From disposable income to residual income: A decomposition of inequality in Austria

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ABSTRACT

Income inequality is commonly measured using disposable household income, yet this approach ignores the necessary expenditures households must incur. When costs such as housing, energy, food and transport absorb a substantial share of resources, disposable income may misrepresent effective living standards. This paper analyses income inequality in Austria using a residual income perspective that deducts essential expenditures from equivalized household income. Using representative microdata on 6,873 households, we compare inequality levels based on disposable and residual income, apply a Lerman-Yitzhaki Gini decomposition to identify the contribution of individual expenditure categories, and examine re-ranking within the income distribution using transition matrices and subgroup analyses. We find that inequality is substantially higher when measured on residual income, indicating that conventional measures understate disparities in disposable monetary resources. While disposable income remains the dominant structural determinant of inequality, necessary expenditures exert heterogeneous effects. Housing costs, particularly rent, increase inequality, whereas other necessities exhibit neutral or mildly equalizing effects. Our re-ranking analysis shows a significant reallocation of households in the lower and middle segments of the income distribution, with pronounced regional and household-type differences. These findings highlight the central role of necessary costs in shaping inequality and demonstrate the value of residual income measures for assessing living standards.

KEYWORDS

inequality, disposable income, residual income, necessary expenditure, Austria

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1. Introduction

Income inequality is commonly measured using indicators based on disposable household income, reflecting the resources available after taxes and transfers. These measures form the empirical foundation of most comparative research on the welfare state and serve as central benchmarks for policy evaluation. Yet a growing body of literature argues that disposable income alone provides an incomplete perspective on living standards because it ignores the necessary expenditures households must incur to secure a minimally adequate standard of living (Gausden/Hasan 2025; Garner/Short 2004; Balestra/Oehler 2023). When essential costs such as rent, utilities, food or transport absorb a substantial share of household budgets, the resources available for discretionary spending, savings and social participation may diverge significantly from what disposable income suggests. This recognition has motivated the development of residual income measures that deduct necessary expenditures from disposable income to approximate the effective resources households have at their command (Calafati et al. 2021; Bassens et al. 2023).

Despite advances in conceptualizing poverty and inequality as multidimensional phenomena, empirical work incorporating expenditure burdens into income distribution analysis remains limited. Studies applying such concepts typically focus on poverty thresholds or material deprivation (Saunders et al. 2002; Serafino/Tonkin 2017), while far fewer investigate how necessary expenditures reshape the entire income distribution or contribute to measured inequality. Moreover, while there is research exploring how housing costs influence inequality, especially in high-cost urban contexts, formal decompositions of inequality that quantify the contribution of different expenditure components are rare (Garner 1993). In the Austrian context, where housing affordability has emerged as a pressing issue alongside rising energy prices and cost-of-living pressures, no systematic analysis has yet examined how necessary expenditures alter inequality levels or re-rank households within the distribution.

This gap is consequential. Austria is frequently characterized as a relatively redistributive welfare state, with a moderate disposable income Gini coefficient compared to other OECD countries (OECD 2024). However, this assessment presumes that disposable income adequately reflects households' command over resources, an assumption that is questionable given regional disparities in housing costs, high levels of private renting in cities, and considerable variation in energy and operating expenses. If necessary expenditures vary systematically across the income distribution, inequality measured on the basis of disposable income may misrepresent actual differences in living standards. In particular, rising housing costs may limit resources in the lower and middle segments of the distribution, potentially altering both inequality levels and households' relative positions.

The present study addresses these gaps by providing the first comprehensive analysis of residual income inequality in Austria. Using a representative microdata sample of 6,873 households, we examine how necessary expenditures affect both the level and structure of inequality and identify which expenditure categories drive changes when moving from disposable to residual income. We combine three complementary analytical strategies. First, we compare disposable and residual income inequality to assess the aggregate impact of subtracting essential costs. Additionally, concentration curves allow us to evaluate whether certain expenditures are regressively or progressively distributed. Second, we employ the Lerman-Yitzhaki decomposition to quantify the contribution of specific expenditure categories, such as rent, energy, food and operating costs, to overall inequality. Third, we analyse re-ranking in the income distribution through transition matrices and subgroup comparisons to determine which households are most affected by necessary expenditures and how these expenditures reshape relative positions across regions, household types, and labour market statuses.

These analyses are guided by the following research questions:

1. How do necessary expenditures contribute to overall inequality in Austria when moving from disposable to residual income?
2. Which expenditure components are most responsible for increasing or decreasing inequality?
3. How stable are households' positions in the income distribution once necessary expenditures are deducted?
4. To what extent do re-ranking patterns vary across regions, household types, and income sources?

By addressing these questions, our study advances the literature on income inequality in two ways. Substantively, it provides a more realistic assessment of living standards by incorporating unavoidable costs into the measurement of resources. The findings show that inequality in Austria is substantially understated when measured according to disposable income alone and that necessary expenditures play a pivotal role in shaping effective living standards. These insights hold broader implications for debates on affordability, welfare state design, and the adequacy of income-based inequality metrics.

The objective of this study is not to estimate the minimum expenditure required to achieve a decent standard of living. Instead, it assesses how the actual structure of essential household expenditures interacts with the income distribution and shapes measured inequality. Using actual expenditure data, the study captures how different cost categories contribute to inequality and lead to a re-ranking within the income distribution. This approach also allows for an analysis of regional and

household-level variations in expenditure burdens, which would be obscured by standardized or normatively defined expenditure assumptions.

2. State of the art: Measuring inequality beyond disposable income

This chapter reviews the literature according to two complementary dimensions: the measurement of income inequality and the conceptualization of well-being that such measures seek to capture. While traditional indices provide well-established tools for summarizing the distribution of monetary income, they remain largely silent on how income translates into actual living conditions. In parallel, a growing body of work has expanded the notion of well-being beyond income, emphasizing multidimensional frameworks that incorporate health, education, and social participation. Rather than treating these strands as competing approaches, this chapter brings them together to advance residual income as a concept that links distributional analysis with a more context-sensitive understanding of material living standards.

2.1 The evolution of income inequality measures

2.1.1 Traditional approaches to measuring inequality

Measuring income inequality has been a central concern in economics for more than a century, and the traditional approaches that emerged in the early literature continue to define empirical practice today. Foundational contributions from Lorenz (1905) and Gini (1912) established the basic mathematical tools for representing and summarizing income distributions. The Lorenz curve, one of the earliest graphical methods, provides a visual depiction of cumulative income shares and forms the conceptual basis for numerous subsequent indices. Building on this, the Gini coefficient became one of the most widely used measures of inequality due to its intuitive interpretation and comparability across contexts (Dorfman 1979). Other traditional approaches also include percentile-based measures, such as the P90/P10 ratio or top income shares. Although these measures became more prominent with later research on top incomes (e.g. Piketty/Saez 2003), their conceptual roots lie in older distributional analyses that used quantiles to highlight gaps between different socioeconomic groups. These measures complement the classical indices by directly capturing tail inequality.

As empirical research expanded in the mid-20th century, scholars developed measures that could capture distributional nuances more transparently. This led to the development of the generalized entropy (GE) class of measures, most notably

the Theil index (Theil 1967) and the mean log deviation (MLD) (Theil 1979). These indices are fully decomposable and allow researchers to distinguish between "within-group" and "between-group" sources of inequality, making them especially valuable in studies of regional, racial or sectoral disparities. GE measures also permit researchers to adjust sensitivity to different parts of the income distribution through a parameterization framework. Atkinson's (1970) seminal work further advanced measures by explicitly incorporating normative welfare considerations. The Atkinson index makes social value judgements transparent through an inequality-aversion parameter, offering a bridge between positive measuring and normative welfare economics.

