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Measuring Housing Inequality with the Value of Freedom in the Capability Approach: Proposal and Demonstration

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ABSTRACT

An ongoing question in capability research is how to incorporate the value of freedom into the measurement of inequality. This article proposes an approach to answering this question in the housing domain and its operationalisation. The approach places an evaluation focus to the conditions constraining or expanding housing choices in the dimensions of opportunity, security, and ability. For operationalisation, the study designed a measurement of multidimensional housing disadvantages (MHDs) using the Alkire-Foster method and data from the Netherlands. Indicators include the entitlement to housing tenure options, vulnerability in housing cost payments, and ability to plan finance for housing. The measurement outcome demonstrates that the MHDs measurement can provide information on whose housing choices are more intensely constrained, thus having a lower capability for housing, and whose current housing situation is likely a result of coerced choices. The findings indicate that adults living with housemates or family (latent households), youths, and those with precarious jobs have a significantly lower capability for housing compared to other population groups. This article also compares the freedom-oriented measure of MHDs with functioning-oriented and other conventional measures and discusses its distinguishing properties. This comparison suggests a need to revisit current policy priorities in addressing housing inequality.

KEYWORDS

Capability approach;
freedom; inequality;
multidimensional
measurement; housing;
capability for housing

Introduction

Housing inequality has become more acute in recent decades owing to the global phenomenon of housing commodification, which has also impacted

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formal housing sectors in advanced economies (UN 2017a). The New Urban Agenda (UN 2017b, 3) notes:

[we] have seen improvements in the quality of life of millions of urban inhabitants, including slum and informal-settlement dwellers. However, the persistence of ... growing inequalities ... remains among the major obstacles, with social and economic exclusion and spatial segregation often an irrefutable reality in cities and human settlements (emphasis by author).

It highlighted that urgent housing issues are no longer limited to a lack of necessities, such as dwellings with access to water and toilet, decent size and the number of rooms, and durable structure. Information on other inequalities beyond the deprivation of basic housing standards is needed.

In measuring housing inequality, much emphasis has been placed on the distribution of monetary resources, such as income and wealth from housing, and the distribution of housing prices. These measures have been core indicators for policy analysis in international dashboards (e.g. the OECD Housing Dashboard) and studies on housing inequality (e.g. Arundel and Hochstenbach 2020; Baker et al. 2016; Christophers 2021; Wiesel et al. 2021). These measurements have the power to signal the significance of housing inequality; however, relying solely on them is a critical limitation from Sen's capability perspective. Monetary-based inequality measures are limited in reflecting disparities in individual abilities to convert a monetary resource to the actual state of residing, and neglect non-monetary values such as human rights and meaningful lives. In addition, they conceal the underlying causes of housing inequality, such as the exclusive structure of entitlements to housing financing, unfair treatment of lessors, or unequal access to information to make appropriate housing choices. Such unequal conditions place some persons in a housing situation that they do not want; in the capability approach language, such inequality limits people's *capabilities* to achieve their valued housing options. Information on these non-monetary inequalities has been missing in measurement practices in the housing field, and applying the capability approach can help fill this gap (Kimhur 2020).

When applying the capability approach, inequality can be measured in terms of (i) the extent of *achievement of beings and doings* (achievement of *functionings*) and (ii) the *freedom to achieve* functionings that people value (*capability*) (Sen 1992). The distinction between them is significant. Imagine that we evaluated the situation of two women staying in equally pleasant living rooms with adequate housing. When we evaluate their beings and doings, no inequalities exist between them. However, we do not know whether they stay home because of insecurity outside or the oppression of their partner. If this is the case for one woman, whereas another has the option to go out freely as she wants, there is an inequality in their freedom.

The value of freedom has often been at the centre of the "cities and the capability approach" discourse (e.g. Anand 2008; Deneulin 2014; Frediani 2021),

particularly in connection with the seminal concept of *the right to the city*—“a right to change ourselves by changing the city” (Harvey 2008, 23). However, urban indices reflecting freedom considerations are scarce (Anand 2008). Studies on housing inequality in the capability space could contribute to developing freedom-oriented urban indicators and guiding policies towards the goal of the right to the city, considering that housing is key to connecting various sectoral socioeconomic plans (UN-Habitat 2015) in the urban agenda.

