POVERTY & EQUITY NOTES

BEHIND ON RENT OR LEFT BEHIND: MEASURING HOUSING POVERTY IN URBAN PAKISTAN

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Pakistan's urban areas face a looming housing crisis: 47% of households live in over-crowded housing units in informal settlements (katchi abadis) with inadequate infrastructure and services.[2] In response to the growing housing shortage, the Government of Pakistan launched the ambitious Naya Pakistan Housing Program (NPHP) in April 2019 with the objective of providing 5 million housing units across the country in five years, prioritizing those in lower income brackets for whom affordable housing is out of reach.

To assist in targeting, and for monitoring the effectiveness of this policy and others, it is important to determine an objective criterion for housing affordability. Typically, policymakers have used the 30 percent rule (the 'ratio' method); housing is considered unaffordable if it absorbs more than 30 percent of the household's total income. However, this benchmark is arbitrary, and does not account for variations in cost of living and individual preferences. To address these concerns, a Residual Income Method (RIM) has been proposed which measures whether households have enough 'residual' income, leftover after paying for housing, to be able to cover their basic needs. However, this method relies on (i) official budget standards, which do not exist in most low-income country contexts, and (ii) household income data, which is not conventionally measured in low-income countries due to high informality and production for own use.

*This note proposes a modified Residual Expenditure Methodology (REM) approach, drawing on existing poverty measurement methodology, to measure housing poverty in urban Pakistan. Based on this, households that are unable to afford a minimum threshold of non-housing expenditures (after paying for housing costs) are classified as **housing-poor**. We use the Cost of Basic Needs (CBN) methodology, and rely on nationally representative household survey data, to estimate a non-housing poverty line and find that 31.3 percent of individuals in urban Pakistan lived in unaffordable*

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[2] International Growth Centre, 2016.

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housing in 2018-19. At the national level, these estimates are similar to those obtained using the traditional 'ratio' approach but diverge in meaningful ways across space and the welfare distribution. They also far exceed the official urban poverty rate of 10.9 percent for the same period. As such, we suggest that the proposed housing poverty metric is better suited to measure and track housing affordability, and to formulate related policy interventions.

MEASURING HOUSING POVERTY

Measuring housing poverty is complex. Despite how often the concept is referenced in day-to-day conversations and policy debates, pinning down the exact definition is often elusive. Part of the difficulty in measuring housing poverty stems from the fact that the term simultaneously evokes a number of societal challenges, including housing prices, housing quality, income distributions, household debt capacity and financial inclusion, public policy, housing supply, and household consumption choices.[3] The other part arises from the difficulty in determining an objective criterion – a threshold beyond which housing-related costs become 'too high' relative to household income.

To estimate housing poverty, policymakers have traditionally used the 'expenditure-to-income' ratio (EIR), or ratio approach. With the EIR, policymakers reference the '30 percent rule-of-thumb', which prescribes that housing costs are affordable up to the point where they make up 30 percent of total household income. This definition is problematic for various reasons, including the fact that it does not take into account household sizes, preferences, the cost of living or tradeoffs households make in how they spend their income. As a result, other means of estimating housing poverty have emerged over the years.

In particular, the residual income method (RIM)[4] has gained prominence. This approach assumes that housing costs make up the largest and least flexible claim on household income, and that non-housing spending is capped by the 'residual' income left after paying for housing. This means that a household has a housing affordability problem if it cannot meet its non-housing needs at some minimum level of adequacy after paying for housing. This minimum threshold relies on a predetermined socially relevant 'budget standard', which often considers the demographic and geographic characteristics of households. As such, the RIM

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[3] Quigley, 2004.
[4] Stone et al, 2011.

method functions like a sliding scale, adjusting for total household income (or household poverty status) and other household characteristics.

However, the RIM approach is limited in its ability to measure housing affordability in low income and developing country contexts, primarily due to lack of reliable data on household incomes. Data on incomes is both notoriously difficult to collect and not particularly informative as a marker of welfare. This is because of high informality, seasonality (relevant for large agriculture sectors) and irregularity (such as reliance on foreign remittances), as well as widespread production for home use.[5] For all these reasons, many developing countries, including Pakistan, use consumption instead of income as a measure of welfare.