Sen (1997) extended traditional approaches by emphasizing the ethical dimensions of inequality measures and the need to reconcile statistical indices with welfare-theoretic principles. Subsequent comparative assessments, such as Champernowne and Cowell (1998) and Cowell (2011), illustrate how the choice of inequality measure influences empirical conclusions and policy interpretation.

Although traditional inequality indices such as the Gini coefficient and the generalized entropy family remain foundational in empirical research, the literature consistently highlights several conceptual and practical limitations.

2.1.2 Limitations of disposable income measures

Traditional inequality measures are based exclusively on monetary income. As Sen (1999) and subsequent human development scholars argue, income captures only one dimension of well-being and may inadequately represent individuals' real freedoms, capabilities and living conditions. Two individuals with identical incomes may experience vastly different levels of health, education or autonomy, none of which are reflected in standard indices. Consequently, these measures risk over- or understating inequality by ignoring differences in individuals' opportunities and living conditions.

Building on Sen's critique, scholars and policymakers increasingly recognized the need for multidimensional measures that consider well-being across multiple domains. The creation of the Human Development Index (HDI) in 1990 marked a turning point in global development thinking (Stanton 2007). By integrating health, education and income into a single composite measure, the HDI challenged the dominance of income-based indicators like the Gini index and presented a more holistic picture of development. Although the HDI is not technically an inequality index, it reflected a conceptual change in narratives surrounding inequality. It acknowledged that disparities in health and education are as consequential as differences in income (United Nations Development Programme 2025).

The evolution towards multidimensional measures advanced further with the development of the Inequality-adjusted Human Development Index (IHDI) and the Multidimensional Poverty Index (MPI). These measures not only broaden the scope of well-being but also incorporate the distribution of achievements within each dimension. The IHDI, for example, adjusts each component of the HDI using inequality-sensitive techniques derived from Atkinson's framework, thereby capturing the uneven distribution of health, education and income (Alkire/Foster 2010). The MPI takes a different but complementary stance. It identifies households experiencing simultaneous deprivations across multiple dimensions, enabling researchers to examine the intensity as well as the incidence of multidimensional poverty (Alkire/Foster 2011).

Together, these developments reflect a profound conceptual shift, from inequality understood narrowly as variation in monetary income, to inequality understood as a complex and interrelated set of deprivations affecting people's capabilities and opportunities. This multidimensional perspective acknowledges that individuals face overlapping disadvantages that cannot be reduced to a single monetary metric. As a result, the contemporary literature increasingly views traditional income-based indices as necessary but insufficient (e.g. Alkire 2011; Handastya/Betti 2023; Muñetón-Santa/Manrique-Ruiz 2023). They remain crucial for understanding economic disparities, but they must be complemented by measures that capture the broader conditions enabling individuals to lead fulfilling lives.

2.2 Conceptualizing residual income

2.2.1 Theoretical foundations of residual income and related approaches

As living costs rise and the structure of household budgets becomes more heterogeneous, researchers have highlighted the importance of evaluating post-expenditure resources rather than relying solely on gross or equivalized income (Gausden/Hasan 2025; Garner/Short 2004; Balestra/Oehler 2023). Such approaches offer a more grounded perspective on household well-being by examining what remains after covering the necessary costs of living, thus providing a measure that is more closely aligned with the lived realities of material deprivation and financial strain. This shift reflects a broader movement within welfare economics and social policy studies towards a focus on capability and equality in accessing monetary and non-monetary resources (Baujard 2016).

One example is after-housing-costs (AHC) income. The rationale is that housing costs, such as rent or mortgages, are the largest necessary expense for many households and vary substantially by tenure type and location. While regional mobility and differences in the regional cost of living may mitigate inequality, as research

from the US suggests (Moretti 2013), they could also reveal higher levels of inequality. Lower-income households generally allocate a larger share of their income to housing. Consequently, increases in housing costs disproportionately affect them and contribute to higher AHC inequality. This has been observed in the UK (Jenkins 2024) and Germany (Dustmann et al. 2022). However, housing is not the only significant expense. In this regard, housing and urban studies scholars have advanced more holistic thinking in analyses of housing affordability, emphasizing that welfare depends on the ability to cover other necessary costs after paying for housing. Stone (2006), for instance, argues that affordability problems cannot be fully understood with rent-to-income ratios because they fail to capture the resources left for non-housing needs. Utility, transportation, childcare and healthcare expenses can be significant and vary widely across regions and social groups.

The concept of residual income incorporates multiple expenditure categories, representing necessary expenses households must incur to sustain a minimum acceptable living standard. These expenditures, such as on food, housing, utilities, education, healthcare and transport, constitute the essential preconditions for participating in economic, social and civic life (Calafati et al. 2021; Bassens et al. 2023; Rao/Min 2018). By subtracting these unavoidable costs from gross household income, residual income measures aim to capture a more precise and contextually sensitive reflection of the disposable resources available for discretionary spending, savings or coping with unforeseen economic shocks. Residual income thus occupies an important conceptual space between conventional income-based poverty measures and broader multidimensional approaches. It retains the analytical clarity and comparability of monetary indicators but incorporates a recognition of cost-based constraints that shape household welfare.

The theoretical foundations of residual income are deeply rooted in the liveability and basic needs literature, as well as in broader welfare-economic debates concerning what constitutes a socially acceptable living standard. Early contributions by Townsend (1979) emphasized that poverty is not simply a matter of low income, but an inability to participate in the customary lifestyle of society due to insufficient resources after basic needs have been met. This perspective established the groundwork for considering necessary costs integral to understanding poverty and inequality. Similarly, Ringen (1988) argued that income alone provides an inadequate picture of material well-being unless contextualized by the demands placed on household budgets.

Sen's (1992, 1997, 1999) capability approach further strengthened this line of thinking by highlighting that individuals differ in their requirements for achieving basic functions. A household with higher health costs or transport needs, for instance, effectively has less real freedom than an identical-income household with fewer obligatory expenditures. This theoretical insight supports residual income

measures by asserting that real command over resources, rather than nominal income, determines well-being. The capability perspective also highlights that the effective value of income depends on the conditions under which it can be converted into living standards. Differences in the costs of securing basic living conditions constitute important conversion factors that shape households' real command over resources. While residual income remains confined to the monetary dimension of welfare and cannot capture the full multidimensional nature of well-being, it reflects an important aspect emphasized in the capability framework: the heterogeneity in the conversion of income into living conditions. In this sense, inequality measured using residual income may offer a closer approximation to differences in households' effective economic opportunities than inequality measured solely on the basis of disposable income.

