Subsidy Reform in Tunisia: Who Benefits from the Current System?

An Impact Assessment Based on the 2021 Household Budget and Consumption Survey

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Abstract

Subsidies have long been one of the main pillars of Tunisia's social policy, with the state providing basic food products and energy at subsidized prices. However, the sustainability of this system has become an increasing concern for public finances. In 2025, subsidy expenditure accounts for approximately 19.4% of total government spending, amounting to TND 11.593 billion, while the state budget records a deficit estimated at TND 11.02 billion.

One of the main limitations of the current system is that subsidized prices are available to all segments of society, regardless of differences in income and living standards. This study examines the distribution of subsidy benefits and identifies the groups that benefit from the current system using data from the 2021 Household Budget, Consumption and Living Standards Survey. The analysis goes beyond examining the distribution of subsidized consumption across households with different living standards by incorporating official fiscal costs to determine how each dinar spent by the state is distributed between household and non-household consumption. The results show that households with higher living standards benefit disproportionately from several subsidized products, particularly energy products. They also indicate that a substantial share of the fiscal cost of certain products is associated with commercial and institutional consumption, although measurement issues and differences in timing between the data sources may also contribute to this gap.

Based on these findings, the study develops three subsidy reform scenarios that link eligibility for subsidized prices to household living standards, with different degrees of protection and targeting across the scenarios. The recommended scenario maintains the diesel subsidy because of its role in transport, freight, and fishing, and the potentially significant inflationary effects of its removal, while redirecting subsidies for other products toward households with lower living standards and addressing non-household use of subsidized products. The recommended scenario is estimated to generate annual fiscal savings of approximately TND 5.4 billion. These estimates, however, represent potential fiscal space rather than the full economic impact of reform, as they do not capture all potential effects on inflation, production costs, employment, and economic activity, which fall beyond the scope of the present analysis.

Keywords: Tunisia, subsidy reform, food subsidies, energy subsidies, incidence analysis, targeting, living standard score, fiscal coverage, household budget survey, poverty.

JEL Classification: D12, H23, I38, Q18, D31.

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1 Introduction

For decades, generalized consumer subsidies have occupied a central place in Tunisia's economic and social policy. By keeping the prices of basic food and energy products below their market cost, the system has helped protect purchasing power and has provided a visible form of social protection across the population. Yet this model also raises a basic question of public finance: when public resources are limited, is subsidizing the consumption of the entire population the best use of scarce budgetary resources?

This question has become increasingly important as the fiscal cost of subsidies has grown relative to the resources available to the Tunisian state, particularly at a time when many essential public services, such as healthcare and education, face increasing pressure and deterioration. Every dinar committed to maintaining the subsidized price of a product is a dinar that cannot be used elsewhere. The relevant choice is therefore not simply between maintaining or removing a subsidy, but between different uses of public resources. Resources currently used to subsidize the consumption of households with relatively high living standards, or the use of subsidized products outside the household sector, could instead be redirected toward public investment in areas such as infrastructure, education, healthcare, and other services with potentially broader and more durable social and economic returns.

The purpose of this paper is not to argue that social protection should disappear. On the contrary, the central policy problem is how to preserve protection where it is genuinely needed while reducing expenditure that does not serve that objective effectively. A fiscally sustainable social policy cannot rely indefinitely on generalized price subsidies whose benefits are available to poor and rich households alike, regardless of their ability to pay. At the same time, a purely mechanical reduction in subsidy expenditure may generate substantial costs for vulnerable households and for the broader economy. The relevant challenge is therefore to distinguish between expenditure that provides meaningful protection and expenditure that could be reduced or redirected with limited damage to lower-living-standard households.

This paper approaches that challenge through two related exercises. The first is diagnostic. Using microdata from Tunisia's 2021 Household Budget, Consumption and Living Standards Survey (EBCNV), we examine how the consumption of subsidized products is distributed across households with different levels of consumption and living standards. The second goes beyond the conventional question of who benefits among observed households. We compare household-level consumption with the official fiscal cost of each subsidized product and ask how much of the total subsidy bill can actually be matched to household purchases recorded in the survey. This distinction matters because a subsidy may appear relatively well distributed among households that consume it directly while a substantial part of its total fiscal cost remains outside household consumption data.

Building on this diagnosis, the paper then develops a reform framework based on observable living-standard indicators (translated operationally into alternative eligibility cutoffs defining the share of the population that remains protected). The objective is not to construct an optimal anti-poverty transfer system, but to operationalize a simple and transparent rule that can distinguish households for which continued subsidy protection appears most justified from those with greater capacity to pay market prices. The specific technical method used to distinguish between households is not the central contribution of the paper and can itself be discussed and refined. Combining this household-level reform with the product-level fiscal decomposition makes it possible to estimate the fiscal space associated with different degrees of protection and different assumptions about the part of subsidy expenditure that is not directly matched to household consumption.

The objective is therefore both diagnostic and forward-looking. We document how the current system distributes benefits and identify where the fiscal cost of the system is actually located, but we also move from diagnosis to a concrete reform framework. The paper does not treat the estimated fiscal savings as costless. Removing or reducing subsidies, particularly for commercial and institutional users, can affect production costs, consumer prices, employment, and economic activity. We are fully aware that such a reform may entail significant economic and social costs. These effects matter for the design of any real reform. However, estimating their full magnitude requires a different empirical framework, including sectoral and macroeconomic modelling that cannot be credibly derived from household expenditure data alone (and will be the subject of future research using quantitative macroeconomic and econometric tools). The present analysis should therefore be understood as identifying the fiscal and household-level dimensions of reform and providing a basis for policy design, rather

than as a complete general-equilibrium evaluation of every possible reform path.

A subsequent stage of research can build on this framework to examine the precise sequencing of reform, the speed at which prices should be adjusted, the sectoral consequences of changes in subsidized input prices, and the complementary policies required to limit adverse effects. These questions are important, but addressing them requires different data and methods. Their absence does not prevent the present paper from answering the prior question: before designing the exact path of reform, it is necessary to establish where public resources are currently going, who benefits from them, and how much fiscal space could potentially be created while maintaining substantial protection for households with lower living standards.

The contribution of this paper lies in bringing these elements together within a single framework. Rather than treating household incidence, fiscal cost, and reform targeting as separate questions, we connect them. The result is an analysis of Tunisia's subsidy system that begins with its current distribution, compares that distribution with the full fiscal envelope, and then examines how a more selective system could redirect part of this expenditure toward other public priorities. The broader objective is not simply to spend less. It is to ask whether a different allocation of the same public resources could provide stronger and more durable social and economic returns than subsidizing, without distinction, the consumption of products such as fuel, sugar, or coffee.

The remainder of the paper is organized as follows. Section 2 reviews the main literature on subsidy reform in Tunisia. Section 3 describes the data and presents the empirical methodology. Section 4 reports the main incidence and fiscal coverage results. Section 5 develops the reform scenarios, while Section 6 discusses their interpretation and limitations. Section 7 concludes.

2 Literature Review

The literature on consumer subsidies in Tunisia has developed along several complementary lines of research. Previous studies have examined the historical evolution and institutional structure of the subsidy system, the distribution of subsidy benefits across households and income groups, and the potential welfare and fiscal effects of reforms to food and energy prices. Other contributions have focused on the design of targeting mechanisms and alternative social protection instruments aimed at reducing the regressive or inefficient allocation of subsidy expenditure. This body of research has also contributed directly to the national policy debate, including work by the National Institute of Statistics (INS) on the distributional incidence of subsidies that was presented before the Tunisian Parliament.[1] More recent research has further examined the factors underlying the growth of subsidy expenditure and the resulting pressures on public finances.

These contributions provide an important basis for the present study, but they do not all address the same policy question. Some focus primarily on poverty and welfare, others on the distributional incidence of subsidies, while others examine the macroeconomic or fiscal consequences of reform. The present paper is positioned at the intersection of these strands. Its primary objective is not to design an optimal anti-poverty transfer system, but to examine how Tunisia can rationalize generalized subsidy expenditure while maintaining protection for households with lower living standards and identifying resources that could potentially be redirected toward other public priorities.

2.1 Historical evolution of subsidy reform in Tunisia

Tunisia has a long history of consumer subsidy policies, particularly for basic food products. The experience of the early 1990s is particularly relevant to the current debate. At the time, rising subsidy expenditure and evidence that several subsidized products disproportionately benefited better-off households led policymakers to reconsider the existing system. A major reform was subsequently introduced as part of the Eighth Development Plan for 1991–1996.

A detailed account of this experience is provided by Tuck and Lindert (1996). Rather than relying primarily on household-level means testing, the reform introduced a greater degree of self-targeting. Household expenditure data were used to identify products disproportionately consumed by higher-income households and those more

[1] See the announcement published by the Tunisian Parliament.

important to lower-income households. Subsidies were gradually reduced or eliminated for products such as baguettes, pasta, couscous, pastry flour, and cube sugar, while support was concentrated on products more closely associated with lower-income consumption, such as semolina.

The reform also relied on product differentiation. Subsidized products were designed to be relatively less attractive to wealthier consumers, while higher-quality unsubsidized alternatives were made available to consumers with greater purchasing power. This allowed consumers to partially self-select between subsidized and unsubsidized products without requiring the administrative identification of each eligible household.

Another dimension of the reform concerned the relationship between subsidies and wages. As noted by Tuck and Lindert (1996), one objective of food subsidies was to limit pressure for nominal wage increases by maintaining the prices of basic "wage goods" at low levels, thereby supporting employment, production, and international competitiveness. Although the authors could not establish this relationship empirically because of limited data, they note that minimum wages increased by an average of 4.5% per year during the relevant period, while average public sector wages and consumer prices both increased by approximately 7.5% annually. They therefore suggest that food price stabilization may have contributed to limiting real wage growth.

This argument remains important for the design of any contemporary reform. The liberalization of subsidized prices cannot be considered independently from wage policy, purchasing power, productivity, and competitiveness. The reform framework developed in this paper is therefore compatible with the need to protect, and progressively improve, the purchasing power of lower-income workers, including through appropriate adjustments to the minimum wage. However, the interaction between subsidy reform, wage adjustments, labor costs, productivity, and external competitiveness requires a broader quantitative macroeconomic framework and remains a subject for future research.

The historical experience nevertheless offers an important parallel with the current situation. Tunisia again faces a large and fiscally costly subsidy system whose benefits are not exclusively captured by lower-income households. The self-targeting approach of the 1990s therefore remains a relevant policy instrument and could still provide useful lessons for the design of contemporary reforms. However, it also represents a partial solution. As long as subsidies remain attached to products and generalized prices remain below market levels, changes in consumption patterns, product substitution, and non-household uses can gradually recreate the same distributional problem.

The present paper therefore builds on, but goes beyond, the logic of the earlier reform. Rather than continuously redesigning subsidized products to discourage consumption by better-off households, it considers a more structural reform based on the progressive liberalization of subsidized prices while maintaining explicit protection for households with lower living standards. The objective is not simply to improve the targeting of the existing system, but to reconsider its underlying structure by separating social protection from generalized price subsidies. In the longer term, such a transition would need to be accompanied by broader reforms aimed at supporting higher wages through productivity gains, greater competitiveness, and a more efficient allocation of economic resources.

2.2 Distributional incidence of food subsidies

A second strand of the literature examines how the benefits of Tunisia's generalized food subsidies are distributed across households. Using household survey data, these studies generally rank households according to consumption or living standards and compare the distribution of subsidy benefits across quantiles, an approach broadly similar to the incidence analysis used in the present paper.

Institut National de la Statistique (2013) examines the effects of food subsidies and social assistance on poor and vulnerable households. It finds that food subsidies provide substantial support to poorer households, but that a significant share of benefits also reaches better-off groups. African Development Bank (2013) reaches a similar conclusion and further examines whether replacing generalized subsidies with more targeted social assistance could improve the allocation of public resources.

Focusing specifically on the food subsidy system, Institut Tunisien de la Compétitivité et des Études Quantitatives (2021) analyzes both its fiscal importance and its distributional profile using an earlier household budget survey. The study also finds that the benefits of generalized food subsidies extend beyond the poorest households. Similarly, World Bank (2020), using the 2015/16 household survey, reports the distribution of

food subsidy benefits across consumption quintiles and confirms that a substantial share of spending accrues to households outside the poorest groups.

Overall, this literature shows that generalized food subsidies protect poorer households but are not exclusively concentrated among them. The present paper builds on this incidence approach using the more recent 2021 EBCNV microdata and provides a product-level analysis. It also distinguishes between subsidy benefits matched to household consumption in the survey and the total official fiscal cost of each subsidy. This allows the paper to complement the traditional question of *who benefits from subsidies?* with a broader fiscal question: *how much of the total subsidy bill can actually be matched to observed household consumption?*

The analysis remains limited by the availability of household survey data. Once the next survey wave becomes available, this work could be extended using more recent evidence and a broader analytical framework. A more complete study could combine the household-level incidence analysis developed here with quantitative macroeconomic analysis, including the effects of subsidy reform on inflation, wages and the minimum wage, as well as other general equilibrium and macroeconomic consequences.

2.3 Energy subsidies and reform simulations

The literature on energy subsidies in Tunisia has examined both their distribution across households and the potential consequences of subsidy reform. Because energy price increases can affect households directly and indirectly through transport and other prices, several studies extend the analysis beyond simple benefit incidence.