To overcome these limitations, we propose a modified RIM approach: the Residual Expenditure Methodology (REM), which allows us to measure housing affordability by estimating a 'housing poverty' rate. As the nomenclature suggests, the motivation here is to circumvent the aforementioned failings of income data by using data on expenditures instead. This is in line with the global best practice on measuring welfare in developing countries. Moreover, household survey data show that income and consumption are highly correlated (Figure 1 highlights that the relationship is both large and significant across all urban households), and this further bolsters the case for using expenditure data.

Figure 1. Scatterplot of nominal income and expenditure for households in urban Pakistan

Log Nominal Total Monthly Household Expenditure
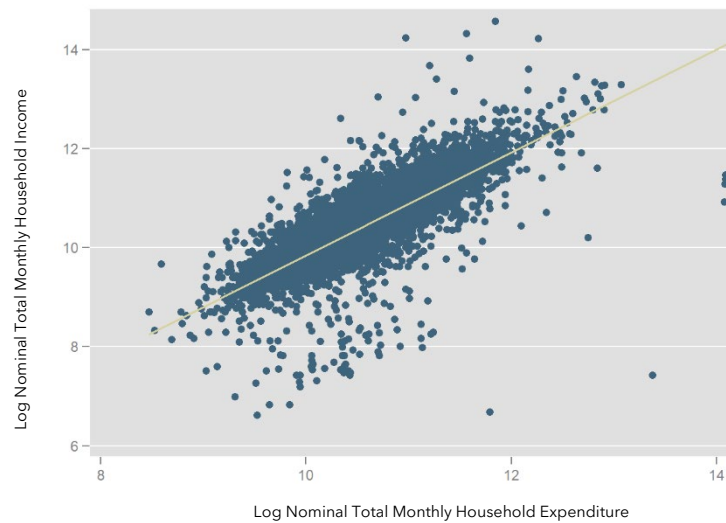
Note: Sample restricted to urban areas only.
Source: author's calculations based on HIES 2018-19 microdata.

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[5] Deaton and Zaidi, 2002.

In place of budget standards, the REM draws on poverty measurement methodologies to determine a minimum acceptable standard of well-being and its associated spending value. Currently, most developing countries measure monetary poverty using consumption expenditure and absolute poverty lines. The fixed standard of well-being represented by an absolute poverty line is a level of utility associated with the minimally acceptable standard of living.[6] For the REM, we draw on the same principles to determine a minimum acceptable level of non-housing spending – in other words, a *non-housing* poverty line.

The REM posits that for housing to be affordable, just being able to pay the rent is not enough. Households need to be able to consume a minimum level of non-housing items, in addition to paying for housing-related costs. Based on this, households that are unable to meet this minimum threshold of non-housing expenditures are classified as **housing-poor**.

METHODOLOGY AND DATA

To implement the REM for urban Pakistan, we use data from the Household Integrated Economic Survey (HIES) 2018-19. The HIES is a nationally representative household survey conducted by the Pakistan Bureau of Statistics (PBS) every alternate year. It collects item-wise data on household expenditures. The latest data available is for 2018-19, which provides a baseline of spending levels and patterns. We limit our sample to urban households in Pakistan as housing affordability is typically considered an 'urban' problem due to the high number of tenants living in cities. Based on the Census 2017, 24.3 percent of households in urban areas report living in rented dwellings, compared to just 3.4 in rural areas.

The REM approach relies on two building blocks to estimate housing poverty: (a) households' non-housing consumption aggregate, as a proxy for residual income, and (b) a minimum socially acceptable standard for these non-housing (residual) expenditures, or a '*non-housing* poverty line'. This differs from the traditional RIM method in two ways. First, to determine households' current level of well-being, it uses survey-based household consumption data to derive a proxy for household residual income. Second, in place of a predetermined budget standard, the Cost of Basic Needs (CBN) method is adapted to establish a minimum threshold of non-housing needs. Putting the two together allows us to identify households living in unaffordable housing conditions.

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[6] Ravallion, 1998.

