ERF Policy Brief

Alternative Targeting Mechanisms for Social Safety Nets in Tunisia

Khaled Nasri, Mohamed Amara, and Imane Helmi

About the authors

Khaled Nasri is a Researcher at the Faculty of Economic Sciences and Management of Tunis and an ERF Research Associate.

Mohamed Amara is an Associate Professor at the Higher School of Economic and Commercial Sciences of Tunis, University of Tunis.

Imane Helmi is a Senior Economist at the World Bank's Poverty and Equity Global Practice an ERF Research Associate.

In a nutshell

- *Institutional weaknesses, poor coordination between different government services, and the increase in informality all make it difficult to identify low-income households using the current cash transfer program.*

- *The coverage rate of the poorest 10 percent using the Mixed Means Test (MMT) targeting model that combines individual and geographical scales is around 29 percent, nearly twice the coverage rate of the current National Program of Aid to Needy Families (PNAFN).*

- *The MMT works well not only at the national level, but also at the regional level. It allows us to minimize inclusion and exclusion errors for the poorest regions of Tunisia.*

- *The multidimensional approach based on household deprivation shows a clear divergence between the selection process of social program beneficiaries and the official identification of poor households in Tunisia.*

- *The proposed multidimensional approach identifies a higher number of beneficiaries compared to the selection process currently implemented in Tunisia. However, the inclusion of this number of households in a social program may be constrained by the unavailability of monetary resources and the country's financial situation. For this purpose, the deprivation targeting approach allows us to categorize potential beneficiaries into three mutually exclusive and collectively exhaustive groups of households according to their degree of deprivation.*

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منتدى البحوث الاقتصادية

1. Introduction

Social safety nets in Tunisia are mainly based on a direct cash transfers scheme, known as the National Program of Aid to Needy Families (PNAFN), and on a health access program providing access to public medical institutions either free of charge (AMGI) or at a reduced rate (AMGII). The PNAFN accounted for around half (53 percent) of the total expenditures of the Ministry of Socials Affairs, 1.9 percent of government spending, and around 0.5 percent of gross domestic product (GDP) in 2016 (Nasri et al., 2022). It addresses families that meet a certain set of criteria. First, their income must fall below the poverty line as assessed by the Tunisian Institute of Statistics (INS). Second, some additional socio-economic conditions are considered, namely household size; the number of household members with a disability and/or chronic health condition; household living conditions, such as dwelling and assets; and the inability of the head of the household to work due to a physical or mental impairment.

Despite improvements in monthly allowance and coverage rates by region and by household standard of living since the 2011 revolution, several studies mentioned the existence of clear signs of leakages and under-coverage in these programs. Together, the PNAFN and AMGII excluded 48.9 percent of poor families in Tunisia (Silva et al., 2013). These shortcomings make the program prone to leakages and inefficiency. Additionally, institutional weaknesses, poor coordination between different government services, and an increase in informality make it difficult to identify low-income households, which increases the level of exclusion and inclusion errors.

Improving the selection of poor and vulnerable households using better targeting can ensure lower subsidy costs and reduce inclusion and exclusion errors. This exercise is reasonably requested and necessary for Tunisia, especially in these very difficult circumstances characterized by the economy's weak recovery since the 2011 revolution coupled with the health crisis caused by the COVID-19 pandemic. In 2013, the Tunisian government started the reform of the social protection system, one of the key issues of which is the review of the rules by which households are selected for the cash transfer program. A new program named 'Amen Social' was created according to organic law no. 10-2019 of January 2019 (Amen Social Law) for the promotion of poor and limited-income categories whose lack of resources affects their income, health, education, access to public services, and living conditions. It is a new and integrated social safety net program that covers most

social assistance programs in Tunisia (specifically the cash transfer program, i.e., PNAFN/AMGI and AMGII) provided by the Ministry of Social Affairs. The purpose of Amen Social is to expand coverage and achieve greater transparency, equity, and efficiency among social protection programs (Nasri et al., 2022). The Proxy Means Test (PMT) model was defined and officially selected as the basic targeting model for identifying and validating the beneficiaries of direct cash transfers (Article 8 of Amen Social Law).

This policy brief proposes two alternative targeting methods and compares them to Tunisia's current social safety nets targeting to test their performance. The first alternative is an extended version of the proxy-means-test (PMT) called the Mixed Means Test (MMT), or a two-hierarchical/multilevel model that combines individual and geographic targeting approaches, and the second is a multidimensional targeting approach based on household deprivation. Both approaches use the National Survey on Household Budget, Consumption, and Standard of Living (EBCNV) of 2015.