In the housing field, evaluating housing inequality in terms of “freedom to achieve” is yet underexplored. Housing research applying the capability approach has been growing, particularly in studies of slums, informal settlements (Fennell, Royo-Olido, and Barac 2018; Frediani 2007; 2021) and homelessness (Batterham 2019; Nicholls 2010). The applications so far have mostly been on the functioning space among the two evaluation spaces, such as deprivations of living in adequate housing that is a basic functioning for human development and achievements of the ways of living that slum dwellers and homeless people value (i.e. achievement of valued functionings). In fact, the functioning of living in adequate housing has long been evaluated by international organisations and studies on poverty and well-being. However, these evaluations have been limited in informing why some people came to live in or were entrapped in inadequate housing—deprived of basic functioning—while others did not. Information about the “freedom to achieve” (capability) can contribute; its embedded concern is about whose choices are more constrained, what makes such coerced choices, and thus, what causes inequality.

An ongoing question among capability scholars is how to incorporate the value of “freedom to achieve” into inequality measurements. The application of this freedom value is largely absent (Burchardt and Hick 2018) with some exceptions (e.g. Krishnakumar 2007), and this is even more scant in studies on housing inequality. This absence may be due to empirical constraints, such as limited housing surveys reflecting the capability concept or because a person’s capability is generally not directly observable. Measuring capability—that is, measuring the *freedom to achieve* valued functionings (Sen 1992)—requires capturing the latent state of a person and the potential to realise their valued functionings. It is difficult to measure and estimate these latent states. Hence, as for other social domains, housing researchers have alternatively measured the extent of achieved functionings relevant to housing as a proxy for the extent of freedom (capability) to achieve those functionings (e.g. Coates, Anand, and Norris 2015; Mitchell and Macció 2021).

To fill the research gap, this study explored how housing inequality can be measured in a capability space by incorporating the value of freedom. The article first discusses how this study perceives the concept of freedom in Sen’s capability approach. It then defines the evaluation space of *housing* functionings and *capability for housing*. Building on these conceptual foundations, this study proposes an approach for incorporating the value of freedom into the inequality

measurement. The core idea of the proposal is to estimate a person's housing capability by evaluating the disadvantages that hinder the person from making suitable housing choices and the disadvantages limiting the range of feasible housing options. This article illustrates the operationalisation of this proposal and its measurement outcome. The study designed a measurement of multidimensional housing disadvantages (MHDs) and produced an index using the Alkire-Foster method of multidimensional poverty measurement. The demonstration of MHDs utilised register data from Statistics Netherlands and data from the De Nederlandsche Bank (DNB) Household Survey (DHS) on a panel administered by Centerdata (Tilburg University, the Netherlands) in 2017.

Proposal: An Approach to Evaluate Capability

Concept of Freedom, Housing Functionings, and Capability for Housing

In the capability approach, Sen (2009) argues that the primary goal of society should be expanding people's freedom to lead the lives they value. Therefore, society should focus primarily on the inequality in such freedom. Sen's concept of freedom is often understood as Berlin's positive freedom, but Robeyns (2017) argues that there is a conceptual distance between the two. She suggests that Sen's concept of freedom can best be understood through Pettit's (2003) concept of *option freedom*. Pettit's option freedom concerns how burdened or hindered a person is when trying to access an option and to what extent the person has a range of alternative options accessible in terms of the number and diversity of those options (Robeyns 2017). This concept efficiently reflects Sen's concern about the "access that a person has to a wide range of valuable alternative [life] options" (Robeyns 2017, 105). It also aligns well with the capability approach's view that persons are "agents to the extent that they are able to scrutinise critically their options, themselves decide ..., act to realise their purposes ..." (Crocker 2008, 219–220). Thus, Sen's argument can be translated as follows: The primary goal of society should be expanding the feasible *options* people have to lead the life they value; the extent of such feasible options is the *capability* of a person, and the achievements that a person attains from the choice made out of the feasible options are *functionings*. In this context, this study's question of how to incorporate the value of freedom into inequality measurements is essentially how to include option freedom and choice matters in the measurements.

Corresponding to Sen's distinction between the extent of achievement and the freedom to achieve, the evaluation spaces of housing inequality can be defined as (1) *the housing achievements—actual state of residing—a person has attained*, which I conceptualise as the functionings relevant to housing, and in short, *housing functionings*; and (2) *the freedom to achieve the valued state of residing*, which I conceptualise as the *capability for housing*—interchangeably,

housing capability. It is worth noting that this study discusses *housing as an act of or for residing* rather than as a material object of a dwelling unit. It reorients the evaluation to focus on how a person is residing rather than the attributes of the person's houses, which is merely a means to reside (Kimhur 2020).