Box 1: Building blocks of REM & housing poverty
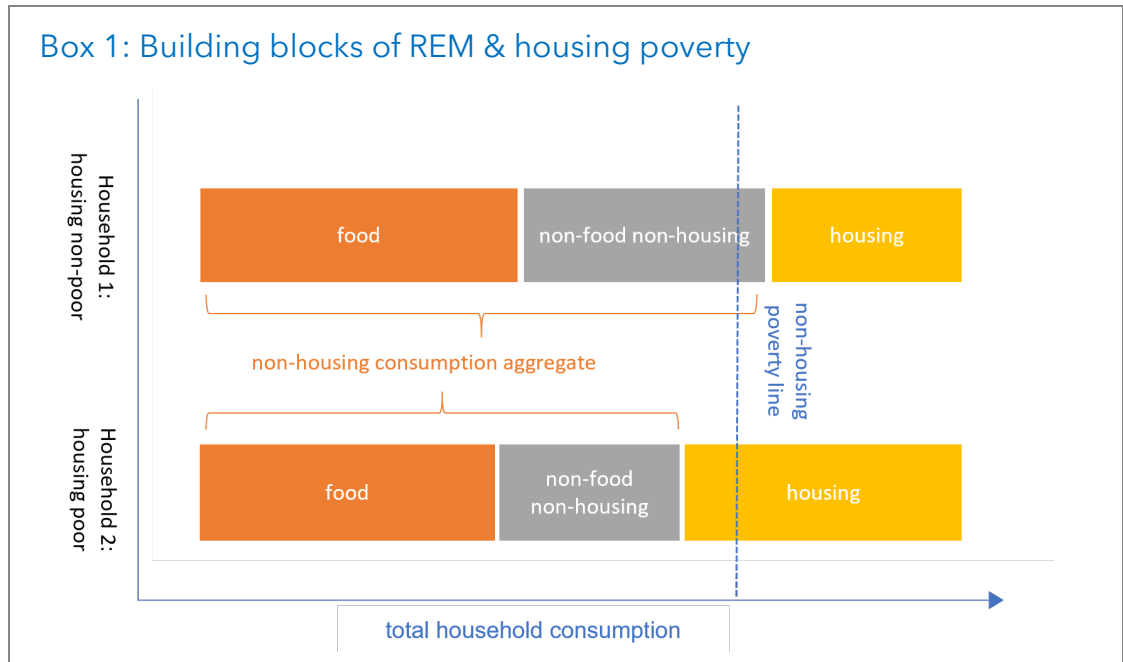
(a) **Obtaining the non-housing consumption aggregate:** The proposed REM approach allows us to estimate the non-housing expenditure aggregate in a direct manner by summing reported expenditures on non-housing items.[7] The non-housing aggregate is simply a summation of all recurrent expenditures that are not related to housing. Housing-related expenditures, which are excluded from the aggregate, include rental payments[8] (actual and imputed), as well as electricity, water, maintenance, fuel and waste collection. Analogous with the poverty methodology used officially,[9] the nominal aggregate is then adjusted for spatial differences in cost of living and transformed using an adult equivalence scale.

(b) **Estimating the non-housing poverty line:** To estimate a minimum acceptable standard for non-housing spending – the *non-housing* poverty line – we follow the standard Cost of Basic Needs (CBN) methodology used to establish the national poverty line for 2013-14[10]. As a first step, we estimate the food poverty line. This is the minimum expenditure required to fulfil basic food requirements for a particular reference group. This reflects the cost of a basic food basket that meets the minimum daily caloric requirement, using

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[7] This is in contrast to the traditional RIM model, in which residual income is estimated by excluding housing costs from total income.

[8] Note that since the aggregate is simply a summation of all non-housing expenditures, the same process applies to both renters and owner-occupants.

[9] Government of Pakistan, 2016.

[10] Government of Pakistan, 2016.

food items, quantities and prices faced by the reference group (see below). In the case of Pakistan, the minimum daily standard has been set at 2350 calories per adult equivalent.[11] Second, we estimate total non-housing basic needs by scaling up the food poverty line. This is indirectly accomplished by estimating the food share of the total *non-housing* budget for households whose food expenditure is close[12] to the food poverty line. This share, or scaling factor, is used to inflate the food poverty line to obtain the basic minimum threshold of total (food and non-food) non-housing expenditures. The scaling factor in the REM approach varies from the traditional CBN methodology since it scales up to total non-housing expenditures required to obtain a minimum acceptable standard of living.

Like the 2013-14 poverty line estimation in Pakistan, the minimum residual non-housing threshold is based on the expenditure patterns of 10th to 40th percentile of the population welfare distribution.[13] This choice of reference group is important because it determines the expenditure patterns, preferences and prices that are implicitly included in the estimation of the *non-housing* poverty line. This reference group was chosen to include households that are neither among the poorest nor the wealthiest in a country, ideally reflecting the needs of those who are at or above the existing subjective minimum threshold.