## 2. Poverty has decreased but remains concentrated in the inland areas

According to the 2015 EBCNV, per capita spending per year was, on average, TND 3,871 compared to TND 2,601 in 2010, an increase of 48.8 percent over the 2010-2015 period. The urban-rural gap in terms of spending remains large despite the improvement in per capita expenditure in rural areas compared to 2010. The poverty rate stood at 15.2 percent in 2015 compared to 32.4 percent in 2000. However, while the poverty rate shows an important decline of 17.2 percentage points in 15 years, it varies considerably between Tunisia's regions. The Central West and North West regions of the country have the highest poverty rates, respectively 28.4 percent and 30.8 percent, followed by the regions located in the south of the Tunisian territory where the overall poverty rate reaches 18.6 percent, while the Greater Tunis region records the lowest rate of 5.3 percent. The rates in the North East and Central East regions are 11.5 and 11.6 percent, respectively (Figure 1).

3. Mixed means test and multidimensional targeting models

The most popular targeting methods can be classified into three groups (Coady et al., 2004): individual/household

Figure 1. Poverty rates at national and regional levels
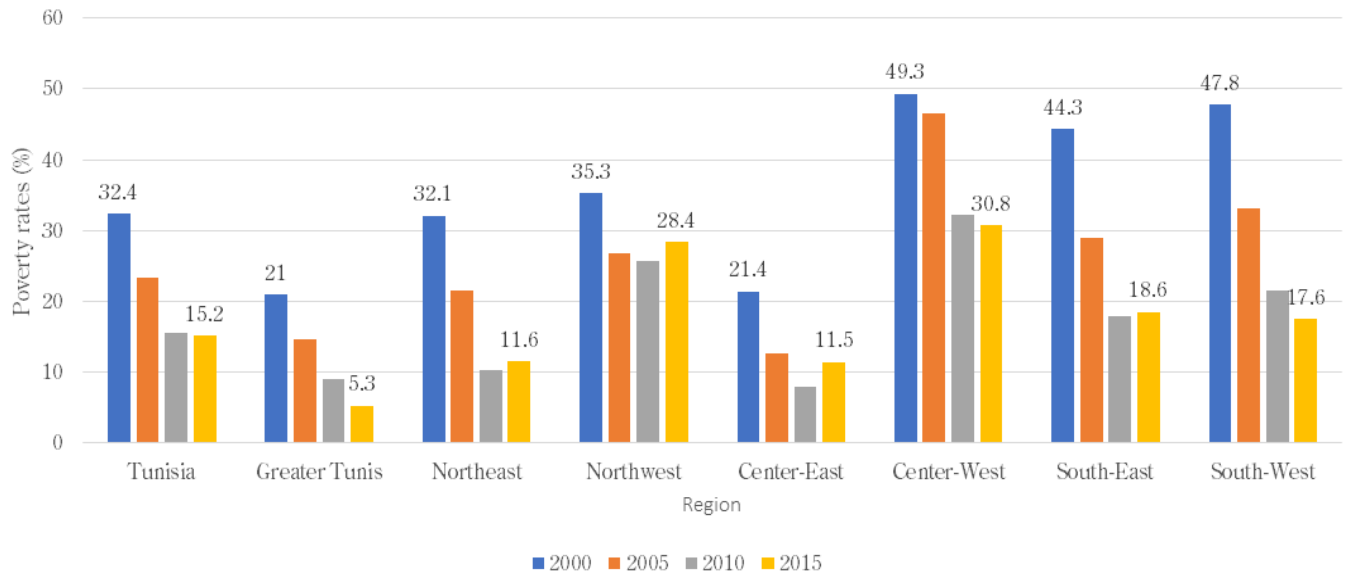
Source: Nasri et al. (2022).

assessment (e.g., Means Test (MT), Proxy Means Test (PMT), Hybrid Means Test (HMT)); categorical targeting (geographical targeting); and self-targeting. Case studies on performance in terms of targeting incidence suggest that the PMT model works well for developing countries, where a large proportion of households are self-employed or informally employed (Grosh and Baker, 1995). The PMT was particularly used in Latin America and the Caribbean (Ficha CAS system, Chile; SISBEN, Colombia; Oportunidades Program, Mexico), in Asia (India, Indonesia, China, Thailand, and the Philippines), and in Africa (Burkina Faso, Ethiopia, Ghana, Malawi, Mali, Niger, Nigeria, Tanzania, and Uganda (Brown et al., 2018), Egypt (Ahmed and Bouis, 2002), and Tunisia (CRES and World Bank, 2021; Muller and Bibi, 2010)). The results found are very encouraging. In Chile and Mexico, for example, approximately 90 percent of social assistance reached the bottom 40 percent of the population when a PMT model was adopted (Sebastian et al., 2018; Castañeda and Lindert, 2005).