World Bank (2013) provides one of the most comprehensive early analyses of Tunisia's energy subsidy system. Using household data, it examines the distribution of energy subsidy benefits across living-standard groups, while also combining this incidence analysis with a computable general equilibrium model and simulations of alternative reform and compensation scenarios. The study finds that energy subsidies, particularly for some products, are disproportionately captured by better-off households and evaluates the macroeconomic and distributional consequences of different reform paths.

Using a more recent simulation approach, Cuesta et al. (2015) examines the socioeconomic effects of energy subsidy reform in Tunisia. The study evaluates the effects of energy price increases on household welfare and poverty and considers alternative compensation mechanisms. Its results show that the fiscal gains from reform must be assessed together with their distributional consequences and the capacity of compensatory policies to protect vulnerable households. Building on this concern, the present paper adopts a cautious approach to energy subsidy reform, particularly by considering the temporary preservation of diesel subsidies in an initial reform package to limit broader inflationary effects. A more complete reform could subsequently reconsider these subsidies as alternative infrastructure and energy sources, including cleaner and renewable energy, become more widely available.

More recently, World Bank (2023) provides updated evidence on the fiscal burden and distributional incidence of energy subsidies in Tunisia. The report distinguishes between different energy products and shows that the benefits of fuel and gas subsidies are largely captured by richer households, confirming the targeting problems identified in earlier studies.

Overall, this literature shows that energy subsidy reform cannot be assessed only through its immediate fiscal savings. Existing studies have already examined household incidence, poverty effects, compensation mechanisms, and, in some cases, broader macroeconomic consequences. This paper therefore does not attempt to simulate the full macroeconomic consequences of subsidy removal. Instead, it establishes the household-matched and residual components of the existing subsidy bill at the product level and estimates the fiscal implications of alternative levels of household protection.

2.4 Targeting, proxy means tests, and social protection

A separate strand of the Tunisian literature focuses on the design of targeted transfers and the reduction of poverty. Its central question is how a given social protection budget can be allocated across households in order to minimize a poverty measure when household income or living standards cannot be perfectly observed.

A major contribution is provided by Bibi (2002). The study considers the allocation of a fixed anti-poverty budget B across households through transfers t_i, and formulates the problem as the minimization of a poverty

index:

$$\min_{\{t_i\}} P_\alpha(y_i + t_i) \qquad \text{subject to} \qquad \sum_i t_i \leq B, \quad t_i \geq 0.$$

The choice of the poverty parameter α determines the policy objective. For $\alpha = 0$, the objective is related to reducing the number of households below the poverty line, while larger values of α place greater weight on the depth and severity of poverty. The optimal allocation of transfers therefore depends directly on the social objective chosen by the policymaker. Bibi (2002) then examines whether proxy means tests, based on observable household characteristics, can approximate this optimal allocation when household income is not directly observable. The results suggest that a more targeted transfer system could reduce poverty more effectively than generalized food subsidies under a given anti-poverty budget. Muller and Bibi (2006) extend this approach by focusing on the statistical problem of predicting household living standards. In the conventional approach, living standards are predicted from observable characteristics x_i, for example through a model of the form

$$y_i = x_i'\beta + \varepsilon_i,$$

often estimated by OLS. Muller and Bibi (2006) argue that minimizing overall prediction errors is not necessarily the appropriate objective when the policy concerns mainly poor and vulnerable households. They therefore develop focused prediction methods, including quantile regressions, which give greater attention to the lower part of the living-standard distribution. Their results show that predictions based on quantiles close to the expected poverty line can improve targeting performance and reduce both leakage and the undercoverage of poor households.

The broader literature on social assistance, including African Development Bank (2013), addresses similar practical questions concerning inclusion errors, exclusion errors, and the administrative capacity required to replace generalized subsidies with targeted transfers.

The present paper builds on this literature but pursues a different policy objective. In the targeting literature, the government starts with a transfer budget B and seeks an allocation $\{t_i\}$ that minimizes poverty:

$$\min P_\alpha \qquad \text{given} \qquad \sum_i t_i \leq B.$$

Our framework reverses this perspective. The starting point is the existing subsidy expenditure, and the central question is how much of this expenditure can be removed while maintaining a defined level of protection for households with lower living standards. In simplified terms, the objective is closer to:

$$\max\ S \qquad \text{subject to} \qquad \text{Household protection} \geq \bar{H},$$

where S represents fiscal savings and $\bar{H}$ represents the minimum level of protection retained under a given reform scenario.

This difference reflects a broader difference in research objectives. The studies of Bibi (2002) and Muller and Bibi (2006) primarily address an anti-poverty problem: how can transfers be designed and targeted to achieve the greatest possible reduction in poverty? This is closely related to the literature on poverty, social protection, and development economics. The present paper instead addresses a problem of fiscal policy and public expenditure. Its objective is to examine how Tunisia can reduce inefficient and poorly targeted public spending while preserving protection for households with lower living standards.

The fiscal space created by such a reform is not treated as an end in itself. It could potentially be redirected toward public investment, infrastructure, education, health, or other public priorities. More broadly, the underlying policy objective is to move from generalized price distortions toward a more efficient allocation of public resources and a more competitive economic environment, while avoiding a reform in which fiscal savings are achieved simply by transferring the cost to vulnerable households.

For this reason, the household protection rule developed in the present paper should not be interpreted as a new proxy means testing methodology competing with the more sophisticated approaches proposed by Bibi (2002)

or Muller and Bibi (2006). It is instead an operational rule used to construct and compare alternative subsidy reform scenarios. Targeting serves here as a policy constraint within a broader exercise of fiscal rationalization, rather than as the primary object of optimization.

2.5 Fiscal dynamics and the broader cost of subsidies

Another strand of the literature focuses on the evolution of subsidy expenditure and the factors behind changes in its fiscal cost. This question is distinct from distributional incidence: a subsidy bill may increase even without changes in its basic structure because of developments in international prices, exchange rates, production costs, subsidized quantities, or domestic policy choices.

Recent work by Jouili and Welleni (2025) examines the factors behind the increase in food subsidy expenditure in Tunisia. Focusing on wheat subsidies, the study shows that their fiscal cost depends not only on international prices, but also on the exchange rate, subsidized quantities, producer prices, and transfer prices. More broadly, it shows that the growth of subsidy expenditure reflects the interaction between external shocks and domestic economic policies.

The broader public finance context is examined by World Bank (2020), which places subsidies within Tunisia's overall public expenditure structure and discusses the fiscal challenges associated with their financing. This perspective raises the question of the opportunity cost of generalized subsidies and whether part of the resources devoted to them could generate greater social and economic returns if allocated differently.

The present paper builds on this literature but addresses a different question. While Jouili and Welleni (2025) examines why subsidy expenditure has increased over time, our analysis focuses on the composition of the existing fiscal envelope. We ask how much of the official subsidy bill can be matched to observed household consumption, how the household-matched component is distributed across living-standard groups, and where the potential scope for fiscal rationalization lies.

The objective is therefore not simply to reduce public expenditure. The fiscal space identified through subsidy reform could potentially be redirected toward other public priorities, including infrastructure, education, healthcare, and public investment. In this sense, the paper approaches subsidy reform as a question of public resource allocation: whether part of the resources currently used to maintain generalized price subsidies could generate greater social and economic returns through alternative uses.

2.6 Positioning of the present study

The existing literature has examined Tunisia's subsidy system from several perspectives, including its historical evolution, distributional incidence, reform scenarios, targeting mechanisms, and fiscal dynamics (Tuck and Lindert, 1996; Institut National de la Statistique, 2013; Cuesta et al., 2015; Bibi, 2002; Muller and Bibi, 2006; Jouili and Welleni, 2025). The present paper builds on these contributions but connects household-level incidence with the full fiscal cost of subsidized products.

Using the 2021 EBCNV microdata, the analysis examines how subsidized consumption is distributed across households and compares the household-matched component of each subsidy with its official fiscal cost. This distinction makes it possible to move beyond the conventional question of *who benefits from subsidies?* and ask how much of the total fiscal envelope can actually be matched to observed household consumption.

The paper then uses this diagnosis to construct transparent reform scenarios with different degrees of protection for households with lower living standards. These scenarios are not presented as an optimal targeting model or a complete macroeconomic simulation, but as a fiscal policy exercise that identifies the potential scope for rationalizing subsidy expenditure while maintaining household protection.

3 Data and methodology

3.1 Data and measurement

The analysis combines household microdata from the 2021 EBCNV with official fiscal information from the 2025 *Citizen Budget*. The EBCNV, collected by the Institut National de la Statistique (INS) between March 2021 and

March 2022, provides household-level information on annual consumption, household size, poverty status, survey weights, and detailed product expenditures. We link the household and product files through the INS product classification and retain 13 subsidized products: vegetable oil, milk, coffee, flour, *gros pain*, baguette, semolina, couscous, and pasta among food products, and bottled gas, gasoline, diesel, electricity and gas among energy products.

For frequently purchased products, expenditures are recorded through a 7-day diary as well as supplementary recall entries covering longer periods. Since these entries overlap, adding them together would double count purchases. We therefore retain the 7-day diary entries and annualize weekly expenditure and quantities using

$$X_{p,i}^{A} = X_{p,i}^{W} \times \frac{365}{7}.$$

This correction gives an implied bread consumption of approximately 65 kilograms per person per year, compared with around 5 kilograms under the uncorrected approach. Electricity and gas bills are already recorded as annual household amounts and require no further adjustment.

For products recorded only in monetary terms, quantities are recovered using regulated retail prices:

$$Q_{p,i} = \frac{X_{p,i}}{P_p}.$$

This applies to gasoline, diesel, and bottled gas. Other products use the quantities directly reported in the survey. Bread is treated as two separate products, *gros pain* and baguette, because each corresponds to a different official subsidy rate.

Official fiscal costs and subsidy rates are obtained from the 2025 *Citizen Budget*. Ten of the thirteen products can be directly matched with official fiscal information. Coffee and electricity and gas are retained in the incidence analysis but excluded from the household-matched fiscal calculation because no independent subsidy rate is available.

The use of 2021 household data and 2025 fiscal data creates a timing difference. To account for population growth, household quantities are scaled by

$$g = \frac{11{,}972{,}169}{11{,}759{,}090} = 1.0181.$$

This adjustment assumes stable per-capita physical consumption and should be interpreted as a limited correction for population growth rather than a complete adjustment for changes in consumption patterns or relative prices.

3.2 Household incidence

Households are ranked according to annual per-capita consumption:

$$c_i = \frac{\texttt{conso\_an\_men}_i}{n_i},$$

where n_i denotes household size. We then divide the population into ten weighted deciles using the individual population weight $v701_i$. Each decile therefore represents approximately 10% of the national population.

For each product p and decile d, we calculate the share of national household expenditure captured by that decile:

$$\text{Share}_{p,d} = \frac{\sum_{i \in d} v701_i X_{p,i}}{\sum_i v701_i X_{p,i}} \times 100.$$

The same approach is used to report the shares received by households classified as poor or extremely poor according to the official EBCNV indicators. These measures describe the distribution of subsidized consumption within the household sector; they do not represent the distribution of the full fiscal cost.

3.3 Household-matched and residual fiscal cost

For each product p, let C_p denote its official fiscal cost and Rate_p its official subsidy per physical unit. The subsidy expenditure that can be matched to household consumption is

$$M_p = \sum_i v700_i \, (gQ_{p,i}) \, \text{Rate}_p.$$

We then define the household-matched share as

$$r_p = \min\left(\frac{M_p}{C_p}, 1\right),$$

and the corresponding household-matched fiscal cost as

$$H_p = r_p C_p.$$

The remaining component is

$$R_p = (1 - r_p) C_p.$$

We refer to R_p as the *residual fiscal cost*, defined as the part of the official fiscal cost that cannot be matched to household purchases observed in the survey. After correcting household quantities for population growth and given the quality and coverage of the EBCNV expenditure data, we consider commercial and institutional use to account for the main part of this residual. For the purpose of the reform scenarios, we therefore assume that 95% of R_p corresponds to commercial, institutional, and other non-household consumption, while the remaining 5% captures possible survey underreporting, measurement differences, timing effects, and other sources of mismatch between the 2021 household data and the 2025 fiscal accounts.

The household-matched fiscal cost is distributed across deciles using the expenditure shares defined above:

$$H_{p,d} = H_p \times \frac{\text{Share}_{p,d}}{100}.$$

This distinction between H_p and C_p is central to the analysis. Household incidence identifies how the observed household component is distributed, while fiscal matching identifies how much of the total subsidy bill can actually be connected to household consumption.

3.4 From incidence to reform and robustness

The incidence analysis and the reform exercise are kept separate. Consumption deciles are used to describe the distribution of existing subsidies, but they cannot serve directly as an operational targeting criterion because a household's position in the national consumption distribution is not directly observable to policymakers.

The reform scenarios therefore rely on the living-standard score developed in Section 5. This score provides an observable basis for defining different levels of household protection. The purpose is not to estimate an optimal transfer system or to simulate the full macroeconomic effects of subsidy removal, but to examine the fiscal implications of alternative degrees of protection.