Housing functionings refers to the state and activities of residing. The kinds of housing functioning that individuals value vary depending on personal values, such as residing with a sense of belonging, living in housing that enhance self-respect, and residing in a lively neighbourhood. They can also vary by community values (e.g. preserving cultural values of the settlements, being part of housing development decision-making) and societal normative values (e.g. living in adequate housing). While some people can achieve their valued housing functionings, others face constraints in pursuing them. This difference comes from the inequality in capability for housing.

The **capability for housing** can be defined as the freedom or substantive opportunity to *pursue* the housing functionings a person values. Given a range of housing options, people make reasoned choices out of feasible options, leading to changes in their housing situations. Individuals would pursue different combinations of valued housing functionings that best suit their values and circumstances, such as livelihoods, family situations, ages, and social norms.

Evaluating the Constraints to Choices and Options

Measuring the capability for housing would involve defining a set of housing functionings that people value, counting how many of them are feasible options for each person—which the person may or may not choose to pursue—and then evaluating the differences between the extent of those feasible options. However, operationalising this concept is extremely challenging. First, capturing latent choices in measurements is difficult, as such information is not observable at the time of assessment. Second, the exceeding diversity and contextuality of valued housing functionings pose a challenge. What housing functionings people value vary according to personal, community, and societal values. Third, a person's set of valued housing functionings is likely to change throughout their life as individuals navigate housing strategies that best fit their changing circumstances. Hence, housing discussions often incorporate the concepts of *housing careers* (Kendig 1984), *housing histories* (Forrest 1987), *housing pathways* (Clapham 2005; Payne and Payne 1977), and *housing transitions* (Beer and Faulkner 2011). These attributes make it nearly impossible to comprehensively define a set of valued housing functionings and assess whether a person can achieve it, especially when aiming to measure inequality at national and city scales.

These practical challenges raise the question of whether a feasible way to measure capability for housing is, in the end, to limit the measurement practice to assessing basic functionings that society should promote (e.g. living in

adequate housing, although “adequate” can be very contextual), as seen in many poverty and well-being studies. Under this approach, assuming individuals would opt to achieve the basic functionings when feasible, we consider this information a proxy for basic capabilities. In this functioning-oriented approach, evaluation strategies will be identifying valued housing functionings that societies should promote and then assessing the distribution of the identified functionings. However, this *functioning-oriented evaluation* lacks insights into the root causes of inequality in achieving the valued housing functionings. Measuring the “living in adequate housing” functioning identifies individuals below the adequacy threshold, but it does not reveal the underlying conditions that led them to live in inadequate housing, such as exclusive entitlements to housing finance, oppression and discrimination by the lessor, and lack of awareness of entitled rights, which constrain choices and freedom to live in adequate housing.

A direct measurement of the *freedom* to pursue valued housing functionings – capabilities for housing – seems almost impossible, but its extent can be estimated by assessing the conditions that constrain or expand people’s choices of suitable housing options. Greater disadvantage in such conditions implies more constraints in housing decisions, leading to choices that a person does not value, thus indicating a lower level of freedom.

This study suggests evaluating the levels of conditions constraining or expanding choices as proxy of freedom. In this *freedom-oriented evaluation*, the question of which specific valued housing functionings a person achieves is left up to individual choice and is not the primary subject of evaluation. In essence, the concern about freedom in the capability approach revolves around how we can better enable people to pursue the life options they value by removing the constraints of choice, enhancing their abilities to expand their feasible life options, and removing unfair and oppressive situations that limit life options and choices.

Measuring the conditions shaping housing capabilities has several merits. First, information on the constraints on housing choices addresses the structural drivers of inequality, which is useful for drawing policy implications. Take the example of “living in adequate housing” again. Whereas a functioning-oriented measurement primarily leads policy discussions to the distribution of adequate dwellings, a freedom-oriented evaluation prompts addressing unfair rules and systems that led a person to live in inadequate housing (Kimhur 2022). Second, information on constraining and expanding conditions reflects the inequalities that occur in a person’s *housing process*. Regarding housing careers, pathways, and transitions, choices and options must be understood. In such a housing path, some people are entrapped in a specific housing option, whereas others have more options to pursue a suitable housing path. Not all households experience an ascending trajectory of housing paths in their lives (as observed in Clark, Deurloo, and Dieleman 2000; 2003), and some of those who go through a descending trajectory are

entrapped in a worsened situation, while others can recover due to the different levels of constraints and advantages they have. Third merit of evaluating capability-shaping conditions is that it remains open to any choices of valued housing functioning that people make, which are too diverse to measure.

