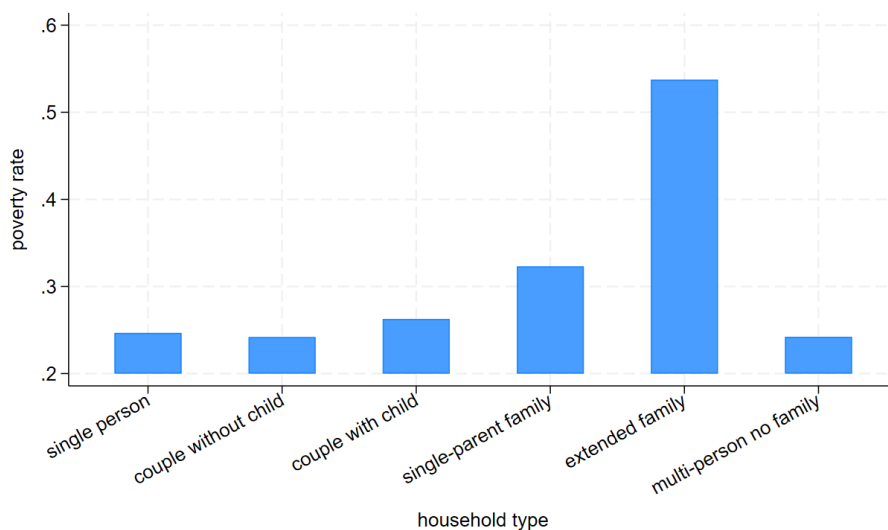
Variable	Observation	Mean	Std. Dev.	Min	Max
<i>Multidimensional poor</i>	26,289	0.29	0.45	0	1
<u><i>Household type</i></u>					
Single person	26,289	0.13	0.33	0	1
Couple without child	26,289	0.19	0.39	0	1
Couple with child	26,289	0.50	0.50	0	1
Single parent family	26,289	0.07	0.26	0	1
Extended family	26,289	0.10	0.29	0	1
Multi person no-family	26,289	0.01	0.12	0	1
<u><i>Age group of HHH</i></u>					
Under 30	26,289	0.07	0.25	0	1
Between 30-40	26,289	0.21	0.41	0	1
Between 41-50	26,289	0.23	0.42	0	1
Between 51-60	26,289	0.20	0.40	0	1
Above 60	26,289	0.28	0.45	0	1
<i>Real estate</i>	26,289	0.13	0.34	0	1
<i>Securities</i>	26,289	0.30	0.46	0	1
<i>Number of earners</i>	26,289	1.05	0.91	0	10
<i>Female HHH</i>	26,289	0.22	0.42	0	1
<i>Number of children</i>	26,289	0.92	1.24	0	10

3.2.2 Descriptive Analysis

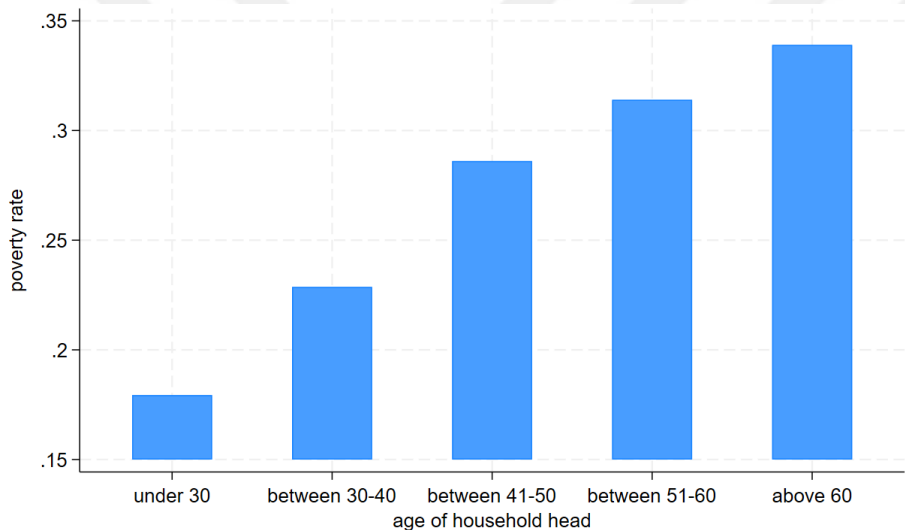
Before starting the empirical analysis, some descriptive graphs are presented that can give preliminary implications regarding the nature of poverty. The following graphs give information about the participants of the SILC 2021 where households are the unit of analysis. Graph 8 shows the multidimensional poverty rates in each

household type. More than half of the extended families are multidimensionally poor. Likewise, single-parent families are more vulnerable to multidimensional poverty than other household types. Graph 9 presents the poverty rates by age group of household heads, and it seems that the higher the age group, the greater the risk of multidimensional poverty. As Graphs 10 and 11 depict, households that have income from real estate or securities have lower rates of multidimensional poverty. It means that the wealthier the household, the lower the risk of poverty, as expected.

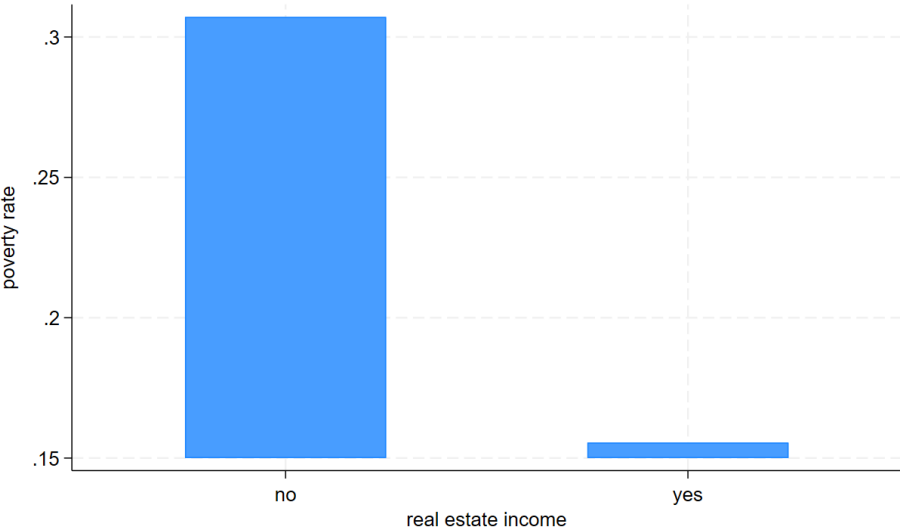
Graph 8. Multidimensional Poverty Rates by Household Type



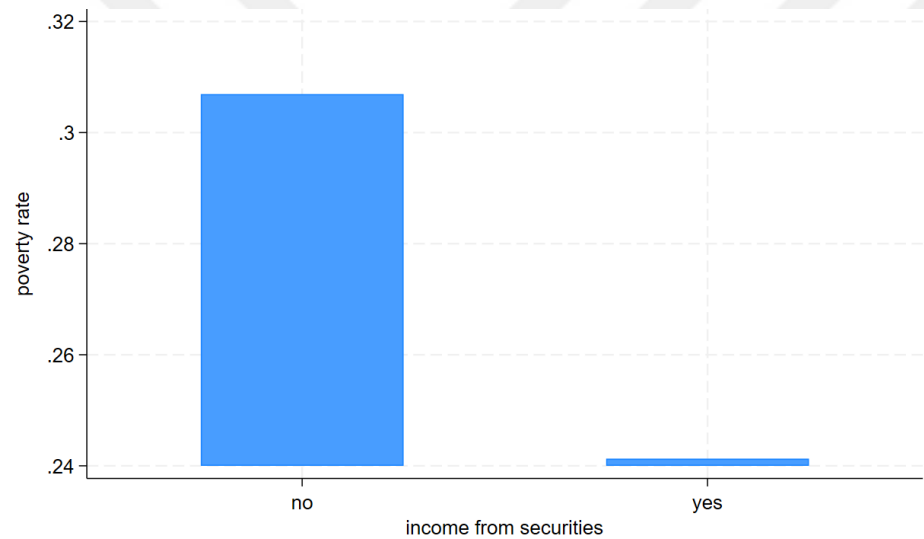
Graph 9. Multidimensional Poverty Rates by Age Group of Household Head



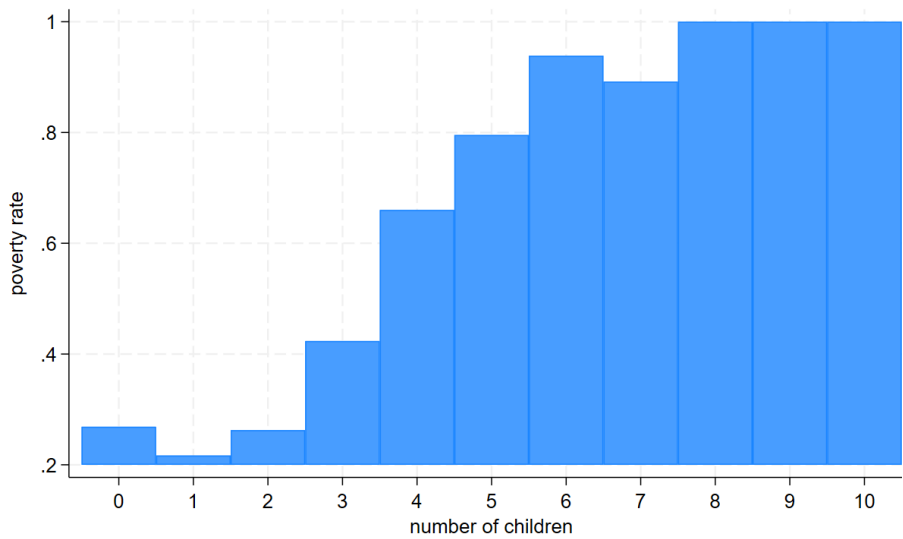
Graph 10. Multidimensional Poverty Rates by Having Real Estate Income



Graph 11. Multidimensional Poverty Rates by Having Income from Securities

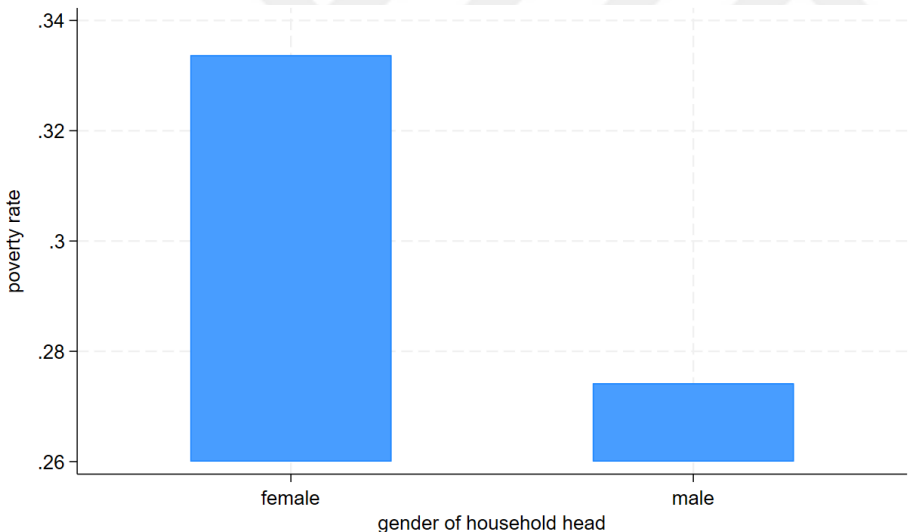


Graph 12. Multidimensional Poverty Rates by Number of Children



Graph 12 demonstrates that having many children considerably aggravates the risk of multidimensional poverty. Graph 13 reveals that female-headed households have higher rates of poverty than male-headed households.

Graph 13. Multidimensional Poverty Rates by Gender of Household Head



Although this descriptive analysis extends our information set about multidimensional poverty, empirical analysis is required for more rigorous implications.

3.2.3 Findings

Sampling weights are employed in the empirical analyses provided by the SILC dataset. They consider unequal probabilities of being included in the sample. Using the survey weights correct this disproportionality and ensure consistency.

Table 20 presents the results of the logit model estimations. In the first four models, explanatory variables are separately incorporated. Model (1) includes only the household types, while model (2) covers just the age group of household head. Having income from real estate and securities -which are proxies for wealth- are incorporated into model (3). Number of earners, number of children, and gender of the household head are employed in model (4). Model (5) covers all of these regressors together, while model (6) also controls the region of residence at the NUTS-2 level.

Table 20. Estimation Results of The Logit Model

	(1)	(2)	(3)	(4)	(5)	(6)
<u>Household type: reference category is couple with child</u>						
single person	-0.183*** (0.0511)				-0.324*** (0.0709)	-0.285*** (0.0732)
couple without child	-0.152*** (0.0448)				-0.0233 (0.0587)	-0.0416 (0.0603)
single-parent family	0.221*** (0.0616)				0.0505 (0.0775)	0.0874 (0.0816)
extended family	1.154*** (0.0539)				0.924*** (0.0628)	1.025*** (0.0654)
multi person no-family	-0.244 (0.158)				0.0624 (0.178)	0.0533 (0.177)
<u>Age group of household head: reference category is under 30</u>						
between 30-40		0.383*** (0.0876)			-0.0283 (0.0924)	0.156 (0.0993)
between 41-50		0.675*** (0.0856)			0.460*** (0.0913)	0.705*** (0.0984)
between 51-60		0.810*** (0.0862)			1.090*** (0.0913)	1.241*** (0.0980)
above 60		0.914***			1.237***	1.399***

	(0.0838)				(0.0893)	(0.0952)
<i>Real estate</i>				-0.854*** (0.0588)	-1.000*** (0.0621)	-0.975*** (0.0640)
<i>Securities</i>				-0.347*** (0.0369)	-0.471*** (0.0392)	-0.466*** (0.0412)
<i>Number of earners</i>				-0.156*** (0.0231)	-0.194*** (0.0250)	-0.194*** (0.0254)
<i>Female head</i>				0.400*** (0.0393)	0.361*** (0.0506)	0.319*** (0.0534)
<i>Number of children</i>				0.347*** (0.0132)	0.450*** (0.0197)	0.321*** (0.0215)
<i>Regions</i>	No	No	No	No	No	Yes
<i>Constant</i>	-1.133*** (0.0237)	-1.726*** (0.0787)	-0.851*** (0.0197)	-1.308*** (0.0330)	-1.853*** (0.0962)	-2.048*** (0.119)
<i>Observation</i>	26,289	26,289	26,289	26,289	26,289	26,289
<i>Pseudo R²</i>	0.0268	0.0102	0.0163	0.0323	0.0963	0.1532

Note: Standard errors in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Model (1) shows that compared to couples with child, households composed of single person and couples without child are less likely to be poor. On the other hand, the probability of poverty is higher among the single parent families and extended families. According to model (2), multidimensional poverty risk escalates as the age group of the household head rises. Model (3) indicates that the probability of multidimensional poverty falls if a household has income from real estate or securities, as expected. Model (4) reveals that the risk of poverty decreases as the number of earners in a household rises, while it increases as the number of children goes up. Furthermore, female-headed households are more likely to be poor than male-headed households. Model (5) includes all these regressors together. It exhibits that although the coefficients of couple without child, single-parent family, and age

group of 30-40 are no longer statistically significant once the other factors are controlled, signs and significances of the other regressors remain unchanged. Model (6) also controls the region of residence of the households and finds very similar results to the model (5). Estimations results of regions are provided in Table A.16 in the annexe which shows that compared to the households living in TR10, households in TR21, TR32, TR41, TR42, TR51, TR72, and TR81 are less likely to be multidimensionally poor, whereas those living in TR61, TR62, TR63, TR83, TR90, TRA1, TRA2, TRB2, TRC1, TRC2, and TRC3 are more vulnerable to poverty.

Since these estimated coefficients are in log-odds scale, they only provide information about the significances and signs of the coefficients. We need marginal effects to interpret the magnitude of the parameters. Table 21 presents the average marginal effects from the model (6) in Table 20. Average marginal effects show the average change in the probability once an explanatory variable changes by one unit (i.e., from zero to one in the case of binary variables). For example, the average marginal effect of being a household composed of single person is a 4.5 percentage points decrease in the probability of being multidimensionally poor compared to a couple with child. On the other hand, being an extended family raises the probability of being multidimensionally poor by 16.2 percentage points. Compared to a household head under 30-year-old, a household head aged between 41-50, 51-60, or above 60-year-old increases this probability by 11.1%, 19.6%, and 22.1%, respectively. Having income from real estate reduces the probability of poverty by 15.4% points, while income from securities decreases this probability by 7.4% points. It means that real estate income is more effective for reducing poverty risk

than income from securities. Having one more household member with a job decreases the risk of poverty by 3.1 percentage points. On the other hand, having one more kid raises the likelihood of poverty by 5.1 percentage points. Moreover, having a female household head increases the probability of poverty by five percentage points.

Table 21. Average Marginal Effects from Logit Model

	dy/dx	Std. Err.	z	P>z	[95% Conf.	Interval]
<i>Household type: reference category couple with child</i>						
single person	-0.045	0.012	-3.92	0	-0.068	-0.023
couple without child	-0.007	0.010	-0.69	0.49	-0.025	0.012
single parent family	0.014	0.013	1.07	0.284	-0.011	0.039
extended family	0.162	0.010	15.93	0	0.142	0.182
multi person no-family	0.008	0.028	0.3	0.764	-0.047	0.063
<i>Age group of household head: reference category is under 30</i>						
between 30-40	0.025	0.016	1.57	0.117	-0.006	0.055
between 41-50	0.111	0.015	7.19	0	0.081	0.142
between 51-60	0.196	0.015	12.82	0	0.166	0.226
above 60	0.221	0.015	14.96	0	0.192	0.250
<i>Real estate</i>	-0.154	0.010	-15.5	0	-0.174	-0.135
<i>Securities</i>	-0.074	0.006	-11.37	0	-0.086	-0.061
<i>Number of earners</i>	-0.031	0.004	-7.68	0	-0.039	-0.023
<i>Female HHH</i>	0.050	0.008	6.02	0	0.034	0.067
<i>Number of children</i>	0.051	0.003	15.22	0	0.044	0.057

Figures 6 and 7 show average marginal effects (AME) from household types and age groups with 95% confidence intervals. It is obvious that the probability of multidimensional poverty is notably higher among extended families and households with older household heads with respect to (w.r.t.) the reference groups.