Because the EBCNV does not provide primary sampling unit or stratum identifiers, we cannot estimate standard survey-design confidence intervals. We therefore use a household-level nonparametric bootstrap with 1,000 replications. In each replication, households are resampled with replacement, while retaining their survey weights, and the full incidence calculation is repeated. We report the 2.5th and 97.5th percentiles as approximate 95% confidence intervals.

These intervals capture sampling variation in the household data only. They do not account for uncertainty in official subsidy rates, fiscal costs, or the timing difference between the 2021 survey and the 2025 fiscal accounts.

4 Results

4.1 Food products, by decile

Figure 1 shows how national household spending on each food product is split across the ten deciles of per-capita consumption. Semolina stands out as the most pro-poor product in the sample: the poorest decile captures the largest share, and the share falls almost monotonically toward the richest decile. Gros pain follows a similar, though flatter, pattern. Both fit the intuition that a large, plain loaf is more of a budget staple than a discretionary purchase. Baguette, coffee, and milk sit at the other end: all three show a sharp jump in the richest decile, with milk and coffee both giving over 30% of national spending to the top tenth of the population alone.

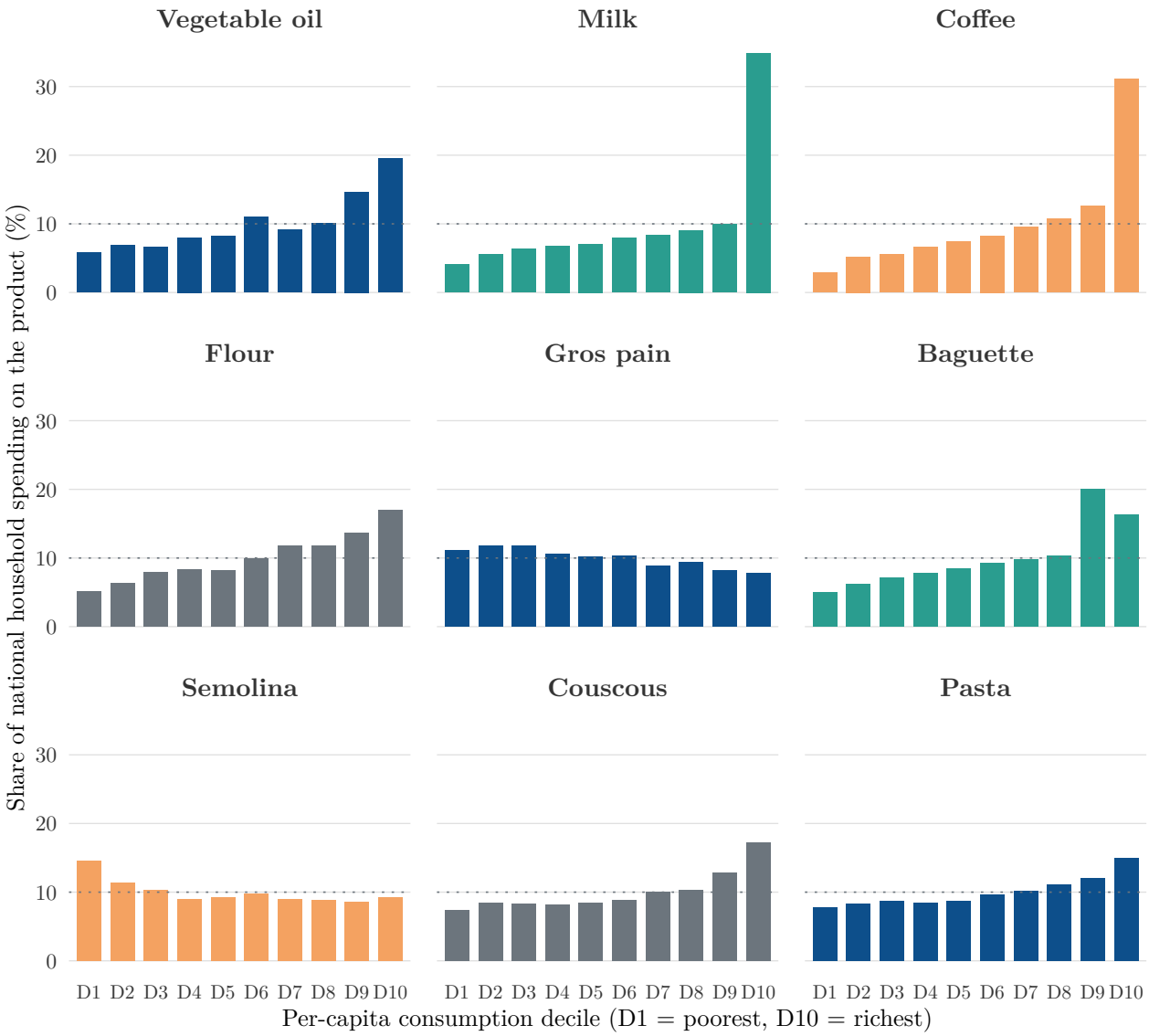


Figure 1: Food subsidy incidence among purchasing households, by per-capita consumption decile

4.2 Energy products, by decile

Figure 2 repeats the exercise for the four energy products. The pattern is more clearly regressive than for food. Gasoline is the most extreme case in the whole sample: the poorest decile captures under 2% of national gasoline spending, against over 32% for the richest decile alone, consistent with car ownership rising sharply with household income in Tunisia. Diesel and electricity and gas follow a similar, if less extreme, climb toward

the richest deciles. Bottled gas is the exception among energy products: its distribution is close to flat, only mildly tilted toward richer deciles, consistent with GPL being an everyday cooking fuel for households that are not connected to the piped gas network, a group that skews poorer and more rural.

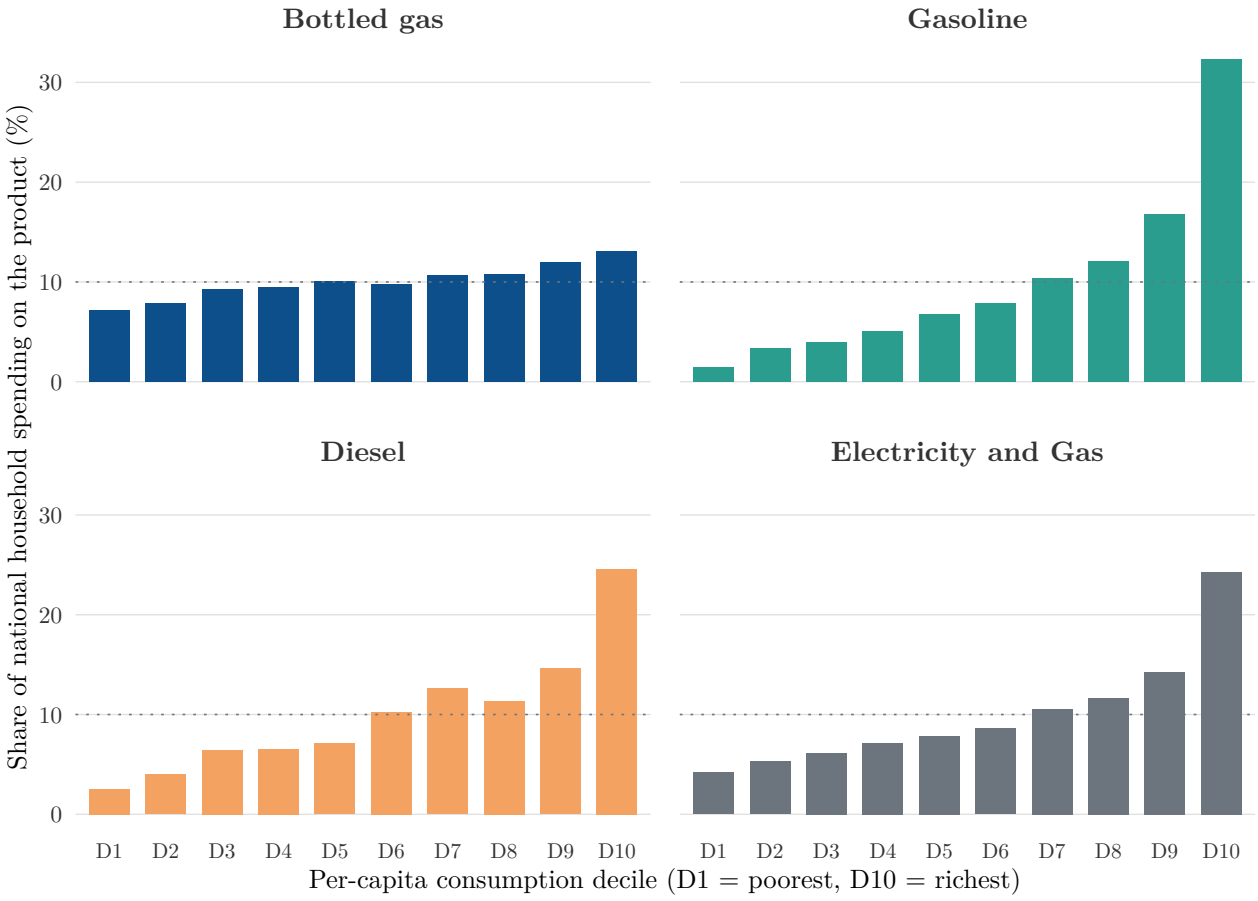
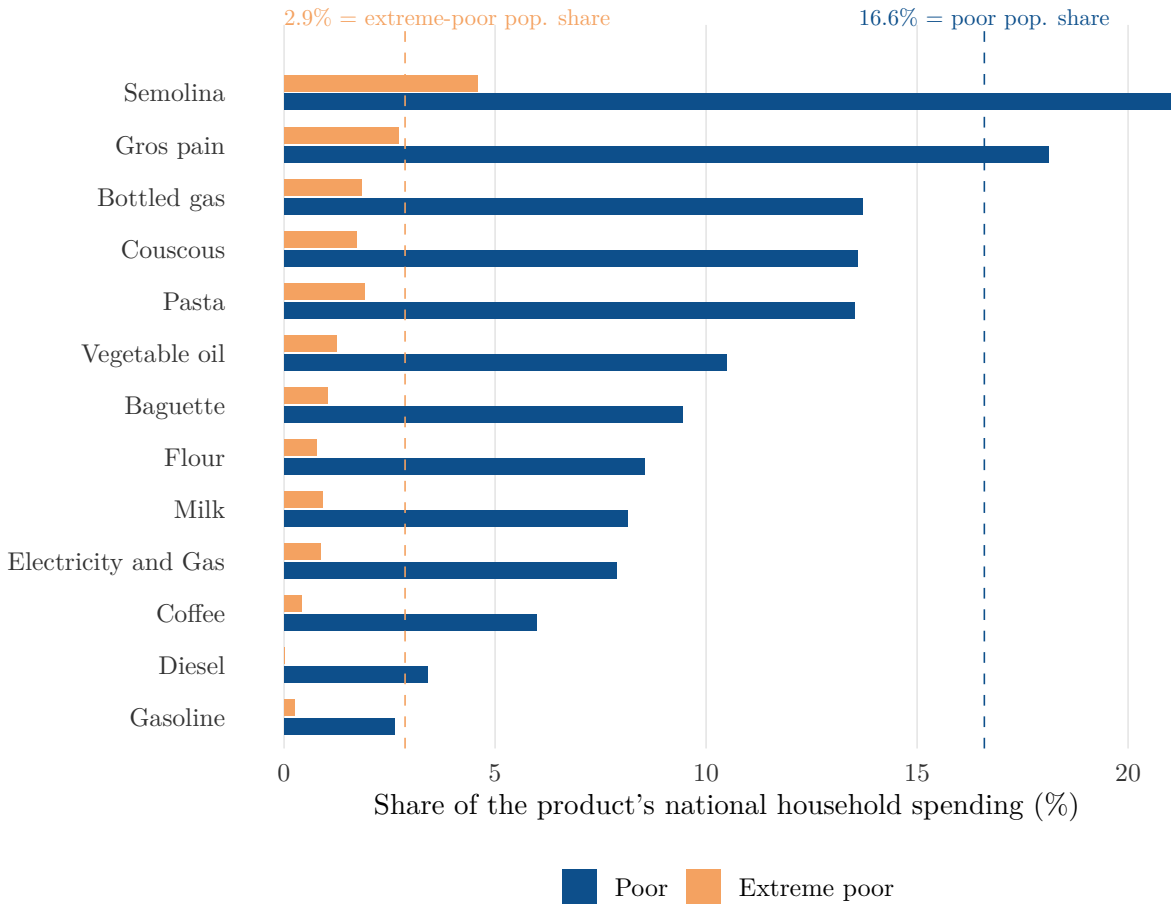


Figure 2: Energy subsidy incidence among purchasing households, by per-capita consumption decile

4.3 Poverty-focused view

Figure 3 reports the same underlying data from a different angle: the share of each product's national household spending captured specifically by poor households (16.6% of the population) and extreme-poor households (2.9% of the population), against the two dashed reference lines marking these population shares. A product whose bar clears its reference line is, in this narrow sense, pro-poor among the households that consume it directly; one that falls short is not. This is a household-level comparison only, and should be read together with Section 4.4, since a product can look pro-poor by this measure while most of its fiscal cost never appears in the household distribution at all.

Semolina is again the standout, the only product where poor households capture a share (21.0%) clearly above their 16.6% population share. Gros pain comes close behind (18.1%). Every other product falls short of its population benchmark, most severely gasoline (2.6%) and diesel (3.4%), where poor households capture only a small fraction of what their population share would imply under an equal split. Extreme-poor households, at 2.9% of the population, receive under 5% of any single product's national spending, and under 1% for gasoline, diesel, and coffee.