The evaluation approach proposed here raises the question of how the evaluation of such shaping conditions differs from the evaluation of the conversion factors between resources and achievements in the capability approach framework. The difference is that the evaluation of the conditions shaping capabilities does not necessarily involve converting resources to something else (i.e. functionings) and directly involves structural constraints that influence people's choices and freedom.

To operationalise the evaluation of capability-shaping conditions, the first step is identifying the dimensions of such shaping conditions. This will be discussed in the following section.

Dimensions of Conditions Shaping the Capability for Housing

Methods to define dimensions of well-being and poverty range from empirical observations to an informed guess, deliberative process, philosophical/theoretical reasoning, and any of their combinations (Alkire 2013; Ballon 2013; Byskov 2018; Robeyns 2003). All methods are applicable for defining the dimensions of capability-shaping conditions. In this study, theoretical reasoning was chosen to identify these dimensions. This choice prioritised how a measurement of housing inequality can best align with the capability approach's idea of freedom.

By scrutinising the meaning of *capability as real opportunities* (Sen 2009) in the housing context, this study suggests that the capability for housing is shaped by at least three dimensions: *housing opportunity*, *housing security*, and *housing ability*. The opportunity dimension is the basic condition for having choices, while the security dimension forms a low threshold of agency freedom to utilise the provided opportunity. Enhancing housing ability then increases agency freedom for the better, thereby maximising people's capability to pursue their valued housing options. These three conditions form the basic boundaries of capability for housing. I have extensively discussed this reasoning elsewhere (Kimhur, 2022); the following is a summary:

- *Opportunity*: Formal and informal entitlements and eligibilities. It forms the basic entry condition to choose a suitable/valued option (e.g. opportunity to access housing information, housing finance, and participation in decision-making). However, having such opportunities does not guarantee real opportunities because other constraints may still hinder their actual and effective utilisation.
- *Security*: A base for utilising feasible housing opportunities. People can be hindered from utilising entitlements if they foresee a risk to residency

security (e.g. a woman entitled to joint tenancy but unable to ask her husband out of fear of losing what she has now). To secure current housing functionings, some people can be forced to make other valued functionings insecure (or vice versa), whereas others do not need to consider these trade-offs. Lastly, suppose people have low levels of residency resilience (i.e. the extent to which they can uphold their current residency or recover adequate residency after adverse effects on livelihoods). In that case, they will likely face greater barriers than others when attempting to utilise entitlements or choose other life options.

- *Ability*: To effectively use available opportunities, people must have adequate knowledge and understanding (e.g. housing literacy). In addition to utilising opportunities others provide, people also need proactive abilities to improve their housing situations (e.g. the ability to claim rights and demand/create opportunities not yet in place). The ability dimension concerns not only what abilities people already possess but also the enabling and empowering environment that fosters such abilities.

Operationalisation: Design of Measurements

This section illustrates how the study operationalised the evaluation of inequality in capability for housing. The following six points provide a structured overview before a detailed discussion of each step:

- (1) Moving the evaluation focus from a set of valued functionings to the conditions expanding or constraining choices and options (shaping conditions of people's capability for housing).
- (2) Identifying the dimensions of such shaping conditions (at least the dimensions of opportunity, security, and housing ability for housing).
- (3) Designing or choosing a measurement method that factors in the simultaneity of disadvantages across dimensions (e.g. Alkire-Foster method), as this evaluation approach estimates the extent of capability by its multiple confines.
- (4) Choosing the theme of the measurement. Indicators of opportunity, security, and ability differ according to the kind of capability concerned, such as inequality in the capability for security of tenure, capability for participating in housing projects, and capability for accessing social housing.
- (5) Selecting or designing indicators for each dimension under the chosen theme, which discern the potential instead of the already attained state (e.g. an indicator of who is more likely to face trouble with rent payment instead of the indicator of rent arrears that evaluates the situation that has already happened)
- (6) When defining the unit of analysis, reflecting the latent state maximally (e.g. for household members that could be independent but stay with other members (latent households), define them as a separate unit of identification)