In parallel, the standard literature on minimum income, such as the work of Mack and Lansley (1985) and later the UK Minimum Income Standard developed by Bradshaw and colleagues (2008; Bradshaw 2020), posits that a minimum living standard must be defined in relation to socially agreed necessities. These necessities translate directly into unavoidable household expenditures. Residual income thus resonates with the idea that welfare assessments must consider whether households possess sufficient resources after meeting these socially defined requirements. This perspective has been operationalized in deprivation indicators that explicitly link acceptable living standards to the ability to afford specific goods and activities. For instance, as part of the EU-SILC (EU statistics on income and living conditions), the severe material and social deprivation rate is an indicator describing an "enforced lack of necessary and desirable items to lead an adequate life" (Eurostat 2026). The items include adequate meals and heating of living areas, the capacity to replace worn-out furniture and clothes, regular leisure activities, eating out with friends on a monthly basis, as well as being able to afford an annual one-week holiday. While some of these items speak to basic functioning and safety, which are included in the residual income approach, others capture norms of social participation that are a prerequisite for avoiding exclusion and may be better captured using complementary deprivation metrics.

Supplementary to expenditure-focused approaches, a separate strand of research highlights an extended version of income. Extended income includes non-cash goods and services that contribute to material well-being and influence inequality. This includes public in-kind services as well as household production, the unpaid activities by and for household members that could theoretically be replaced by market goods or paid services (Reid 1934). Both extensions of the classical definitions of income have been found to have a mitigating effect on inequality. When considering the value for European households of public services and social infrastructures, like subsidized housing, education and healthcare, studies find a dampening of the inequality levels (Paulus et al. 2010; Christl et al. 2025). Similarly,

household production contributes to material living standards but varies less across households than market earnings (Gautham/Folbre 2026). However, there is a gendered dimension to household production, revealing intra-household inequalities when it comes to paid and unpaid labour (Samtleben/Müller 2022). Market income, household production and the availability and accessibility of social infrastructure and public services are interconnected and partial substitutes for each other (Neuhuber/Schneider 2025).

Overall, residual income can be understood as occupying a middle ground between traditional income-based inequality measures and fully multidimensional approaches. By focusing on income after the deduction of essential expenditures, it preserves the analytical clarity and comparability of monetary indicators while incorporating key insights from the broader well-being literature, particularly the importance of heterogeneous needs and cost-of-living constraints. At the same time, it remains a partial measure: it does not capture non-monetary dimensions of well-being, nor the role of public services or social participation in shaping living standards. Its contribution therefore lies not in replacing existing approaches, but in complementing them by offering a policy-relevant perspective on material inequality that is sensitive to the conditions under which income is converted into effective economic resources.

2.2.2 Defining residual income

In line with these theoretical foundations, we define residual income as:

> *adjusted gross household income minus essential expenditures for food, rent, operating costs, energy costs, transport, education and health.*[1]

This definition aligns with established conceptual frameworks in the liveability literature (see e.g. Bassens et al. 2023; Riepl/Grabow 2025). The inclusion of this set of expenditure categories reflects their centrality to sustaining daily life and social participation. Food and housing costs represent the most fundamental requirements, while operating and energy costs capture the infrastructural necessities of modern living. Transport is included due to its essential role in accessing employment, services and social opportunities. Education and health expenditures account for human capital maintenance and differences in household needs that influence real living standards.

1 A more detailed overview of the expenditure items included in the residual income approach can be found in Table 4 in the Appendix.

By focusing on the resources that remain after covering essential expenditures, residual income provides a more accurate measure of a household's capacity to engage in discretionary consumption, participate in society and withstand financial volatility. It captures both the monetary and cost-side determinants of material well-being, thereby offering a comprehensive lens through which to assess inequality, poverty risk and economic vulnerability. In policy analysis, residual income enables the identification of households that may not appear to be poor according to income-based thresholds but do in fact face severe financial strain once essential costs are deducted. This is an increasingly relevant insight in contexts of rising housing and energy costs. The intention of this approach is therefore not to define a normative basket of minimum needs but to capture the effective resources households retain after meeting expenditures that are structurally difficult to avoid in practice. Consequently, residual income reflects the budget constraints households experience within existing housing, energy and transport systems rather than an externally defined sufficiency standard.

An alternative approach would be to define "necessary expenditures" using standardized thresholds such as median expenditures, housing benefit limits, or normative consumption baskets. While such approaches are widely used in research on poverty and minimum income, they serve a different analytical purpose. Constructing standardized baskets requires normative assumptions about adequate consumption levels and reduces variation across households by imposing identical expenditure standards. This standardization would obscure the heterogeneity in cost burdens across regions, housing markets and household types that is central to understanding how expenditures interact with the income distribution. Because the objective of this study is to analyse how expenditure categories contribute to inequality and re-ranking within the income distribution, our analysis relies on observed household expenditures, which preserve the empirical variation necessary for distributional analysis.

3. Methods

3.1 Measuring residual income

Standard approaches to measuring inequality rely on equivalized disposable income, which accounts for household size and composition but ignores the role of necessary expenditures. As discussed, these expenditures represent largely unavoidable demands on household budgets and thus reduce the income that households can devote to discretionary consumption, savings and social participation. To account for these constraints, we calculate residual income at the household level with $i = 1,\ldots, I$ as:

$$y_i^{res} = y_i^{disp} - \sum_k A_{ik} \quad (1)$$

where y_i^{disp} is the equivalized[2] disposable income of household i and A_{ik} represents necessary expenditure category k: rent, food, energy, operational costs, health, transport and education. All expenditure variables are treated as negative components.

3.2 Measuring inequality

The focus of the analysis is on how necessary expenditures reshape the entire income distribution, rather than on identifying households below a poverty threshold. While poverty measures provide valuable insights into economic vulnerability at the lower end of the distribution, they do not capture how expenditure burdens affect inequality and relative positions across the full distribution. Inequality is assessed using the Gini coefficient for both disposable and residual income. The Gini coefficient is defined as:

$$G = \frac{2}{\mu_y} Cov(y, R) \quad (2)$$

where μ_y is the mean of income y, and R is the fractional rank of households in the income distribution.

To understand how necessary expenditures contribute to the observed increase in inequality when moving from disposable to residual income, we apply the Lerman-Yitzhaki (1984, 1985; Yitzhaki 1983) Gini decomposition. This method decomposes overall inequality into the sum of the contributions from each expenditure component:

$$G = \sum_k C_k \quad (3)$$

with

2 To ensure comparability across households of different sizes and compositions, all income and expenditure variables are equivalized using the modified OECD equivalence scale. This approach follows the methodology used in the Austrian Household Budget Survey by Statistics Austria, where expenditures are reported as equivalized "weighted per-capita expenditures" (Statistics Austria n.d.). In this scale, the first adult in the household receives a weight of 1.0, additional adults receive a weight of 0.5, and children under 14 receive a weight of 0.3.

(4) $$C_k = \frac{2}{\mu_y} Cov(x_k, R)$$

where x_k denotes component k.

For each component k, the decomposition reports four quantities:

(I) *The mean component* (μ_k):

(5) $$\mu_k = \mathrm{E}[x_k]$$

which represents the average monetary amount associated with component k.

Because residual income is calculated by subtracting necessary expenditures from disposable income, expenditure items appear as negative values in the decomposition table. Thus, the mean component provides insight into the budgetary weight of each category.

(II) *The residual income share* (S_k): The income share reports the ratio of each component's mean value to mean residual income. It expresses how large each income or expenditure category is relative to the resources households retain after necessary deductions.

(6) $$S_k = \frac{\mu_k}{\mu_y}$$

An income share exceeding one, as in the case of disposable income, indicates that the average disposable income is more than the average residual income, which is expected because residual income is defined net of expenditures. Negative income shares, shown for all expenditure categories, indicate the proportion of income absorbed by each expenditure item. These ratios provide an intuitive measure of how costly each necessity is relative to the income available after essential deductions, allowing us to contextualize the burden each category imposes on households across the entire distribution.