Dashed lines: population share of poor (16.6%) and extreme-poor (2.9%) households.

Figure 3: Share of national household spending captured by poor and extreme-poor households, by product

Table 1: Poverty targeting by product

Category	Product	Poor households (%)	95% CI	Extreme-poor (%)	95% CI
Food	Semolina	21.0	[18.7, 23.4]	4.6	[3.5, 5.9]
Food	Gros pain	18.1	[16.8, 19.5]	2.7	[2.1, 3.4]
Energy	Bottled gas	13.7	[12.6, 14.9]	1.8	[1.3, 2.5]
Food	Couscous	13.6	[12.3, 14.9]	1.7	[1.3, 2.2]
Food	Pasta	13.5	[12.7, 14.4]	1.9	[1.6, 2.3]
Food	Vegetable oil	10.5	[9.4, 11.6]	1.2	[1.0, 1.5]
Food	Baguette	9.4	[7.6, 11.4]	1.0	[0.8, 1.3]
Food	Flour	8.5	[7.5, 9.6]	0.8	[0.5, 1.1]
Food	Milk	8.1	[5.9, 10.7]	0.9	[0.6, 1.3]
Energy	Electricity and Gas	7.9	[7.4, 8.4]	0.9	[0.7, 1.0]
Food	Coffee	6.0	[4.6, 7.4]	0.4	[0.3, 0.6]
Energy	Diesel	3.4	[1.6, 5.7]	0.0	[0.0, 0.0]
Energy	Gasoline	2.6	[2.2, 3.1]	0.2	[0.1, 0.4]

Share of each product's national household spending captured by poor and extreme-poor households, with 95% bootstrap confidence intervals (B = 1,000 replicates). Population baselines: poor households represent 16.6% of the population, extreme-poor 2.9%. A product whose captured share exceeds these baselines is pro-poor. Source: authors' calculations from EBCNV 2021 (official poverty and extreme-poverty flags).

4.4 How much of the fiscal cost is matched to household purchases

The results so far describe only the households that report buying a subsidized product themselves. They say nothing about the part of each subsidy's official fiscal cost that cannot be matched to any household purchase observed in the survey. Table 2 compares, for every product with a published official subsidy rate, the total fiscal cost from the Citizen Budget, the amount that can be matched to household purchases following Section 3, and the residual.

Table 2: Fiscal incidence by product

Product	Rate (DT/kg or L)	Total cost (MD)	HH-matched (MD)	Residual (MD)	Residual 95% CI (%)	Bottom 60% (MD)	Top 40% (MD)
Vegetable oil	3.078	760.2	350.7	409.5	[53.3, 56.0]	183.3	167.4
Milk	0.410	380.1	291.2	88.9	[23.7, 25.8]	141.1	150.1
Flour	0.432	152.0	35.7	116.4	[76.0, 77.8]	16.2	19.4
Gros pain	1.163	418.1	298.4	119.7	[27.6, 32.2]	198.7	99.7
Baguette	1.064	912.2	553.3	358.9	[39.5, 41.4]	274.0	279.3
Semolina	1.252	418.1	355.6	62.5	[12.1, 20.4]	228.4	127.2
Couscous	1.945	266.1	137.8	128.2	[47.3, 50.9]	70.1	67.8
Pasta	1.937	494.1	347.1	147.0	[29.5, 32.3]	182.4	164.8
Coffee	–	–	–	–	–	–	–
Bottled gas	2.154	1,067.0	1,044.0	23.0	[1.0, 7.0]	559.1	484.9
Gasoline	0.504	427.0	360.9	66.1	[13.3, 20.9]	102.8	258.1
Diesel	0.661	1,351.0	98.4	1,252.6	[91.9, 93.7]	36.2	62.1
Electricity and Gas	–	3,912.0	–	–	–	–	–

The gap is large for most products. Diesel is the extreme case: only 7.3% of its total fiscal cost (98.4 of 1,351.0 million DT) can be matched to household purchases. The remaining 92.7% is not directly captured in household consumption data, which is consistent with substantial use by transport, freight, and fishing fleets running on subsidized diesel, though the residual may also partly reflect survey underreporting or the timing gap discussed in Section 3. Flour follows a similar pattern, with 76.6% of its cost unmatched. At the other end, bottled gas is the product whose fiscal cost is most fully matched by reported household purchases in the sample: only 2.2% falls into the residual. This does not imply that bottled gas is used exclusively by households, as subsidized domestic cylinders are also known to be used by restaurants, taxis, and other professional activities. Rather, the close accounting match suggests that household purchases, as captured by the survey, account for nearly the entire fiscal cost, either because domestic consumption dominates overall use or because some non-household consumption is indirectly captured through household purchases.

Figure 4 and Figure 5 show the same decomposition as a chart, splitting each product's fiscal cost into the bottom 60% of households, the top 40%, and the residual. Coffee and electricity and gas are left out of both, since neither has a published official per-unit subsidy rate, which means the household-matched/residual split cannot be computed for either.

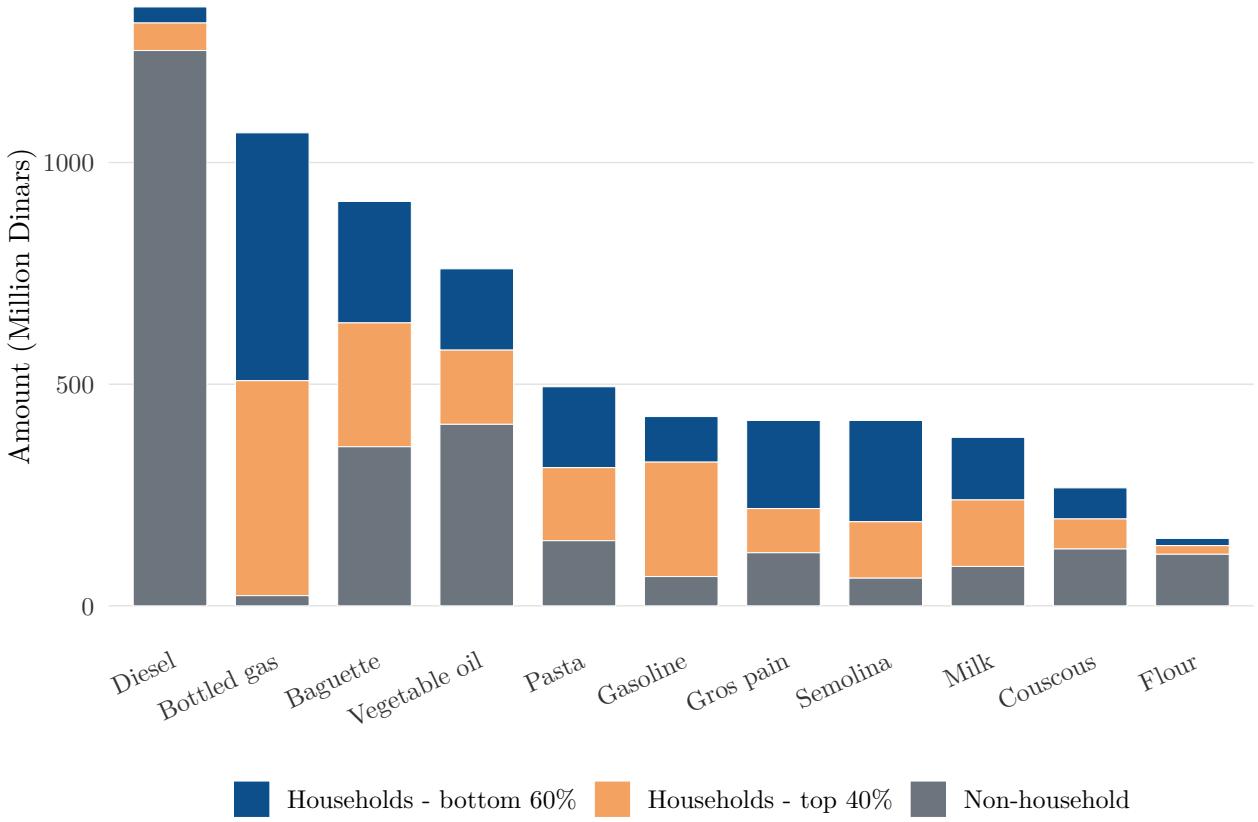


Figure 4: Fiscal cost by product, split between poorer households, richer households, and the residual not matched to household purchases (million DT)

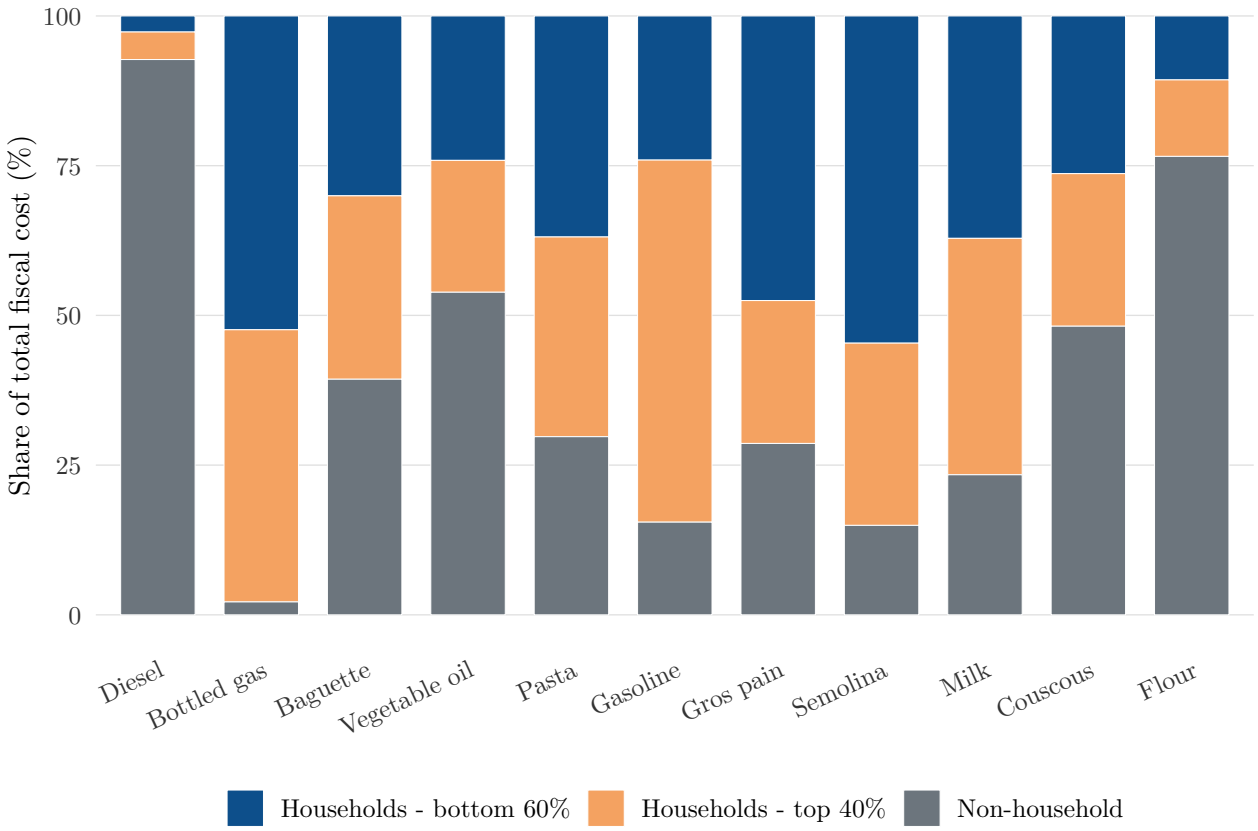


Figure 5: Fiscal cost by product, split between poorer households, richer households, and the residual not matched to household purchases (% of total fiscal cost)

4.5 Why diesel needs separate treatment

Diesel is the extreme case in every incidence measure in this paper: only 3.4% of its household-matched spending reaches poor households directly (Section 4), and only 7.3% of its total fiscal cost can be matched to a household purchase at all (Section 4.4). On a purely mechanical basis, it is the best-targeted candidate for reform in the entire sample; Section 5 shows exactly how large that mechanical case is, and why we do not accept it.

We do not recommend removing diesel's subsidy, for one reason that goes beyond mechanical targeting: diesel is a direct input into road transport, freight, and fishing. Removing its subsidy, for households or for existing non-household use, would raise the cost of moving goods and people around the country, and in an economy where most food and other basic goods travel by road at some point, this cost increase would likely show up as inflation in the price of other things, including some of the same staples this paper finds to be relatively well targeted at the household level, such as semolina and gros pain. This is the paper's central distinction between *mechanical targeting performance*, how much of a subsidy's fiscal cost is matched to household purchases and how it is distributed among them, and the *broader economic consequences* of actually removing it. The two do not always point the same way, and diesel is the clearest example in our sample of a product where they diverge.