Measurements Method

The core idea of the proposal outlined above is to estimate the level of housing capability by measuring its confines in the dimensions of housing opportunities, security, and ability. All three dimensions are essential for creating real housing opportunities. This concept requires the measurement of the extent to which a person has the three dimensional disadvantages simultaneously. Measuring disadvantages per dimension, such as dashboards and composite indices, does not match this conceptual framework (Alkire et al. 2015). A method that fulfils this conceptual requirement is the Alkire-Foster method of multidimensional poverty measurement (Alkire and Foster 2011), the primary property of which is to capture simultaneous deprivation across dimensions and produce the intensity of such simultaneity. Additionally, the index score produced by this method, a summary of multidimensional disadvantages, is easily decomposable into dimensions and the number of simultaneous disadvantages. This property allows us to analyse the inequality in the intensity of disadvantages and which dimension is a more pressing constraint on people's choices.

Although the method was developed to measure *poverty* (deprivations in basic functionings) and is generally used for multidimensional poverty measures, it is flexible and can be used to measure other kinds of states of affairs. This study defined the freedom-oriented dimensions presented above and designed indicators and analysis units that maximally discern the latent state instead of the already attained state. The study then applied the Alkire-Foster method using these dimensions and indicators to measure the multidimensional housing disadvantages (MHDs) that constrain people's choices in their housing process.

Theme of Measurements

The three conceptual dimensions of opportunity, security, and ability can be applied to various themes of housing issues, and the dimensional indicators of MHDs differ depending on the theme of concern. For example, suppose we aim to measure the capability for the security of tenure. In that case, we need to evaluate the formal/informal entitlements to the right to security of tenure (opportunity indicators), a system that prevents adverse effects on residency when claiming the right against lessors (security indicators), and knowledge of the right and how to claim it effectively (indicators of ability). Similarly, for the capability for "participatory slum upgrading", we need to evaluate not only the entitlement for participation and eligibility for the project resources (opportunity indicators) but also know-how in the effective participatory process (ability indicators) and low risk to residency security during the projects or low necessity for a trade-off between participating in the project and other basic functionings (security indicators). As such, specific dimensional indicators differ by the measurement theme.

This study chose the financial theme for demonstration purposes, evaluating the housing disadvantages shaped by financial terms (labelled MHDs-f). Here, the disadvantages in financial terms do not refer to the monetary resources of income and wealth; instead, they refer to the entitlements, vulnerable situations, and abilities related to housing financing activities. For example, entitlements to different housing tenure options are often associated with job type and employment status to determine whether a person can regularly pay rent or mortgages. Vulnerability in rent or mortgage payments can be shaped by livelihood shocks such as sickness and temporary job loss. Financial knowledge is the ability to expand the capability for housing, but it is not related to monetary values.

This financial theme was selected considering two issues. First, housing choices in many countries are dominated by finance-related conditions. Evaluation practices usually summarise such conditions as a measure of income, and it is still questionable whether a measurement using the capability approach would provide a much different understanding of housing inequality. The measurement of MHDs-f was designed by aligning the capability concept, and comparing the measurement outcomes was useful in determining the significance of differences from conventional measures. Second, incorporating the capability concept into inequality measurements requires new data types and indicators. The existing housing surveys have several limitations. There is a wide range of data on financial themes, some of which are relevant to the concept of capability. This allowed me to design new housing indicators aligned better with capability considerations.

Datasets

Register data from the Netherlands Statistics (CBS) and microdata from the 2017 DNB Household Survey (DHS) were used. The DHS includes surveys on the financial behaviour of individuals aged 16 years or older. The study analysed those aged 18 or older from 2292 households (5032 individuals). These datasets were selected by examining whether they had variables to design the indicators that aligned with the concept of each dimension and whether the data were linkable to register data, allowing the study to supplement the variables that a subject-specific survey might not cover.

Dimensional Indicators and Disadvantage Thresholds

The indicators were designed or selected using three selection criteria: (i) given the datasets, which indicator best reflects the underlying ideas of each dimension?; (ii) can the indicator reflect potential and latent housing situations rather than the state already attained?; and (iii) regarding entitlements structured by society's informal rules, can the indicator be contextualised in different societies while still comparable?

I designed one indicator per dimension instead of developing an exhaustive list. The scope of the study and the data availability were considered. The purpose of this study is primarily to demonstrate the proposed evaluation approach and its added value rather than to provide a comprehensive picture of housing inequality. Regarding data availability, there is a lack of housing surveys from a capability perspective. Traditionally, large-scale housing surveys have collected data on the material attributes of housing, residential satisfaction, and economic resources (Foye 2021; Kimhur 2020). The discussion on housing capability began relatively recently, and capability-oriented housing surveys have been absent naturally.