The *non-housing* poverty line for urban Pakistan is estimated at Rs. 3,716 per adult equivalent per month in 2018-19. Alternately, this means that a family of five with three children requires a minimum of Rs.16,350 per month leftover after paying for housing, to be considered as living in affordable housing. This translates to a housing poverty headcount rate of 31.1 percent.

It is worth noting that estimations of housing poverty may vary based on changes to the reference group. Altering the reference group signifies a change in the typical food basket, the prices faced to consume it, and the share of food spending relative to the non-housing budget. All of these have a bearing on the housing poverty rate. This is depicted in Table 1. The higher the reference group, the higher the share of individuals classified as housing poor. This is also reflected in housing quality measures on average. Households belonging to higher deciles are

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[11] A child's consumption is assumed equivalent to 0.8 adults. That is, a child (age<18) consumes 80 percent as much as an adult.

[12] The food share is non-parametrically estimated 10 times and all values are averaged. In the first iteration, we use households with food expenditure lying within a 1 percent band around the food poverty line. The band is increased by 1 percentage point in each iteration, until we reach the maximum bandwidth of 10 percent.

[13] Population welfare percentiles are based on the urban sample only, taking the consumption aggregate used for official monetary poverty.

less likely to reside in low quality housing, and report better access to improved urban services (Table 2).

Table 1. Scaling factors, *non-housing* poverty lines and housing unaffordability, by reference group

Reference group (percentile range)	Scaling factor	*Non-housing* poverty line (2018-19 Rs)	Housing poverty rate
0-10	0.68	2,781	7 .6
10-20	0.68	3,329	17 .1
20-30	0.64	3,676	24 .3
30-40	0.62	4,078	32 .4
40-50	0.59	4,519	41 .8
50-60	0.59	4,884	49 .4
60-70	0.54	5,485	59 .2
70-80	0.52	6,147	67 .9
80-90	0.48	7,603	80 .1
90-100	0.42	10,852	91 .9

Note: Sample restricted to urban areas only.
Source: Authors' calculations based HIES 2018-19 microdata.

Table 2. Housing quality, by reference group

Reference group (percentile range)	10 to 40	20 to 40	0 to 60	20 to 50
Non-housing poverty line (2018-19 Rs.)	3,716	3,911	4,049	4,156
Housing poverty rate (percent)	31.1	35.6	38.7	40.8
Share of population with access to (percent)				
safely managed sanitation	66.8	68.2	68.2	70.6
safely managed drinking water	84.2	84.3	83.8	84.8
roof, floor & walls constructed with low-quality material	36.2	35.7	34.8	35.2

Note: Sample restricted to urban areas only.
Source: Authors' calculations based HIES 2018-19 microdata.

RESULTS

Based on the proposed housing poverty approach, we find that more than one in three urban residents face unaffordable housing conditions. On the face of it, this is similar to the standard ratio rule-of-thumb method, which estimates that approximately 38.0 of the urban population lives in unaffordable housing. However, we find that both methods target very different groups: while 54.2 percent of the

urban population is classified similarly by both methods, 19.5 percent of the population are housing poor but excluded under the simplistic ratio method. A provincial breakdown also shows large differences across the two methods (see Table 3) for urban Khyber Pakhtunkhwa, the rate of housing unaffordability almost doubles when we use the housing poverty metric. This has important implications for targeting policy interventions to population subgroups where they are needed the most. This also underscores the potential benefits of computing this measure at further disaggregated geographical levels, particularly since housing markets and prices tend to vary across locations.

Table 3. Share of urban population in unaffordable housing, by region & type of measure

Urban areas	Housing poverty (%)	Ratio unaffordability (%)
Pakistan	*31.3*	*38.0*
KPK	*42.1*	*23.6*
Punjab	*25.8*	*35.8*
Sindh	*34.0*	*45.3*
Balochistan	*59.8*	*37.1*

Note: Sample restricted to urban areas only.
Source: Authors' calculations based HIES 2018-19 microdata.

Housing poverty does a better job of targeting the poor than the traditional ratio method. As expected, nearly all those in the bottom quintile[14] are also housing poor, and the housing poverty rate decreases as individuals get better off (Table 4). It is interesting to note that using the ratio method yields very counterintuitive results in comparison. Using the ratio method, well-off people are more likely to live in unaffordable housing conditions. This highlights one of the main shortcomings of the ratio method: it fails to correctly account for the fact that the rich can afford to spend a larger proportion of their overall expenditure on housing, even after paying for basic needs. Conversely, people at the bottom end of the expenditure spectrum struggle with meeting their basic needs even if they spend less than the stipulated 30 percent of their expenditure on rent. In other words, housing costs matter more for the poor, and we need to measure housing affordability while keeping this in mind.