A household that does not own a car still pays more for bread if the bakery's delivery costs rise, and still pays a higher shared-taxi fare if the driver's fuel costs rise. Removing the diesel subsidy, especially for the commercial and institutional use folded into its residual, risks hurting exactly the households a targeting reform is meant to protect. Gasoline is treated differently: it is overwhelmingly a private-vehicle fuel with a much smaller role in freight and food logistics, so it does not carry the same inflation-transmission risk and is included in the reform basket built in Section 5 like any other product. Section 5.5 carries this distinction forward directly: every reform scenario in this paper is computed twice, once keeping diesel subsidised for everyone (our recommendation) and once treating it like every other product (a mechanical upper bound, not a recommendation), so the fiscal cost

of this one judgement is visible rather than hidden inside a single number.

This recommendation should not, however, be interpreted as an argument for preserving diesel dependence indefinitely. Tunisia should progressively reduce its reliance on fossil fuels and move towards a broader ecological and environmental transition, particularly in transport and freight. Expanding access to cleaner and more energy-efficient alternatives could eventually reduce the economic and social cost of reforming diesel subsidies. Public support could therefore be redirected, at least in part, towards greener energy sources and technologies rather than simply maintaining fossil-fuel subsidies. Designing such a transition requires careful analysis of infrastructure, technology, energy markets, public investment, and distributional consequences. These questions go beyond the scope of this paper and would require dedicated work by specialists in energy, transport, and environmental policy. Our argument is therefore narrower: under the current structure of the Tunisian economy and in the absence of sufficiently developed alternatives, removing the diesel subsidy mechanically on the basis of its poor targeting performance could generate broader economic costs that this household-level analysis does not capture.

5 Beyond Consumption Deciles: Identifying Households for Targeted Subsidy Protection

Everything in Section 4 describes *incidence*: given the subsidy system as it currently exists, who captures its benefits, and how much of its fiscal cost can be matched to household purchases at all. This section addresses a different question: *where should the protection threshold be placed?* More precisely, if Tunisia moved from universal subsidies to targeted protection, what share of the population should continue to receive support?

This is the purpose of the model developed in this section. Rather than choosing a coverage rate arbitrarily, such as protecting the bottom 20%, 40%, or 50% of households, we use information on household living conditions to identify an endogenous cutoff that reflects differences in living standards. The objective is therefore not to reproduce a government targeting mechanism or to claim that the state cannot identify household income. It is to provide a principled answer to a prior policy question: *how far up the living-standard distribution should subsidised protection extend?* The resulting cutoff is then used as the common benchmark for every reform scenario in this paper.

The practical identification of eligible households is a separate implementation question. Tunisia already operates several forms of targeted or differentiated access to public services and support, and a reform would not necessarily require the government to reproduce the consumption measure used in this study. Income declarations, administrative records, social protection databases, local authorities, and other sources of information can all contribute to identifying eligible households. We are also aware that tax evasion, income under-declaration, and informality can complicate income-based targeting in Tunisia. These are real implementation constraints, but they do not invalidate the distinction made here between the analytical problem of determining an appropriate protection threshold and the administrative problem of identifying the households located below it. The latter would require a dedicated institutional and administrative design that lies beyond the scope of this paper.

5.1 Data: merging in the living-conditions module

The living-conditions file covers housing characteristics, durable assets, and productive assets for 17,394 households, identified by the same household code used throughout the rest of the paper. We verified the merge and both files use a numeric household identifier over the same range (1 to 17,394), neither file contains a duplicated or missing identifier, and every one of the 17,394 households in the expenditure data has a matching record in the living-conditions data, for a match rate of exactly 100%. The living-conditions file does not carry its own survey weight, so all analysis in this section continues to use the same household weight (`v700`) and individual weight (`v701`) as the rest of the paper. Ranking is population-weighted throughout, by individuals rather than by households, for the same reason as in Section 3: a larger household represents more people, and a targeting rule is ultimately about how many *people*, not how many households, are protected or excluded.

5.2 A score built from what actually distinguishes households today

An asset or housing indicator is only informative about relative living standards if it is not already nearly universal. Air conditioning or a connected sewage system might have signalled real comfort in Tunisia a generation ago; whether they still do is a question the data can answer directly, and we let it, rather than assume an answer. For every candidate indicator we compute its population-weighted ownership rate in this sample and classify it accordingly.

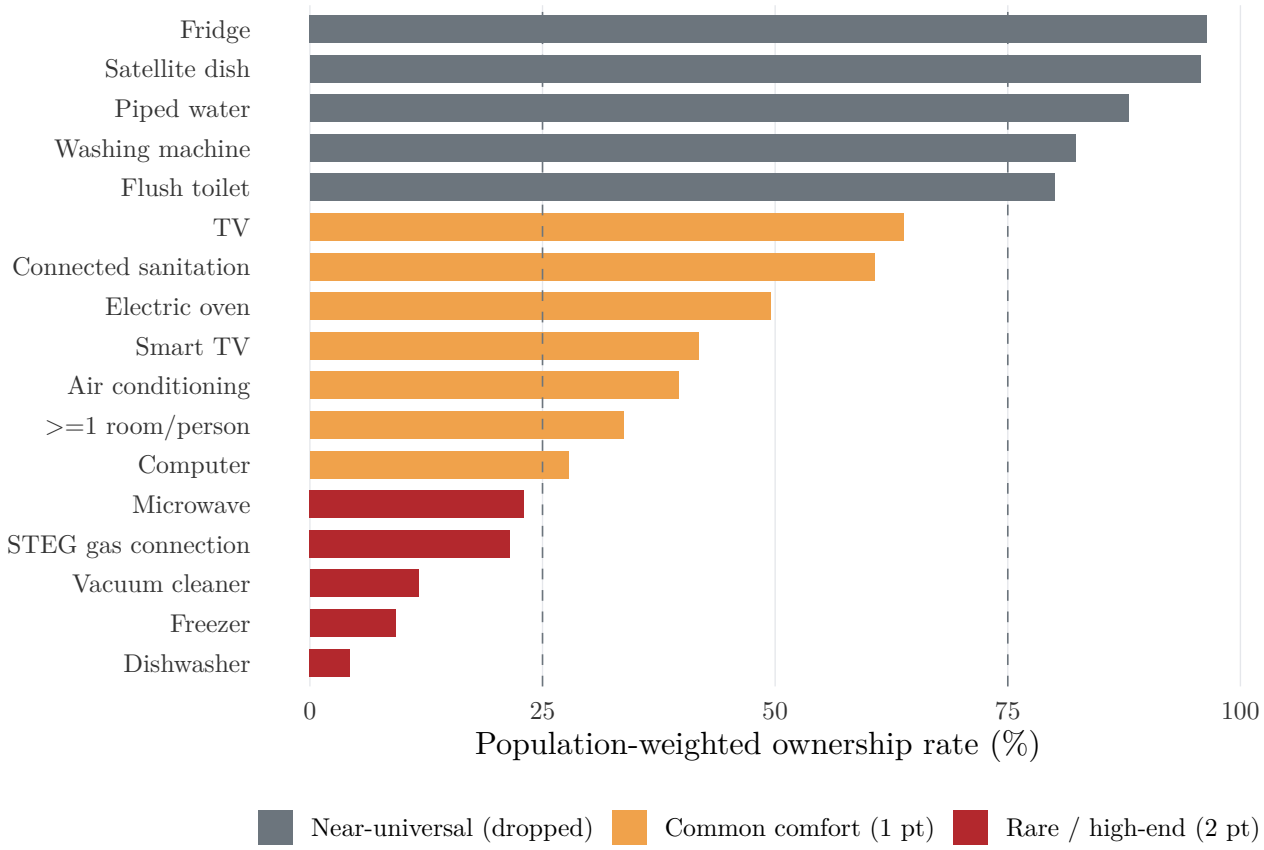


Figure 6: Population-weighted ownership rate of every candidate indicator

Table 3: Population-weighted ownership rate and tier, every candidate item

Item	Ownership (%)	Tier
d_fridge	96.40	Near-universal (dropped)
d_satellite	95.70	Near-universal (dropped)
water_piped	88.00	Near-universal (dropped)
d_washer	82.30	Near-universal (dropped)
toilet_modern	80.00	Near-universal (dropped)
d_tv	63.80	Common (1 pt)
sanitation_connected	60.70	Common (1 pt)
d_electric_oven	49.50	Common (1 pt)
d_smarttv	41.80	Common (1 pt)
d_ac	39.60	Common (1 pt)
rooms_adequate	33.70	Common (1 pt)
d_computer	27.80	Common (1 pt)
d_microwave	23.00	Rare (2 pt)
gas_steg	21.50	Rare (2 pt)
d_vacuum	11.70	Rare (2 pt)
d_freezer	9.20	Rare (2 pt)
d_dishwasher	4.30	Rare (2 pt)

Figure 6 and Table 3 make the point concretely. A refrigerator (96.4%), a satellite dish (95.7%), piped water (88.0%), a washing machine (82.3%), and a flush toilet (80.0%) are all owned by more than three-quarters of the population: these are dropped from the score entirely, since owning one says almost nothing about a household's *relative* position. This is also where air conditioning (39.6%) and a connected sanitation network (60.7%) land, exactly the two indicators one might have expected to signal comfort a decade ago: both fall well short of the 75% near-universal threshold, but both are common enough, owned by a large minority to a majority of the population, that we treat them as ordinary modern comfort rather than genuine luxury. They are worth one point each, the same as a television, a smart TV, an electric oven, adequate rooms per capita, or a computer, six other indicators in the same 25–75% band. Only five indicators fall under 25% ownership, and only these are treated as genuinely rare, high-end signals worth two points each: a microwave, a STEG piped gas connection, a vacuum cleaner, a freezer, and a dishwasher. The resulting living standard score runs from 0 (owns none of the 12 scored items) to 17 (owns every common item once and every rare item twice), with a population-weighted median of 4 and a middle 50% of the population scoring between 2 and 6.

5.3 Three cutoff scenarios

A cutoff is only useful if a reader looking at a household that clears it would agree that household is not an obvious priority for subsidy protection. We did not start from a target population share and search for a score that hits it; we started from the score's own distribution and from what combination of items each score level actually represents, and only then checked what population share the resulting cutoffs imply.

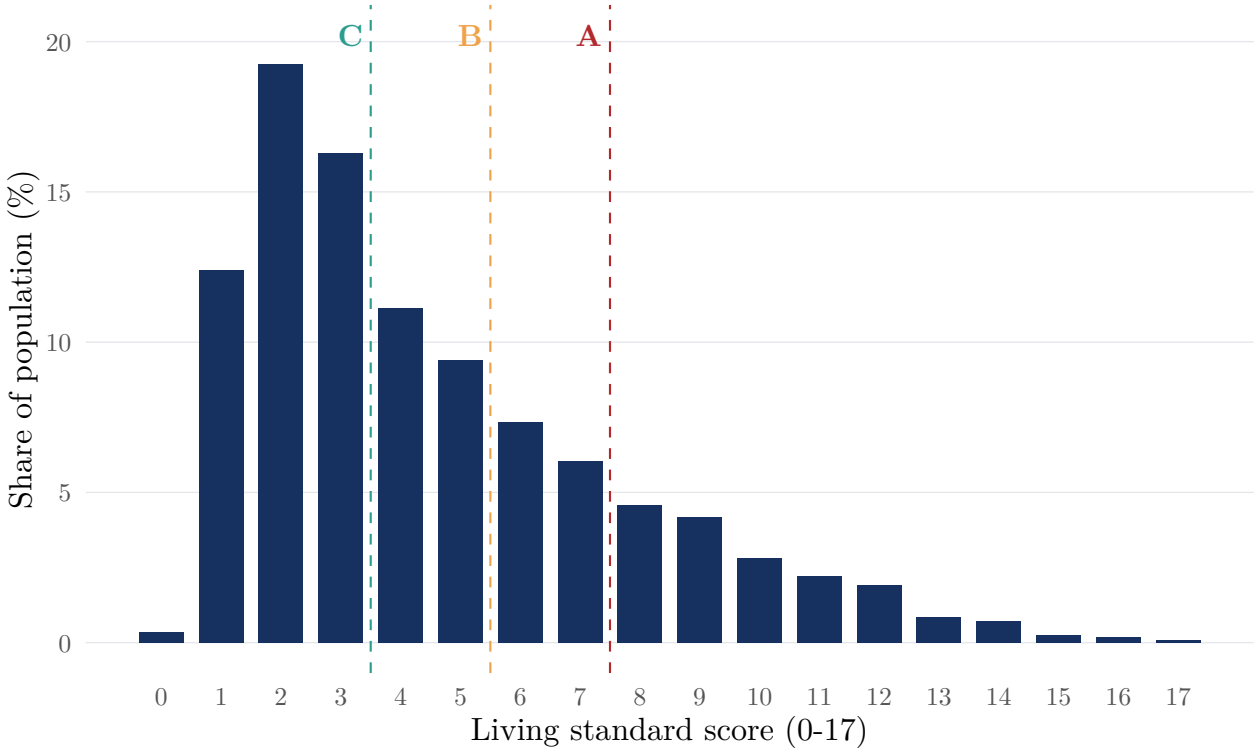


Figure 7: Population-weighted distribution of the living standard score, with the three scenario cutoffs

Table 4: Living-standard cutoff scenarios and implied population shares (score range 0-17)

Scenario	Score cutoff	Excluded (%)	Protected, x (%)
A	8	17.80	82.20
B	6	31.20	68.80
C	4	51.70	48.30

Scenario A (score $\geq$ 8, protects 82.2%). The most cautious scenario. A score of 8 or more requires

either owning most of the seven common-comfort items outright, or a smaller number of common items combined with at least one genuinely rare good, a household that owns a dishwasher or a freezer alongside ordinary modern comfort is not a household most readers would flag as needing help with the price of bread or cooking gas. This scenario excludes only households combining several comfort markers at once, and protects the remaining 82.2% of the population, minimising the risk of wrongly excluding anyone in real need at the cost of leaving most of the fiscal envelope untouched.