Utilising the available data, this study designed best-guess indicators. Table 1 summarises these indicators. Equal weight was allocated to each dimension because, conceptually, all three dimensions are equally essential for expanding the capability for housing.

The indicator of opportunity dimension measures the extent to which a person has feasible tenure options among owner-occupation, private rental, and social rent. In a person's housing path, the most reasonable choice of tenure is not a fixed entity; it changes according to personal situations, values, and societal conditions. Presumably, being trapped in only one option or having no options implies a lower capability to choose a suitable housing path according to life strategy. This study reviewed the key determinants of eligibility for different housing tenure options in the Netherlands and designed an indicator.

For the security dimension, the indicator was designed using the survey question "Under which unforeseen circumstances would it possibly be difficult for you to pay your living expenses [i.e. either rent or mortgage interest]?" The indicator evaluates whether a person would become immediately vulnerable to paying expenses, even with minor shocks to their livelihood, such as illness and temporary employment gaps in their partner. Being disadvantaged in this indicator means that one's state of residency is much more dependent on surrounding situations and may be more hampered than others when choosing suitable housing and life options. This indicator is distinguished from rent arrears, commonly used to evaluate housing vulnerability. The former is information on the possibility of being difficult to pay, and the latter is information on the already occurring state of rent debts.

As an indicator of the ability dimension, this study designed an indicator of basic financial planning ability. Being disadvantaged in this indicator means that the person might be unable to utilise the financial opportunities provided for housing effectively or may make undesirable financial choices without awareness of their consequences. Housing requires a person to manage large sums of money over their lifetime; knowledge of and the ability to utilise various financial products and long-term financial planning are essential. Surveys on housing-related financial knowledge, such as understanding

Table 1. Dimensional indicators and disadvantage thresholds.

Dimension: Thematic dimension	Disadvantaged if:	weight
Opportunity: Entitlements to housing tenure options	<p>A person is entitled to only one or none of the following options: mortgage access for homeownership, rental housing in private sector, and social housing.</p> <p>Entitlement conditions for each options:</p> <ul style="list-style-type: none"> • <i>Mortgage access</i>: permanent employment, or self-employed for more than three years, and no debts other than mortgages • <i>Private rental housing</i>¹: employed, monthly gross income no less than four times of the Rent Liberalisation Threshold (RLT) and having withdrawable savings more than three times of the RLT² • <i>Social housing</i>: the taxable income of household lower than the social housing eligibility threshold (36,798 euro in 2017) 	1/3
Security: Resilience to risks for housing cost payments	A person becomes immediately vulnerable to pay housing costs (rent or mortgage) with minor shocks ³	1/3
Ability: Basic ability of financial planning for housing	A person has little knowledge on financial matters, or did not learn from (grand) parents how to plan budget between 12 and 16 years of age	1/3

¹Informal rules that lessors ask tenants for proofs of ability for stable rent payment, such as regular income and monthly gross income more than three to four times of the rent (Verberk, Warnaar, and Bos 2019). Generally, tenants need disposable savings of roughly three times of monthly rent to cover the first month rent, a down payment and the fee for broker agency.

²RLT is the monthly rent limit of social housing in the Dutch housing system (710.68 euro in 2017). If the rent is higher than RLT, housing is categorised as private rental housing. The study used the RLT as a minimum requirement for the entitlement to the private rent.

³Minor shocks were defined in relative terms from the list of shocks in the survey question. They include: suspension or reduction of social/housing benefits or pension, temporary unemployment of breadwinner, increase in rent, increase of the mortgage interest, expense for unexpected shocks such as illness

mortgage products and their risks and knowledge of homeowner expenses other than mortgages, would be ideal to evaluate such an ability. However, substantive surveys of this information are not yet available. Alternatively, the study took a pragmatic approach by utilising second-best surveys on general financial literacy, that is, a questionnaire on the self-assessment of general financial knowledge and experiences of learning about budget planning at an early age. Financial literacy reflects the “ability to discern financial choices, [...] plan for the future, and respond competently to life events that affect everyday financial decisions” (Vitt et al. 2000, xii). Research on financial literacy has shown its relationship with housing wealth (Lusardi, Michaud, and Mitchell 2017) and the likelihood of risky mortgages and mortgage delinquency (Van Ooijen and van Rooij 2014; Zahirovic-Herbert, Gibler, and Chatterjee 2016), which can impact residency security. Consider the case of an interest-only mortgage product in which borrowers have to repay the capital sum at the end of the term. Twenty years after its introduction in the Netherlands, many borrowers have reached the end of their mortgage term and are facing the risk of losing a place to live. They did not have an adequate repayment strategy, and many did not clearly understand the product’s repayment scheme or its consequences (Waterval 2019). Seay, Preece, and Le (2017) find that people with low financial literacy are likelier to use interest-only mortgages.