(III) *Contribution to the Gini coefficient* (C_k): The measure in Equation (4) reports the absolute effect of each income component on residual income inequality. It is derived from the covariance between the component and households' ranked position in the income distribution. A positive contribution indicates that the component increases inequality, which means it is more strongly concentrated among higher-income households. A negative contribution, by contrast, implies that the component reduces inequality, either because it is

relatively uniform across households, or because its values rise more slowly than income as one moves up the distribution.

(IV) *Share of Gini (Θ_k)*: The share of Gini expresses each component's contribution relative to the total level of inequality, thus decomposing the Gini coefficient into percentages attributable to each category.

(7) $$\theta_k = \frac{C_k}{G}$$

3.3 Re-ranking and transition analysis

To assess how necessary expenditures reshape the relative position of households within the income distribution, we examine mobility between disposable income quintiles and residual income quintiles. The analysis proceeds in three steps.

First, households are sorted by equivalized disposable income and assigned to quintiles of equal population size. Quintile 1 (Q1) denotes the lowest-income fifth of the distribution, and quintile 5 (Q5) the highest. The same procedure is then applied to equivalized residual income, defined as disposable income net of necessary expenditures such as rent, operating costs, energy and food. Quintiles are constructed using quantile-based cut points applied to the rank distribution to ensure validity even in the presence of ties or discretized income values.

Second, we link each household's quintile position under disposable income with its corresponding position under residual income. This produces a5×5 transition matrix, where each cell counts the number of households that move from quintile *i* (based on disposable income) to quintile *j* (based on residual income). For each row, we compute the row-normalized transition share, which expresses the proportion of households in each disposable income quintile that transition to each residual income quintile. This measure captures the extent to which necessary expenditures alter the ordinal structure of the income distribution.

Let y_i^{disp} be the disposable income and y_i^{res} the residual income of household *i*. We then define the rank operators as:

(8) $$r_i^{disp} = rank\left(y_i^{disp}\right)$$
$$r_i^{res} = rank\left(\mathrm{y_i^{res}}\right)$$

on the interval [1,*N*].

Quintile membership is defined as:

$$Q_i^{disp} = q \; if \; \frac{(q-1)}{5} < \frac{r_i^{disp}}{N} \leq \frac{q}{5}$$

$$Q_i^{res} = q \; if \; \frac{(q-1)}{5} < \frac{\mathrm{r_i^{res}}}{N} \leq \frac{q}{5} \tag{9}$$

for q = 1,…,5.

The transition from one quintile to another can then be defined as:

$$T_{ij} = \#\{i : Q_i^{disp} = a \; and \; Q_i^{res} = b\} \tag{10}$$

for quintiles $a,b \in \{1,2,3,4,5\}$. Thus, T_{ij} counts households that were in quintile i under disposable income and in quintile j under residual income.

4. Data and descriptives

Our analysis uses data from the 2019/2020 Household Budget Survey conducted by Statistics Austria. The survey, which is carried out every five years, collects detailed information on household consumption over a two-week reporting period and includes comprehensive data on household income and composition. The original sample comprises 7,139 households. After excluding observations with missing values, the final sample consists of 6,873 households with a mean disposable monthly income of €2,917 and a mean residual monthly income of €2,061.

Table 1 reports mean disposable income, necessary expenditures, and residual income by disposable income quintile. Disposable monthly income ranges from €1,262 in the lowest quintile to €5,270 in the highest, whereas expenditures increase much more gradually. Rent is the largest expenditure in all quintiles and rises only moderately with income, implying a strongly regressive burden at the bottom of the distribution. Energy and operating costs vary little across quintiles, which reflects their largely fixed nature, whereas health, education and transport expenditures increase more noticeably at higher income levels.[3] As a result, residual income increases disproportionately with disposable income, from €500 per month in the lowest quintile to over €4,200 in the top quintile.

3 see Section 5.1 below.

Table 1: Mean disposable income, mean expenditure and mean residual income per month per income quintile (in EUR)

Mean Quintile	Disposable income	Rent	Energy	Operating costs	Health	Education	Transport	Residual income
Q1	1,262	290	99	109	193	106	161	500
Q2	2,059	306	109	105	186	83	158	1,238
Q3	2,636	336	105	100	210	97	148	1,793
Q4	3,359	357	108	100	197	104	177	2,491
Q5	5,270	434	116	107	248	134	202	4,284

Note: Income and expenditure variables are equivalized using the modified OECD scale. Authors' own calculations based on the Austrian Household Budget Survey for 2019/2020

While the Household Budget Survey gives insights into the spending of Austrian households, it does not capture mortgage repayments, which means that housing costs for owner-occupiers with outstanding loans are only partially observed. As a result, the full burden of housing-related expenditures is understated for a subset of households, which is a limitation of the study. However, several considerations suggest that this limitation does not undermine the central findings. Evidence from the Austrian Household Finance and Consumption Survey (HFCS) shows that mortgage debt is highly concentrated among higher-income and higher-wealth households, while the majority of lower-income households are renters. Moreover, only about 30% of Austrian households hold any debt at all, and collateralized mortgage loans are predominantly held by households in the upper half of the income distribution. This implies that omitting mortgage payments mainly affects households that are relatively well positioned economically and therefore less exposed to binding residual income constraints (Oesterreichische Nationalbank 2025). By contrast, rental payments, which are fully captured in our data, represent the dominant housing cost for lower- and middle-income households, which are most vulnerable to expenditure-induced reductions in effective living standards. Consequently, while the absence of mortgage costs may lead to a conservative estimate of housing-related burdens at the top of the distribution, it is unlikely to bias the main conclusions regarding inequality amplification.

A further limitation of using observed expenditures is that some spending within the selected categories may reflect discretionary consumption rather than strictly necessary costs. For example, higher-income households may occupy larger dwellings, choose higher-quality housing, or incur higher transport expenditures due to lifestyle preferences. In principle, subtracting such expenditures could reflect

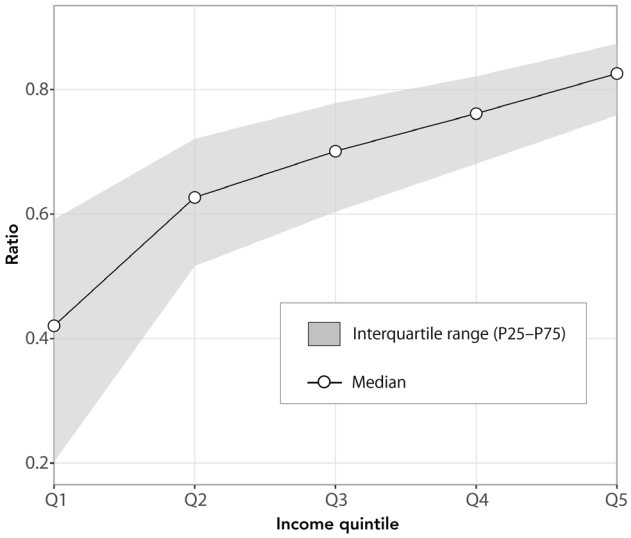
differences in consumption choices rather than unavoidable cost burdens. However, the empirical patterns in the data (Table 1) suggest that this concern does not fundamentally distort the distributional analysis. Higher-income households do indeed spend more in absolute terms across most expenditure categories, reflecting both higher consumption levels and greater purchasing power. At the same time, these households retain substantially higher residual incomes even after these expenditures are deducted. This indicates that residual income continues to capture the underlying gradient in economic resources rather than merely reflecting differences in consumption choices.