Scenario B (score $\geq$ 6, protects 68.8%). Our recommended scenario, and a moderate bar. It is cleared by a household with solid ordinary comfort, most of the common items, even without any of the five rare goods, or by a household with fewer common items but one rare good. This captures a broader, still clearly comfortable group without requiring the near-complete asset ownership Scenario A does. It excludes 31.2% of the population and protects 68.8%, close to the two-thirds mark and, in our view, the most defensible single number if a government had to pick one scenario: broad enough to matter fiscally, narrow enough that few readers would look at the excluded group's actual living conditions and object.

Scenario C (score $\geq$ 4, protects 48.3%). The most assertive scenario, close to the population median. It reflects a more demanding view of targeting: that a household combining even a modest set of comfort indicators, four common items, or two common items plus one rare good, can reasonably be asked to pay the unsubsidised price. It excludes 51.7% of the population and protects 48.3%, the narrowest and most fiscally ambitious of the three.

5.4 Does the score actually track economic welfare?

The score is built with no reference whatsoever to consumption, income, or the official poverty flag, which makes it possible to use those measures as an independent check rather than a circular validation. Under Scenario A, the households the score excludes have an official poverty rate of just 1.2%, against 19.8% among the households it protects; under Scenario C, the widest exclusion, the excluded group's poverty rate is still only 5.3%, against 28.5% among the protected group. Mean per-capita consumption tells the same story: excluded households consume roughly twice as much per person as protected households under every scenario (2,770 DT against 1,301 DT under Scenario A; 2,036 DT against 1,056 DT even under the broadest scenario, C).

These results should nevertheless be interpreted in light of the objective of the score. More specialized approaches, such as those developed by Bibi (2002) and Muller and Bibi (2006), are designed specifically to improve the identification of poor households and the allocation of targeted transfers. They are therefore more suitable when the primary objective is precise micro-level targeting or the optimization of poverty reduction.

The purpose here is different. The score is not intended to replace a formal proxy means test or to compete with specialized targeting models. It is used as a simple and transparent rule for separating households according to observable differences in living standards and for constructing subsidy reform scenarios. In this context, its value lies not in maximizing predictive accuracy, but in providing an auditable and operational basis for discussing how different degrees of household protection affect the fiscal consequences of reform.

5.5 The reform: one basket, three scenarios, two variants each

For every scenario, households scoring at or above the cutoff are *excluded*: every subsidy in the reform basket is removed for them. Households below the cutoff are *protected*: every subsidy is left unchanged. The reform basket covers every product with a computable household-matched subsidy (Section 3: vegetable oil, milk, flour, gros pain, baguette, semolina, couscous, pasta, bottled gas, gasoline, diesel) plus electricity and gas.

Diesel is the one product treated differently within this basket, for the reasons set out in Section 4.5: removing it risks second-round price increases through transport, freight, and fishing that could hurt the same households a targeting reform is meant to protect. We therefore compute every scenario twice. **Diesel kept**, our recommended variant, leaves diesel subsidised for every household regardless of living-standard score; only the rest of the basket is removed from excluded households. **Diesel included** is a mechanical upper bound, not a recommendation, showing what would additionally be saved if diesel were treated like every other product. Reporting both, for every scenario, makes the fiscal cost of the diesel judgement visible rather than folding it silently into a single number.

Coffee is left out of the basket entirely, since no official per-unit rate exists for it. The residual of every product, the part not matched to any household purchase, is treated differently, and deliberately so. Throughout this paper we have described the residual as consistent with commercial and institutional use, but also possibly reflecting survey underreporting: the EBCNV is a large, nationally representative survey (Section 3), so we treat only a small share, 5%, of the residual as unrecoverable measurement error and timing gaps. The remaining **95% of the residual** we treat as recoverable, applied uniformly across the three living-standard scenarios, since it does not depend on which households are excluded: it is consistent with commercial and institutional use, bakeries buying flour, restaurants buying bread, taxis buying bottled gas at the same subsidised price a household pays, and we do not see a principled reason a targeting reform should remove the subsidy from a comfortable household while leaving it in place for a business. Diesel is the one exception: for the reasons set out in Section 4.5, its own residual, 1,252.6 million DT, is left untouched in our recommended variant along with its household-matched share, and only recovered, worth 1,190.0 million DT of the 95% rate, in the mechanical upper bound. Recovering the non-diesel residual, 3,723.3 million DT means withdrawing the subsidised price from the commercial and institutional users who currently rely on it, a real and likely inflationary cost we discuss explicitly, and by name, in Section 6.2.

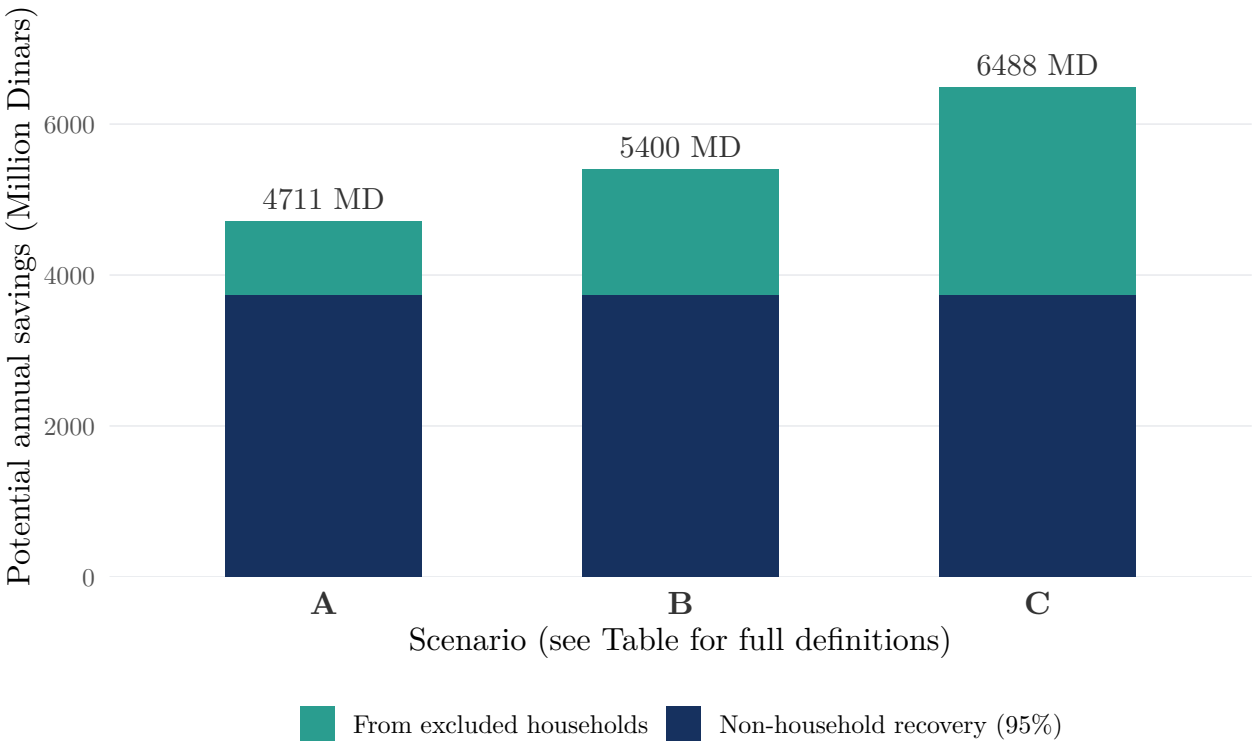


Figure 8: Potential annual savings by scenario: subsidy removed from excluded households plus the 5% residual recovery (diesel kept, recommended variant)

Table 5: Potential fiscal savings by living-standard scenario

Scenario	Protected, x (%)	Excluded (%)	From excluded HH (MD)	Residual recovery, 95% (MD)	Total, diesel kept (MD)	% of 2025 deficit	Total, diesel incl. (MD)
A	82.20	17.80	987.3	3,723.3	4,710.6	46.40	5,931.7
B	68.80	31.20	1,676.8	3,723.3	5,400.2	53.20	6,636.7
C	48.30	51.70	2,765.0	3,723.3	6,488.3	63.90	7,749.1

Under the recommended, diesel-kept variant, potential annual savings range from 4,710.6 million DT under the most cautious scenario (A, 46.4% of the projected 2025 deficit) to 6,488.3 million DT under the most assertive scenario (C, 63.9% of the deficit), with our recommended Scenario B in between at 5,400.2 million DT (53.2% of the deficit). Of this, 3,723.3 million DT in every scenario comes from the residual recovery alone,

the remainder from the subsidy removed from excluded households directly; the residual recovery is, by a wide margin, the larger of the two components in every scenario. Including diesel, and its own residual, raises every figure substantially, by 1,221 to 1,261 million DT depending on the scenario, since diesel's residual (Section 4.4) is large in absolute terms even though diesel's household-matched share is small; this is precisely the fiscal cost of the policy judgement in Section 4.5, now visible directly in the reform's headline numbers rather than folded into a smaller, household-only comparison.

5.6 Who actually pays: the recommended scenario in detail

Table 5 reports totals; Figure 9 breaks the recommended scenario (B) down product by product, splitting each one's official fiscal cost three ways: the households it protects, the households it excludes (one source of the savings reported above), and the residual not matched to any household purchase at all, 95% of which is the other, larger source (Section 5.5). This is the same three-way split as Figure 5, now organised by living-standard scenario rather than by consumption decile.

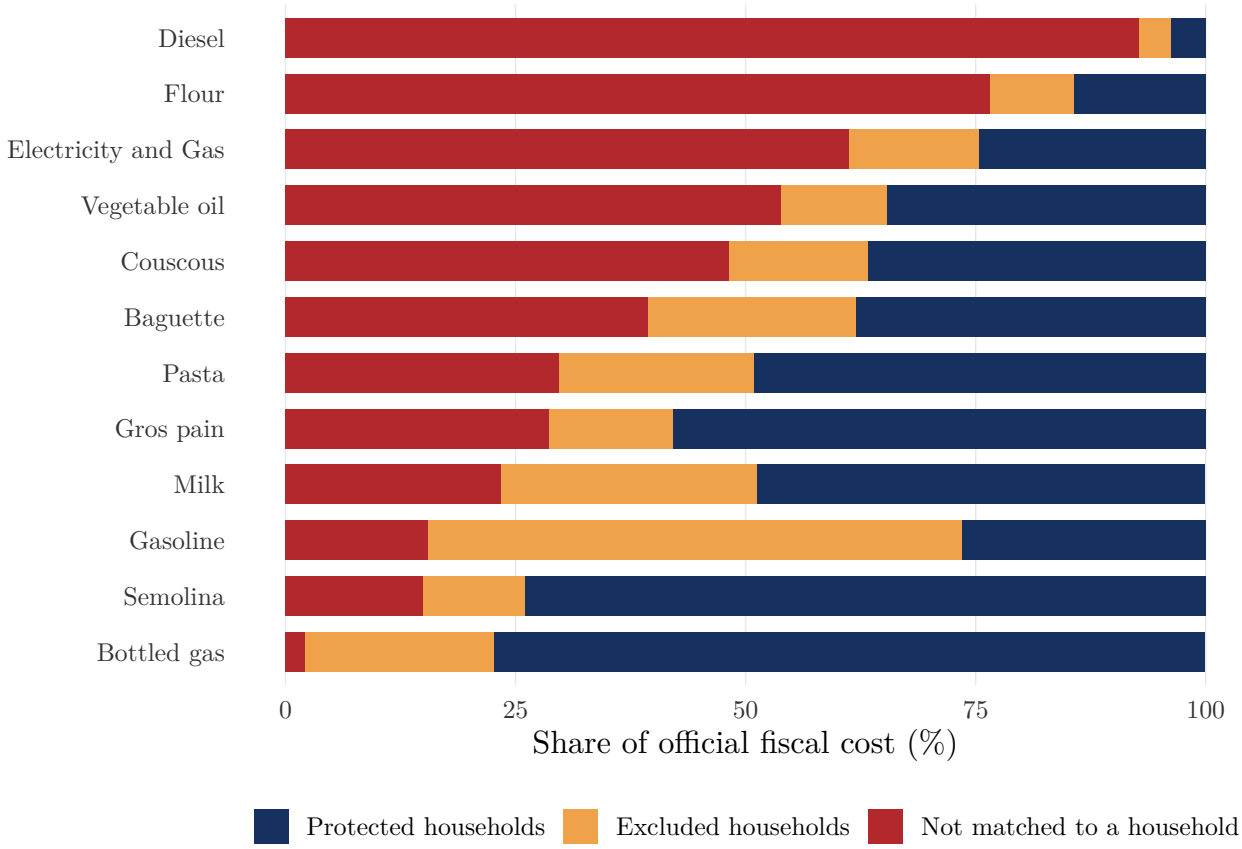


Figure 9: Recommended scenario (B): fiscal cost split into protected households, excluded households, and the residual

Table 6: Recommended scenario (B): fiscal cost split by product

Product	Total (MD)	Protected (MD)	Excluded (MD)	Not matched to a household (MD)
Vegetable oil	760.2	263.6	86.9	409.5
Milk	380.1	185.2	105.8	88.9
Flour	152.0	21.8	13.8	116.4
Gros pain	418.1	241.9	56.4	119.7
Baguette	912.2	346.0	206.7	358.9
Semolina	418.1	309.3	46.3	62.5
Couscous	266.1	97.6	40.2	128.2
Pasta	494.1	242.3	104.5	147.0
Bottled gas	1,067.0	825.1	218.4	23.0
Gasoline	427.0	112.9	247.7	66.1
Diesel	1,351.0	51.8	46.6	1,252.6
Electricity and Gas	3,912.0	965.1	550.2	2,396.7

The pattern is straightforward. For diesel, 92% of the fiscal cost remains in the residual, while only a small share can be linked directly to household consumption. This supports the decision to keep diesel outside the initial reform package (Section 4.5). For gasoline, the excluded households account for 59%, the largest share among all products, confirming that its benefits are concentrated among better-off households. By contrast, semolina and bottled gas remain largely concentrated among protected households, consistent with the pro-poor patterns identified in Section 4.