Unit of Analysis

The MHD-f measurement uses households as the unit of disadvantage identification and individuals as the unit of analysis. However, this study distinguishes between (a) household members who could be independent but stay with other members and (b) household heads and their married/unmarried partners. I named the former *latent households* (i.e. those aged 18 years or older in the Netherlands in this study) and the latter *current households*. This study designed this method to incorporate the capability approach's argument to distinguish between deliberate and coerced choices. Examples of latent households include non-family-based household members (housemates) and youths living with their parents. Some latent households may voluntarily live with others even though they can move out, whereas others have no choice but to live with others. Hitherto, housing indicators have mostly been measured at the household level, and information on latent households has been largely hidden.

There were limitations in applying this method for measuring housing security and ability indicators. Only partial data on latent households were available because the survey did not collect all household members. As a pragmatic compromise, the study allocated the value of the current households to the latent households when data were missing; if at least one of the current household members (head or their partner) was identified as advantaged, the study defined the latent household members are also advantaged by assuming a mutual share of advantages within the household. This approach may not provide a precise measurement outcome; however, the systematic application of a compromising rule can provide sufficient meaningful information for *comparing* the level of disadvantage within the target population.

Measurement Outcome and Discussion

Index of Multidimensional Housing Disadvantages

Table 2 presents the percentage of the population disadvantaged in each dimension and the percentage of the population disadvantaged in all dimensions to no dimension. The percentage of disadvantaged individuals in each dimension ranged from 23% to 25%, as highlighted by the coloured cells in the table. Approximately 25% of Dutch adults have no or only one feasible tenure option, 23% lack basic financial planning abilities, and 23% face difficulties paying housing costs, even with minor shocks to their livelihoods. In this dashboard measurement, the percentage of disadvantaged individuals was approximately 25% for each dimension. With this dashboard method, however, we cannot know whether the persons advantaged in the opportunity dimension are also advantaged in other dimensions (thus being less constrained in housing choices) or whether they are disadvantaged in the ability dimension and thereby hindered from utilising their opportunities. The persons in the

Table 2. Incidence of disadvantages in each dimension and simultaneous disadvantages.

Incidence of disadvantages in each dimension		
Opportunity: Entitlements to different housing tenure options	Entitled to none of the options (disadvantaged)	10.8%
	Entitled to only 1 option (disadvantaged)	14.4%
	Entitled to 2 options	25.6%
	Entitled to all options	49.2%
Security: Resilience to risks for housing cost payments	Vulnerable to minor shocks (disadvantaged)	22.5%
	Vulnerable to moderate shocks	27.1%
	Vulnerable only to extreme shocks	5.6%
	Not vulnerable to any shocks	44.8%
Ability: Basic ability for financial planning for housing	Neither have knowledge nor learned how to budget (disadvantaged)	22.7%
	Have financial knowledge <i>or</i> learned how to budget	50.6%
	Have financial knowledge <i>and</i> learned how to budget	26.7%
Incidence of simultaneous disadvantages		
Disadvantaged in all three dimensions		2.6%
Disadvantaged in two dimensions		16.0%
Disadvantaged in one dimension		39.7%
Disadvantaged in none of the dimensions		41.7%

latter cases have a lower housing capability than those in the former, but the dashboard measurement cannot provide information distinguishing them. Thus, it is essential to determine the incidence of simultaneous disadvantages in MHDs measurements. As presented in Table 2, we can instead count the percentage of the population with disadvantages in all three dimensions, one or two dimensions, and none of the dimensions. This information must be transformed into a summarised index score to analyse inequality in housing capability and draw policy implications.