Figure 6. AME from Household Type (w.r.t. “couple with child”)

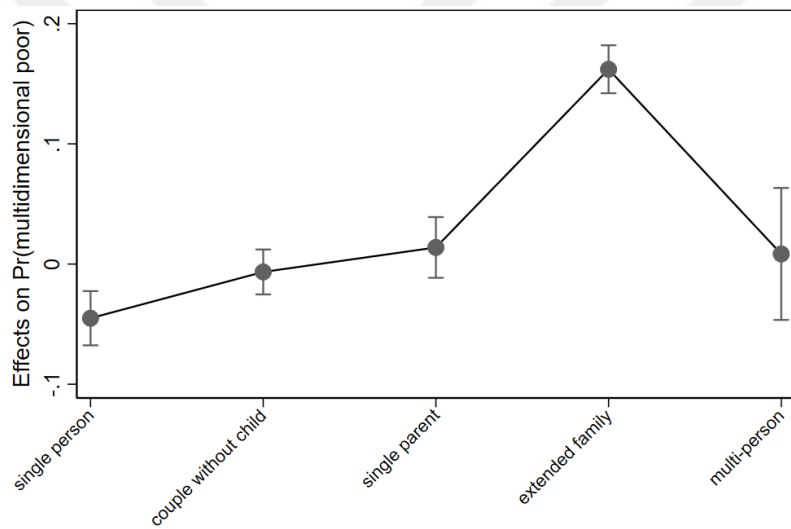
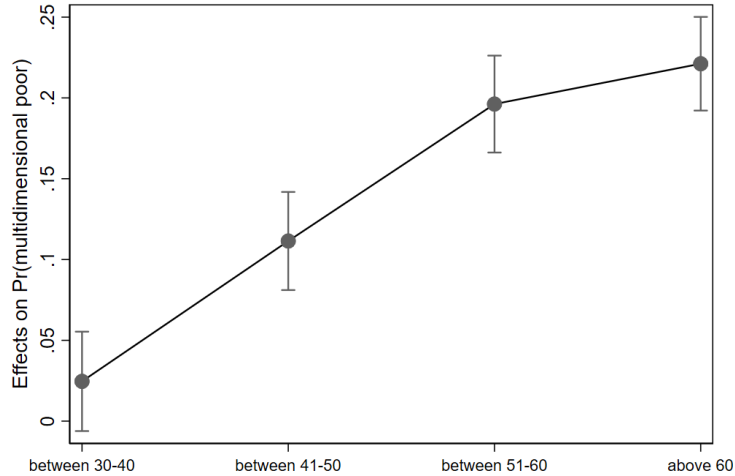


Figure 7. AME from Age Group of Household Head (w.r.t. “under 30”)



3.2.4 Robustness Checks

We also estimate the model (6) using different dependent variables to check for robustness. For this purpose, being multidimensional poor or not is detected through $\frac{1}{2}$ and $\frac{1}{4}$ poverty cut-offs instead of the $\frac{1}{3}$ threshold. In this case, findings can be interpreted as the factors influencing extreme multidimensional poverty (i.e., $\frac{1}{2}$ cutoff) and moderate multidimensional poverty (i.e., $\frac{1}{4}$ cutoff), respectively. Estimation results (i.e., log odds) and average marginal effects are presented in Table 22 and Table 23, successively. Once the pseudo-R-squares are examined, the highest explanatory power is observed in the extreme poverty model. Households whose head is in the group of 30–40 years old have a statistically significant coefficient in the moderate poverty model, while it is insignificant in the other models. Still, the tables show that there is no noteworthy change in the significances and signs of the other coefficients. Hence, these results confirm that our baseline estimation is robust to the choice of poverty cut-off.

Table 22. Estimation Results of the Logit Models ($\frac{1}{2}$ and $\frac{1}{4}$ cut-offs)

poverty-cutoff	$\frac{1}{2}$ (extreme)	$\frac{1}{3}$ (baseline)	$\frac{1}{4}$ (moderate)
<i>Household type: reference category is couple with child</i>			
single person	-0.568** (0.13)	-0.285** (0.07)	-0.28** (0.07)
couple without child	-0.153 (0.11)	-0.042 (0.06)	-0.021 (0.05)
single-parent family	0.189 (0.13)	0.087 (0.08)	0.102 (0.08)
extended family	1.071** (0.09)	1.025** (0.07)	1.056** (0.07)

multi person no-family	0.318 (0.29)	0.053 (0.18)	0.003 (0.16)
<i><u>Age group of household head: reference category is under 30</u></i>			
between 30-40	0.227 (0.16)	0.156 (0.10)	0.22** (0.09)
between 41-50	0.68** (0.15)	0.705** (0.10)	0.744** (0.08)
between 51-60	1.066** (0.16)	1.241** (0.10)	1.276** (0.08)
above 60	1.076** (0.15)	1.399** (0.10)	1.564** (0.08)
<i>Real estate</i>	-1.288** (0.13)	-0.975** (0.06)	-0.89** (0.05)
<i>Securities</i>	-0.402** (0.07)	-0.466** (0.04)	-0.491** (0.04)
<i>Number of earners</i>	-0.202** (0.04)	-0.194** (0.03)	-0.172** (0.02)
<i>Female head</i>	0.467** (0.09)	0.319** (0.05)	0.289** (0.05)
<i>Number of children</i>	0.338** (0.03)	0.321** (0.02)	0.275** (0.02)
<i>Regions</i>	yes	yes	yes
<i>Observation</i>	26,289	26,289	26,289
<i>Pseudo R²</i>	0.1946	0.1532	0.1392

Note: ** p<.01, * p<.05

Table 23. AME from Logit Model ($\frac{1}{2}$ and $\frac{1}{4}$ cut-offs)

Poverty cut-off	1/2	1/3	1/4
<i><u>Household type: Reference category is couple with child</u></i>			
single person	-0.033 (0.008)	-0.045 (0.012)	-0.055 (0.013)
couple without child	-0.009 (0.006)	-0.007 (0.010)	-0.004 (0.010)
single-parent family	0.011 (0.007)	0.014 (0.013)	0.020 (0.015)
extended family	0.063 (0.005)	0.162 (0.010)	0.207 (0.012)
multi person no-family	0.019 (0.017)	0.008 (0.028)	0.001 (0.031)
<i><u>Age group of household head: reference category is under 30</u></i>			
between 30-40	0.013 (0.009)	0.025 (0.016)	0.043 (0.017)
between 41-50	0.040 (0.009)	0.111 (0.015)	0.145 (0.016)
between 51-60	0.063 (0.009)	0.196 (0.015)	0.249 (0.016)
above 60	0.063 (0.009)	0.221 (0.015)	0.306 (0.016)
<i>Real estate</i>	-0.076 (0.008)	-0.154 (0.010)	-0.174 (0.010)
<i>Securities</i>	-0.024 (0.004)	-0.074 (0.006)	-0.096 (0.007)
<i>Number of earners</i>	-0.012 (0.002)	-0.031 (0.004)	-0.034 (0.004)
<i>Female head</i>	0.027 (0.005)	0.050 (0.008)	0.057 (0.010)
<i>Number of children</i>	0.020 (0.002)	0.051 (0.003)	0.054 (0.004)

Note: Standard errors are in parentheses.

3.3. Conclusion

This section empirically investigates the household characteristics potentially affecting multidimensional poverty in Türkiye. Logistic regression models are estimated using the SILC micro dataset for the year 2021. As the dependent variable, multidimensional poverty estimation in Chapter two is preferred to the other poverty estimates because it is considered as a better poverty estimation (due to the reasons discussed in that chapter). Findings reveal that, compared to couples with child, households that are composed of single person are less likely to be multidimensionally poor, while extended families are more vulnerable to poverty. Single-parent families have a higher risk of poverty supporting the findings of Peña-Casas and Latta (2004), but this relationship disappears once the other factors are controlled.

The age group of household heads emerges as another factor influencing poverty. While some previous studies (e.g., Akçakaya, 2009) argue that households with a younger head are more likely to be poor, this study finds that multidimensional poverty probability escalates as the age group of household heads rises. This finding probably arises from the fact that young people often better perform in education and health dimensions in our multidimensional poverty index. It is very normal that the older population is more likely to be deprived in terms of health and education. Wealth can easily influence poverty status, but it is difficult to control it in empirical analyses due to data constraints. Here, we use income from real estate and securities as indicators of wealth and find that income from real estate and income from securities decrease the probability of multidimensional poverty by 15.4 and 7.4

percentage points, respectively. This finding implies that income from real estate is more helpful to be out of poverty compared to income from securities.

High household dependency is often shown as a potential determinant of poverty (e.g., Crettaz, 2011; Özbilgin, 2016). Some previous studies conclude that dual-earning households are less likely to be poor (e.g., Alisjahbana and Manning, 2006; Sissons et al., 2018). In our model, we use the *number of earners in the household* as an explanatory variable and conclude that having one more earner in the household reduces the risk of poverty by 3 percentage points.

Number of children is another factor related to household dependency. Some studies put forward that an increase in the number of children (e.g., Sissons et al., 2018) or household size (e.g., Şengül, 2003; Akçakaya, 2009; Acar, 2014; Ullah et al., 2020) raises the probability of poverty. The findings of the current study reveal that having one more child increases the probability of poverty by 5.1 percentage points.

This study also finds that having households with female household heads are more prone to poverty. This finding is in line with the previous studies (e.g., Akçakaya, 2009). However, the gender of the household head is not a perfect indicator of the gender of poverty. Since the unit of analysis is households here, intra-household inequalities are disregarded. For instance, even if a household is counted as non-poor, female members of that household may be poor (Özar, Kutlu, and Mülâyim, 2022). Frequently, women tend to earn less than men and also spend a lower share of their income on their own needs compared to men. Therefore, if intra-household inequalities were incorporated, the feminization of poverty would probably have been more salient.

In sum, to cope with multidimensional poverty, promoting labour force participation would be an effective policy. It is especially important for women not only because the female labour force participation rate in Türkiye is very low⁵⁷, but also because female-headed households are more likely to be poor as the findings show. In addition, more attention needs to be given to elderly individuals and those living in the prone regions in poverty alleviation policies. Furthermore, as wealth resources are observed as effective tools to alleviate poverty risks, the financial literacy of vulnerable households needs to be improved. Last not but not least, social policies need to be oriented regarding household types because having children, being an extended family, or being a single-parent family exacerbate poverty risks.

⁵⁷ Indeed, with a rate of 37.3%, Türkiye had the lowest female labour force participation ratio among the OECD countries in 2021.

4. REGIONAL EXPLANATIONS FOR POVERTY

This chapter investigates regional factors influencing multidimensional poverty in Türkiye. Some factors beyond household characteristics may lead to poverty. For example, macroeconomic conditions, inequalities, access to credit, or social benefits can play a significant role in explaining why some regions are poorer. This chapter seeks explanations for regional multidimensional poverty using regional MPI estimated in Chapter 2 at the NUTS-2 level for the 2014-2021 period. The next section examines the relevant literature, followed by empirical analyses. Finally, findings are interpreted, and policy suggestions are provided based on the empirical evidence.

4.1. Literature Review

This section examines the previous literature on the macro-level determinants of poverty.

4.1.1 Economic Growth and Inequality

Economic growth is very often regarded as a key to eradicating poverty. According to Ravallion (2001), a 2% yearly growth rate of average household income is associated with a fall in poverty rate by 1 to 7 percentage points. However, inequality can mediate the effect of economic growth on poverty. For example, Ravallion and Chen (2007) observe that high initial income inequality leads to a lower poverty-growth elasticity.

The idea of pro-poor growth lies behind this literature. Economic growth is considered as pro-poor if it brings policies reducing inequalities, generates

employment for the poor, and increases their income levels. Pro-poor growth reduces poverty more than it would have decreased poverty in the case of distribution-neutral growth. Some studies decompose the change in poverty rate into a *growth component* and a *redistribution component*. For example, Ravallion and Datt (1992) decompose changes in absolute poverty rates into growth and redistribution components in India and Brazil during the 1980s. They find that most of the change in the poverty rate results from the growth component rather than the distribution component. Kakwani and Pernia (2000) describe pro-poor growth as a departure from the "trickle-down" theory.⁵⁸ They argue that a strategy which is deliberately in favour of poor people is required for improving pro-poor growth.⁵⁹ Dollar and Kraay (2002) investigate the relationship between the growth rate of average income levels of the poor and the growth rate of all incomes in a large sample comprised of 137 developing and developed countries. Assuming that individuals in the bottom fifth of the income distribution are poor, they find that the mean income levels of the poor increase proportionately with the mean income level in the countries so that economic growth is good for the poor. In other words, economic growth benefits the

⁵⁸ According to the *trickle-down development theory*, poor people benefit indirectly from economic growth via a vertical flow from the rich. It implies that the poor can obtain a smaller proportion of the benefits of economic growth.

⁵⁹ A progressive tax system; public expenditures for health, family planning, and basic education; promoting small and medium-sized enterprises; and easing access to credit are examples of these direct pro-poor policies.

poor on average as much as anyone else in the country (i.e., growth is neither pro-poor nor anti-poor).⁶⁰

Though the literature mainly focuses on monetary poverty, there are a few studies on the nexus between economic growth and multidimensional poverty. For instance, Santos, Dabus, and Delbianco (2017) examine the connection between economic growth and global MPI in 78 countries for the period 1999-2014. By applying a first difference estimator (FDE) model and also a cross-sectional ordinary least squares (OLS) model, they find that economic growth reduces multidimensional poverty. However, its effect is limited as it has an elasticity lower than unity. More specifically, a one per cent rise in the growth rate is associated with a 0.56 per cent decrease in the MPI.⁶¹ Similarly, a recent paper examines the relationship between economic growth and multidimensional poverty -comprised of education, work, and health dimensions- in low and middle-income countries for the period of 1990-2018

⁶⁰ They also find that pro-growth macroeconomic policies including sound financial development, rule of law, low inflation, openness to international trade, and moderate-sized government increase the income levels of the poor people to the same extent that it amplifies the income levels of the other members of the society. Contrary to the "trickle-down" process, their findings suggest that these macroeconomic policies generate a good environment for the poor to raise their income levels as much as anyone else in the country.

⁶¹ They also conclude that economic growth has a higher effect on income poverty compared to multidimensional poverty. Moreover, countries with higher exports, a greater share of industry and services in GDP, and better control of corruption have lower multidimensional poverty.

(Balasubramanian, Burchi, and Malerba, 2023). It finds that a 10 per cent rise in GDP reduces multidimensional poverty by around 4-5 per cent.⁶²

Cashin et al. (2001) review the influence of macroeconomic policies on poverty. They state that the positive effect of economic growth on poverty reduction cannot be taken for granted. Proper conditions such as easing credit constraints, building human capital, and cutting labour market distortions need to be generated for the poor to benefit from economic growth. They argue that macroeconomic policies can lead to higher growth rates, and therefore indirectly reduce poverty. Besides, inflation can exacerbate poverty by reducing real wages. Trade liberalization can promote investment and innovation, create new markets for the poor, and change prices. They further argue that macroeconomic crises usually aggravate income poverty.

4.1.2 Inflation

Some studies discuss that inflation usually hurts the poor more than the rich because the latter tend to protect themselves against (or even benefit from) the effects of inflation. The rich are very often more able to access to financial instruments, whereas the little portfolios of the poor include a larger share of cash. Moreover, the earnings of the poor are frequently not fully indexed to inflation, so the real value of their earnings decreases during times of inflation. For example, Datt and Ravallion

⁶² They further conclude that the size of the growth elasticity is higher for the countries that have lower initial multidimensional poverty. Moreover, this elasticity is found higher for the period of 2001-2018 compared to the previous period.

(1998) find that inflation is negatively connected with mean consumption and positively connected with poverty indexes (i.e., HCR, PGR, and SPG) in rural India. Using polling data from 38 countries for the year 1995, Easterly and Fischer (2001) indicate that the poor are more likely to declare inflation as a main concern compared to the rich. Furthermore, they figure out that inflation is negatively connected with the improvements in the welfare of the poor, the percentage fall in poverty, and the percentage change in the real minimum wage. On the other hand, Cardoso (1992) contends that the inflation tax did not influence the poor in Latin America since their cash holdings were already negligible. Still, she associates higher inflation with lower real wages in Latin American countries.

In an empirical analysis, Omar and Inaba (2020) find that inflation reduces poverty in developing countries probably because inflation increases employment opportunities. Talukdar (2012) examines the effect of inflation on poverty in developing countries and finds that although there is a positive connection between inflation and poverty in general, inflation has a negative influence on poverty in low-income countries in the dynamic panel model.

To figure out if monetary policy can be used for poverty alleviation, Romer and Romer (1998) employ time series data from the US and find that a cyclical boom resulting from expansionary monetary policy is good for the poor in the short run because increasing output and declining unemployment reduce poverty. However, they also use cross-sectional data from many countries and find that low inflation is associated with improved well-being of the poor in the long-term. Therefore, they

conclude that monetary policy targeting low inflation helps permanently improve the conditions of the poor.

4.1.3 Trade Liberalization

Trade policies can influence the welfare of households by affecting prices of consumption goods and production factors, employment, government revenue, and also incentives for investment and innovation (Winters, 2002). Winters, McCulloch, and McKay (2004) review many studies on the relationship between poverty and trade liberalization. They state that even if there is no simple general conclusion, trade liberalization aids economic growth and productivity, and thereby helps poverty alleviation. They conclude that "*trade liberalization can be an important component of a pro-poor development strategy.*" Dollar and Kraay (2004) argue that even if trade liberalisation may hurt some poor people in the short run, it would raise national income and thereby allow for the fiscal ability to offer an effective social protection mechanism. By examining many developing countries since 1980, they conclude that globalisation causes higher economic growth and lower absolute poverty.

Some studies conclude that the link between trade and poverty is unclear. According to Cockburn and Giordano (2008), trade liberalization in developing countries since the late 1980s has not coincided with a proportional fall in poverty as initially expected. They argue that empirical evidence on the nexus between trade and poverty is usually mixed. The effect of trade liberalization on poverty depends on both preexisting conditions (e.g., institutions, geography, and market size), and also

complementary policies that encourage the poor to participate in the emerging opportunities and protect them from possible detrimental effects.

Vos (2008) states that the effect of trade reforms on poverty is unambiguous. Although more trade tends to produce positive effects on aggregate income, this connection varies from country to country and even between different groups within countries. For example, while trade liberalization reduced income inequality in the East Asian countries in the 1960s and 1970s, it more recently increased wage inequality in China. Furthermore, trade liberalization is associated with rising wage inequality in Latin America.

Gauci and Karingi (2008) state that export expansion in Africa did not decrease the poverty rate. Instead, it coincided with a rise in the poverty rate due to the oligopolistic structure of agricultural exports (which is the main source of exports) where the primary beneficiaries are the middlemen. They, therefore, argue that whether a trade policy is pro-poor or not depends on the market structure.

4.1.4 Financial Development

Omar and Inaba (2020) examine the influence of financial inclusion on poverty reduction through panel data from 116 developing countries for the 2004-2016 period. They construct a financial inclusion index including many financial indicators and find that financial inclusion significantly decreases poverty rates and also income inequality in developing countries. Similarly, Bae, Han, and Sohn (2012) examine the connections between poverty, income inequality, and access to finance in the US. They estimate a fixed effects model using state-level panel data

for the 2000-2007 period. Findings indicate that access to finance significantly lessens poverty and income inequality. Likewise, Alvarez-Gamboa, et al. (2021) examine the effect on multidimensional poverty of financial inclusion in Ecuador for the 2015-2018 period and find that financial inclusion significantly reduces multidimensional poverty. Similarly, Park and Mercado (2015) generate a financial inclusion indicator⁶³ for 37 developing Asian economies and find that financial inclusion has positive impacts on the reduction of poverty and income inequality. Mushtaq and Bruneau (2019) test whether the diffusion of information and communication technologies influences poverty via financial inclusion channel using data from 62 countries for the 2001-2012 period. They find a negative connection between financial inclusion and poverty and suggest that promoting e-finance can be a useful instrument for poverty reduction.