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[14] Welfare quintiles are based on the urban sample only, taking the consumption aggregate used for official monetary poverty.

Table 4. Share of urban population in unaffordable housing, by welfare quintiles & type of measure

Urban welfare quintiles	Housing poverty (%)	Ratio Unaffordability (%)
Pakistan	*31.1*	*38.0*
Q1 (lowest)	*98.4*	*22.4*
Q2	*50.5*	*31.3*
Q3	*6.7*	*38.4*
Q4	*0.9*	*43.7*
Q5 (highest)	*0.1*	*54.3*

Note: Sample restricted to urban areas only.
Source: Authors' calculations based HIES 2018-19 microdata.

At the same time, official measures of monetary poverty are not enough on their own to identify those living in precarious housing conditions. The urban housing poverty rate is three times as high as the official urban poverty rate. This stems from the fact that the two measures use different poverty lines and consumption aggregates. The *non-housing* poverty line (based on urban consumption patterns only) in Pakistan is Rs. 3,716 for 2018-19 (per adult equivalent), while the official national poverty line is Rs. 3,769 (per adult equivalent, expressed in urban prices). However, both measures have some overlap: almost half of the urban population is categorized as poor/non-poor similarly by both measures (Table 5).

Table 5. Share of the urban population living in monetary poverty and housing poverty

Urban residents	Monetary Poverty (%)	Housing Poverty (%)	Overlap
Pakistan	10.9	31.1	54.3
KPK	18.3	42.1	76.2
Punjab	8.9	25.8	83.1
Sindh	10.4	34.0	76.4
Balochistan	25.7	59.8	65.8

Note: Sample restricted to urban areas only.
Source: Authors' calculations based HIES 2018-19 microdata.

Caveat. For the purposes of policy and program design in the housing sector, decision-makers typically measure social affordability with the household as unit of analysis. It is because housing units are constructed and consumed largely by households, and mortgages are underwritten based on household income and expenditure as a whole. When we use households as the unit for analysis, we estimate that approximately 25.2 percent of households live in unaffordable housing across urban Pakistan. This ratio differs from previous estimates in Table 5

suggesting that 31.1 percent of the total population live in housing poverty, which reflects the fact that the poor live in larger households with more household members.

POLICY IMPLICATIONS

The proposed housing poverty measure provides a significant addition to the repertoire of tools available to measure housing affordability, particularly in developing countries. Existing work on housing affordability in Pakistan has been limited in scope, leveraging alternate and often noisy datasets, such as officially reported monthly rent and property valuations from the Excise Department.[15] One of the key advantages of using this approach is that the analysis can be targeted to specific sub-populations based on the policy need. These can include specific regions, income levels, and type of employment. While we pilot the housing poverty method for urban Pakistan, this can be simulated at the provincial level, and at even further levels of geographical disaggregation depending on data availability and representativeness. This is particularly important since housing costs are likely to vary significantly across regions.

Housing poverty is not just a descriptive metric but has the potential to be used for targeting and monitoring interventions. Policy interventions like housing and energy subsidies, public infrastructure investments in water and sanitation, cash transfers and credit facilities can be targeted based on the profile of those we know are living in housing poverty. Similarly, by fixing the real value of the *non-housing* poverty line, the effectiveness of various programs and policies can be monitored over time. Further work is needed to measure the targeting efficacy of using housing poverty relative to existing proxy-based means testing methods.

Housing poverty can also be a useful tool in devising housing finance policies and housing programs. For one, our work suggests that efforts to create more inclusive policies requires more attention to be paid towards how much poorer households can pay without compromising on overall welfare. This is likely to be more important than the traditional 30 percent rule-of-thumb. Indeed, our results indicate that the ratio method might *overestimate* what poorer households can pay monthly to finance a mortgage or to pay rent, by only considering their aggregate expenditure rather than looking at what is left over after paying for housing. Housing costs are often inflexible, and policies need to broaden their focus from being able to just afford housing, to sustaining a reasonable standard of living.

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[15] Urban Unit, 2019.

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