4. Mixed means test model

Given the spatial dimension of poverty in Tunisia (poverty is concentrated in the North West and Central West regions), we use a new targeting model that explicitly combines individual targeting with geographic targeting. It is a Mixed Means Test (MMT) or a two-hierarchical/multilevel model where households (level 1) are nested within governorates (level 2).

This model, which combines individual and regional variables, was first developed by Bigman et al. (2000) for targeting antipoverty programs and public projects for poor communities in rural and urban areas in Burkina Faso. They combine an extensive dataset from a large number of sources (demographic data from the population census, household-level data from a variety of surveys…etc.) to identify the key explanatory variables that determine the standard of living in rural and urban areas. Bigman et al. (2000) show that such targeting is an improvement over regional targeting in that it reduces leakage and under-coverage. Additionally, this mixed model properly accounts for the household survey design, including the analytic weights and the design structure (strata and primary sampling unit). Taking into account the hierarchical structure of the data, we can explicitly consider the different sources of variability in the data collected at the household level.

In this policy brief, we propose a new approach that combines individual/household characteristics (e.g., age, education, sex, marital status…etc.) and regional variables at the governorate level (unemployment rate, the share of agriculture activity, the share of manufacturing activity, poverty rate, population density, urbanization rate, and the share of population by education level) to compute MMT scores based on coefficient estimates, and we determine beneficiaries based on the resulting MMT scores.

5. Multidimensional targeting model

The proposed targeting methodology is drawn from the identification step of the family of multidimensional poverty measures developed by Alkire and Foster (2007, 2011), based on the dual cutoff method. Such a family of measures satisfies a set of properties considered desirable in poverty measurement. The identification implies (1) defining a cutoff point for each considered dimension and (2) defining a cutoff point across dimensions as the number of dimensions in which the household should be deprived to belong to the poor group. The criteria for identifying the poor can range from 'union' to 'intersection.' The intersection criterion identifies a household as poor only if it is deprived of all considered dimensions. In contrast, the union criterion identifies a household as poor if it is deprived in any dimension and indicates the swath of society that risks poverty at some point in time. In other words, if the intention is to prevent poverty in the future, vulnerability to poverty must be considered in the anti-poverty program and the union approach is helpful in that regard (Alkire and Foster, 2007, 2011).

Three dimensions (food, health, and education) were considered the main sources of deprivation for Tunisian households and they are used to identify the potential beneficiaries of the social programs (PNAFN and AMGII). The eligibility criteria officially fixed for social safety nets will also be used as deprivation thresholds in the multidimensional targeting model (Nasri and Belhaj, 2018). Each household is deprived in the food dimension if its achievement in this dimension is below the food threshold estimated by the INS for each stratum. This threshold is estimated at TND 1,085 in the metropolitan area, TND 1,050 in the municipal area, and TND 952 in the non-municipal area. The household is deprived in the education dimension if there is a child between six and 16 years of age who does not pursue an education or training cycle in the family. Households are deprived in the health dimension if their annual income does not exceed the Interprofessional Guaranteed Minimum Wage (SMIG), which is estimated at TND 314 if the family comprises fewer than two individuals, 1.5*SMIG if the family comprises three to five individuals, and 2*SMIG if the family comprises more than five individuals.

6. Does geographical scale matter for the targeting process?

Figure 2 shows the results of the empty model, also called the 'random intercept model' or the 'intercept only' model that predicts the level 1 (household) intercept of the dependent variable (log of the welfare ratio) as a random effect of level 2 (governorate) without independent variables at levels 1 or 2. The between governorate variance is non-zero, showing that the geographical dimension is needed for the targeting process in Tunisia. Specifically, coastal governorates, such as Tunis, Ariana,