5. Results

Before analysing residual income inequality, Figure 1 shows the ratio of residual income divided by disposable income. The interquartile range captures the within-quintile heterogeneity, illustrating how strongly and how unevenly necessary expenditures reduce household resources across the income distribution. The residual income ratio exhibits a strong and systematic gradient across the income distribution. In the lowest disposable income quintile (Q1), the median ratio of approximately 0.42 indicates that households retain less than half of their income after covering necessary expenditures. At the same time, the wide interquartile range in Q1 reveals pronounced heterogeneity: while some low-income households face extreme budget constraints, others experience substantially lower expenditure burdens, likely reflecting differences in housing tenure, subsidized rents, or cost-sharing arrangements. In the second quintile (Q2), the median residual income ratio rises sharply to around 0.62, accompanied by a markedly narrower range. This suggests that households in this segment face a more uniform expenditure burden, albeit still substantial in proportional terms. From the middle of the distribution onward, the residual income ratio increases gradually, reaching approximately 0.70 in Q3, 0.76 in Q4, and 0.82 in Q5, while dispersion continues to decline steadily. This pattern implies that higher-income households not only face lower proportional expenditure burdens on average but may also experience more predictable and stable cost shares. Essential expenditures become less binding and more uniform relative to income, reflecting both greater financial buffers and a reduced sensitivity of living standards to unavoidable costs.

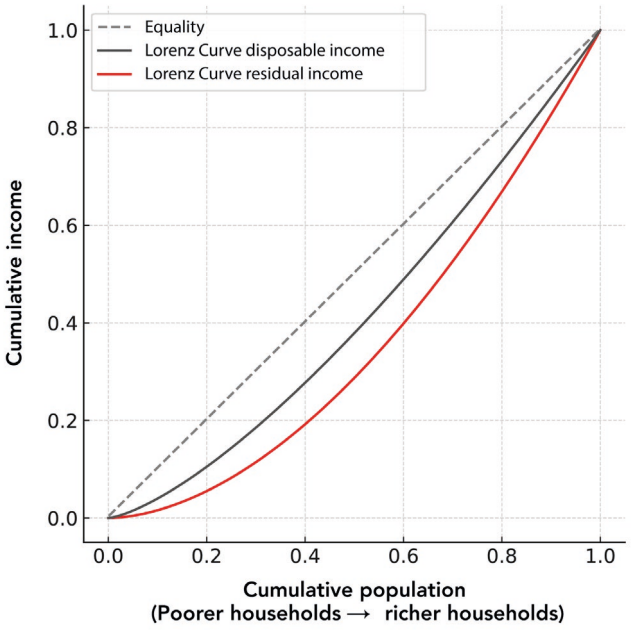
Taken together, the declining dispersion across quintiles highlights an important asymmetry in how necessary expenditures shape living standards. At the bottom of the distribution, expenditures introduce both strong compression and high heterogeneity. Higher up the distribution, expenditures primarily shift income levels downward in a relatively uniform manner, without generating comparable instability.

Figure 1: Ratio of residual income and disposable income per income quintile



Note: Quintiles are defined based on equivalized disposable income. Authors' own calculations based on the Austrian Household Budget Survey for 2019/2020.

Figure 2: Lorenz curves for disposable and residual income



Note: Authors' own calculations based on the Austrian Household Budget Survey for 2019/2020.

To assess how necessary expenditures reshape the income distribution in Austria, we first compare inequality levels based on equivalized disposable income and residual income. As expected, deducting essential expenditures leads to a substantial increase in measured inequality. The Gini coefficient for residual income is 0.38 compared to the Gini coefficient of 0.27 for disposable income, as shown in Figure 2. This indicates that once unavoidable costs are accounted for, the dispersion in household resources available for discretionary spending is considerably higher than suggested by conventional measures. This motivates a closer examination of the specific components that drive this increase.

5.1 Decomposition of residual income inequality

Table 2 presents the Lerman-Yitzhaki decomposition of the residual income Gini into its underlying components.

Table 2: Lerman-Yitzhaki decomposition of residual income inequality (per month)

	Disposable income	Rent	Operating costs	Energy	Food	Health	Transport	Education
Mean component	2,917.3	-126.6	-99.2	-104.5	-297.7	-68.6	-39.5	-27.5
Residual income share	1.415	-0.061	-0.048	-0.051	-0.144	-0.033	-0.019	-0.013
Contribution	0.371	0.014	0.002	-0.009	-0.002	0.001	-0.002	< -0.001
Share of Gini	0.966	0.036	0.006	-0.002	-0.005	0.003	-0.005	-0.001

Note: Authors' own calculations based on the Austrian Household Budget Survey for 2019/2020.

Disposable income remains the dominant determinant of inequality. Its mean value (€2,917 per month) is the only positive component in the decomposition, and its residual income share of 1.415 indicates that average disposable income exceeds average residual income by more than 40%, reflecting the substantial combined burden of essential expenditures. More importantly, disposable income contributes 0.371 to the Gini coefficient, accounting for 96.6% of total residual income inequality. This does not contradict the fact that residual income inequality is higher than disposable income inequality. Instead, it points to an important conceptual distinction: the rise in inequality is driven by how expenditures reduce incomes across the distribution, whereas the structure of inequality (i.e. its shape, ranking and underlying dispersion) is still overwhelmingly determined by disposable income itself.

In other words, necessary expenditures compress resources asymmetrically across the income distribution. While higher-income households typically incur larger expenditures in absolute terms (see Table 1), these costs represent a relatively small share of their income and therefore leave substantial residual resources. In contrast, lower-income households must allocate a much larger proportion of their income to essential expenditures such as rent, energy and food. As a result, deducting these costs disproportionately reduces resources at the bottom of the distribution, whereas households at the top retain a large share of their income. This asymmetric compression widens the dispersion of residual income even though the overall structure of inequality continues to be driven primarily by the underlying distribution of disposable income.

Among all necessary expenditures, rent stands out as the only category with a substantively inequality-increasing effect. In the decomposition, rental payments constitute the second largest expenditure component (in absolute terms), with an average contribution of €126.60 per household per month. Additionally, rent has an income share of −0.061, which indicates that rental payments represent a large negative component relative to total income and therefore play a central role in reducing residual income, especially for households at the bottom of the income distribution. Crucially, rent contributes 0.036 to the Gini coefficient, representing 3.7% of overall inequality, by far the largest contribution among expenditures. This reflects a strong positive covariance with income rank: although higher-income households tend to rent larger or higher-quality dwellings and therefore pay more in absolute terms, rent remains a disproportionately burdensome expenditure for households in the lower deciles. The form and distribution of rental costs thus reinforce the income distribution.

Operating housing costs and health expenditures per month are small in average magnitude (−€99 and −€69, respectively), but both exhibit slight inequality-increasing effects. Their contributions, though modest (0.002 and 0.001), reflect expenditure patterns that scale gradually with income. Higher-income households tend to occupy larger dwellings with higher associated maintenance or operating fees, and may also make greater use of private or elective medical services not covered by public insurance. Although these differences do not materially shape overall inequality, they do represent areas where income-related consumption gradients subtly reinforce existing disparities.