Mobile money accounts pave the way for financial inclusion among vulnerable groups (Suri et al., 2023). Mobile money not only significantly decreases transaction costs and time taken for transactions but also improves security and convenience. Suri and Jack (2016) conclude that accession to the Kenyan mobile money system (i.e., M-PESA) reduced poverty by 2 percentage points in Kenya in the long-run which means that about 196,000 families got out of extreme poverty. Moreover,

⁶³ They also estimate a financial inclusion index for 176 countries in the world, and Türkiye is ranked 38th among these countries.

almost 186,000 women changed their occupations from the agricultural sector to the business or retail sector.

A randomized experiment in Bangladesh tests if mobile banking can diminish inequality by modernizing the ways of money transfer (Lee et al., 2021). It introduces mobile banking technology to rural households who are ultra-poor and to their family members who migrated to the city. Findings show that urban-to-rural remittances among mobile banking users rose by 26 per cent, and consequently, rural consumption increased by 7.5 per cent and extreme poverty decreased.

4.1.5 The Role of State

There are various views about the linkage between state policies and poverty. While liberal economists attribute poverty to poor people, Keynesian economists believe that human capital building (i.e., education and training) and amelioratory interventions can prevent poverty (O'Connor, 2016).

Welfare state applications can play a significant role in poverty alleviation. The welfare state refers to social policies and programs which allocate resources disproportionately to the vulnerable groups of a country (Brady, 2009). Its scope may include cash and in-kind assistance, progressive taxes, publicly funded healthcare services, economic security, government activities for social inclusion, and so on. Brady, Blome, and Kleider (2016) state that politics and institutions are neglected but very important reasons for poverty. Politics have the power to determine the distribution of resources, insurance against risks (e.g., unemployment, illnesses, accidents), invest in capabilities (education, health, etc.), and generate

opportunities (like creating jobs). Also, unions can influence poverty directly by improving earnings and working conditions and indirectly by stimulating more generous social policies (Brady et al., 2016). Piketty (2014) argues that a progressive wealth tax system would be a key policy tool to alleviate inequalities.

Brady (2009) contends that there is a considerable cross-national variation in the prevalence of poverty even within rich Western countries. He argues that *"poverty is lower and equality is more likely to be established where welfare states are generous, leftist collective political actors are in power, latent coalitions for egalitarianism exert influence, and all of this is institutionalized in the formal political arena"*.

Brady (2003) evaluates the liberal economic model of poverty using a panel data analysis of 18 Western countries for the 1967-1997 period and finds that the size of the state has a negative effect on relative poverty rates. In other words, as the ratio of government receipts to GDP rises, poverty rates decrease.

According to Milotay et al. (2022), the share of social expenditures in GDP was almost 28% in 2018 in the EU. Old age, healthcare, family/children, and unemployment benefits constitute 85 per cent of the social expenditures. These social expenditures not only combat poverty but also prevent it. Social transfers decreased the at risk of poverty ratio by about 10 per cent in the EU27 (despite the heterogeneity across members). Welfare systems also lower income inequality because social transfers are more equally distributed compared to wages.

By using data from ten European countries⁶⁴, Dewilde (2008) applies a logit model to explain the differences in the incidence of multidimensional poverty between these countries with the disparities in the welfare state regimes. First, she estimates multidimensional poverty among the population under 65 years old in these countries, then reveals that multidimensional poverty risk declines as the unemployment replacement rate and employment protection rise.

On the other hand, liberal economists believe that poverty reduction depends on economic growth, worker productivity, free markets, and reduced unemployment (Brady, 2003). They contend that even if the welfare state can initially decrease poverty, it may deepen it in the long run. According to neoclassical theories, welfare programs make the poor culminate in permanent poverty and retard growth (Somers and Block, 2005). Studies that condemn the welfare state argue that generous welfare benefits might discourage work, reduce savings, and deepen poverty (Danziger, Haveman, and Plotnik, 1981; Murray, 1984). A welfare state characterized by high taxes and a large public sector may harm the international competitiveness of the country (Alesina and Perotti, 1997). Some countries have imposed restrictions on the welfare state approach because of the fear of falling behind in global economic competition.

Lein et al. (2016) mention that since the 1980s, due to the diffusion of neoliberal ideology, the idea of welfare state has been questioned even in the generous Nordic

⁶⁴ Denmark, Belgium, Netherlands, France, Austria, Ireland, Italy, Spain, Portugal, and Greece.

countries. Benefits have become conditional on some behaviours like labour market participation. Lee and Koo (2016) state that the generosity of the welfare state programs has shrunk since the 1990s. A shift has been seen from cash transfers to work-related services such as childcare, or parental leave. Therefore, they argue that welfare states might not effectively benefit the unemployed individuals who struggle with poverty more probably than the employed people. Besides, OECD (2008) report demonstrates that while the poverty risks for older groups declined, these risks increased for the younger individuals because of the upward trend in old-age income security and the fall in the benefits for the non-elderly people. After the global crisis in 2008, the US and many European countries adopted austerity policies and lower public provisions (Lein et al., 2016). States have started to either offer fewer services or serve fewer recipients.

4.1.6 Education

Education is not only a individual-level property related to poverty but also a region or state-level factor. For example, Hidalgo-Hidalgo (2019) examines the long-run effect of childhood-related public policies on poverty in adulthood using EU-SILC and UNESCO databases for 13 European countries and finds that one standard deviation rise in public expenditures on primary education reduces the incidence of monetary poverty in adulthood by 3.1 percentage points.

Banerjee et al. (2016) argue that school enrolment rates rapidly increased in many developing countries over the last decades, but despite this, learning levels remained stagnated. For example, a survey in India unveiled that 39% of the fifth graders could not read even at the level of second-grade, and similar results are obtained in other

developing countries such as Uganda, Pakistan, and Kenya. Therefore, the current problem in developing countries is often the quality of education instead of low enrolment rates.

Van der Berg et al. (2017) argue that the low quality of education received by the poorest children leads to a permanent disadvantage for them compared to the children who receive education from better-performing schools. According to their research, children often attend a school near their home and the schools of the disadvantaged kids tend to have low quality. The education system usually generates outcomes reinforcing the current poverty patterns instead of changing them. Hence, they conclude that this weak quality of education results in a poverty trap.

Similarly, Santos (2011) generates a poverty trap model resulting from differences in education quality. She argues that pupils with low socioeconomic backgrounds receive poor-quality education, while children with favourable socioeconomic backgrounds can access to high-quality education. Furthermore, intergenerational transmission of poverty cannot be broken down since low-quality education is not sufficient to get a decent income to get rid of poverty. To increase the quality of education, she suggests generating policies that attract more senior teachers to disadvantaged schools, school-based health programs, school meal programs, and means-tested voucher programs.

4.1.7 Fertility

Some studies put forward that there is a connection between fertility and poverty. Falling birth rates can increase the labour force participation of women because they spend less time to bring up children, leading to a rise in employment and output.

Eastwood and Lipton (1999) apply cross-national regressions and conclude that higher fertility rates are associated with higher absolute poverty. They contend that this mechanism occurs not only by retarding economic growth but also by skewing distribution to the detriment of the poor.

Wietzke (2020) argues that demographic change is an omitted reason for the global poverty reduction since the 1990s. By using data from 140 countries from the late 1970s to 2016, he argues that there is an inverted-U relationship between poverty and fertility rates. At the earlier stages of demographic transition, rich households start to have lower rates of fertility than poor households, and therefore poverty rates increase. Afterwards, fertility differentials between households from high and low socioeconomic status converge, and then poverty rates fall.

Joshi and Schultz (2007) examine 141 villages in Bangladesh for the period 1974-1996 where half the villages received a family planning program. Their findings show that fertility rates in the program villages decreased by about 15% compared to the control villages. As a consequence of the program, long-run improvements are detected in household welfare indicators such as earnings and household assets, the health of women, and the schooling of children.

Mussa (2014) investigates the effect of fertility on both objective and subjective poverty in Malawi. He finds that fertility increases the risk of objective poverty (measured through household consumption data), whereas it decreases the probability of subjective poverty (measured through self-rated well-being evaluations). He explains the latter finding with the sociocultural context of Malawi where having more children is treated with respect and elevates the status in society.

4.1.8 Rural Underdevelopment

It is often argued that rural poverty is more pervasive than urban poverty. According to Lipton (1977), the real explanation of poverty is the *urban bias* which is the failure of development to benefit the rural poor. Rural poverty usually results from the lack of opportunities such as stable jobs and good education leading to the concentration of poverty and its reproduction from generation to generation. Slack (2010) shows that rural workers in the US are 1.62 times more probably poor than urban workers. In other words, working poverty is much higher in non-metropolitan places than that in metropolitans. Probably, the poor in rural areas are rewarded less even if they work hard resulting from low wages and part-time employment.

Lichter and Schafft (2016) state that rural poverty was almost twice as much as urban poverty in the US in 1959. Then, poverty rates in both metropolitan and non-metropolitan parts of the US decreased significantly during the 1960s coinciding with the War on Poverty. However, there has been little progress in poverty reduction since the 1970s. They contend that rural poverty is spatially concentrated, chronic, and fortified by the lack of jobs and family demographics.

4.1.9 Other Factors

Some studies examine the effects of various factors on poverty. For instance, Klump and Prüfer (2006) apply the Bayesian Model Averaging method to figure out the factors influencing poverty in Vietnam and find that a high Gini and birth rate are the most important reasons for poverty, whereas urbanization helps reduce it.

Chen, Leu, and Wang (2019) measure multidimensional poverty in Taiwan for the year 2009 and seek possible explanations for it. They find that while micro-level factors influencing multidimensional poverty are household size, age, marital status, socioeconomic status, and household income; macro-level factors are the ratio of employment in services to the manufacturing sector and urbanization.

Rupasingha and Goetz (2007) seek explanations for poverty in 3,047 counties in the US using the family poverty rate for the year 1999 and ten-year lagged explanatory variables including economic and structural factors, demographic properties, and social and political characteristics. By applying spatial econometric techniques, they find that having more children, economic polarization, income inequality, and ethnic heterogeneity significantly increase poverty rates, whereas higher education level, employment rate, female labour force participation, social capital, and political competition lower poverty. They also find that higher per capita federal grant funding is associated with higher poverty rates and interpret this finding as follows. While there may be reverse causality (i.e., federal grants may be directed to poorer regions), it is also possible that these grants may be given to seek patronage by politicians rather than targeting to reduce poverty.

Ullah, Majeed, and Mustafa (2020) explore determinants of poverty in 148 districts of Pakistan through spatial autoregressive models. Findings reveal that poverty rates rise as the average household size and the share of the young population increase. Furthermore, an increment in government jobs, average rainfall, road infrastructure, and population growth reduce poverty.

4.1.10 Literature on Türkiye

Demir Şeker and Jenkins (2013) apply a poverty decomposition method and conclude that the decline in the absolute poverty in Türkiye from 2003 to 2011 was largely due to the changes in the economic growth rate instead of the changes in the income distribution, or in the distribution of poverty risks.

Özbilgin (2016) analyses the factors affecting urban poverty in Türkiye over the 2008-2014 period through spatial panel data analysis. He uses the change in the number of poor measured by TurkStat based on the relative poverty line as the dependent variable and concludes that population growth in the urban areas and increasing dependency ratio cause urban poverty, while growth in employment in the services sector and exports per capita decrease it.

Şahin and Aydın (2017) apply a cointegration test at the NUTS-1 level and find that there was a long-run correlation between poverty rates and population density, unemployment rates, net migration rates, and schooling rates in Türkiye for the period of 2007-2014.

In another study, drivers of regional poverty reduction and poverty convergence in Türkiye are examined using international poverty lines (i.e., 2.5\$ and 5\$ per person per day) from 2006 through 2013 (Azevedo, et al. 2016). It is found that poverty rates decreased (but heterogeneously) across regions, and the growth in the agricultural and services sector (through job creation channel), and the increases in central spending (e.g., social security payments) are mentioned as the drivers of the regional poverty reduction. Moreover, the study finds no income poverty

convergence because of the polarizing trends in the Eastern regions. Once the Eastern regions are excluded, poverty convergence is observed in the rest of the country.

Aksoy (2021) investigates the income and inequality elasticities of relative poverty in the NUTS-2 level regions of Türkiye for the 2014-2018 period and finds a very strong and positive relationship between the Gini coefficient and relative poverty. Furthermore, this connection is found stronger in the regions where agricultural income is higher than the median income, whereas it is weaker in the regions where income from industrial and services sectors is higher.

4.2. Empirical Analysis

In this section, a balanced panel dataset from 26 NUTS-2 level regions of Türkiye covering the 2014-2021 period is employed. MPI in each region is used as the dependent variable in the empirical model.

4.2.1 Methodology

There are a vast number of regional factors possibly affecting poverty and therefore it is very hard to generate a single robust model explaining it. Standard statistical techniques are based on first choosing a model from some class of models, and then estimating the parameters of this model as if the chosen model had generated the data. Yet, any uncertainty regarding the selection of regressors is ignored in this approach, and estimation results are conditioned on the chosen model, which leads to overconfident inferences (Hoeting, Madigan, Raftery, and Volinsky, 1999).

In this study, we utilize Bayesian Model Averaging (BMA) approach to unveil the most important influencers of regional poverty. Under model uncertainty, BMA is a

very useful method because it averages over all possible models instead of choosing a unique model. It decreases the overconfidence in the model selection as it provides inference by averaging the results over all candidate models through posterior model probabilities as weights. To the best of our knowledge, the present study is the first one examining the potential determinants of poverty in Türkiye through the Bayesian framework.

Assuming that we have k regressors, BMA model space covers 2^k models composed of all possible combinations of inclusion or exclusion of each of the k regressors. The considered models are indicated by H_i where $i=1, 2, \dots, 2^k$. In the BMA framework, model H is a random variable with prior $pr(H)$ distributed over the model space. The likelihood of H is the probability of the observed data with respect to H (i.e., $pr(data|H)$). Then, according to the Bayes rule, the posterior probability of H is:

$$pr(H|data) = \frac{pr(data|H) pr(H)}{\sum_{i=1}^{2^k} pr(data|H_i) pr(H_i)}$$

$pr(H|data)$ is the posterior model probability (PMP) which is a key statistic in the BMA inference. Assuming that we have a regression coefficient β , and its estimation $\hat{\beta}_{H_i}$ w.r.t. model H_i where coefficients of predictors out of the model are set to zero, the model weighted estimation is:

$$\hat{\beta}_{BMA} = \sum_{i=1}^{2^k} pr(H_i | data) \hat{\beta}_{H_i}$$

Posterior inclusion probability (PIP) of a regressor -which is another key statistic of BMA- is the sum of the posterior probabilities of all models including that regressor.

Let $\gamma_i = 1$ indicate the inclusion of a variable in a model, and $\gamma_i = 0$ vice versa. Then PIP of the variable is:

$$pr(\gamma_{i=1} | \text{data}) = \sum_{H \in \hat{H}: \gamma_i=1} pr(H | \text{data})$$

BMA framework requires prior distributions for the parameters which are the initial beliefs about the relative plausibility of the parameters before the data is seen. The choice of prior can substantially influence the results. It is usual to assume that all models have equal probability a priori (Hinne et al., 2020). According to Hoeting et al. (1999), the assumption of equal prior for all models is a reasonable "neutral" choice. Following this standard practice, we utilize a uniform prior distribution approach which gives equal probability to each model (i.e., $pr(H) = 2^{-k}$). Still, robustness checks are required to verify that findings are not dependent on arbitrary selection of priors. We, therefore, also employ binomial and beta-binomial model priors for robustness checks. Another prior is the one on regression coefficients. It is usual to assume a conservative prior mean of zero which reflects that there is not much information about the coefficients. The g prior is a hyperparameter indicating how certain the researcher is that the coefficients are zero. A small g means that the researcher is very certain that the coefficients are zero, whereas a large g indicates that the researcher is quite uncertain that the coefficients are zero. Following the usual approach in the literature, the unit information prior (UIP) on Zellner's g prior is employed here.

Finally, after the baseline analysis, we also employ convergence club analysis to deal with the within-country heterogeneity. To cluster the regions into clubs with similar

convergence properties, we follow the Phillips and Sul (PS) approach which is a regression-based convergence test and a method to cluster panels into club convergence groups. According to the poverty convergence concept, economies starting with prevalent poverty would have a higher subsequent growth rate and thereby a higher reduction in poverty rate (Ravallion, 2012b)⁶⁵.

Phillips and Sul (2009) argue that least squares regressions used in the standard convergence tests suffer from omitted variables and endogeneity since they do not consider heterogeneous technological progress. The PS framework has some advantages compared to the traditional convergence methods. First, rather than homogeneous technological progress, it relies on heterogeneous technological progress which is region and time varying. Moreover, it does not require the assumption of common stochastic trends in time series and also allows for overall convergence, club convergence, and divergence. In this approach, panel data X_{it} is decomposed into a transitory factor (δ_{it}) and a common factor (μ_t).

$$X_{it} = \delta_{it} \mu_t$$

The common factor μ_t can be eliminated by scaling, then the relative transition coefficient (h_{it}) is obtained as follows:

⁶⁵ Ravallion (2012b) examined the poverty rates of 90 developing countries and found no sign of convergence. Even though the overall poverty rate of developing countries has decreased since the 1980s, the proportionate rate of fall was not higher in the poorest ones among these countries. His findings suggest that high initial poverty had a negative direct effect on growth, and also high initial poverty attenuates the influence of growth on poverty.

$$h_{it} = \frac{X_{it}}{\frac{1}{N} \sum_{i=1}^N X_{it}} = \frac{\delta_{it}}{\frac{1}{N} \sum_{i=1}^N \delta_{it}}$$

The relative transition parameter, h_{it} , traces out a transition path in relation to the panel average. The cross-sectional mean of h_{it} is unity. If δ_{it} converges to δ , then h_{it} converges to unity. In this case, cross-sectional variance of h_{it} (indicated by H_{it}) converges to zero in the long-run:

$$H_t = \frac{1}{N} \sum_{i=1}^N (h_{it} - 1)^2 \rightarrow 0 \text{ as } t \rightarrow \infty$$

This property is utilized for testing the null hypothesis of convergence and grouping regions into convergence clusters. The PS approach generates a semiparametric model for the transition factors as follows:

$$\delta_{it} = \delta_i + \sigma_{it} \xi_{it} \quad , \quad \sigma_{it} = \frac{\sigma_i}{L(t)t^\alpha} \quad , \quad t \geq 1, \quad \sigma_i > 0 \quad \forall i$$

where ξ_{it} is an iid (0,1) weak dependent random variable, $L(t)$ function represents the slowly varying component such as $\log(t)$, and α measures how fast cross-sectional variations decay to zero over the transitions. This model allows for slowly varying functions $L_i(t)$ that differ over i , and individual specific decay rates α_i .

This formulation ensures that $\delta_{it} \rightarrow \delta_i$ as $t \rightarrow \infty$ and $\alpha \geq 0$, and this is the null hypothesis of convergence against the alternative hypothesis of no convergence:

$$H_0 : \delta_i = \delta \text{ and } \alpha \geq 0$$

$$H_1 : \delta_i \neq \delta \quad \forall i \text{ or } \alpha < 0$$

Then, the following regression -also called $\log(t)$ regression- is estimated by OLS.

$$\log\left(\frac{H_1}{H_t}\right) - 2\log L(t) = \hat{a} + \hat{b}\log t + \hat{u}_t \quad , \quad \text{for } t=[rT], [rT]+1, \dots, T \text{ with } r>0$$

where $L(t)=\log(t+1)$, $\hat{b}=2\alpha$ and α is the decay rate (i.e., a measure of convergence speed). PS suggests discarding some fraction “r” of the time series data and setting this truncation parameter at $r=0.3$. Then, a one-sided t-test with HAC standard errors is applied. The null hypothesis is rejected if $t_{\hat{b}} < -1.65$ at the 5% level. On the other hand, if $t_{\hat{b}}$ is above -1.65, the null hypothesis of convergence cannot be rejected. In this case, whether there is absolute or conditional convergence depends on the magnitude of b . If $b \geq 2$ (i.e., $\alpha \geq 1$), then the common factor μ_t is random walk which implies to absolute convergence in the levels. If $2 > b \geq 0$, conditional convergence exists at the growth rates.