All estimated savings imply higher prices for someone currently benefiting from the subsidy, whether a household, business, or other user. This section does not estimate the inflationary effect of these changes. Section 6.2 discusses this cost qualitatively and treats it as a real trade-off of reform rather than a reason to avoid reform altogether.

6 Discussion: The Agony of Reform

6.1 Limitations and conditions for implementation

The results of this paper should be interpreted with several limitations in mind. First, the household incidence estimates are based on the 2021 EBCNV, while the fiscal costs and subsidy rates correspond to 2025. Household quantities are adjusted for population growth, but this does not account for possible changes in consumption patterns, relative prices, or the composition of demand between the two periods.

Second, the distinction between the household-matched component and the residual fiscal cost is necessarily an approximation. The residual cannot be directly interpreted as observed commercial or institutional consumption. Although the quality and coverage of the household data, together with the population adjustment, lead us to treat 95% of the residual as non-household consumption for the reform scenarios, this remains an assumption rather than a directly observed quantity. The remaining mismatch may reflect survey underreporting, product classification differences, timing effects, or other measurement errors.

Third, the analysis focuses deliberately on the fiscal and distributional diagnosis of the existing subsidy system and on the potential fiscal space associated with alternative reform scenarios. It does not attempt to estimate the full general-equilibrium effects of reform on inflation, employment, production, investment, or household behaviour. Analysing these mechanisms is an important next step and should extend the present work through a broader quantitative macroeconomic framework. We view this limitation as defining the scope of the paper rather than reducing the importance of its contribution. Before estimating the full consequences of a reform, it is necessary to establish what the existing system costs, who benefits from it, how much of its fiscal expenditure can be linked to household consumption, and where the potential scope for reform lies. This diagnosis is difficult in itself and provides the empirical basis on which a more complete reform analysis can be built. As discussed in Section 6.2, the consequences of reform cannot be reduced to a mechanical calculation of fiscal savings, and future work should therefore extend this analysis to inflationary, employment, and broader macroeconomic effects.

The targeting strategy also has a limited purpose. The living-standard score is used to construct transparent reform scenarios and to illustrate the trade-off between household protection and fiscal savings. It should not be interpreted as a proposed national targeting mechanism. Actual implementation should rely on more sophisticated identification methods, such as those discussed by Bibi (2002) and Muller and Bibi (2006), together with existing and future administrative and social protection systems.

These limitations also imply that the recommended reform should not be implemented as an isolated measure. Subsidy reform should form part of a broader economic package. A gradual adjustment of wages and minimum income protection may be necessary to protect purchasing power. Competitiveness reforms are also needed to help firms adapt to higher input costs rather than simply transferring these costs to consumers. Reducing rent-seeking and improving competition would be equally important, particularly where subsidized inputs currently create opportunities for inefficient allocation or private capture of public resources.

The fiscal savings identified in this paper should therefore be understood as potential fiscal space, not as money that can be removed from the economy without consequences. The broader policy question is how this fiscal space can be created and how it should subsequently be used.

6.2 The agony of reform

The reform proposed in this paper would be difficult. It would probably be politically unpopular, and its effects would extend well beyond the households directly excluded from subsidy protection.

This point is particularly important for the residual component of the reform. Removing subsidies from commercial and institutional users does not mean that households are unaffected. A restaurant facing higher prices for flour, bread, gas, or electricity may increase its prices. A pastry shop may do the same. Transport operators facing higher costs may increase fares. The same mechanism can affect food processing, small businesses, informal activities, and other sectors that currently benefit from subsidized inputs.

In other words, protecting a household directly does not necessarily protect it from all the indirect consequences of reform. Higher production and transport costs can return to households through prices. This is why the fiscal savings estimated in this paper should not be interpreted as a free gain. They involve a real economic cost that would need to be managed.

We use the term *agony* deliberately. Major economic reforms are rarely painless. The British reforms of the 1980s and the market transitions experienced by several former socialist economies during the 1990s illustrate very different reform paths, but they share one basic lesson: changing deeply embedded economic structures can generate substantial short-term social and political costs. The removal of protected arrangements, administered prices, inefficient production structures, or state-supported rents can create resistance precisely because existing beneficiaries are visible, while the future benefits remain uncertain.

Yet postponing reform does not eliminate its cost. It may instead defer adjustment while allowing the underlying fiscal and structural distortions to accumulate. Milton Friedman's well-known "cutting the dog's tail" metaphor captures this argument: when an adjustment is considered necessary, spreading the adjustment over a prolonged period may not reduce its total cost, but can instead extend the period of uncertainty and delay the process of adaptation. In the context of subsidy reform, repeated postponement may preserve the very distortions that make future adjustment more difficult, fiscally costly, and politically contentious. This does not imply that all reforms should be implemented abruptly or without transitional protection. Rather, it suggests a distinction between a gradual but credible reform strategy, supported by clear sequencing and compensatory measures, and the indefinite postponement of necessary adjustment.

This does not mean that every painful reform is justified, nor that pain itself is evidence of good policy. The relevant question is whether the existing system can continue to justify its fiscal and economic cost, and whether reform is accompanied by institutions capable of managing the transition.

Our results suggest that Tunisia's generalized subsidy system raises precisely this question. A large share of public resources is devoted to maintaining prices for households and users that do not all require the same degree of protection. At the same time, the fiscal resources committed to this system cannot be used for infrastructure, education, healthcare, public transport, or other investments.

The potential gains from reform are therefore larger than the direct budgetary savings reported in this paper. A more sustainable fiscal position could reduce pressure on public finances and create room for public investment.

A more competitive economic environment could also reduce the dependence of firms on subsidized inputs and encourage efficiency rather than survival through permanently cheap prices.

There is also a broader political-economic dimension. A system in which households and firms depend extensively on administratively maintained prices strengthens the role of the state in everyday economic decisions. Moving gradually toward a system in which public support is concentrated on those who genuinely need it, while prices and competition play a greater role elsewhere, would change this relationship. The objective is not to remove the state from the economy, but to redefine its role: less permanent support for generalized consumption, and greater capacity to provide public goods, enforce competition, invest in infrastructure, and protect genuinely vulnerable households.

In this sense, the reform is not only about reducing a budget line. It concerns the type of economic relationship between citizens, firms, and the state. Generalized subsidies provide visible and immediate protection, but they can also create long-term dependence on a system that becomes increasingly difficult to reform as its fiscal cost grows.

The transition would therefore involve a genuine trade-off. Some prices would increase, some firms would face adjustment costs, and the reform would almost certainly generate political resistance. These costs should not be hidden. But maintaining the existing system also has costs: fiscal pressure, inefficient allocation of public resources, opportunities for rent capture, and reduced capacity to finance other public priorities.

For this reason, the choice is not between a painful reform and a costless status quo. It is between different forms of economic cost, distributed across different groups and across time. The argument of this paper is that, if reform is gradual, accompanied by stronger social protection, wage and competitiveness policies, and followed by the reallocation of fiscal savings toward productive public expenditure, the longer-term gains can justify the difficulty of the transition.

7 Conclusion

This paper examines the distribution and fiscal structure of food and energy subsidies in Tunisia using household microdata from the 2021 EBCNV and official fiscal information for 2025. The results confirm a finding already present in the Tunisian literature: generalized subsidies do not benefit poor households exclusively. Their incidence differs substantially across products, with some subsidized goods remaining relatively concentrated among households with lower living standards, while others are disproportionately captured by better-off households.

The analysis adds a fiscal dimension to this incidence approach by comparing household consumption with the total official cost of each subsidy. This distinction shows that household purchases observed in the survey do not account for the entire fiscal envelope. A substantial residual remains for several products, particularly in sectors where subsidized goods are also likely to be used by commercial, institutional, or other non-household actors. Under the assumptions used in this paper, this residual represents an important source of potential fiscal recovery.

The reform scenarios suggest that substantial fiscal space could be created while maintaining protection for households with lower living standards. Under the recommended variant, which excludes diesel from the initial reform package, estimated annual savings range from approximately 4.7 to 6.5 billion DT depending on the degree of household protection. These figures should not be interpreted as costless gains. Reform would affect prices, firms, employment, and household purchasing power through both direct and indirect channels.

For this reason, the results of this paper should be understood as a starting point for a broader reform strategy rather than as a complete reform programme. Effective implementation would require stronger and more sophisticated targeting systems, gradual adjustment, protection of purchasing power, measures to improve competition and productivity, and efforts to reduce rent-seeking. The fiscal space created by reform would also need to be redirected toward productive public priorities, including infrastructure, education, healthcare, and other investments capable of generating longer-term social and economic returns.

The central argument is therefore not simply that Tunisia should spend less. It is that public resources currently committed to generalized subsidies have an opportunity cost. Maintaining low prices for all users, including households and economic actors that do not require public support, limits the capacity of the state to

finance other priorities. A gradual move toward more selective protection would involve difficult economic and political choices, but maintaining the existing system is also a choice with its own fiscal and social costs.

Subsidy reform is therefore neither a purely technical exercise nor an automatic route to better outcomes. Its success depends on how the transition is designed and what replaces the existing system. But the evidence presented in this paper suggests that the current structure leaves significant room for a different allocation of public resources, one that protects vulnerable households while reducing generalized dependence on subsidized prices and creating greater fiscal capacity for the public goods and investments on which long-term economic welfare depends.

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A Subsidized products and INS product codes

Table 7: Subsidized products and their INS product codes (EBCNV 2021, `code_produit.dta`)

Category	Product	INS product code(s)
Food	Vegetable oil	1821
Food	Milk	1621, 1622
Food	Coffee	1903, 1904
Food	Flour	1041, 1042
Food	Gros pain	1043
Food	Baguette	1044
Food	Semolina	1020, 1021
Food	Couscous	1022
Food	Pasta	1025
Energy	Bottled gas (GPL)	4131
Energy	Gasoline (essence)	7131, 7135
Energy	Diesel (gasoil)	7132
Energy	Electricity & Gas	4112, 4113, 4114, 4122, 4123, 4124

B Robustness: 95% bootstrap confidence intervals

This appendix reports the confidence-interval version of the main-text decile and poverty figures, using the household-level nonparametric bootstrap described in Section 3.4. Error bars denote 95% confidence intervals across 1,000 replications. These intervals describe sampling variability within the EBCNV only; they say nothing about uncertainty in the retail prices or subsidy rates used in Section 5.5, or about the 2021-to-2025 timing gap discussed in Section 3.