While rent increases inequality by interacting strongly with the income distribution, most other necessities have the opposite effect. Energy costs, for example, tend to be fairly similar across households relative to their income position and therefore slightly reduce residual income inequality, as shown by their negative Gini contribution (−0.009), despite constituting a noticeable share of household resources in the decomposition (−0.051). This reflects consumption patterns: energy

use rises with dwelling size and may therefore increase with income, but the variance across households is limited, and low-income households are constrained in their ability to reduce energy needs further. The result is a negative covariance with income rank.

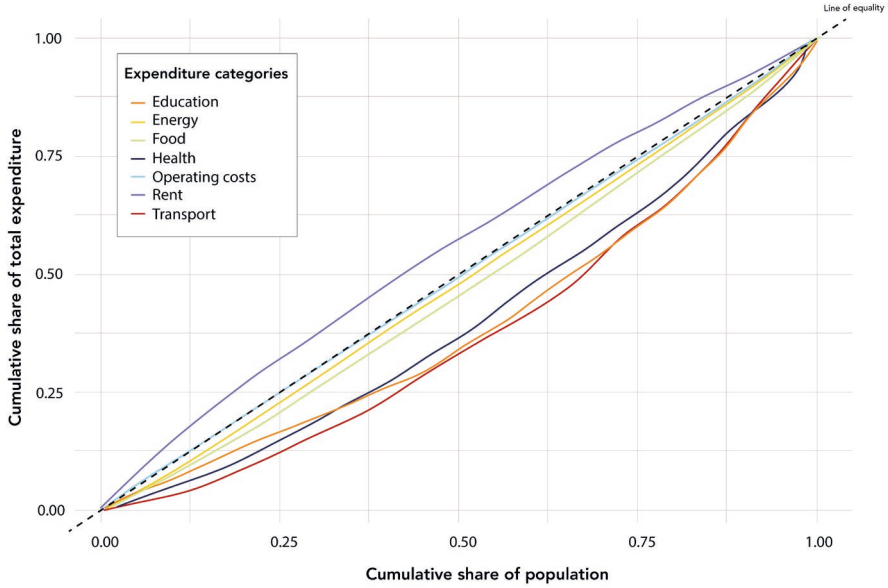
Food expenditures appear as a large negative component in the decomposition (–€298), but their contribution to residual income inequality is small and negative (–0.002). These results suggest that as income rises, the proportional increase in food expenditure is modest. This dampens the effect on inequality. Transport and education expenditures follow a similar pattern. Their mean components (–€39 and –€27, respectively) indicate that they represent relatively minor budget items for most households. Their negative contributions (around –0.002 and less than –0.001, respectively) suggest that they do not intensify inequality and may even counteract it slightly. Transport expenses often rise with income due to car ownership or commuting distances, and education spending reflects low and relatively uniform out-of-pocket costs in Austria's publicly funded education system.

Together, these findings reveal a clear structure in the role of necessary expenditures. While subtracting essential costs increases measured inequality, which highlights the precariousness of living conditions among lower-income households, the components themselves exert different effects on inequality. Rent is the only expenditure category that substantively increases inequality. By contrast, expenditure categories such as food and energy exhibit limited variation across households and therefore have mildly equalizing effects. The key insight is that necessary expenditures do not replace income as the primary axis of inequality. Rather, they reveal how the burden of essential costs interacts with pre-existing income structures to compound disparities in effective living standards.

As robustness checks, we perform two additional decompositions. First, we restrict the sample to renter households only, thereby excluding homeowners for whom housing expenditures are not directly observed (Table 5 in the Appendix). In this specification, rent contributes more strongly to residual income inequality, reflecting the substantial housing cost burden faced by renters. Second, we include imputed rents for homeowners to account for the housing services they receive from owner-occupied housing (Table 6 in the Appendix). In this case, the housing component becomes slightly equalizing, as homeowners are assigned substantial housing services. Across both specifications, the overall pattern of results remains unchanged. Housing costs constitute the most important expenditure component that contributes to residual income inequality. This largely reflects tenure differences, as homeowners benefit from housing through owner-occupation, while lower-income households in the rental sector face comparatively higher housing cost burdens.

To further investigate how necessary expenditures interact with the income distribution, we construct concentration curves for each major expenditure category. A concentration curve plots the cumulative share of a given expenditure against the cumulative share of the population ranked by disposable income and thereby provides a visual assessment of whether a cost is disproportionately borne by lower- or higher-income households. If a curve lies above the 45-degree line of equality, the expenditure is regressive, indicating that poorer households account for a larger share of total spending than their population share would suggest. If it lies on or below the line, the expenditure is proportional or progressive. In the context of our analysis, concentration curves allow us to determine whether the rise in inequality observed when moving from disposable to residual income is driven by the regressive incidence of certain essential expenditures or by other mechanisms, such as variation in expenditure levels among higher-income households.

Figure 3: Concentration curves of necessary expenditure categories by disposable income rank



The concentration curves shown in Figure 3 offer a complementary perspective on the decomposition results by illustrating how necessary expenditures are distributed across the income rank. Only the rent curve lies clearly above the line of equality, indicating that lower-income households shoulder a disproportionately large share of total rental expenditures. This regressive pattern aligns directly with the decomposition findings, where rent emerges as the only expenditure category with a substantively meaningful inequality-increasing effect. The remaining curves lie on or below the 45-degree line, demonstrating that these expenditures

are broadly proportional or even mildly progressive in incidence. Yet several of these categories, particularly operating costs and health, still exhibit small positive contributions to inequality in the decomposition. The decomposition captures how each component covaries with income level, rather than whether it burdens poorer households more heavily. Higher-income households spend more in absolute terms on larger dwellings, private health services, and other quality-related consumption, generating a positive covariance with income that contributes slightly to the overall Gini coefficient, even though these expenditures are not regressive. In contrast, categories such as food and energy display limited variation across the distribution and are therefore associated with small equalizing effects.

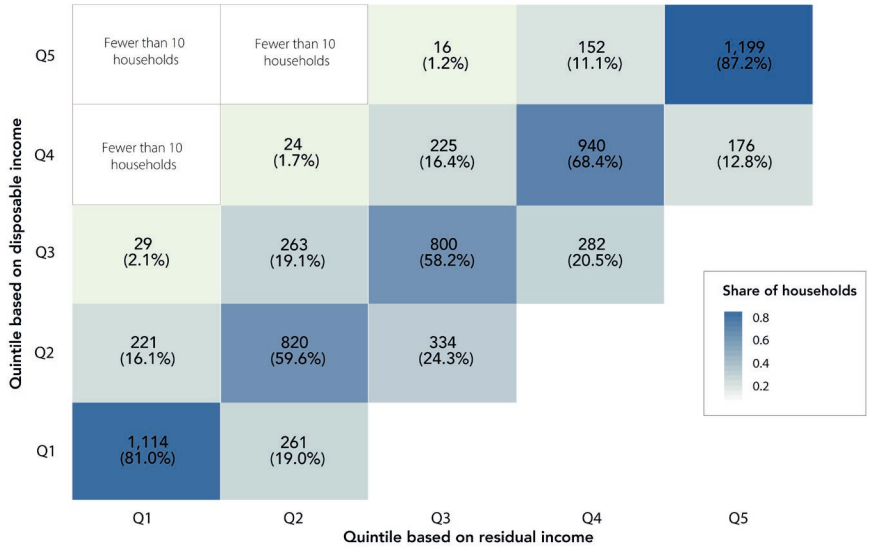
Taken together, the curves and decomposition results show that in general the rise in residual income inequality is not driven by necessities but almost entirely by the structure of the housing market. Rent is both regressive in incidence and inequality-amplifying through covariance with income, whereas other expenditure categories either scale with income or exert neutralizing effects.