Even if we reject the null hypothesis of convergence, there may be convergence in subgroups. The PS approach has a specific interest in the case of divergence as it allows for the possibility of club convergence clusters. To test for club convergence, the following steps are applied. Regions in the panel are ordered according to the last time series observation. The first k highest regions in the panel are selected to form the core group for some $N > k \geq 2$. Afterwards, $\log(t)$ regression is run to estimate the convergence test statistic for this group. By adding regions one by one, this convergence test is repeated. For the regions out of the core group, another group is formed, and the $\log(t)$ test is applied to see if this subgroup converges. The process is replicated for all regions. If there are remaining regions that do not converge, it is concluded that these units are divergent. Finally, convergence clubs may be merged if the convergence hypothesis is jointly fulfilled by consecutive clubs.

4.2.2 Dataset and Empirical Specification

We include many variables in our BMA space that are theoretically expected to influence multidimensional poverty. In this way, possible endogeneity resulting from omitted variable bias is minimized. In the model below, natural logarithm of real GDP per capita, Gini, unemployment rate, natural logarithm of social assistance in real terms, natural logarithm of credits per adult in real terms, early motherhood rate, inflation, exports rate, imports rate, net migration rate, and student per teacher are used as explanatory variables.

$$MPI_{it} = f(\log(GDP_{\text{industry}}), \log(GDP_{\text{services}}), \log(GDP_{\text{agriculture}}), \text{Gini}, \text{unemployment}, \log(\text{social assistance}), \log(\text{credits}), \text{early motherhood}, \text{inflation}, \text{exports rate}, \text{imports rate}, \text{net migration}, \text{student per teacher})_{it}$$

where $i=26$ regions at the NUTS-2 level and $t= 2014, \dots, 2021$.

GDP variable is composed of three main sectors (i.e., industry, services, and agriculture), and each of them is incorporated into the model separately. Gini is an indicator of income inequality. Social assistance variable represents the government policy towards poverty alleviation. Per capita credit is an indicator of accession to credits. Early motherhood rate is a variable not only about being a mother at a young age but also a deeper indicator for gender discrimination and social institutions in the region. It carries information about the role of girls in society and can also be interpreted as a proxy for the “child bride” issue. Inflation has been a striking challenge in Türkiye for years, and examining its effect on poverty would be relevant. Export and import rates are incorporated into the model to see the links between trade openness and poverty. Migration may also be a relevant variable to

explain poverty. Finally, the number of students per teacher is employed as a proxy for the quality of education. As the number of students per teacher increases it is expected education quality to fall.⁶⁶ Definition of the variables and summary statistics are given in Tables 24 and 25. Moreover, the correlation matrix of the regressors is shown in Table A.17 in the annexe.

Table 24. Definition of the Variables

Variable	Definition	Source
<i>MPI</i>	Multidimensional poverty index (H*A) (estimated in Chapter 2)	Author (via the SILC dataset)
<i>log(GDP_{industry})</i>	Natural logarithm of real GDP per capita (industry)	TurkStat
<i>log(GDP_{services})</i>	Natural logarithm of real GDP per capita (services)	TurkStat
<i>log(GDP_{agriculture})</i>	Natural logarithm of real GDP per capita (agriculture)	TurkStat
<i>Gini</i>	Gini coefficient	TurkStat
<i>unemployment</i>	Unemployment rate	TurkStat
<i>log(social assistance)⁶⁷</i>	Natural logarithm of the real value of per capita social security and social assistance expenditures (TL)	Ministry of Treasury and Finance
<i>log(credits)</i>	Natural logarithm of the real value of total credits per adult ⁶⁸	The Banks Association of Türkiye
<i>early motherhood</i>	Ratio of births by mothers under 18-year-old to total births	TurkStat

⁶⁶ There are many studies regarding the negative effect of class size on the quality of education. For example, Kokkenlenberg, Dillon, and Christy (2008) investigate the effect of class size on student grades using information from 760,000 students and find that as the class size increases, average grade point falls even after student ability, peer effects, minority status, gender, and many other factors are controlled. Therefore, they conclude that there are diseconomies of scale in the link between class size and student outcomes.

⁶⁷ Social assistance includes sickness and disability benefit, old-age benefit, widow and orphan pension, family and child benefit, unemployment benefit, housing benefit.

⁶⁸ Adult is defined here as the individuals aged 20 or above.

<i>inflation</i>	Consumer Price Index (CPI): Rate of change in 12-months moving averages	TurkStat
<i>exports rate</i>	Total value of exports divided by GDP (\$)	TurkStat
<i>imports rate</i>	Total value of imports divided by GDP (\$)	TurkStat
<i>net migration</i>	Net number of emigrants per thousand people who can migrate ⁶⁹	TurkStat
<i>student per teacher</i>	Number of students per teacher (primary school)	TurkStat

Table 25. Summary Statistics

Variables	Median	Mean	Min.	Max.
<i>MPI</i>	0.149	0.189	0.040	0.505
<i>log(GDP_{industry})</i>	8.341	8.293	6.644	9.741
<i>log(GDP_{services})</i>	8.887	8.964	8.247	10.185
<i>log(GDP_{agriculture})</i>	7.351	7.207	3.576	8.129
<i>Gini</i>	0.355	0.354	0.281	0.451
<i>unemployment</i>	0.099	0.110	0.034	0.335
<i>log(social assistance)</i>	4.344	4.345	3.469	4.898
<i>log(credits)</i>	9.146	9.210	8.216	10.752
<i>early motherhood</i>	0.010	0.011	0.002	0.039
<i>inflation</i>	0.119	0.126	0.058	0.232
<i>exports rate</i>	0.107	0.13	0.004	0.523
<i>imports rate</i>	0.07	0.122	0.005	0.589
<i>migration</i>	-1.480	-0.838	-35.15	60.26
<i>student per teacher</i>	16	16.55	13	25

As suggested by Santos et al. (2017) and Balasubramanian et al. (2023), the effects of the changes in some variables are not simultaneously observed on multidimensional poverty. These effects may emerge over time, so that lagged explanatory variables would allow us to capture these connections. Using lagged

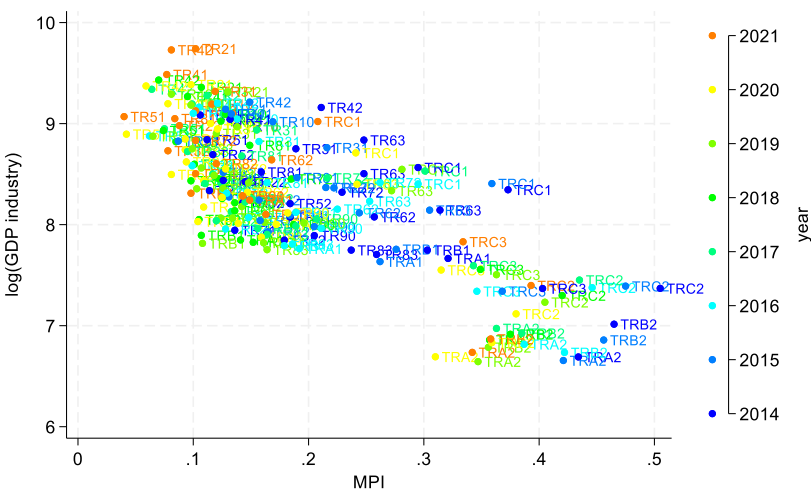
⁶⁹ Net migration in a region is positive if it receives more people than it sends out.

regressors also minimizes potential endogeneity in the model. Therefore, three different estimations are conducted in this chapter. The first one includes the current values of the regressors, while the other two models utilize the first and fifth lags of the explanatory variables. These models would allow us to observe the effects at different time periods. The dependent variable, MPI, in all models is from 2014 to 2021. In the first lag model (t-1), regressors are from 2013 to 2020, while regressors in the fifth lag model (t-5) are from 2009 to 2016. The lagged models are defined in this way to avoid loss of observation. Some variables are not included in the lagged models due to data unavailability.

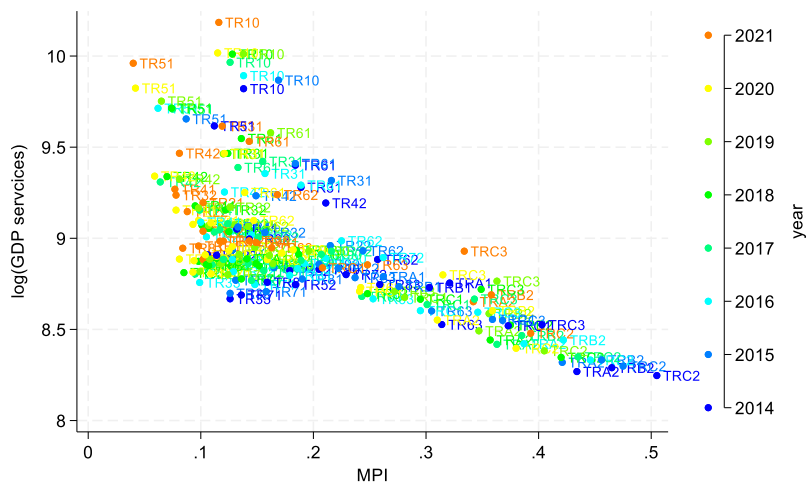
4.2.3 Descriptive Analysis

Before starting the empirical analysis, some descriptive analysis is presented in this sub-chapter. It seems that MPI falls as GDP per capita from industry and services sectors increases (see Graphs 14 and 15). On the other hand, the link between GDP per capita from the agriculture sector and MPI is unclear, and TR10 (Istanbul) emerges as an outlier (see Graph 16). According to the other graphs, a rise in Gini, unemployment rate, early motherhood rate, and the number of students per teacher exacerbate MPI. The nexus between social assistance and MPI seems unclear. Furthermore, MPI decreases as access to credits improves. Likewise, a negative relationship seems between migration and MPI. The nexus between inflation and MPI is more complex. While a notable variation in inflation rates is observed from year to year, inflation does not differ that much between regions. Finally, an increase in the export rate reduces MPI, but TRC1 seems like an outlier. MPI also falls as the import rate rises. Similar relations are observed with the lagged regressors.

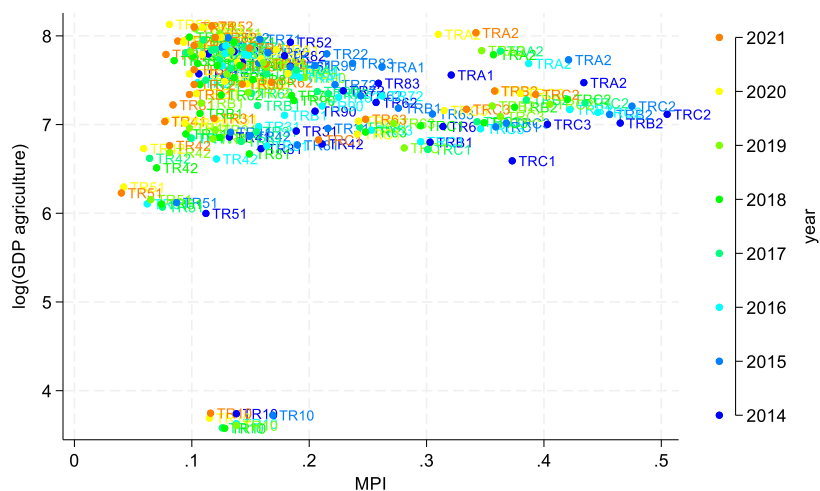
Graph 14. MPI and GDP per capita (Industry)



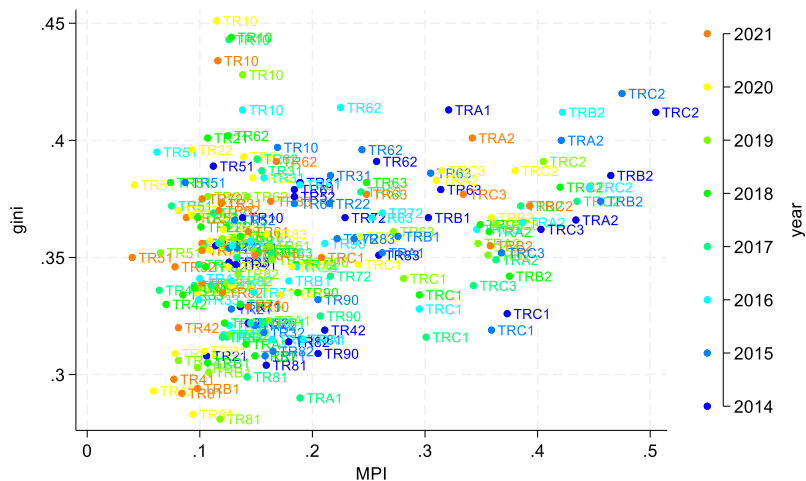
Graph 15. MPI and GDP per capita (Services)



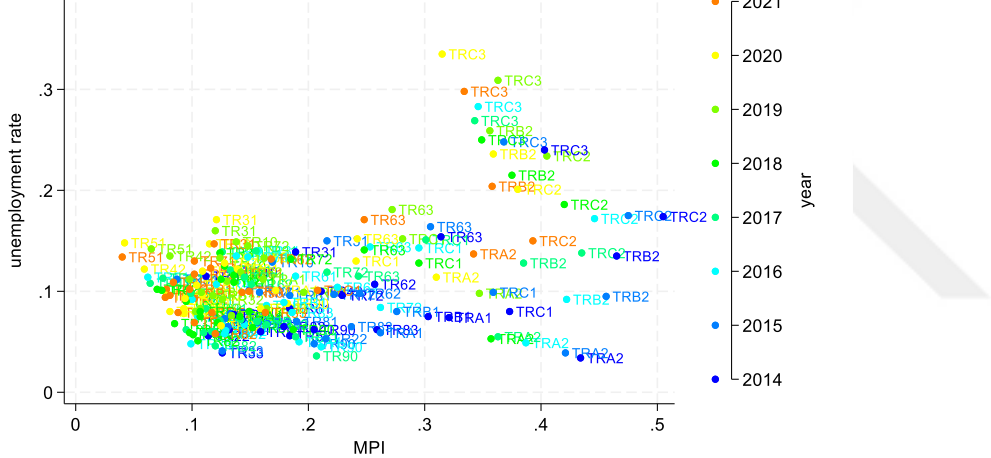
Graph 16. MPI and GDP per capita (Agriculture)



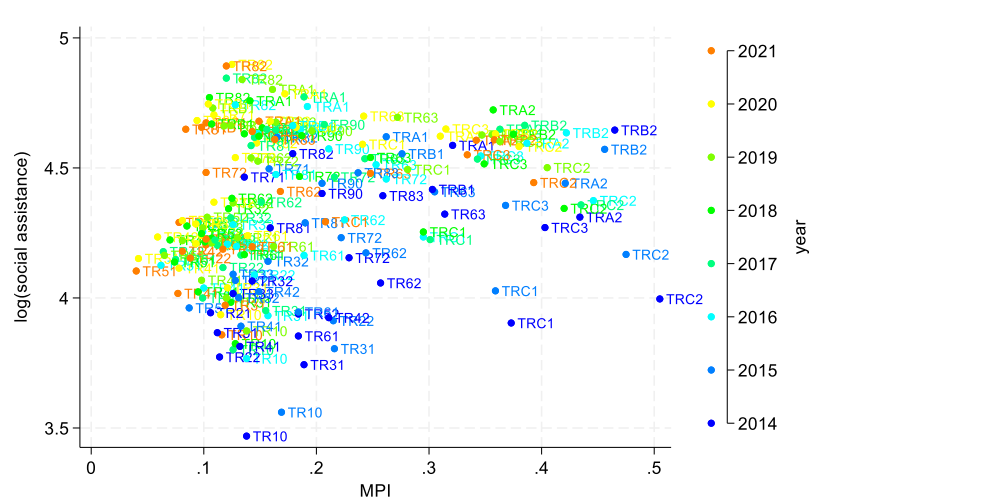
Graph 17. MPI and Gini



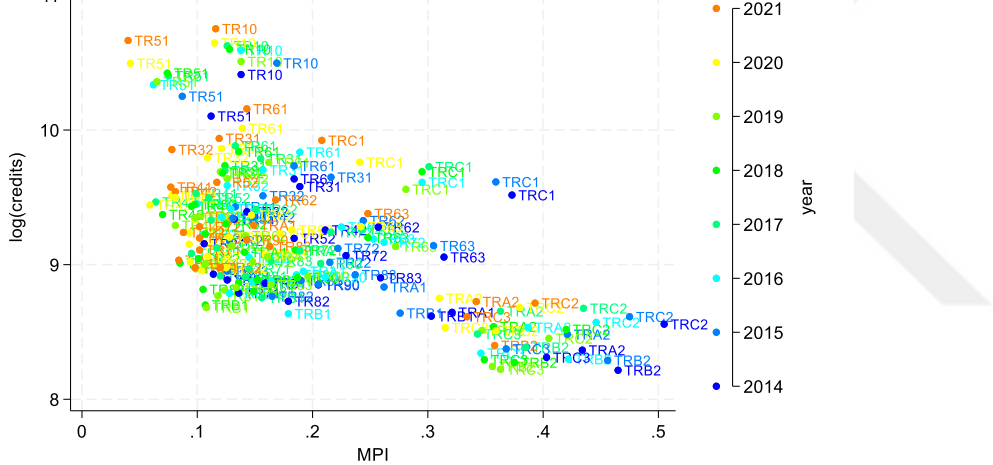
Year	MFL	Unemployment Rate
2010	0.40	0.10
2011	0.41	0.11
2012	0.42	0.12
2013	0.43	0.13
2014	0.44	0.14
2015	0.45	0.15
2016	0.46	0.16
2017	0.47	0.17
2018	0.48	0.18
2019	0.49	0.19
2020	0.50	0.20
2021	0.51	0.21
2022	0.52	0.22
2023	0.53	0.23
2024	0.54	0.24