Figure 2. Variation in random intercept of empty model across governorates
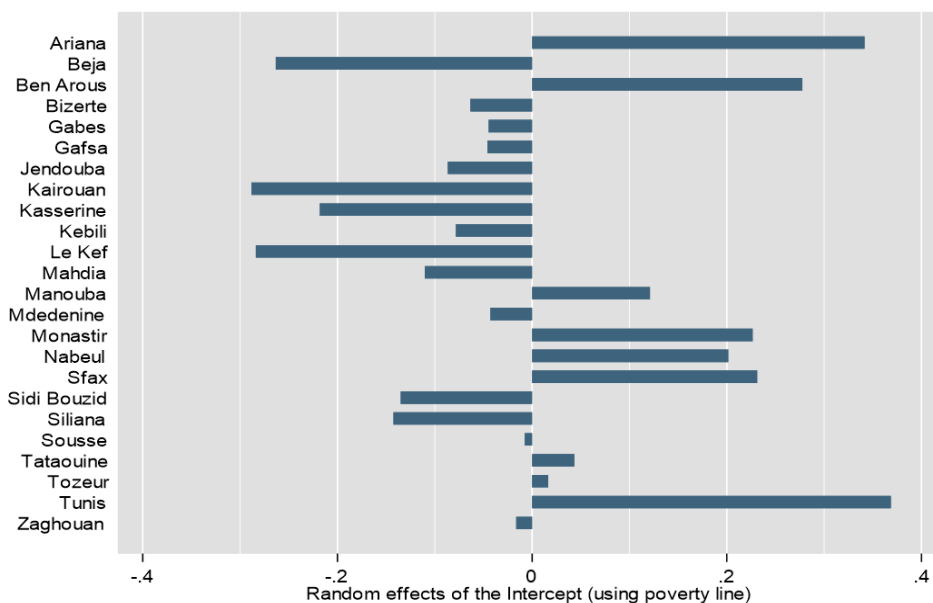
Notes: Welfare ratio is calculated as the annual per capita expenditure of household i at governorate j (y_ij) divided by the cost of living (the poverty line z_j) at governorate j. The LR tests indicate that the mixed or multilevel model is more appropriate than the simple model (the LR tests are significant at the one percent level), which allows us to justify the use of this mixed modeling approach.
Source: Authors' calculations using the 2015 EBCNV survey.

Manouba, Ben Arous, Monastir, Nabeul, and Sfax have a comparatively higher welfare ratio, while non-coastal governorates (Beja, Kairouan, Kasserine, Le Kef, Siliana, and Sidi Bouzid) have a relatively lower welfare ratio.

7. The MMT performs better than the current programs

Figure 3 reports the distribution of beneficiaries by deciles of the welfare ratio for six cutoff scores under the full MMT model, including both individual/household and regional explanatory variables. The MMT cutoffs are set at the 10th, 15th, 20th, 25th, 30th, and 40th percentiles of the welfare ratio distribution, implying that around 10, 15, 20, 25, 30, and 40 percent of the population with scores below the respective cutoffs are considered eligible for benefits. The first cutoff is close to the coverage of the existing PNAFN program (which covered nearly eight percent of the population in 2015). The second cutoff of 15 percent is close to the coverage of the AMGII program (it is also equal to the poverty rate in 2015) and the 25 percent cutoff is close to the coverage of both programs (AMGI and AMGII).

Figure 3 shows that 17 percent and 14 percent of the first (the poorest 10 percent) and second (the poorest 20 percent) deciles, respectively, are PNAFN beneficiaries. The result shows, however, that nearly five percent of the 7th decile and four percent of the 8th decile (which are generally non-poor households) also benefit from this program designed to serve first and foremost the poor population (inclusion errors). Using the full MMT model for a program that targets the poorest 10 percent of the population (based on the welfare ratio), the coverage rate of the poorest 10 percent equals 29 percent, nearly twice the coverage rate of the current PNAFN program that covers an eligible population of eight percent. The coverage rate of the last five deciles does not exceed one percent (less than one percent of non-poor households benefit from this program which covers the poorest 10 percent of the population). If we use the second cutoff of 15 percent (15 percent of the population below this cutoff would be eligible for benefits based on the full MMT model), more than 46 percent of program beneficiaries would come from the poorest decile compared to 41 percent based on the current AMGII program. These results show that the targeting performance based on the full MMT model (combining individual and geographical targeting) is considerably better than the existing programs (PNAFN/AMGI and AMGII).

8. What about inclusion and exclusion errors?

Figure 4 plots the results of the under-coverage rates, leakage rates, and eligible shares measures by the full MMT cutoff scores. If we set the cutoff score at the 20th percentile, which would make 12.3 percent of households eligible (a little less than the poor population in Tunisia