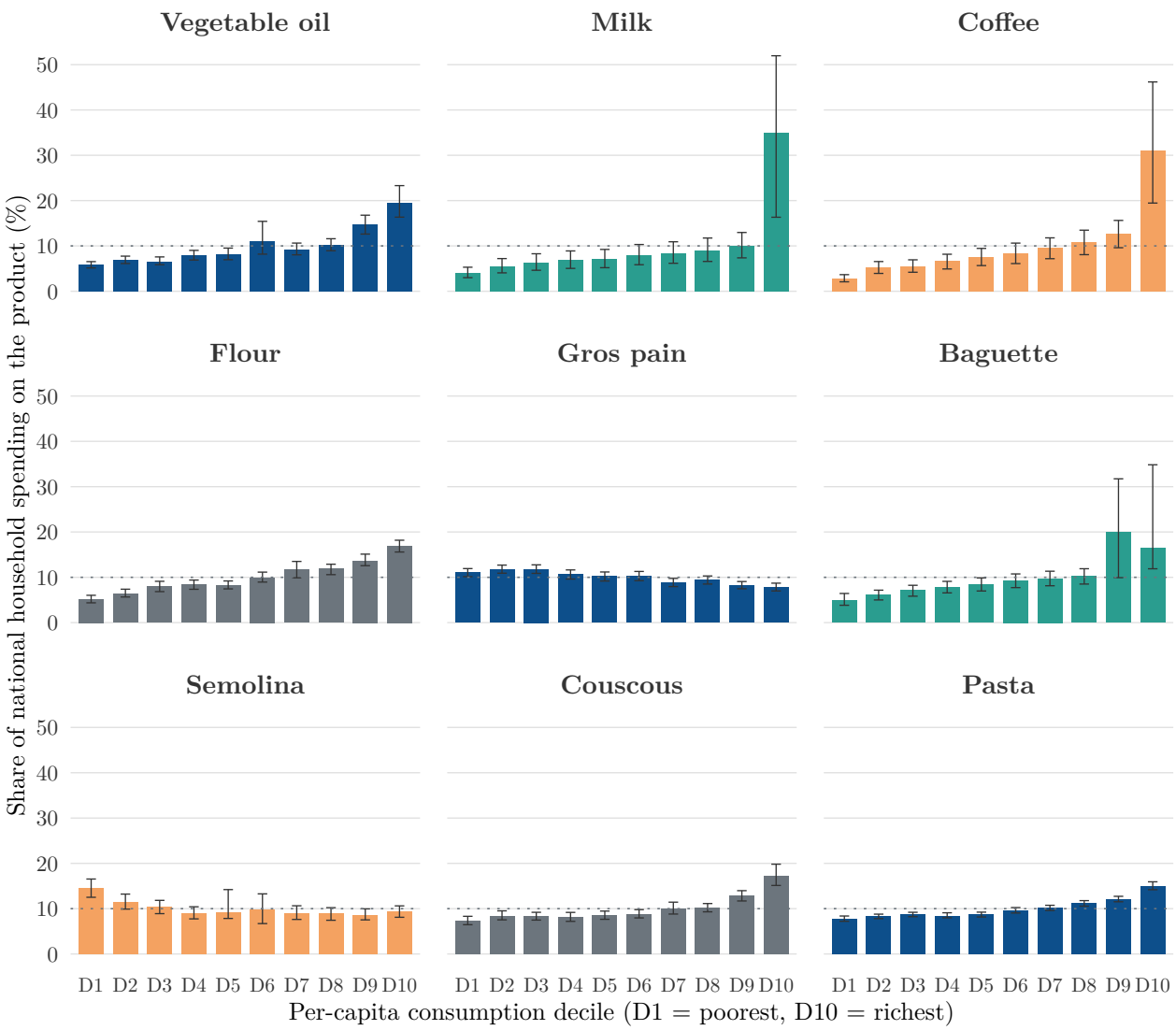

Figure 10: Food subsidy incidence among purchasing households, with 95% bootstrap confidence intervals

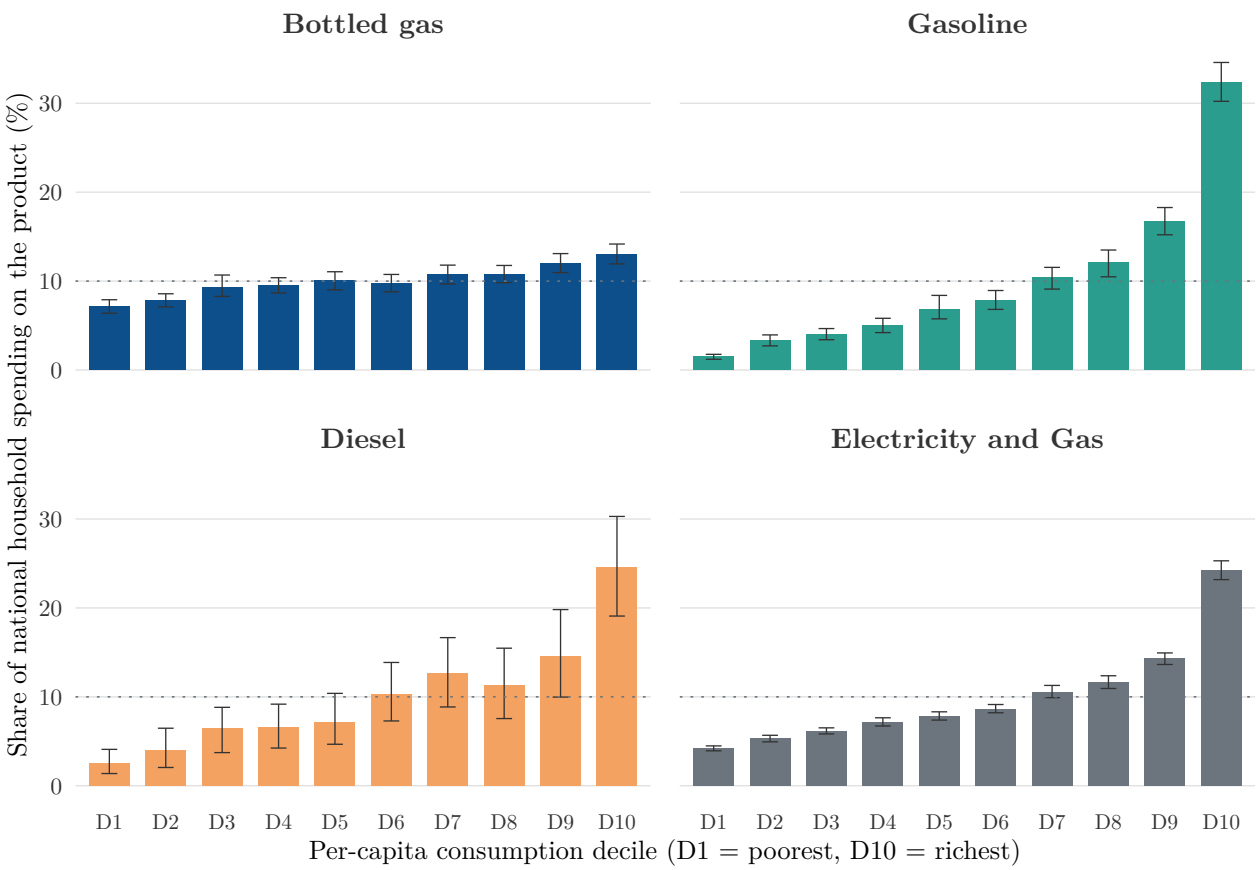

Figure 11: Energy subsidy incidence among purchasing households, with 95% bootstrap confidence intervals

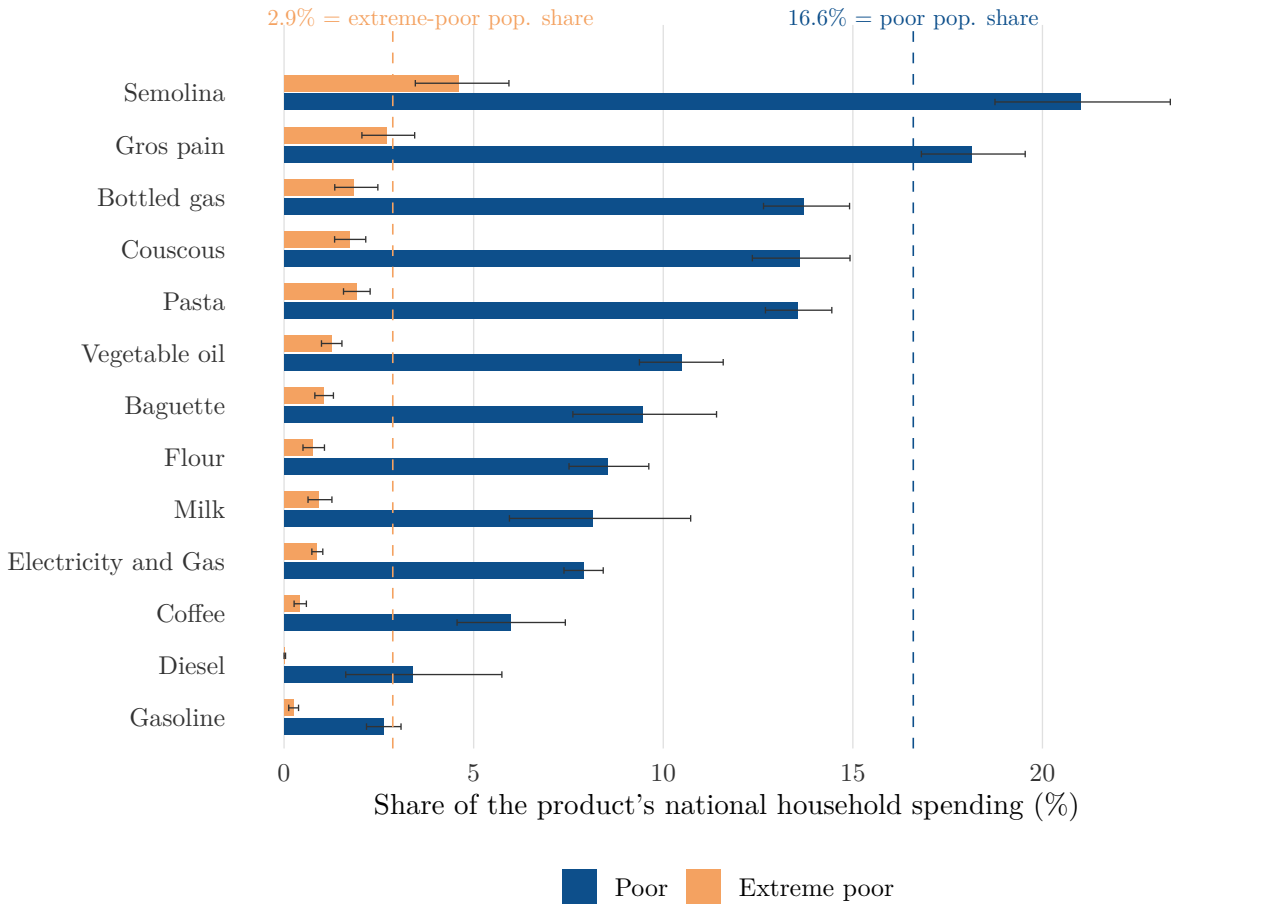

Figure 12: Share of national household spending captured by poor and extreme-poor households, with 95% bootstrap confidence intervals

C Full decile-by-product detail

Table 8 reports the full decile-by-product detail behind every figure in Section 4: the share of national household spending reaching each decile, for all 13 products, together with the household/top-40/residual split of each product's fiscal cost where it can be computed. It is set as a `longtable` in portrait, so it breaks automatically across as many pages as it needs.

Table 8: Full decile-by-product detail

Product	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	B60 (%)	T40 (%)	Residual (%)
Baguette	4.9	6.2	7.1	7.8	8.4	9.3	9.7	10.3	20.0	16.4	30.0	30.6	39.3
Coffee	2.9	5.2	5.5	6.6	7.5	8.3	9.5	10.8	12.6	31.1	–	–	–
Couscous	7.4	8.4	8.3	8.2	8.5	8.9	10.0	10.2	12.8	17.2	26.3	25.5	48.2
Flour	5.2	6.4	7.9	8.4	8.1	9.9	11.7	11.8	13.6	16.9	10.7	12.8	76.6
Gros pain	11.1	11.7	11.8	10.6	10.2	10.3	8.8	9.4	8.2	7.8	47.5	23.9	28.6
Milk	4.1	5.5	6.3	6.8	7.1	7.9	8.3	9.1	9.9	34.9	37.1	39.5	23.4
Pasta	7.8	8.3	8.8	8.4	8.7	9.7	10.1	11.2	12.1	15.0	36.9	33.3	29.7
Semolina	14.5	11.4	10.3	8.9	9.2	9.8	9.0	8.9	8.5	9.3	54.6	30.4	14.9
Vegetable oil	5.8	6.9	6.6	8.0	8.2	11.0	9.2	10.1	14.6	19.5	24.1	22.0	53.9
Bottled gas	7.1	7.9	9.3	9.5	10.0	9.8	10.7	10.8	11.9	13.0	52.4	45.4	2.2
Diesel	2.5	4.0	6.4	6.5	7.1	10.3	12.6	11.3	14.6	24.6	2.7	4.6	92.7
Electricity and Gas	4.2	5.3	6.2	7.1	7.9	8.6	10.6	11.6	14.3	24.3	–	–	–
Gasoline	1.5	3.3	3.9	5.0	6.8	7.9	10.4	12.1	16.7	32.4	24.1	60.5	15.5

D Living-standard score: variable definitions

The population-weighted ownership rate and resulting tier of every candidate indicator behind the living standard score is reported in Table 3 in the main text (Section 5.2); it is not repeated here. This appendix instead documents the underlying EBCNV 2021 living-conditions variables (`microdonnees_condvie.dta`) each indicator is built from. Piped water identifies households on the SONEDE network (billed or unbilled); a flush toilet requires a "toilettes avec chasse d'eau" response; connected sanitation, an STEG gas connection, and every durable-asset indicator are direct yes/no survey questions. Rooms per capita divides the reported room count by household size, the same per-capita logic used for consumption throughout this paper (Section 3). Livestock ownership (productive assets) was considered but not used in the final score: in this sample it does not cleanly separate low- from high-welfare households, plausibly because it captures both subsistence farming and genuine agricultural wealth in opposite directions, and we did not find a way to sign that relationship with confidence. Full recoding rules are documented in the replication code.

Replication and Transparency Statement

All data and replication materials used in this paper are provided together with the manuscript. The replication package includes the data, all scripts required to reproduce the empirical analysis, and the code used to generate the tables and figures reported in the paper.

Artificial intelligence tools were used as technical assistance during the preparation of this study, including support for parts of the coding workflow and for improving the clarity and structure of the manuscript. All modelling decisions, robustness checks, empirical analysis, and conclusions remain the sole responsibility of the author.