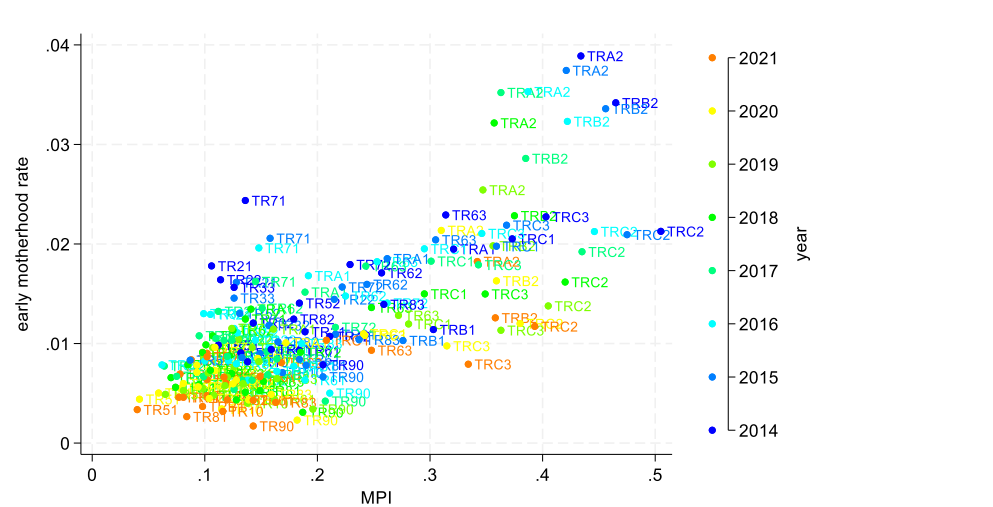
Graph 19. MPI and Per Capita Social Assistance



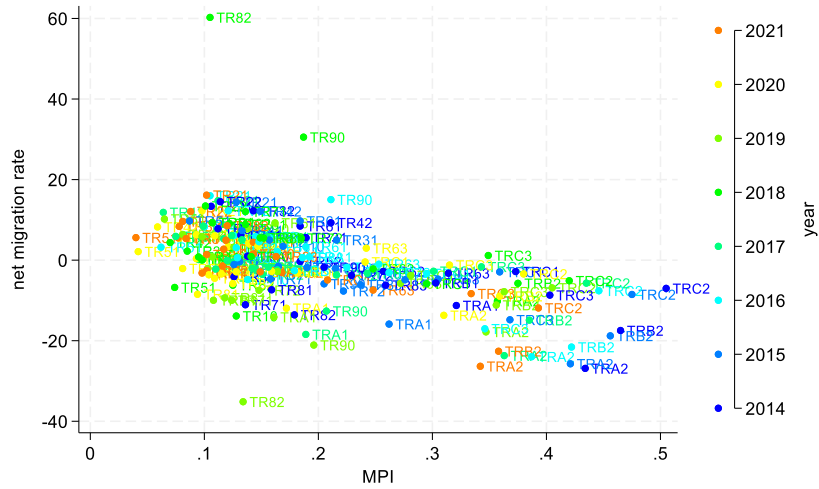
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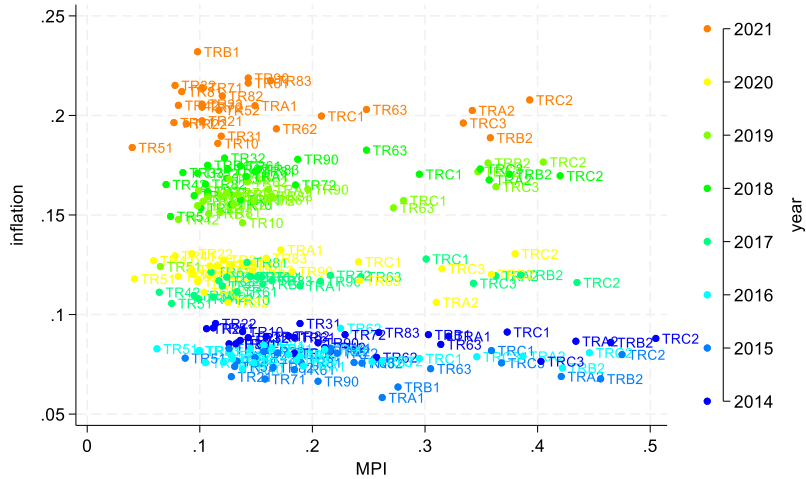
Graph 21. MPI and Early Motherhood Rate



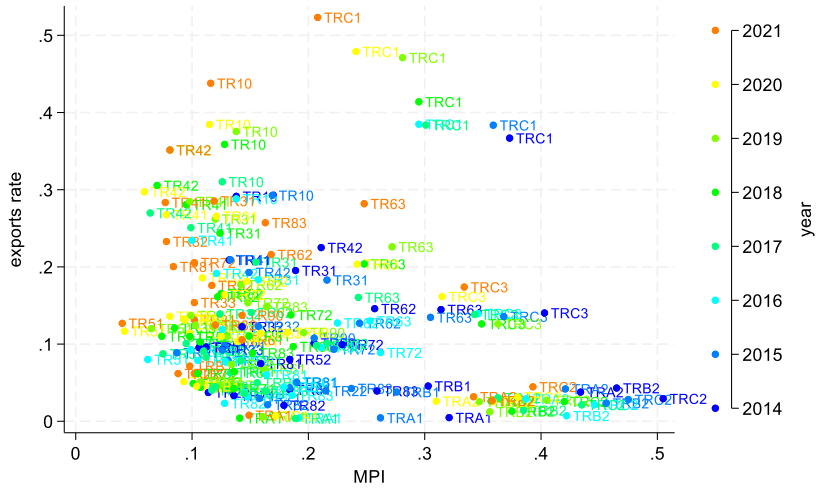
Graph 22. MPI and Net Migration Rate



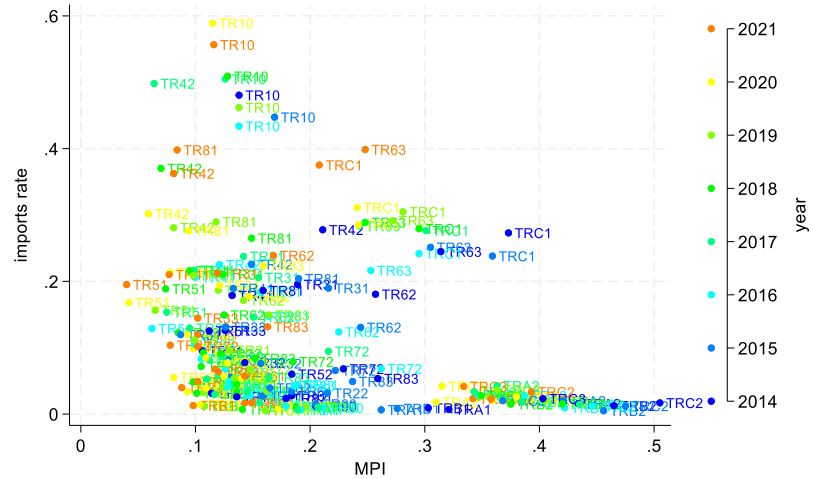
Graph 23. MPI and Inflation



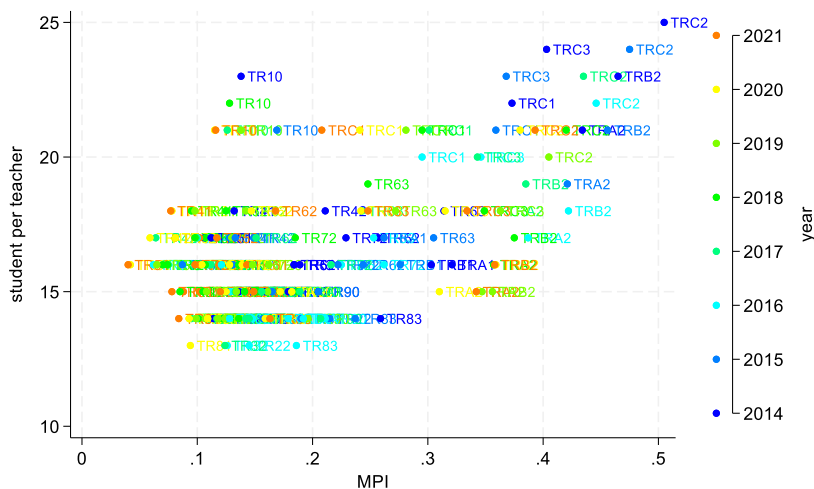
Graph 24: M1 and Exports, GDP



Graph 25. MPI and Imports/GDP



Graph 26. MPI and Student per Teacher



4.2.4 Findings

4.2.4.1 Baseline Model

We first apply a BMA to seek for the most effective influencers of multidimensional poverty across regions. Table 26 presents the estimation results of the full sample model. Posterior inclusion probability (PIP) shows how relevant a regressor is across all candidate models. 2^{13} (i.e., 8,192) models are estimated in the specification without lags, whereas 2^{12} (i.e., 4,096) and 2^9 (i.e., 512) models are run in the t-1 and t-5 specifications, respectively. The variables that have a PIP higher than 0.5, which is a common threshold to consider a variable important, are highlighted (see Table 26). The highlighted regressors are also consistent with the statistical significance rule of $|\text{post mean}/\text{post standard deviation}| > 1$.

Findings reveal that an increase in GDP per capita from all three sectors is associated with a decrease in MPI at time t , $t+1$, and $t+5$. Similarly, social assistance is found helpful in reducing multidimensional poverty in all times. On the other hand, The Gini coefficient and MPI have a positive connection which means that multidimensional poverty and inequality act together. Likewise, unemployment rate and the number of students per teacher are positively associated with MPI. Early motherhood rate is also found positively connected with MPI, but this connection disappears five years later. While credit amount per adult does not have a statistically significant effect at time t , an increase in credits is associated with a rise in MPI at time $t+5$. Other variables are found unimportant in explaining regional MPI. Figures 8, 9, and 10 show the posterior inclusion probabilities of the variables based on various model priors. Since PIPs do not differ that much, it can be concluded that our estimations are robust to the choice of model prior.

Table 26. Full Sample Model

	t		t-1		t-5	
	PIP	Post mean	PIP	Post mean	PIP	Post mean
<i>(Intercept)</i>	1.000	17.92	1.000	18.98	1.000	22.12
<i>log(GDP_{industry})</i>	1.000	-0.488 (0.058)	1.000	-0.511 (0.055)	1.000	-0.558 (0.056)
<i>log(GDP_{services})</i>	1.000	-0.405 (0.068)	1.000	-0.408 (0.068)	1.000	-0.685 (0.068)
<i>unemployment</i>	1.000	0.160 (0.029)	1.000	0.164 (0.029)	1.000	0.241 (0.032)
<i>student per teacher</i>	0.999	0.213 (0.049)	1.000	0.249 (0.049)		

<i>log(social assistance)</i>	0.980	-0.136 (0.043)	0.998	-0.160 (0.039)	0.830	-0.095 (0.054)
<i>early motherhood</i>	0.929	0.121 (0.051)	0.606	0.062 (0.060)	0.377	0.043 (0.066)
<i>log(GDP_{agriculture})</i>	0.841	-0.115 (0.064)	0.820	-0.118 (0.069)	1.000	-0.260 (0.043)
<i>Gini</i>	0.601	0.045 (0.043)				
<i>exports rate</i>	0.365	0.029 (0.046)	0.186	0.011 (0.029)		
<i>imports rate</i>	0.177	0.012 (0.038)	0.227	0.020 (0.046)		
<i>inflation</i>	0.084	-0.001 (0.011)	0.070	0.000 (0.008)	0.143	0.005 (0.017)
<i>log(credits)</i>	0.076	-0.001 (0.018)	0.150	0.011 (0.033)	0.998	0.287 (0.067)
<i>net migration rate</i>	0.071	-0.001 (0.009)	0.104	0.003 (0.014)	0.357	0.039 (0.062)

Note: Standard deviations are in parentheses.

Figure 8. Model Prior Comparison (t)

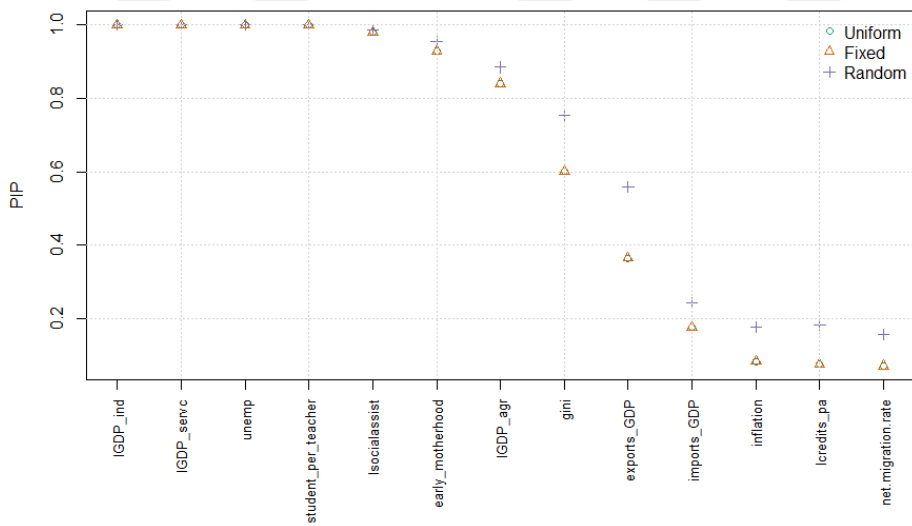


Figure 9. Model Prior Comparison (t-1)

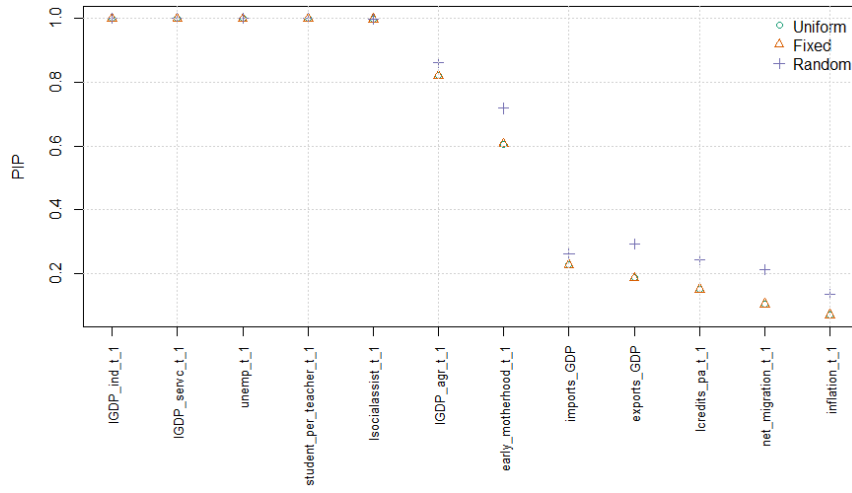
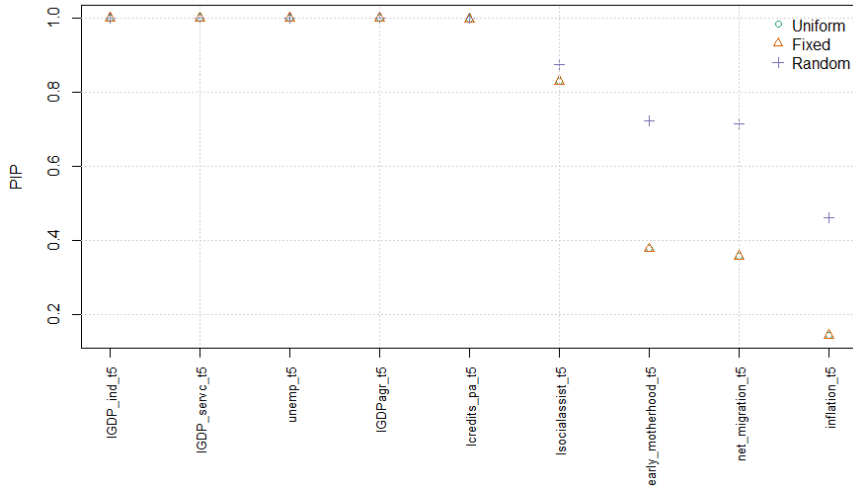


Figure 10. Model Prior Comparison (t-5)



4.2.4.2 Convergence Clubs

Since Türkiye is a quite heterogeneous country, drivers of multidimensional poverty may differ from region to region. Then, we go further by dividing the country into groups to get a deeper understanding. For this purpose, we apply the PS approach. The results of the convergence analysis are provided in Table 27. The estimated coefficient of $\log(t)$ is statistically significant which means that the null hypothesis of convergence in the full sample is rejected. Hence, there is no multidimensional poverty convergence across 26 regions of the country over the 2014-2021 period. The absence of full panel convergence confirms the regional heterogeneity in Türkiye.

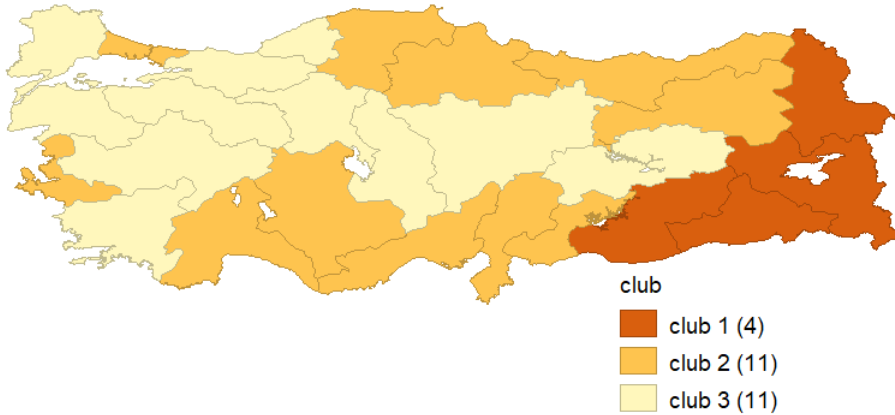
Once the club convergence is investigated, the PS approach initially detects four convergence clubs in Türkiye, but three clubs are identified after the club merging

method is applied. The null hypothesis of convergence cannot be rejected in all these clubs since t statistics are larger than -1.65. This finding implies to club convergence. Club 1 includes the regions whose MPIs are highest. These regions are located in Eastern and Southeastern Anatolia, as expected. Except for the highest MPI club, club membership is geographically very diverse. Club 2 consists of 11 regions whose MPI paths become moderate over time. Mediterranean regions, some parts of the Black Sea, and two big cities TR10 (Istanbul) and TR31 (Izmir) make up this club. Finally, club 3 includes 11 regions mostly located in the inner parts and Western Marmara, and this club traces the lowest MPI path over time. There is no divergent region in terms of MPI. Figure 11 can be examined to see the geographical distribution of these three clubs. Relative transition paths are provided in Figure B.3 in the appendix.

Table 27. Convergence Clubs

Tests	Regions	Beta	Standard error	t-stat
Convergence test	26 regions of Türkiye	-1.434	6.242	-4.485
<u>Club tests</u>	merged clubs			
Club 1	TRC2, TRB2, TRA2, TRC3	-0.52	0.478	-1.088
Club 2	TR63, TRC1, TR62, TR83, TRA1, TR61, TR90, TR82, TR31, TR52, TR10	-0.496	0.356	-1.394
Club 3	TR21, TR33, TR71, TR72, TRB1, TR22, TR81, TR42, TR32, TR41, TR51	0.142	0.284	0.499

Figure 11. Convergence Clubs



Then, we apply BMA for these three clubs separately. Summary statistics of each club is given in Tables A.18-20 in the annexe.