Figure 3. Targeting performance of the full MMT model using different cutoff scores
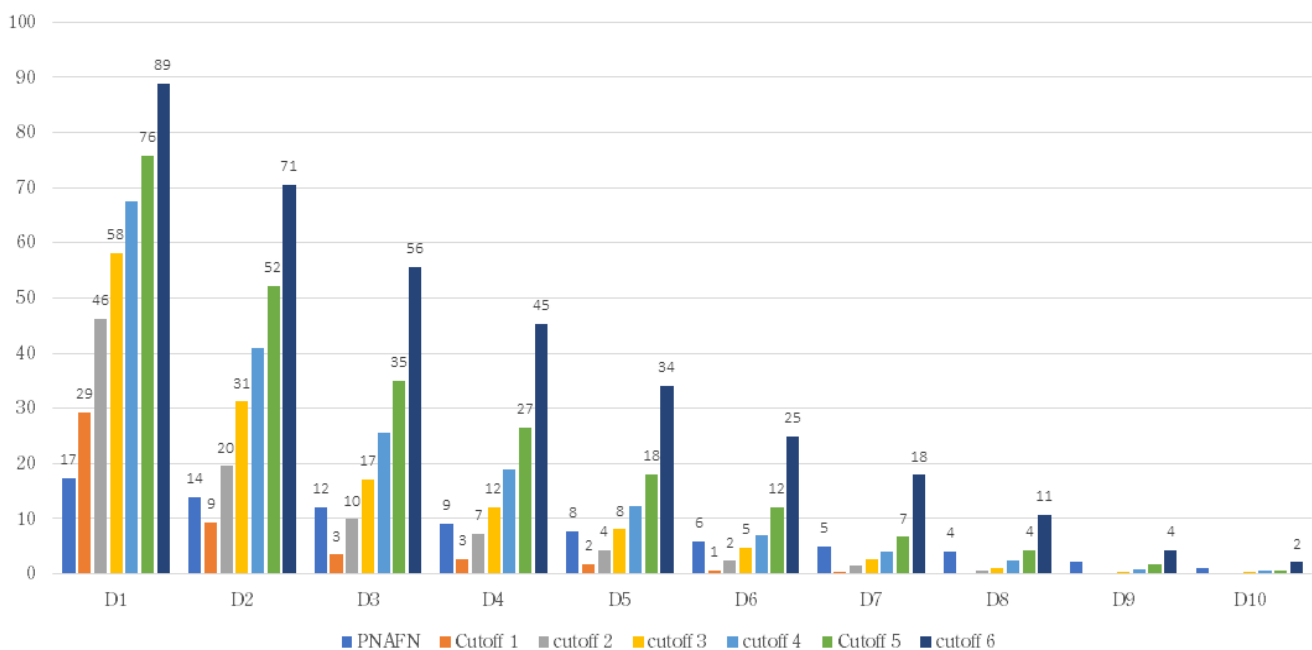
Source: Authors' calculations using the 2015 EBCNV survey.

in 2015), the corresponding Inclusion Error Rate (IER) is around 34.2 percent. These results imply that 34.2 percent of those identified as poor by the full MMT model are not, in fact, poor. This is a very acceptable rate of inclusion error compared to the results found in other work using PMT as a targeting model. For example, Brown et al. (2018) show that the average rate of inclusion error across their selected sample of countries is around 37 percent with an average exclusion error of 72 percent, for a fixed poverty level of 20 percent.

It is also important to note that both inclusion and exclusion errors decrease with increasing cutoffs. For example, the inclusion error decreases from 39.3 percent for a cutoff of the 10th percentile (cutoff 1) to 26.6 percent for a cutoff of the 40th percentile, and the EER decreases from 70.7 percent to only 34.9 percent.

Given the spatial dimension of poverty in Tunisia, which is clustered in the North West and Central West regions, it is also interesting to see the performance of the MMT model at the regional scale. As Figure 5 shows, the eligible population shares are very low for the least poor regions (Greater Tunis and Central East), in contrast to the poor regions (North West and Central West). For example, if we set the cutoff score at the national level of the 20th percentile, 36 percent of the population in the Central West and 29 percent of the population in the North West will benefit from this program compared to only two percent for Greater Tunis and nine percent for the Central East region (Figure 5a).

It is also important to note that the inclusion and exclusion errors are much lower in the two poorest regions than in the less poor ones. The inclusion error ranges from 23 percent to 35 percent for the Central West region (the poorest region) and from 23 percent to 43 percent for the North West region. For these two poorest regions (the Central West and North West), the exclusion rates are also very low compared to the other regions, respectively at 36 percent and 42 percent for a 20th percentile cutoff and at only 16 percent and 21 percent for a 40th percentile cutoff (Figure 5a and Figure 5b). These results show that the full MMT targeting model combining individual and geographical scales works well not only at the national level, but also at the regional level. It allows us to minimize inclusion and exclusion errors for the poorest regions of Tunisia.