5.2 Re-ranking in the income distribution

To assess how accounting for necessary expenditures reshapes the relative economic position of households, we examine transitions across income quintiles. The transition matrix reveals a substantial reordering of households once necessary expenditures are deducted from disposable income. Across the full sample of 6,873 households, residual income adjustments leave the majority of households in their original quintile, but there is still a sizeable number of households experiencing upward or downward mobility. This implies that necessary expenditures meaningfully alter household living standards beyond what is suggested by disposable income alone. The pattern is especially pronounced for households in quintiles 1–3, which reflects the relatively larger budgetary burden of rent, operating costs, food and energy among lower- and middle-income groups.

Among households initially classified in the lowest disposable income quintile (Q1), 81% remain in Q1 after accounting for necessary expenditures. This is expected: households with low disposable income tend to also have low residual income, and many face high expenditure burdens that limit upward movement. However, 19% of Q1 households move into Q2, indicating that a meaningful fraction of low-income households appears more deprived in disposable income terms than in actual residual resources. These may be households with relatively low housing costs (e.g. homeowners or people with subsidized rents). Upward movement beyond Q2 is negligible, reflecting structural constraints on mobility at the lower end of the distribution.

Figure 4: Re-ranking of households from disposable income to residual income quintiles



Note: The figure shows how households move across income quintiles when income is measured as residual income rather than disposable income. Residual income is defined as equivalized disposable income minus expenditures on housing, energy, food, transport, health and education. Quintiles are defined based on equivalized disposable income. Income and expenditure variables are equivalized using the modified OECD scale. Authors' own calculations based on the Austrian Household Budget Survey for 2019/2020.

Income dynamics become more complex in Q2. Only 59.6% of Q2 households remain in Q2 after expenditure adjustments. A substantial 16.1% fall into Q1, and 24.3% rise to Q3. This symmetrical dispersion is important: Q2 households are highly sensitive to necessary expenditures. The downward movement likely reflects households for whom rent and energy constitute disproportionately large shares of income. Q3 exhibits the most substantial two-sided mobility. Only 58.2% remain in Q3, while 19.1% fall to Q2, 2.1% fall to Q1, and 20.5% rise to Q4.

Households in the fourth disposable income quintile show moderate stability, with about two-thirds (68%) remaining in Q4 after accounting for necessary expenditures. Nonetheless, a notable share moves downward, most commonly into Q3, reflecting the extent to which housing and other essential costs can strain upper-middle-income budgets. At the same time, around 13% transition upward into the top quintile, suggesting that some Q4 households have comparatively low expenditure burdens or sufficiently high disposable incomes to move ahead once necessities are paid for. At the top of the distribution, mobility is minimal. Nearly 90% of Q5 households remain in Q5, and downward shifts are small and concentrated one quintile below. This high stability illustrates that necessary expenditures have little influence on the relative standing of high-income households.

In summary, the transition analysis shows that necessary expenditures meaningfully reshape the income distribution in Austria, even though disposable income remains the principal structural determinant of inequality. Once expenditures are deducted, a substantial share of households experience changes in their relative position, with re-ranking particularly concentrated in the lower and middle segments of the distribution. Overall, the transition results demonstrate that inequality is not only higher when measured in residual income terms but also distributed differently, with expenditure burdens reshuffling the relative positions of a large share of Austrian households. This re-ranking provides additional evidence that inequality based on disposable income understates material differences in living standards and that necessary expenditures, particularly housing, play a pivotal role in shaping these disparities.

The subgroup analysis (Table 3) reveals substantial heterogeneity in re-ranking dynamics once necessary expenditures are deducted from disposable income. While the overall transition matrix already indicated pronounced mobility in the lower and middle parts of the income distribution, the disaggregated results show that this mobility is structured by geography, household composition and income sources.

Regional variation is particularly pronounced. Vienna exhibits by far the highest share of downward re-ranking (21.1%), substantially exceeding the rates observed in all other provinces. This pattern is consistent with Vienna's comparatively high rental share. In contrast, provinces such as Styria and Upper Austria display notably lower downward mobility (9–11%), which may potentially reflect more moderate rental markets and higher rates of owner-occupation. Upward mobility is most common in Vorarlberg (20.8%) and Styria (18.2%).

Table 3: Re-ranking from disposable to residual income by household subgroup

Province	n	Share moved down	Share moved up
Burgenland	257	12.5%	19.8%
Carinthia	424	13.7%	15.1%
Lower Austria	1279	11.3%	16.1%
Upper Austria	1008	10.8%	19.0%
Salzburg	358	15.1%	15.6%
Styria	1065	9.5%	18.2%
Tyrol	503	11.5%	17.5%
Vorarlberg	380	13.9%	20.8%
Vienna	1599	21.1%	7.7%

Municipality size	n	Share moved down	Share moved up
< 2,500 inhabitants	1491	9.1%	22.5%
≥ 2,500 < 10,000 inhabitants	2169	11.1%	17.7%
≥ 10,000 < 100,000 inhabitants	1066	13.1%	15.1%
≥ 100,000 inhabitants (excl. Vienna)	548	17.3%	9.1%
Vienna	1599	21.1%	7.7%

Household type	n	Share moved down	Share moved up
Shared living	412	11.7%	11.9%
Couple	1745	12.9%	17.1%
Single	2679	16.5%	13.7%
Single with children	330	17.0%	10.9%
Two adults with children	1121	11.5%	17.8%
More than 2 adults with children	171	9.4%	17.5%
More than two adults	415	7.7%	17.8%

Main income source	n	Share moved down	Share moved up
Employment	3774	14.7%	13.5%
Self-employment	381	14.2%	12.6%
Retired	2270	13.4%	20.4%
Unemployed/social transfers	308	5.8%	5.5%
Other/unknown	140	10.7%	12.1%

Note: Authors' own calculations based on the Austrian Household Budget Survey for 2019/2020.

Furthermore, a clear urban-rural gradient emerges in the analysis by municipality size. Upward mobility is highest in small municipalities (22.5%), where housing costs are low and homeownership rates are high. These factors reduce the extent to which necessary expenditures decrease residual income. As municipality size increases, upward mobility declines and downward mobility rises. This gradient underscores the substantial geographical inequalities in Austria's cost-of-living structure.

Patterns by household type reveal a similarly stratified pattern. Single adults and single parents experience the highest downward mobility, 16.5% and 17%, respectively. The economic interpretation may be that households without the possibility of sharing housing and utility costs face disproportionately high expenditure burdens relative to income. Conversely, multi-adult households, with or without children, exhibit substantially lower rates of downward movement, potentially reflecting economies of scale in consumption and more diversified income structures. Upward mobility is comparatively balanced across most household types but remains lowest for single parents.