➤ **Club 1**

Table 28 indicates that the effects of GDP per capita from industry, services, and agriculture are different in club 1. While GDP per capita from services is found as an important factor in decreasing MPI at both $t+1$ and $t+5$, GDP from industry lessens MPI only at $t+5$. On the other hand, GDP from agriculture does not have any significant effect. While unemployment emerges as a determinant of poverty at time $t+5$ in this club, student per teacher, social assistance, Gini, exports rate, and credits are found as important factors at time t . For an instant reduction in MPI, exports rate, access to credits, and social assistance in this club can be promoted. Considering that this club is the group with the highest poverty, these policies would be very beneficial to decrease the overall MPI in the country. On the other hand, an increase

in early motherhood rate in this club is associated with a lower MPI five years later. Considering the theoretical expectations and the positive link between early motherhood and MPI in the full sample model, this finding is hard to explain. Once the connection between early motherhood and five dimensions of MPI is examined, it is observed that early motherhood reduces the social exclusion risk in this club at time t+5. Therefore, the negative link may be explained through social exclusion channel. Still, the number of observations (which is 32) is not very large in this club, and this limitation needs to be taken into account when making inferences.

Table 28. BMA (Club 1)

	t		t-1		t-5	
	PIP	Post mean	PIP	Post mean	PIP	Post mean
<i>(Intercept)</i>	1.000	19.20	1.000	40.17	1.000	73.66
<i>log(GDP_{industry})</i>	0.539	0.173 (0.209)	0.274	0.053 (0.133)	0.951	-0.452 (0.179)
<i>log(GDP_{services})</i>	0.260	-0.049 (0.183)	0.714	-0.530 (0.404)	1.000	-1.059 (0.141)
<i>unemployment</i>	0.500	-0.141 (0.188)	0.187	0.008 (0.097)	0.912	0.279 (0.127)
<i>student per teacher</i>	0.838	0.421 (0.256)	0.487	0.246 (0.397)		
<i>log(social assistance)</i>	0.677	-0.152 (0.137)	0.325	-0.060 (0.119)	0.178	-0.015 (0.084)
<i>early motherhood</i>	0.432	0.102 (0.161)	0.186	0.000 (0.161)	0.992	-0.704 (0.195)
<i>log(GDP_{agriculture})</i>	0.402	-0.125 (0.234)	0.471	-0.111 (0.154)	0.264	-0.033 (0.082)

<i>Gini</i>	0.967	0.225 (0.079)				
<i>exports rate</i>	0.947	-0.456 (0.176)	0.565	-0.223 (0.246)		
<i>imports rate</i>	0.178	0.006 (0.053)	0.184	0.000 (0.062)		
<i>inflation</i>	0.221	0.015 (0.065)	0.521	-0.129 (0.160)	0.158	0.003 (0.031)
<i>log(credits)</i>	0.765	-0.219 (0.156)	0.322	-0.041 (0.094)	0.252	-0.038 (0.108)
<i>net migration rate</i>	0.257	-0.027 (0.072)	0.551	0.164 (0.192)	0.199	0.018 (0.066)

Note: Standard deviations are in parentheses.

➤ *Club 2*

In club 2, GDP per capita from industry is found as a very significant factor in reducing MPI in all time periods estimated, while GDP per capita from services and agriculture are effective only after five years (see Table 29). Unemployment emerges as a determinant of multidimensional poverty in all periods. Early motherhood is found as a factor increasing MPI at t and $t+1$, but its effect wanes at $t+5$. Contrary to club 1, an increase in the exports rate is associated with a rise in MPI in this club. However, once the data is thoroughly examined, it is observed that TRC1 region in club 2 has a very high export rate (even the highest rate in the country) despite its quite high MPI. It seems like an outlier in this relationship, and the link between the

exports rate and MPI turns negative in the absence of this outlier.⁷⁰ Finally, an increase in the credit amounts per adult is associated with a rise in MPI at time t+5. This may result from overborrowing and the inability to pay back the loans later.

Table 29. BMA (Club 2)

	t		t-1		t-5	
	PIP	Post mean	PIP	Post mean	PIP	Post mean
(Intercept)	1.000	19.52	1.000	23.55	1.000	26.32
<i>log(GDP_{industry})</i>	1.000	-0.635 (0.124)	1.000	-0.704 (0.134)	0.956	-0.510 (0.213)
<i>log(GDP_{services})</i>	0.376	-0.126 (0.210)	0.370	-0.175 (0.296)	1.000	-0.747 (0.142)
<i>unemployment</i>	0.883	0.220 (0.117)	0.627	0.153 (0.151)	0.995	0.394 (0.098)
<i>student per teacher</i>	0.141	-0.013 (0.061)	0.116	0.004 (0.050)		
<i>log(social assistance)</i>	0.359	-0.073 (0.121)	0.604	-0.164 (0.168)	0.132	-0.008 (0.040)
<i>early motherhood</i>	0.994	0.479 (0.120)	0.933	0.434 (0.179)	0.467	0.114 (0.147)
<i>log(GDP_{agriculture})</i>	0.360	-0.108 (0.189)	0.437	-0.144 (0.213)	0.998	-0.451 (0.103)
<i>Gini</i>	0.111	-0.003 (0.028)				
<i>exports rate</i>	0.997	0.614	0.987	0.619		

⁷⁰ It is obvious that high rates of exports in TRC1 do not help reduce multidimensional poverty. They may even exacerbate poverty probably because profits from exports only go to some privileged part of the society and feed the inequalities in the region.

		(0.137)		(0.175)		
<i>imports rate</i>	0.215	-0.056	0.173	-0.027		
		(0.153)		(0.120)		
<i>inflation</i>	0.281	-0.033	0.118	-0.004	0.117	0.005
		(0.066)		(0.029)		(0.025)
<i>log(credits)</i>	0.323	-0.080	0.286	-0.071	0.686	0.268
		(0.147)		(0.142)		(0.224)
<i>net migration rate</i>	0.105	-0.003	0.127	0.005	0.222	0.023
		(0.020)		(0.025)		(0.057)

Note: Standard deviations are in parentheses.

➤ **Club 3**

In club 3, GDP per capita from services is found as a very important factor in decreasing MPI in all time periods estimated (see Table 30). On the other hand, GDP from industry is significant only at time t and $t+1$, and GDP from agriculture is significant only at time $t+1$. Unemployment emerges as a determinant of poverty at time $t+5$ as always found. The number of students per teacher is another stimulator of poverty. Finally, an increase in inflation is associated with a lower MPI at time t , while its sign turns positive five years later (although it is statistically insignificant). It implies that an inflationary environment can reduce poverty only in the short-run. The adverse effect of inflation is felt over time. This finding is in line with the findings of Romer and Romer (1998).⁷¹

⁷¹ Romer and Romer (1998) empirically find that the link between inflation and poverty differs in the short and long run. They argue that an expansionary policy at the expense of rising inflation may alleviate poverty in the short-run, but it ends up with higher poverty in the long-run. Therefore, price stabilization matters for long-term poverty alleviation.

Table 30. BMA (Club 3)

	t		t-1		t-5	
	PIP	Post mean	PIP	Post mean	PIP	Post mean
(Intercept)	1.000	25.282	1.000	31.223	1.000	17.276
<i>log(GDP_{industry})</i>	0.923	-0.421 (0.182)	0.746	-0.336 (0.240)	0.490	-0.110 (0.136)
<i>log(GDP_{services})</i>	0.764	-0.427 (0.300)	0.911	-0.544 (0.265)	0.630	-0.319 (0.282)
<i>unemployment</i>	0.120	-0.004 (0.040)	0.154	0.002 (0.061)	0.983	0.344 (0.113)
<i>student per teacher</i>	0.793	0.249 (0.162)	0.608	0.189 (0.184)		
<i>log(social assistance)</i>	0.181	-0.025 (0.078)	0.510	-0.127 (0.152)	0.329	-0.049 (0.086)
<i>early motherhood</i>	0.413	0.095 (0.137)	0.454	0.113 (0.150)	0.134	0.011 (0.048)
<i>log(GDP_{agriculture})</i>	0.546	-0.213 (0.242)	0.704	-0.323 (0.274)	0.141	-0.012 (0.054)
<i>Gini</i>	0.580	0.120 (0.125)				
<i>exports rate</i>	0.196	0.031 (0.092)	0.170	0.019 (0.084)		
<i>imports rate</i>	0.222	-0.018 (0.128)	0.391	-0.118 (0.189)		
<i>inflation</i>	0.604	-0.150 (0.145)	0.265	-0.042 (0.091)	0.399	0.058 (0.087)
<i>log(credits)</i>	0.330	-0.106	0.174	-0.025	0.485	-0.221

		(0.185)		(0.119)		(0.265)
<i>net migration rate</i>	0.112	0.000	0.113	0.005	0.287	-0.050
		(0.037)		(0.039)		(0.100)

Note: Standard deviations are in parentheses.

4.3. Conclusion

This chapter examines the region-level factors affecting multidimensional poverty in Türkiye. For this purpose, it applies the BMA approach using data from 26 NUTS-2 level regions over the period 2014-2021. In the full sample model, GDP per capita from all three sectors are found as a very effective factor in decreasing MPI (supporting the findings of Santos et al. (2017) and Balasubramanian et al. (2023)). Likewise, social assistance is found as another important tool for reducing multidimensional poverty, similar to Milotay et al. (2022). On the other hand, unemployment, the number of students per teacher, and income inequality emerge as factors exacerbating multidimensional poverty. High rates of early motherhood rate are associated with higher multidimensional poverty, but this relationship wanes five years later. Access to credits has also exacerbating effect on multidimensional poverty at t+5.

Afterwards, considering the heterogeneity in the country, the same analysis is conducted for various subgroups. To cluster regions into clubs, the PS approach is traced, and three convergence clubs are identified. Unemployment is detected as a determinant of multidimensional poverty at least at time t+5 in all clubs. Despite the phenomenon of *working poverty* arguing that having a job is not sufficient to be out of poverty, our finding implies that employment still protects from poverty to a large extent.

In particular, policies towards augmenting GDP from the industry and services sectors; promoting social assistance; reducing the number of students per teacher (by increasing the number of teachers and decreasing class sizes); alleviating income inequalities; easing access to credits; and supporting exports would be useful to eliminate poverty in club 1.

In club 2, economic growth in all three sectors, preventing early motherhood, and lessening overborrowing (considering the later effects of credits on poverty) would be beneficial poverty alleviation strategies. Finally, economic growth in all three sectors and reducing the number of students per teacher would be effective in the fight against poverty in club 3.

Despite these implications, this chapter has some limitations. First, the time period used in the convergence club analysis is somewhat short. Future studies using longer periods would better capture regional poverty convergence in the country. Also, the number of observations is not that large in club 1. Therefore, the findings of the full sample model are considered more reliable. Furthermore, to prevent loss of observation, Gini is not used in the lagged models since NUTS-2 level Gini is available only since 2014. Likewise, NUTS-2 level data for student per teacher, exports rate, and imports rate are not available in the t-5 model. Finally, although the NUTS-2 level dataset allows us to examine regional poverty disparities to some extent, a more detailed regional dataset such as at the NUTS-3 level would better reveal regional characteristics of poverty. With the data availability, future studies can produce better predictions and thereby more precise poverty alleviation policies.

5. CONCLUDING REMARKS

This thesis estimates poverty in Türkiye by considering the problems in poverty measurement and investigates factors explaining poverty. In chapter two, poverty in the country is measured through five different approaches using two nationwide micro datasets. The chapter compares these poverty estimations for the 2010-2021 period and examines which poverty concept can produce a better poverty estimate for the country. Findings reveal that poverty rates had a decreasing tendency until recently except for subjective poverty, which remained almost unchanged during the period. However, estimations based on the latest surveys indicate that poverty in the country has increased recently.

Absolute poverty estimations via the updated absolute line of TurkStat, and the official relative poverty identify less than 20 per cent of the population as poor. Absolute poverty measured via the updated lines probably underestimates poverty because the inflation-adjusted absolute poverty lines cannot sufficiently capture the changes in needs over time. Similarly, the official relative poverty rates probably underestimate the actual poverty in Türkiye because if the median income level in the country is low, it is normal to find low rates of relative poverty. Around 60% of the population is found subjectively poor throughout the period, and these high and stable rates probably stem from that people tend to find their income insufficient. Around 70% of the population is identified as poor through the poverty line of TURK-IS. These high rates of poverty can be explained by the fact that TURK-IS is a labour union defending the rights of employees and plays a significant role in the

negotiations on minimum wage. It is finally found that multidimensional poverty rates decreased from 49.2% in 2013 to 31.5% in 2021. Lack of education and health problems are observed as the most striking deprivations in the multidimensional poverty index. This study proposes multidimensional poverty as a better poverty estimation for Türkiye not only because multidimensional poverty rates are found among two extreme groups of poverty rates, but also because this approach accounts for monetary and non-monetary aspects of poverty together.

Moreover, a notable clustering of poverty is observed in the sub-national estimations. South-eastern and Eastern Anatolia have the highest rates of poverty no matter which methodology is applied. Hence, more public resources need to be allocated for these regions not only for alleviating poverty in these regions but also for indirectly preventing the migration waves from East to West and ameliorating the urban poverty in Western cities.

Chapter three examines household-level explanations for multidimensional poverty by estimating a logit model using the SILC micro dataset for the year 2021. Findings disclose that households with an older household head, a female household head, more children, fewer earners, without income from securities or real estate, and extended families are more vulnerable to multidimensional poverty. The likelihood of multidimensional poverty escalates as the age group of household head rises. This finding probably results from that young people tend to better perform in education and health dimensions in our MPI. Wealth is a factor that can easily affect poverty status, but it is difficult to control it in empirical analyses due to data constraints. We use income from real estate and securities as indicators of wealth and substantiate

that income from these sources is helpful to be out of poverty. Therefore, it can be concluded that improving the financial literacy and savings of vulnerable households would be an effective tool for reducing their poverty risks. Furthermore, since the probability of poverty decreases as the number of earners in the household increases, increasing labour force participation would be useful to reduce poverty. This is especially important for women not only because the female labour force participation rate in Türkiye is very low, but also because female-headed households are more likely to be poor. Finally, social policies need to be oriented regarding household types because having children, being an extended family, or being a single-parent family exacerbate poverty risks.

Chapter four examines the regional factors affecting multidimensional poverty in Türkiye by applying the BMA method using data from 26 regions over the 2014-2021 period. According to the full sample model, an increase in GDP per capita from all three sectors is very effective in decreasing MPI. Likewise, social assistance emerges as another important tool to decrease multidimensional poverty. Unemployment, low quality of education (proxied by the number of students per teacher), early motherhood, and income inequality (measured by Gini) are found as factors exacerbating multidimensional poverty. Access to credits is also associated with a rise in multidimensional poverty after five years.

Afterwards, considering the heterogeneity in the country, regional poverty convergence is investigated using the PS convergence clubs approach, and three poverty convergence clubs are identified. Then, the BMA method is applied to these three clubs separately. GDP per capita from services and industry are found

statistically significant in most estimates, while GDP per capita from agriculture is found rarely significant. Unemployment is identified as a determinant of multidimensional poverty at least at $t+5$ in all clubs, implying that employment is a key to escape from poverty.

Considering the variation between poverty clubs, different policy sets can be applied for an effective poverty alleviation strategy. For instance, the number of students per teacher is a problem in club 1 and club 3, while it is not in club 2 implying that providing more teachers for club 1 and club 3 can help reduce multidimensional poverty by improving the quality of education. Moreover, income inequality is found as a very critical factor in explaining multidimensional poverty only in club 1 which therefore requires special attention in the policies against inequalities. Policies promoting exports would be also useful for poverty eradication in this club. Moreover, while credit accession can be facilitated in club 1, more careful investigations are required regarding the credit levels in club 2 considering the later adverse effects on poverty. Even though social assistance is found useful in reducing MPI in the full sample analysis, the club-level analysis reveals that it is statistically significant only in club 1 at time t , implying that there is more room for improvement in the allocation of these government resources.

The findings of this thesis show that poverty is a quite complex phenomenon not only because its measurement is sensitive to the applied methodology, but also because its underlying reasons can differ across regions. Hence, policymakers should consider this sensitivity and also need to generate policies regarding the specific needs of regions. Future studies with more detailed regional datasets and

longer time periods would better capture the underlying reasons for poverty and generate more specific poverty alleviation policies.

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APPENDIX A: TABLES

Table A.1 Summary Statistics of Equivalised Consumption (HBS)

Survey	Number of households	Mean	Std. Dev.	Min.	Max.
2010	10,082	881	718	38	10,726
2011	9,918	1,028	878	26	20,218
2012	9,987	1,177	1,023	42	22,714
2013	10,060	1,247	1,061	39	25,347
2014	10,122	1,377	1,202	64	39,487
2015	11,491	1,463	1,424	70	41,040
2016	12,096	1,633	1,409	102	39,329
2017	12,166	1,835	1,622	107	27,843
2018	11,828	2,172	1,940	109	35,526
2019	11,521	2,468	2,096	117	47,568

Table A.2 Summary Statistics of Equivalised Income (SILC)

Survey	Number of households	Mean	Std. Dev.	Min.	Max.
2010	12,106	885	943	4	35,621
2011	15,025	962	965	0	23,734
2012	17,562	1,038	1,019	6	23,807
2013	19,899	1,147	1,115	0.5	31,160
2014	22,740	1,257	1,129	7	25,856
2015	22,763	1,426	1,261	27	18,116
2016	22,441	1,658	1,643	4	38,923
2017	22,869	1,848	1,989	18	51,414
2018	24,068	2,058	2,301	10	75,240
2019	24,924	2,420	2,482	17	73,273
2020	25,706	2,779	2,901	14	76,203
2021	26,289	3,141	3,339	5	202,854

Table A.3 NUTS-1 and NUTS-2 Regions

NUTS-1 level regions	NUTS-2 level regions
TR1: İstanbul	TR10: İstanbul
TR2: Western Marmara	TR21: Tekirdağ, Edirne, Kırklareli
	TR22: Balıkesir, Çanakkale
TR3: Aegean	TR31: İzmir
	TR32: Aydın, Denizli, Muğla
	TR33: Manisa, Afyon, Kütahya, Uşak
TR4: Eastern Marmara	TR41: Bursa, Eskişehir, Bilecik
	TR42: Kocaeli, Sakarya, Düzce, Bolu, Yalova
TR5: Western Anatolia	TR51: Ankara
	TR52: Konya, Karaman
TR6: Mediterranean	TR61: Antalya, Isparta, Burdur
	TR62: Adana, Mersin
	TR63: Hatay, Kahramanmaraş, Osmaniye
TR7: Central Anatolia	TR71: Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir
	TR72: Kayseri, Sivas, Yozgat
TR8: Western Black Sea	TR81: Zonguldak, Karabük, Bartın
	TR82: Kastamonu, Çankırı, Sinop
	TR83: Samsun, Tokat, Çorum, Amasya
TR9: Eastern Black Sea	TR90: Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane
TRA: North-eastern Anatolia	TRA1: Erzurum, Erzincan, Bayburt
	TRA2: Ağrı, Kars, Iğdır, Ardahan
TRB: Central Eastern Anatolia	TRB1: Malatya, Elazığ, Bingöl, Tunceli
	TRB2: Van, Muş, Bitlis, Hakkari
TRC: South-eastern Anatolia	TRC1: Gaziantep, Adıyaman, Kilis
	TRC2: Şanlıurfa, Diyarbakır
	TRC3: Mardin, Batman, Şırnak, Siirt

Table A.4 Regional Absolute Poverty Rates Based on Income (2010-2012)

Region	2010	2011	2012
<i>TR1</i>	11.12 (.01)	9.23 (.009)	8.40 (.008)
<i>TR2</i>	18.71 (.016)	16.46 (.013)	13.28 (.011)
<i>TR3</i>	14.61 (.01)	12.10 (.008)	11.06 (.008)
<i>TR4</i>	14.41 (.013)	12.21 (.013)	9.03 (.009)
<i>TR5</i>	15.01 (.013)	10.93 (.01)	10.46 (.009)

<i>TR6</i>	24.78 (.014)	26.52 (.013)	25.38 (.012)
<i>TR7</i>	21.92 (.018)	18.99 (.015)	19.93 (.016)
<i>TR8</i>	20.93 (.018)	18.39 (.016)	18.17 (.016)
<i>TR9</i>	23.93 (.023)	17.96 (.02)	14.04 (.018)
<i>TRA</i>	43.35 (.019)	46.22 (.019)	43.85 (.018)
<i>TRB</i>	55.12 (.02)	48.59 (.019)	46.00 (.02)
<i>TRC</i>	58.40 (.018)	54.05 (.017)	53.81 (.016)

Note: Standard errors are in parentheses.