9. Beneficiary identification using the multidimensional targeting model

The total number of potential beneficiaries using the multidimensional targeting model is estimated at 1,213,939 households, which represents 43.64 percent
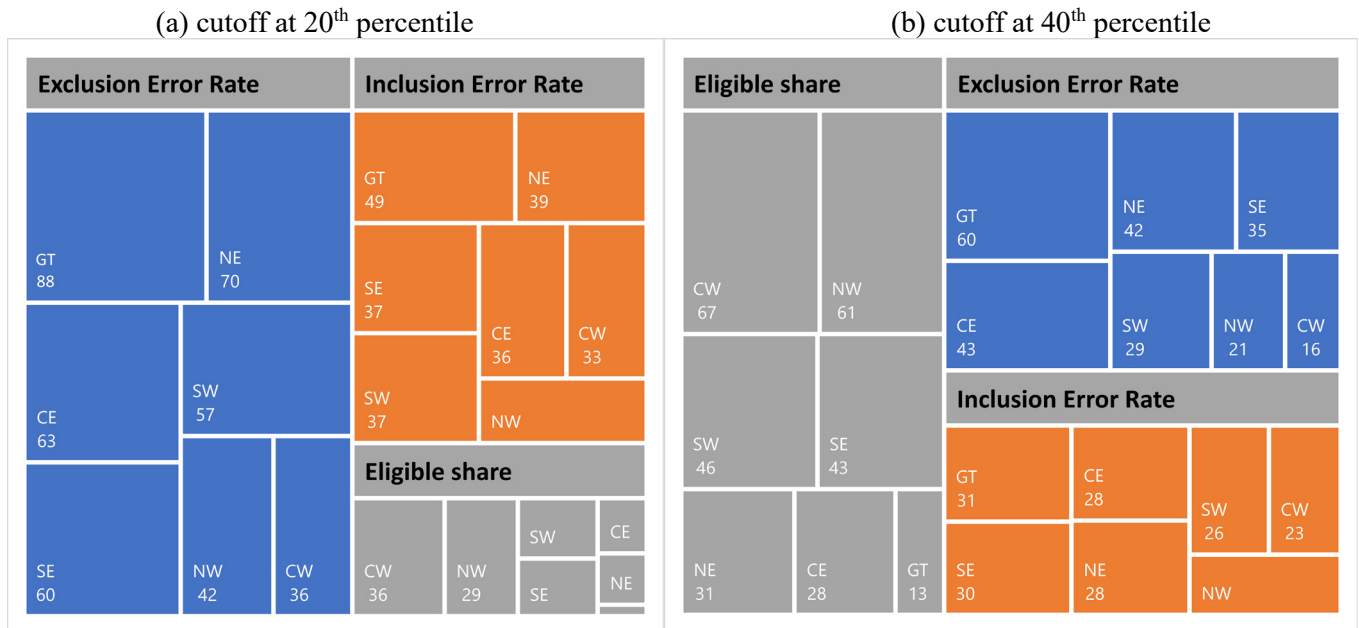
Figure 4. Under-coverage and leakage rates and eligible share by cutoff scores
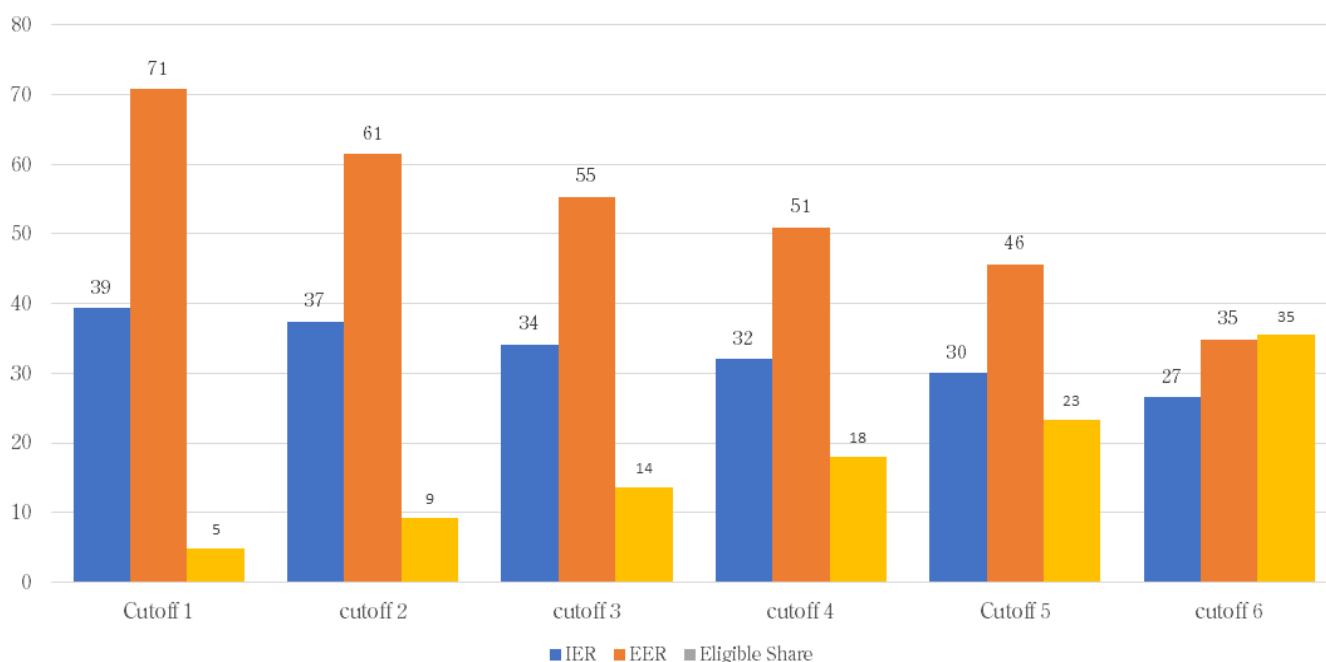
Source: Authors' calculations using the 2015 EBCNV survey.