Differences by main income source further highlight the role of institutional and labour market factors. Retired households exhibit comparatively high upward mobility (20.4%). By contrast, households reliant on unemployment benefits or social transfers show minimal upward mobility (5.5%) and very low downward mobility (5.8%). Their income constraints leave little room for upward movement, while their residual income cannot fall much below their already low disposable incomes.

6. Discussion and conclusion

The analysis presents a comprehensive assessment of how necessary expenditures reshape the distribution of living standards in Austria and demonstrates that conventional measures of disposable income obscure a substantial degree of inequality. The comparison between disposable and residual income inequality provides the first indication of this discrepancy. Once essential expenditures are deducted, inequality increases markedly, with the Gini coefficient rising from 0.27 to 0.38. This shift reflects the fact that disposable income alone masks the extent to which unavoidable costs, most notably rent, erode the effective resources available to households. By focusing on residual income, we capture a more realistic picture of economic well-being that better aligns with households' actual capacity to participate in social and economic life.

A central insight emerging from this analysis is that necessary expenditures do not uniformly exacerbate inequality. Instead, inequality amplification is highly concentrated in the housing sector. Rent is the only component that both imposes a regressive burden and exhibits positive covariance with income rank, thereby magnifying inequality through two distinct channels: it compresses the budgets of poorer households more heavily, and it reflects a systematic gradient across the income distribution. This dual role distinguishes rent from other expenditure categories and aligns with long-standing concerns in housing research regarding affordability pressures, especially in urban rental markets (Stone 2006). The concentration curve reinforces this interpretation by demonstrating that rental costs are disproportionately borne by households at the lower end of the income distribution,

whereas other necessary expenditures, such as energy, food, transport, and health, are broadly proportional or mildly progressive. This suggests that the redistributive challenges associated with necessary expenditures are not inherent to essential consumption per se but are structurally linked to Austria's housing market.

The re-ranking results extend these insights by showing that expenditure burdens do not merely elevate inequality but also reorder households within the distribution. While downward mobility is most pronounced among households in the lower part of the distribution, reflecting the disproportionate weight of necessary expenditures on limited budgets, the second and third quintiles also exhibit substantial movement. This indicates that the economic position of what is often understood as the "middle class" is more fragile than disposable income measures alone suggest. Moreover, some households in the upper-middle quintiles also experience downward mobility once expenditures are deducted, demonstrating that exposure to cost pressures is not confined to the poorest groups. Conversely, the upward mobility observed among a subset of low-income households suggests that disposable income can misclassify households whose housing situations provide them with comparatively higher effective resources. Together, these patterns challenge simplified narratives of inequality by illustrating that households' position in the distribution depends not only on income flows but also on the expenditure environment in which those incomes are realized.

While these findings illuminate key mechanisms of inequality, they also raise broader questions concerning the interplay between market structure and social policy. Austria's redistributive welfare state plays a critical role in mitigating health and education costs, which helps explain why these categories do not exacerbate inequality. This observation aligns with a broader strand of research on extended income, which is an expanded conception of material well-being that goes beyond cash income to include non-cash goods and services, such as public in-kind transfers and household production (Reid 1934). Studies examining the value of public services and social infrastructure consistently find that these transfers dampen inequality levels among European households (Paulus et al. 2010; Christl et al. 2025). Austria's welfare architecture thus appears to perform precisely this equalizing function in the domains of health and education. Yet the relative absence of similarly redistributive mechanisms in the housing sector, particularly in urban private rental markets, means that housing costs remain a major source of unequal constraint. This suggests a potential misalignment between the welfare state's protective design and contemporary sources of economic insecurity.

Finally, the analysis highlights several avenues for future research. First, future research could explore how expenditure burdens evolve over time, especially in response to rising energy prices, inflationary pressures and tightening housing markets. Another potential avenue involves examining the extent to which residual

income predicts subjective well-being, material deprivation and social participation more accurately than disposable income. Moreover, linking these findings to broader comparative research may shed light on whether Austria's patterns reflect generalizable features of similar welfare states or specific institutional designs in housing and social policy.

Additionally, future research could examine how residual income affects the measurement of income poverty. While the present study focuses on inequality across the entire income distribution, analysing poverty within a residual income framework could provide additional insights into how necessary expenditures shape economic vulnerability at the lower end of the distribution. A limitation of the residual income approach applied in this study is that the expenditure categories are based on observed household spending rather than normative estimates of the minimum cost required to achieve a given living standard. As a result, expenditures within these categories may partly reflect differences in preferences or consumption choices. For example, higher-income households may choose larger or higher-quality housing than would be strictly necessary, while some lower-income households may spend less than what would be required to secure adequate living conditions. Consequently, the approach does not distinguish between strictly necessary and discretionary spending within each category.

Such an analysis would require a definition of normative thresholds for minimum living standards against which residual resources could be evaluated. A compelling foundation for such thresholds is provided by the social participation tradition in poverty research. Townsend (1979) transformed the conception of poverty, viewing it not simply as a lack of income but as the configuration of economic conditions that prevent people from being full members of society. This constitutes a threshold below which adequate participation becomes impossible. Building on this tradition, the reference budget method constructs priced baskets of goods and services representing the minimum cost of such participation and has been shown to be applicable across diverse European contexts (Goedemé et al. 2015). When combined with a residual income framework, minimum budget standards allow for the identification of households facing genuine affordability constraints relative to what decent social participation requires (Deeming 2005). Investigating how different approaches to setting these thresholds influence poverty estimates and the identification of vulnerable households would therefore represent a valuable extension of the present analysis.

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7. Appendix

Table 4: Expenditure categories used to calculate residual income

Category	Expenditure item
Food	Food Non-alcoholic beverages
Housing	Rent for primary residence
Operating costs	Running costs incurred through the intended use of a residential building (e.g. water and wastewater, common facilities, facility management)
Energy	Energy Heating
Transport	Train fares Bus fares Trams and metro fares Petrol/diesel
Education	Kindergarten/early childhood education fees School-related expenses University-related expenses Tutoring
Health	Medical consultation and hospital costs Medications

Table 5: Sensitivity analysis of Lerman–Yitzhaki decomposition of residual income inequality (only renters)

	Disposable income	Rent	Operating costs	Energy	Food	Health	Transport	Education
Mean component	2,485.6	–424.2	–133.6	–82.8	–267.1	–49.4	–35.5	–30.7
Residual income share	1.689	–0.288	–0.091	–0.056	–0.182	–0.034	–0.024	–0.021
Contribution	0.454	0.084	–0.002	< –0.001	< 0.001	–0.001	–0.003	< 0.001
Share of Gini	1.023	0.190	–0.005	< –0.001	0.001	–0.004	–0.007	0.002

Note: Authors' own calculations based on the Austrian Household Budget Survey for 2019/2020.

Table 6: Sensitivity analysis of Lerman–Yitzhaki decomposition of residual income inequality (including imputed rents for homeowners)

	Disposable income	Rent	Operating costs	Energy	Food	Health	Transport	Education
Mean component	2,917.3	−442.3	−99.2	−104.5	−297.7	−68.6	−39.5	−27.5
Residual income share	1.415	−0.215	−0.048	−0.051	−0.144	−0.033	−0.019	−0.013
Contribution	0.371	−0.017	0.002	−0.009	−0.002	0.001	−0.002	< −0.001
Share of Gini	0.966	−0.045	0.006	−0.002	−0.005	0.003	−0.005	−0.001

Note: Authors' own calculations based on the Austrian Household Budget Survey for 2019/2020.