Table A.5 Regional Absolute Poverty Rates Based on Income (2013-2020)

Region	2013	2014	2015	2016	2017	2018	2019	2020
<i>TR10</i>	9.61 (.009)	9.98 (.009)	6.93 (.008)	5.23 (.007)	7.42 (.008)	5.14 (.007)	5.45 (.007)	7.99 (.008)
<i>TR21</i>	7.58 (.013)	9.45 (.016)	7.01 (.015)	5.78 (.012)	6.67 (.014)	7.25 (.013)	5.99 (.012)	6.83 (.001)
<i>TR22</i>	16.57 (.018)	18.00 (.018)	14.08 (.017)	13.74 (.016)	13.26 (.015)	12.23 (.015)	17.57 (.019)	11.57 (.016)
<i>TR31</i>	14.59 (.015)	11.51 (.013)	8.22 (.012)	7.18 (.01)	6.26 (.011)	5.02 (.009)	5.80 (.009)	7.13 (.013)
<i>TR32</i>	8.90 (.012)	8.55 (.012)	7.99 (.011)	7.05 (.011)	7.33 (.01)	7.77 (.012)	9.48 (.012)	5.53 (.01)
<i>TR33</i>	10.42 (.014)	11.96 (.014)	9.19 (.012)	7.16 (.011)	8.06 (.012)	8.88 (.012)	9.40 (.012)	7.79 (.012)
<i>TR41</i>	6.71 (.009)	7.77 (.012)	6.32 (.01)	4.84 (.012)	4.86 (.01)	3.96 (.008)	3.69 (.007)	2.62 (.018)
<i>TR42</i>	10.43 (.014)	7.97 (.011)	6.05 (.012)	4.15 (.008)	6.74 (.011)	6.49 (.011)	5.35 (.011)	6.03 (.011)
<i>TR51</i>	7.22 (.01)	5.86 (.008)	4.77 (.008)	5.70 (.01)	6.15 (.01)	4.06 (.007)	4.26 (.007)	2.45 (.006)
<i>TR52</i>	14.61 (.017)	11.14 (.016)	10.23 (.015)	11.27 (.018)	11.08 (.015)	9.45 (.016)	11.76 (.015)	10.93 (.015)
<i>TR61</i>	13.27 (.016)	13.01 (.016)	14.46 (.018)	9.97 (.014)	9.11 (.014)	9.65 (.013)	11.16 (.012)	8.69 (.013)
<i>TR62</i>	26.70 (.02)	21.68 (.018)	19.37 (.019)	13.24 (.015)	13.65 (.016)	14.72 (.017)	14.87 (.014)	22.80 (.018)

<i>TR63</i>	33.28 (.021)	29.91 (.022)	23.30 (.021)	20.89 (.02)	19.21 (.02)	21.81 (.019)	16.41 (.015)	23.36 (.019)
<i>TR71</i>	15.23 (.018)	12.48 (.015)	15.00 (.02)	9.69 (.016)	11.84 (.017)	9.64 (.016)	11.56 (.017)	11.44 (.018)
<i>TR72</i>	16.54 (.018)	16.22 (.019)	13.71 (.018)	10.14 (.016)	12.47 (.016)	9.64 (.014)	11.88 (.014)	12.01 (.018)
<i>TR81</i>	4.90 (.009)	7.58 (.017)	4.57 (.01)	4.19 (.013)	6.51 (.015)	3.96 (.01)	5.02 (.009)	6.02 (.014)
<i>TR82</i>	13.56 (.017)	13.20 (.017)	13.39 (.021)	9.74 (.018)	11.51 (.019)	12.34 (.021)	13.18 (.018)	10.87 (.017)
<i>TR83</i>	20.78 (.022)	18.35 (.02)	14.33 (.019)	11.62 (.017)	11.80 (.015)	11.47 (.014)	15.04 (.017)	13.32 (.016)
<i>TR90</i>	12.57 (.017)	14.29 (.018)	8.87 (.014)	8.70 (.014)	10.55 (.017)	11.42 (.019)	11.42 (.017)	7.39 (.015)
<i>TRA1</i>	32.57 (.025)	23.46 (.024)	12.39 (.02)	11.43 (.016)	11.26 (.014)	14.62 (.015)	18.12 (.016)	17.72 (.018)
<i>TRA2</i>	43.67 (.025)	40.65 (.024)	34.70 (.025)	26.40 (.023)	33.14 (.022)	30.21 (.02)	37.72 (.02)	37.85 (.021)
<i>TRB1</i>	31.01 (.026)	23.69 (.021)	18.45 (.026)	14.37 (.025)	11.76 (.019)	10.41 (.018)	14.25 (.019)	10.74 (.017)
<i>TRB2</i>	54.63 (.027)	53.87 (.027)	41.75 (.029)	40.34 (.026)	46.28 (.025)	41.19 (.023)	50.18 (.022)	44.97 (.021)
<i>TRC1</i>	33.59 (.023)	24.63 (.021)	25.12 (.022)	19.55 (.021)	21.34 (.021)	18.20 (.019)	21.16 (.02)	16.30 (.019)
<i>TRC2</i>	58.90 (.023)	58.00 (.025)	52.87 (.028)	53.59 (.026)	50.32 (.027)	47.80 (.023)	48.21 (.021)	48.41 (.021)
<i>TRC3</i>	53.28 (.028)	44.4 (.029)	48.03 (.03)	43.91 (.028)	44.72 (.025)	44.15 (.022)	41.40 (.021)	41.52 (.021)

Note: Standard errors are in parentheses.

Table A.6 Number of Individuals in Absolute Poverty Based on Income (2010-2012)

Region	2010	2011	2012
<i>TR1</i>	1,429,058	1,200,732	1,102,951
<i>TR2</i>	586,800	528,626	432,663
<i>TR3</i>	1,373,923	1,152,754	1,059,456
<i>TR4</i>	983,235	862,794	653,043
<i>TR5</i>	1,024,736	760,290	736,728
<i>TR6</i>	2,279,747	2,509,148	2,439,371
<i>TR7</i>	828,002	717,598	754,015
<i>TR8</i>	925,072	807,428	794,663
<i>TR9</i>	604,223	453,721	355,972
<i>TRA</i>	915,961	957,480	900,952

<i>TRB</i>	2,018,083	1,808,643	1,736,066
<i>TRC</i>	4,456,025	4,260,795	4,346,341

Table A.7 Number of Individuals in Absolute Poverty Based on Income (2013-2020)

Region	2013	2014	2015	2016	2017	2018	2019	2020
<i>TR10</i>	1,359,556	1,433,144	1,011,730	773,397	1,113,056	776,301	837,000	1,240,244
<i>TR21</i>	119,788	151,317	113,813	97,173	114,589	127,869	107,862	125,526
<i>TR22</i>	268,070	291,735	229,609	229,251	222,951	208,861	304,475	202,852
<i>TR31</i>	585,037	465,468	335,194	299,568	264,206	214,417	249,928	310,404
<i>TR32</i>	249,221	240,463	225,986	207,913	218,994	236,196	292,293	172,372
<i>TR33</i>	303,209	347,631	267,420	213,146	241,271	267,804	285,524	238,434
<i>TR41</i>	249,523	292,161	240,739	190,144	193,703	161,013	152,366	109,815
<i>TR42</i>	355,064	274,973	211,482	152,396	252,844	249,547	209,312	240,208
<i>TR51</i>	360,707	297,959	246,878	300,318	330,302	221,476	236,510	138,320
<i>TR52</i>	332,049	253,671	233,844	267,072	264,844	227,876	286,204	268,384
<i>TR61</i>	372,801	370,822	419,170	297,995	275,736	298,133	354,598	281,420
<i>TR62</i>	1,023,763	836,046	752,811	525,390	545,416	591,153	601,470	931,134
<i>TR63</i>	1,011,142	912,250	715,755	663,055	617,356	710,402	541,524	779,924
<i>TR71</i>	223,632	182,264	218,068	146,263	179,421	148,429	180,628	179,385
<i>TR72</i>	384,325	376,934	318,424	240,017	295,939	230,324	286,955	291,576
<i>TR81</i>	48,314	74,222	44,405	41,676	64,845	39,643	50,404	60,431
<i>TR82</i>	99,107	95,165	96,588	71,715	84,391	93,221	101,791	83,241
<i>TR83</i>	553,146	485,731	377,308	314,132	319,919	313,798	414,113	368,135
<i>TR90</i>	313,454	353,020	220,423	224,573	271,550	296,378	298,848	193,118
<i>TRA1</i>	334,027	243,322	127,985	117,923	115,154	148,643	186,386	183,075
<i>TRA2</i>	488,754	457,710	390,856	289,802	361,422	325,007	409,891	413,665
<i>TRB1</i>	509,170	390,912	305,152	240,521	198,056	177,237	245,603	186,037
<i>TRB2</i>	1,120,491	1,113,077	868,651	837,855	967,347	860,290	1,065,129	969,233
<i>TRC1</i>	859,392	643,610	662,120	529,399	586,424	505,913	595,619	464,913
<i>TRC2</i>	2,012,877	2,026,258	1,885,194	1,944,037	1,860,917	1,797,323	1,846,538	1,883,118
<i>TRC3</i>	1,110,462	936,213	1,026,562	946,280	979,968	980,385	941,347	967,112

Table A.8 Poverty Gap Ratio Estimates Based on Income (2010-2012) %

Region	2010	2011	2012
<i>TR</i>	7.44 (.002)	6.77 (.002)	5.92 (.002)
<i>TR1</i>	2.32 (.003)	2.01 (.002)	1.81 (.002)
<i>TR2</i>	5.51 (.007)	4.84 (.005)	3.21 (.004)
<i>TR3</i>	3.45 (.003)	3.16 (.003)	2.40 (.002)
<i>TR4</i>	3.21 (.004)	3.04 (.004)	2.23 (.003)

<i>TR5</i>	3.91 (.005)	2.88 (.003)	2.70 (.003)
<i>TR6</i>	6.66 (.005)	7.32 (.005)	6.44 (.004)
<i>TR7</i>	6.28 (.007)	5.35 (.005)	5.11 (.006)
<i>TR8</i>	6.11 (.007)	5.26 (.007)	4.51 (.005)
<i>TR9</i>	5.55 (.007)	4.82 (.007)	3.35 (.005)
<i>TRA</i>	14.50 (.008)	16.24 (.009)	14.24 (.008)
<i>TRB</i>	20.33 (.011)	16.83 (.009)	15.68 (.009)
<i>TRC</i>	23.47 (.01)	20.78 (.009)	18.61 (.008)

Note: Standard errors are in parentheses.

Table A.9 Poverty Gap Ratio Estimates Based on Income (2013-2020) %

Region	2013	2014	2015	2016	2017	2018	2019	2020
<i>TR10</i>	2.03 (.003)	2.23 (.003)	1.51 (.002)	1.42 (.002)	1.68 (.002)	1.28 (.002)	1.23 (.002)	1.85 (.002)
<i>TR21</i>	1.39 (.003)	2.67 (.005)	1.95 (.004)	1.16 (.003)	1.78 (.004)	2.10 (.004)	2.07 (.005)	1.51 (.003)
<i>TR22</i>	4.31 (.006)	6.00 (.007)	3.46 (.005)	3.84 (.006)	4.48 (.006)	4.28 (.006)	5.73 (.008)	3.48 (.006)
<i>TR31</i>	3.72 (.006)	3.35 (.005)	2.26 (.004)	2.20 (.004)	1.19 (.002)	1.05 (.002)	1.78 (.003)	2.03 (.004)
<i>TR32</i>	1.55 (.003)	2.00 (.004)	1.49 (.003)	1.39 (.003)	1.70 (.003)	1.49 (.003)	2.15 (.003)	1.15 (.002)
<i>TR33</i>	1.95 (.004)	1.87 (.003)	1.67 (.003)	1.21 (.002)	1.55 (.003)	2.07 (.004)	2.60 (.003)	1.80 (.003)
<i>TR41</i>	1.68 (.003)	1.46 (.003)	1.28 (.002)	1.03 (.004)	0.75 (.002)	0.83 (.002)	1.15 (.002)	0.04 (.001)
<i>TR42</i>	2.50 (.004)	1.87 (.003)	1.37 (.003)	0.96 (.002)	1.04 (.002)	1.03 (.002)	1.78 (.004)	2.12 (.005)
<i>TR51</i>	1.85 (.003)	1.22 (.002)	0.84 (.002)	1.22 (.002)	1.25 (.003)	0.79 (.002)	1.16 (.002)	0.08 (.003)
<i>TR52</i>	4.01 (.006)	2.73 (.005)	2.42 (.005)	2.67 (.006)	3.22 (.005)	2.47 (.004)	3.42 (.005)	3.96 (.006)
<i>TR61</i>	3.93 (.006)	3.38 (.005)	3.69 (.006)	2.44 (.004)	1.89 (.004)	3.15 (.005)	3.63 (.005)	2.56 (.004)

<i>TR62</i>	7.36 (.007)	5.75 (.006)	5.20 (.007)	3.67 (.006)	3.04 (.005)	3.20 (.004)	4.31 (.005)	6.16 (.006)
<i>TR63</i>	9.21 (.008)	8.24 (.009)	5.72 (.007)	5.50 (.007)	4.49 (.006)	6.17 (.008)	4.90 (.006)	6.25 (.006)
<i>TR71</i>	3.52 (.005)	2.88 (.004)	3.82 (.009)	2.38 (.006)	2.76 (.005)	2.31 (.005)	3.23 (.005)	3.13 (.005)
<i>TR72</i>	4.53 (.006)	4.44 (.007)	3.67 (.008)	2.13 (.004)	3.26 (.005)	1.90 (.003)	3.43 (.005)	4.12 (.007)
<i>TR81</i>	1.05 (.002)	2.27 (.006)	0.89 (.003)	0.85 (.004)	0.93 (.002)	1.26 (.004)	1.70 (.004)	1.92 (.006)
<i>TR82</i>	3.62 (.006)	4.05 (.006)	4.60 (.01)	2.78 (.008)	3.37 (.007)	4.76 (.012)	4.83 (.009)	4.6 (.009)
<i>TR83</i>	5.72 (.008)	4.85 (.007)	3.17 (.005)	2.67 (.005)	3.03 (.005)	2.83 (.004)	4.34 (.006)	3.71 (.005)
<i>TR90</i>	3.39 (.005)	3.40 (.005)	2.43 (.005)	1.66 (.003)	3.03 (.007)	3.07 (.007)	3.01 (.005)	1.84 (.004)
<i>TRA1</i>	9.84 (.010)	5.89 (.007)	2.75 (.006)	2.63 (.004)	2.90 (.005)	3.63 (.005)	5.21 (.006)	4.40 (.005)
<i>TRA2</i>	14.28 (.011)	13.47 (.010)	9.67 (.009)	6.83 (.008)	8.99 (.009)	8.54 (.007)	12.35 (.009)	12.91 (.009)
<i>TRB1</i>	9.05 (.010)	6.61 (.007)	4.35 (.007)	2.71 (.006)	2.02 (.004)	1.55 (.004)	2.75 (.004)	1.33 (.002)
<i>TRB2</i>	17.58 (.011)	16.26 (.010)	13.62 (.021)	12.21 (.011)	15.12 (.01)	11.92 (.008)	17.02 (.01)	14.29 (.008)
<i>TRC1</i>	8.00 (.007)	6.27 (.007)	6.02 (.007)	4.06 (.006)	4.21 (.005)	3.82 (.005)	4.69 (.006)	3.93 (.006)
<i>TRC2</i>	20.25 (.013)	22.76 (.014)	18.54 (.013)	16.23 (.011)	16.51 (.012)	15.43 (.010)	13.35 (.008)	15.5 (.009)
<i>TRC3</i>	16.70 (.010)	13.74 (.011)	15.43 (.013)	11.98 (.01)	13.19 (.009)	12.75 (.009)	12.11 (.008)	13.17 (.009)

Note: Standard errors are in parentheses.

Table A.10 Squared Poverty Gap Estimates Based on Income (2010-2012)

Region	2010	2011	2012
<i>TR</i>	3.36 (.001)	3.03 (.001)	2.55 (.001)
<i>TR1</i>	0.79 (.001)	0.69 (.001)	0.63 (.001)
<i>TR2</i>	2.45 (.004)	2.15 (.004)	1.27 (.002)
<i>TR3</i>	1.26 (.001)	1.33 (.002)	0.90 (.001)

<i>TR4</i>	1.14 (.002)	1.19 (.002)	0.87 (.002)
<i>TR5</i>	1.60 (.003)	1.19 (.002)	1.13 (.002)
<i>TR6</i>	2.68 (.003)	2.85 (.002)	2.56 (.002)
<i>TR7</i>	2.63 (.004)	2.18 (.003)	2.00 (.003)
<i>TR8</i>	2.51 (.004)	2.40 (.004)	1.72 (.003)
<i>TR9</i>	2.01 (.003)	1.88 (.003)	1.20 (.002)
<i>TRA</i>	6.62 (.005)	7.57 (.006)	6.41 (.005)
<i>TRB</i>	10.05 (.007)	7.96 (.005)	7.29 (.006)
<i>TRC</i>	12.2 (.007)	10.43 (.007)	8.82 (.005)

Note: Standard errors are in parentheses.