Figure 5. Under-coverage and leakage rates and eligible share by cutoff scores and by region

(a) cutoff at 20th percentile

(b) cutoff at 40th percentile

Source: Authors' calculations using the 2015 EBCNV survey.

of the total population in 2014. This proportion includes all Tunisian households suffering from at least one deprivation and varies substantially between regions. It is estimated at 27.38 percent in Greater Tunis, and it is around 44.30 percent in the North East. However, this proportion is estimated at 56.43 percent in the North West, 64.89 percent in the Central West, and 56.99 percent in the South West. The proportion of potential beneficiaries living in the South East is 53.88 percent. The lowest proportion is estimated in the Central East (23.42 percent). There is clear evidence that the proposed targeting methodology identifies a higher number of beneficiaries compared to the selection process currently implemented in Tunisia. However, the inclusion of such a number of households in a social program may be constrained by the unavailability of monetary resources and by the financial situation of the country. For this purpose, the deprivations targeting approach allows us to categorize potential beneficiaries into three mutually exclusive and collectively exhaustive groups of households according to their degree of deprivation.

The first group includes potential beneficiaries who are in extreme deprivation (8,748 households are identified in this group, around 0.31 percent of the total population). The proportion of households included in this group varies considerably among the seven regions of Tunisia. The highest rates are estimated in the Central West (1.19 percent), the North West (0.47 percent),

and the Central East (0.31 percent). The Greater Tunis region has the lowest rate (0.03 percent). The North East has the second lowest rate (0.09 percent), followed by the South West (0.17 percent) and the South East (0.28 percent). Therefore, there is an urgent need to target all dimensional interventions for all first group members without exception.

The second group includes potential beneficiaries suffering from two deprivations simultaneously and equally. We have identified 4.75 percent of the total population that should be included in this group; this is estimated at 4.06 percent in the Central East and around 3.33 percent in the North East. However, this proportion is estimated at 8.30 percent in the North West, 5.09 percent in the South East, and 5.47 percent in the South West. This second group should also include the 11.78 percent of potential beneficiaries in the Central West. The lowest proportion is estimated in Greater Tunis (1.28 percent). The potential beneficiaries of this second group also need social interventions in two dimensions constituting the main causes of their deprivations. If the public decision-maker in Tunisia sets multidimensional poverty alleviation as an objective, then there is an urgent need to prioritize the households included in these last two groups who suffer from multiple deprivations, even in the case of an austerity policy. However, to eradicate all deprivation forms, it would be useful to strengthen the targeting of the first two groups through a forward-looking policy targeting the proportion of households living in one deprivation. This proportion constitutes the

potential beneficiaries of the third group. We found that this third group includes 1,073,137 Tunisian households living with a single deprivation, around 38.58 percent of the total population. This proportion represents 34.02 percent and 40.88 percent of households living in the Central East and North East, respectively. The high proportions are observed in the Central West (51.93 percent), the South West (51.35 percent), and the North West (47.65 percent).

The proportion of non-poor households that were excluded from the second group is estimated at 90.43 percent, while the poor households excluded from this group of households living with exactly two deprivations represent only 9.57 percent (Figure 6). However, we find that the two proportions of poor and non-poor households selected as potential beneficiaries are similar and estimated at around 50 percent. Regarding the third group, the proportion of non-poor households is estimated at 77.05 percent.

10. Conclusion

From our findings, there is clear evidence that the targeting performance of the full MMT model is considerably better than the existing programs (PNAFN/AMGI and AMGII). We find that the coverage rate of the poorest 10 percent equals 29.26 percent using the full MMT model, which is nearly twice the coverage rate of the current PNAFN program that covers only

17.44 percent (with a coverage rate of eight percent for all the population). Moreover, we have observed that both inclusion and exclusion errors decrease when increasing the cutoffs. Based on the full MMT model, the inclusion error decreases from 37.41 percent for a cutoff of the 15th percentile to 26.55 percent for a cutoff of the 40th percentile, and the exclusion error decreases from 61.47 percent to only 34.89 percent. By calculating targeting errors by region, the results show that the eligible population shares are very low for the least poor regions (Great Tunis and Central East) in contrast to the poorest regions (North West and Central West) regardless of the MMT cutoff scores.