Table A.11 Squared Poverty Gap Estimates Based on Income (2013-2020)

Region	2013	2014	2015	2016	2017	2018	2019	2020
<i>TR10</i>	0.74 (.001)	0.84 (.002)	0.53 (.001)	0.65 (.002)	0.63 (.001)	0.46 (.001)	0.45 (.004)	0.07 (.001)
<i>TR21</i>	0.41 (.001)	1.07 (.003)	0.87 (.002)	0.38 (.001)	0.78 (.003)	0.99 (.003)	1.01 (.003)	0.06 (.002)
<i>TR22</i>	1.74 (.003)	3.11 (.005)	1.37 (.002)	1.72 (.004)	2.37 (.004)	2.11 (.004)	2.87 (.002)	1.65 (.003)
<i>TR31</i>	1.46 (.003)	1.52 (.003)	0.96 (.002)	0.92 (.002)	0.45 (.001)	0.45 (.001)	0.81 (.006)	0.09 (.002)
<i>TR32</i>	0.42 (.001)	0.79 (.002)	0.49 (.001)	0.45 (.001)	0.67 (.002)	0.43 (.001)	0.91 (.003)	0.04 (.001)
<i>TR33</i>	0.57 (.001)	0.51 (.001)	0.46 (.001)	0.31 (.001)	0.48 (.001)	0.80 (.002)	1.16 (.006)	0.06 (.001)
<i>TR41</i>	0.71 (.002)	0.50 (.001)	0.45 (.001)	0.34 (.002)	0.21 (.001)	0.29 (.001)	0.55 (.003)	0.13 (.001)
<i>TR42</i>	0.88 (.002)	0.62 (.001)	0.46 (.002)	0.33 (.001)	0.26 (.001)	0.39 (.001)	0.85 (.001)	1.10 (.003)
<i>TR51</i>	0.73 (.002)	0.45 (.001)	0.28 (.001)	0.46 (.001)	0.40 (.001)	0.33 (.001)	0.50 (.005)	0.42 (.002)
<i>TR52</i>	1.62 (.003)	0.93 (.002)	0.93 (.002)	1.21 (.004)	1.40 (.003)	1.04 (.003)	1.75 (.003)	2.14 (.004)

<i>TR61</i>	1.71 (.004)	(1.29 (.003)	1.41 (.003)	1.06 (.003)	0.76 (.003)	1.51 (.003)	1.93 (.004)	1.11 (.002)
<i>TR62</i>	2.94 (.004)	2.32 (.003)	2.03 (.004)	1.46 (.003)	1.07 (.002)	1.16 (.002)	1.95 (.001)	2.48 (.003)
<i>TR63</i>	3.77 (.004)	3.45 (.005)	2.12 (.003)	2.23 (.004)	1.79 (.003)	2.73 (.005)	2.29 (.002)	2.57 (.003)
<i>TR71</i>	1.17 (.002)	0.94 (.002)	1.54 (.005)	0.96 (.003)	1.03 (.003)	0.89 (.003)	1.38 (.003)	1.35 (.003)
<i>TR72</i>	2.02 (.004)	1.98 (.005)	1.61 (.005)	0.73 (.002)	1.28 (.003)	0.68 (.002)	1.72 (.002)	2.40 (.006)
<i>TR81</i>	0.36 (.001)	1.09 (.004)	0.27 (.001)	0.27 (.002)	0.21 (.001)	0.49 (.002)	0.87 (.004)	1.03 (.005)
<i>TR82</i>	1.50 (.003)	1.60 (.003)	2.66 (.008)	1.53 (.006)	1.65 (.005)	2.69 (.009)	2.82 (.002)	2.71 (.007)
<i>TR83</i>	2.33 (.004)	1.89 (.003)	1.20 (.002)	0.97 (.002)	1.18 (.002)	1.11 (.002)	1.87 (.004)	1.66 (.003)
<i>TR90</i>	1.33 (.003)	1.34 (.003)	0.90 (.002)	0.43 (.001)	1.31 (.004)	1.39 (.005)	1.33 (.002)	0.07 (.002)
<i>TRA1</i>	4.19 (.006)	2.20 (.003)	0.84 (.002)	0.92 (.002)	1.27 (.003)	1.52 (.003)	2.42 (.001)	1.74 (.003)
<i>TRA2</i>	6.33 (.006)	6.09 (.006)	3.83 (.005)	2.74 (.005)	3.74 (.006)	3.42 (.004)	5.66 (.003)	6.25 (.006)
<i>TRB1</i>	3.91 (.006)	3.03 (.004)	1.41 (.003)	0.87 (.003)	0.63 (.002)	0.37 (.001)	0.86 (.005)	0.27 (.001)
<i>TRB2</i>	8.00 (.007)	6.68 (.006)	6.58 (.019)	5.44 (.007)	6.85 (.006)	4.79 (.004)	7.89 (.001)	6.11 (.004)
<i>TRC1</i>	2.79 (.003)	2.40 (.004)	2.06 (.003)	1.36 (.003)	1.43 (.003)	1.25 (.002)	1.83 (.003)	1.49 (.003)
<i>TRC2</i>	9.41 (.009)	11.57 (.009)	8.79 (.009)	7.02 (.007)	7.13 (.007)	6.84 (.006)	5.38 (.005)	6.57 (.005)
<i>TRC3</i>	6.96 (.006)	5.86 (.006)	6.73 (.007)	4.92 (.005)	5.61 (.005)	5.41 (.005)	5.11 (.002)	6.02 (.005)

Note: Standard errors are in parentheses.

Table A.12 Estimations through Various Poverty Cut-offs

Year	H (%)			M (%)		
Cut-off	1/4	1/3	1/2	1/4	1/3	1/2
<i>2013</i>	60.7 (.004)	49.2 (.005)	24.4 (.004)	28.7 (.002)	25.4 (.003)	15.3 (.003)
<i>2014</i>	54.7 (.004)	43.2 (.005)	19.8 (.004)	25.1 (.002)	21.8 (.003)	12.3 (.003)
<i>2015</i>	55.1 (.004)	43.5 (.005)	19.4 (.004)	25 (.002)	21.6 (.003)	11.9 (.003)
<i>2016</i>	50.3	38.6	15.7	22	18.6	9.4

	(.005)	(.005)	(.004)	(.002)	(.002)	(.002)
2017	47.6 (.005)	35.6 (.005)	13 (.004)	20.3 (.002)	16.9 (.002)	7.8 (.002)
2018	45.9 (.005)	33.9 (.005)	12.2 (.003)	19.4 (.002)	16 (.002)	7.2 (.002)
2019	47 (.004)	34.9 (.004)	12.3 (.003)	19.9 (.002)	16.4 (.002)	7.4 (.002)
2020	43 (.004)	31.6 (.004)	10.5 (.003)	17.9 (.002)	14.6 (.002)	6.1 (.002)
2021	43.8 (.004)	31.5 (.004)	11 (.003)	18.2 (.002)	14.6 (.002)	6.5 (.002)

Note: Standard errors are in parentheses.

Table A.13 Regional Multidimensional Poverty Rates (H) %

Region	2014	2015	2016	2017	2018	2019	2020	2021
TR10	29.7	35.4	29.3	27.2	26.9	29.5	25.2	25.4
TR21	22.9	28.3	21.9	23.5	22.6	27	21.7	22
TR22	25.7	45.1	33.3	26.9	23.7	24.2	21.1	21.1
TR31	38.1	42.8	33.5	32.8	26.7	26.2	27.3	26.2
TR32	32.4	35.1	29.3	29	28.2	28.9	24.8	18.8
TR33	28.6	28.3	22.9	22.3	19.8	23.8	22	24.2
TR41	28.2	28.5	23.3	23.2	22.6	23.1	18.6	17.8
TR42	43.5	33.8	27.1	15.5	16.6	19.2	14.5	19.1
TR51	25.1	20.1	14	16.6	16.9	14.9	10.2	9.5
TR52	39.5	29.4	29.9	25.2	22.4	23.8	18.8	26.4
TR61	36.6	37.9	38.9	28.9	29.9	33.9	29.8	30.9
TR62	49.7	49.3	45.3	33	28.2	31	32.4	36.6
TR63	59.4	58.2	50.1	49.4	49.5	54.9	50.5	52.1
TR71	30.2	35.2	33.3	33.1	30.6	27.9	24.8	23.2
TR72	47.2	46.3	53	46.2	38.4	31.9	30	24
TR81	36.3	41.1	35.5	32.6	34.2	28.6	22.8	20.1
TR82	38.8	36.6	29.6	29.1	25	32.8	29.5	27.8
TR83	51.1	49.1	42.1	38.4	35.7	36.9	36.3	36.2
TR90	43.2	43.7	46.2	44.4	40.5	41.8	39.9	32.4
TRA1	59.4	52.3	41	39.9	32.3	35	36.6	32.9
TRA2	79.3	74.1	72.3	71.1	70.9	69	64	66.1
TRB1	59.3	56.8	38.8	35.9	26.8	26.8	25.4	24.5
TRB2	82.6	82.4	79.7	75.8	76.1	72.1	71.4	69.8
TRC1	67.8	65.9	58.2	60.4	58.4	57.9	50.8	44.1
TRC2	84.9	81.7	81.8	79.9	81.2	76.7	73.8	75.4
TRC3	77.2	71.6	69.8	66.8	68.9	71.1	63.9	67.5

Table A.14 Regional Multidimensional Poverty Index (M) %

Region	2014	2015	2016	2017	2018	2019	2020	2021
TR10	13.8	16.9	13.8	12.6	12.8	13.8	11.5	11.6
TR21	10.6	12.8	10.5	11.2	10.7	13	9.8	10.2
TR22	11.4	21.5	14.5	11.7	10.1	10.7	9.3	8.8
TR31	18.9	21.6	15.7	15.5	12.4	12	12.1	11.9
TR32	14.3	15.7	12.6	12.4	12.2	12.6	10.9	7.8
TR33	12.6	12.6	9.9	9.5	8.5	9.9	9.3	10.2
TR41	13.2	13.3	10	9.9	9.5	9.8	7.8	7.7
TR42	21.1	14.9	12.1	6.4	7	8.1	5.9	8.1
TR51	11.2	8.7	6.2	7.5	7.4	6.5	4.2	4
TR52	18.4	13.1	12.9	11	9.8	10.3	8.1	11.7
TR61	18.4	18.4	18.9	13.3	13.6	16.2	13.9	14.3
TR62	25.7	24.4	22.5	15.1	12.5	14.2	14.7	16.8
TR63	31.4	30.5	25.3	24.3	24.8	27.2	24.2	24.8
TR71	13.6	15.8	14.8	14.5	13.6	12.4	10.9	10.2
TR72	22.9	22.2	26.2	21.6	18.5	14.8	12.8	10.2
TR81	15.9	19	16.4	14.2	14.9	11.8	9.4	8.4
TR82	17.9	16.5	12.8	12	10.5	13.4	12.5	12
TR83	25.9	23.7	18.6	16.4	15.2	16.4	15.9	16.3
TR90	20.5	20.5	21.1	20.7	18.7	19.6	18.2	14.3
TRA1	32.1	26.2	19.2	18.9	14.1	16.1	17.2	14.9
TRA2	43.4	42.1	38.7	36.3	35.7	34.7	31	34.2
TRB1	30.3	27.6	17.9	15.6	10.7	10.8	10.4	9.8
TRB2	46.5	45.6	42.2	38.5	37.5	35.6	35.9	35.8
TRC1	37.3	35.9	29.5	30.1	29.5	28.1	24.1	20.8
TRC2	50.5	47.5	44.6	43.5	42	40.5	38	39.3
TRC3	40.3	36.8	34.6	34.3	34.9	36.3	31.5	33.4

Table A.15 Regional Multidimensional Poverty in 2013

2013	H	M
TR1	36.3	17.3
TR2	36	16.3
TR3	37.1	17.3
TR4	37.4	17.6
TR5	31.8	14.7
TR6	55.1	28.4
TR7	52.6	26.7
TR8	55.7	28.1
TR9	54.4	26.3
TRA	77.2	45.8
TRB	73.5	40.9

TRC	83.3	49.8
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Note: H and M refers to multidimensional poverty rate (headcount ratio) and multidimensional poverty index, successively.

Table A.16 Estimation Results of the Logit Model (Regions)

Region of residence (reference category is TR10)	(6)
TR21	-0.283** (0.119)
TR22	-0.185 (0.118)
TR31	-0.0597 (0.0958)
TR32	-0.184* (0.104)
TR33	-0.154 (0.101)
TR41	-0.514*** (0.106)
TR42	-0.491*** (0.112)
TR51	-1.336*** (0.123)
TR52	0.0283 (0.112)
TR61	0.357*** (0.0947)
TR62	0.425*** (0.0914)
TR63	1.170*** (0.0929)
TR71	-0.0383 (0.116)
TR72	-0.414*** (0.112)
TR81	-0.438*** (0.128)
TR82	0.0993 (0.110)
TR83	0.445***

	(0.0921)
<i>TR90</i>	0.394***
	(0.103)
<i>TRA1</i>	0.193**
	(0.0972)
<i>TRA2</i>	1.439***
	(0.101)
<i>TRB1</i>	-0.164
	(0.112)
<i>TRB2</i>	1.491***
	(0.0976)
<i>TRC1</i>	0.681***
	(0.101)
<i>TRC2</i>	1.692***
	(0.102)
<i>TRC3</i>	1.300***
	(0.0962)

Table A.17 Correlation Matrix

	GDP_a	GDP_i	GDP_s	gini	unemp	inflation	social assist	credits	early mother	migration	student pt	imports	exports
GDP _a	1	-.333	-.588	-.36	-.264	.077	.475	-.562	.196	-.044	-.511	-.748	-.552
GDP _i	-.333	1	.681	-.14	-.205	.142	-.555	.691	-.635	.590	-.098	.616	.590
GDP _s	-.588	.681	1	.197	-.033	.143	-.562	.861	-.656	.434	-.102	.527	.416
gini	-.355	-.136	.197	1	.288	-.065	-.310	.238	.173	-.148	.407	.143	.054
unemp	-.264	-.205	-.033	.288	1	.178	.035	-.096	.080	-.168	.467	.097	.183
inflation	.077	.142	.143	-.07	.178	1	.239	.076	-.383	.073	-.054	.093	.207
social assist	.475	-.555	-.562	-.31	.035	.239	1	-.637	.145	-.349	-.263	-.454	-.429
credits	-.562	.691	.861	.238	-.096	.076	-.637	1	-.517	.382	.068	.618	.579
early mother	.196	-.635	-.656	.173	.080	-.383	.145	-.517	1	-.498	.351	-.299	-.305
migration	-.044	.590	.434	-.15	-.168	.073	-.349	.382	-.498	1	-.229	.175	.193
student pt	-.511	-.098	-.102	.407	.467	-.054	-.263	.068	.351	-.229	1	.335	.411
imports	-.748	.616	.527	.143	.097	.093	-.454	.618	-.299	.175	.335	1	.815
exports	-.552	.590	.416	.054	.183	.207	-.429	.579	-.305	.193	.411	.815	1

Table A.18 Summary Statistics for Club 1

club1	Median	Mean	Min.	Max.
<i>MPI</i>	0.3775	0.388	0.31	0.505
<i>log(GDP_{industry})</i>	7.066	7.116	6.644	7.831
<i>log(GDP_{services})</i>	8.473	8.496	8.247	8.929
<i>log(GDP_{agriculture})</i>	7.219	7.328	6.953	8.035
<i>Gini</i>	0.372	0.3738	0.338	0.42
<i>unemployment</i>	0.175	0.175	0.034	0.335
<i>log(social assistance)</i>	4.577	4.512	3.996	4.723
<i>log(credits)</i>	8.496	8.473	8.216	8.75
<i>early motherhood</i>	0.021	0.022	0.008	0.039
<i>inflation</i>	0.120	0.127	0.068	0.208
<i>exports rate</i>	0.029	0.056	0.007	0.174
<i>imports rate</i>	0.022	0.023	0.005	0.043
<i>migration</i>	-10.65	-12.62	-26.87	1.16
<i>student per teacher</i>	19	19.28	15	25

Table A.19 Summary Statistics for Club 2

	Median	Mean	Min.	Max.
<i>MPI</i>	0.1645	0.1831	0.081	0.373
<i>log(GDP_{industry})</i>	8.249	8.32	7.634	9.319
<i>log(GDP_{services})</i>	8.898	9.05	8.52	10.185
<i>log(GDP_{agriculture})</i>	7.464	7.09	3.576	8.129
<i>Gini</i>	0.359	0.3622	0.29	0.451
<i>unemployment</i>	0.101	0.10282	0.036	0.181
<i>log(social assistance)</i>	4.388	4.343	3.469	4.898
<i>log(credits)</i>	9.315	9.422	8.646	10.752
<i>early motherhood</i>	0.009	0.010	0.002	0.023
<i>inflation</i>	0.119	0.127	0.058	0.219

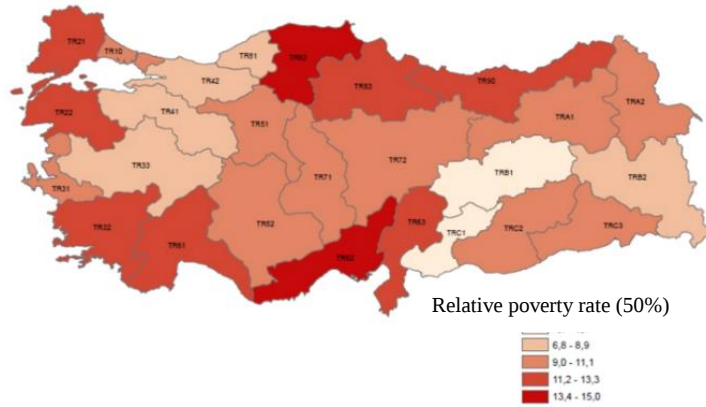
<i>exports rate</i>	0.127	0.163	0.004	0.523
<i>imports rate</i>	0.078	0.154	0.006	0.589
<i>migration</i>	-1.775	-0.7079	-35.15	60.26
<i>student per teacher</i>	16	16.67	13	23

Table A.20 Summary Statistics for Club 3

	Median	Mean	Min.	Max.
<i>MPI</i>	0.1105	0.1235	0.04	0.303
<i>log(GDP_{industry})</i>	8.65	8.693	7.748	9.741
<i>log(GDP_{services})</i>	9.002	9.047	8.668	9.961
<i>log(GDP_{agriculture})</i>	7.372	7.28	5.998	8.101
<i>Gini</i>	0.3385	0.3388	0.281	0.401
<i>unemployment</i>	0.093	0.092	0.039	0.148
<i>log(social assistance)</i>	4.232	4.287	3.773	4.746
<i>log(credits)</i>	9.172	9.266	8.617	10.665
<i>early motherhood</i>	0.009	0.009	0.003	0.024
<i>inflation</i>	0.119	0.126	0.064	0.232
<i>exports rate</i>	0.102	0.125	0.030	0.351
<i>imports rate</i>	0.097	0.126	0.008	0.498
<i>migration</i>	5.145	3.317	-11.07	16.14
<i>student per teacher</i>	16	15.44	13	18

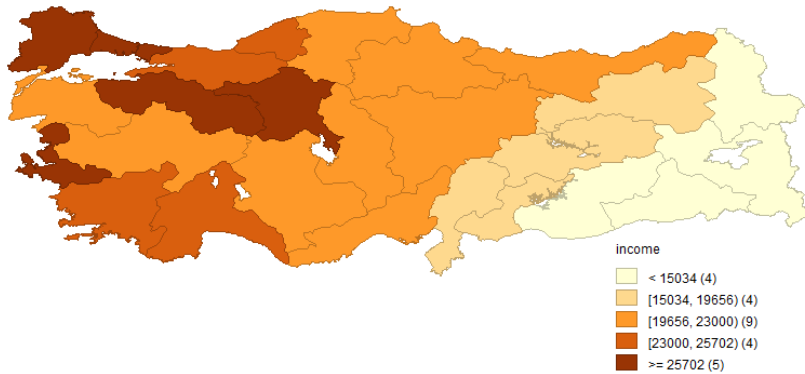
APPENDIX B: FIGURES

Figure B.1 Relative Poverty Estimates of TurkStat (2019)



Note: Relative poverty line is 50% of median income in each region.

Figure B.2 Median Income by Region (2019)



Source: Prepared by the author based on the TurkStat data.

Figure B.3 Transition Paths of the Clubs