Combining the two targeting approaches (individual/ household assessment and geographical targeting) significantly improves the targeting of the poor and vulnerable households not only at the national level, but also at the regional level. It is therefore strongly recommended that the specific characteristics of the regions (such as poverty rate, unemployment, education level, and the distribution of economic activity by sector) be considered in the targeting models for the case of Tunisia.

On the other hand, the multidimensional approach based on household deprivation shows a clear divergence between the selection process of social program beneficiaries and the official identification of poor households in Tunisia. The dimensions used are those of the social safety nets currently implemented in Tunisia, and the deprivation thresholds are directly derived from the eligibility criteria

Figure 6. Accuracy of the multidimensional targeting model by deprivations group
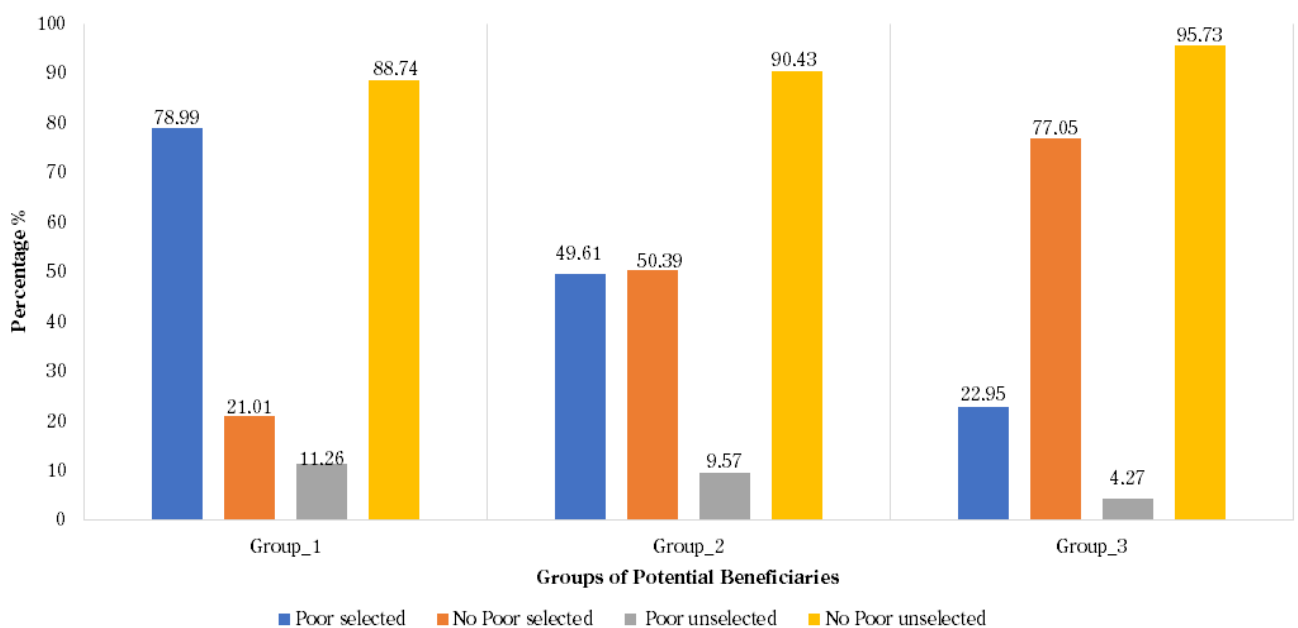
Source: Authors' calculations using the 2015 EBCNV survey.

used by the PNAFN and AMGII programs. There is clear evidence that the proposed targeting methodology identifies a higher number of beneficiaries compared to the selection process currently implemented in Tunisia. However, the inclusion of such a number of households in a social program may be constrained by the unavailability of monetary resources and the country's financial situation. For this purpose, the deprivation targeting approach allows us to categorize potential beneficiaries into three mutually exclusive and collectively exhaustive groups of households according to their degree of deprivation. On the other hand, targeting household deprivations is more accurate in including those who are officially poor and excluding the non-poor compared to the selection processes currently implemented in Tunisia.

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Contact Information

ERF Office
Address: 21 Al-Sad Al-Aaly St. Dokki, Giza, Egypt
PO Box 12311
Tel: +202 333 18 600 - 603
Fax: +202 333 18 604
Email: erf@erf.org.eg
Website: http://www.erf.org.eg

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