The study utilised the Alkire-Foster method to obtain a score for housing capability to reflect the degree of joint disadvantages. Following this method, the study first measured the multidimensional headcount (H): the percentage of individuals disadvantaged by one dimension or more (i.e. disadvantage threshold $k = 1/3$), two dimensions or more ($k = 2/3$), and all three dimensions ($k = 3/3 = 1.00$). It then measured the average weighted share of disadvantages experienced by the disadvantaged person, for each disadvantage threshold k (A) and calculates the adjusted headcount ratio ($M_o = H \times A$), the summarised information of the MHDs-f Index. Table 3 presents the measurement outcomes using different cutoff values (k) that determine the cases in which we can consider a person multidimensionally disadvantaged. If policymakers choose $k = 2/3$ as the level of concern, the MHDs-f index is 0.133, and a policy document would note that the Dutch population's capability for housing is constrained at the level of 0.133 and that policy should first address the problems of those in the 19% bracket who are disadvantaged by 2.15 dimensions on average.

The following subsections compares the MHDs-f to other conventional measures, and analyses the inequality in the MHDs-f. For simplicity and clarity, the comparison and analysis examine the MHD-f with $k = 2/3$.

Table 3. Multidimensional housing disadvantages in financial terms (MHDs-f) by different cutoffs of multidimensional disadvantage, the Netherlands 2017.

		(1) MHDs-f Index (Mo = H x A)	(2) Multidimensional Headcount (H)	(3) Intensity of Disadvantage (A)	(4) Average number of dimensions disadvantaged
	Disadvantage cutoff (k)				
(1)	0	–	41.7%	–	–
(2)	≥ 1/3	0.264	58.3%	0.453	1.36
(3)	≥ 2/3	0.133	18.6%	0.716	2.15
(4)	= 3/3	0.026	2.6%	n/a	3.00

The Added Value of the MHDs Index: Comparison of Capability, Functioning, Income and Satisfaction

A straightforward way to examine the added value of this study's evaluation approach is to compare performance rankings using different evaluation approaches, as Sen (1985; 1999) did when comparing country rankings by income and basic capabilities to demonstrate the value of capability evaluation. Conflicting rankings in the results indicate the need for policy to revisit its target groups and priorities. In this study, provincial performance in the Netherlands was compared in terms of the MHDs-f and other housing indicators conventionally used for policy discussions, such as income, housing adequacy, and housing satisfaction (Figure 1).

It may be questionable whether the MHDs-f information would ultimately be commensurate with a measure of income considering that this study measured housing disadvantages structured in “financial terms”. However, Figure 1 shows a discrepancy between the MHDs-f and income deprivation. Consider Utrecht and Flevoland as examples. Both provinces had the lowest income-deprivation ratios for accessing adequate housing (first and second, respectively). Nonetheless, Utrecht's population is least multidimensionally disadvantaged (ranked first), while Flevoland's population is most disadvantaged (ranked 12th). These conflicting rankings highlight that even if people have decent income, their housing choices can be substantially constrained by other types of disadvantages. A policy solely focusing on social housing provision to low-income people could overlook a significant portion of the population in need. For instance, Flevoland residents, with more constrained housing choices, might be deemed lower priority despite requiring substantial public support.

The study aimed to evaluate housing inequality in the evaluation space of “freedom to achieve” (capability for housing), instead of “the extent of achievement” (housing functionings attained). We may speculate that the empirical difference between the two is marginal unlike their conceptual distinction, assuming that less advantaged people would have prioritised achieving basic functioning of living in adequate housing. However, the conflicting provincial rankings between MHDs-f and housing adequacy (Figure 1) revealed a clear

	Deprivation of income for adequate housing [1]		MHD-f index (k=2/3)		Deprivation of housing adequacy [2]		Dissatisfied with housing [3]	
Utrecht	32.8%	1	0.090	1	37.3%	9	13.6%	9
Flevoland	35.7%	2	0.161	12	36.3%	8	13.2%	7
Gelderland	36.4%	3	0.147	8	33.1%	5	13.1%	6
Noord-Brabant	36.9%	4	0.115	4	30.6%	2	12.9%	5
Noord-Holland	37.1%	5	0.147	9	41.5%	11	16.5%	11
Zeeland	37.2%	6	0.125	7	33.1%	4	11.4%	1
Zuid-Holland	38.0%	7	0.159	11	40.3%	10	17.1%	12
Overijssel	38.1%	8	0.104	3	34.1%	6	12.8%	4
Drenthe	38.5%	9	0.095	2	29.8%	1	12.1%	3
Limburg	41.2%	10	0.124	6	30.9%	3	13.3%	8
Friesland	44.4%	11	0.155	10	34.6%	7	11.6%	2
Groningen	46.3%	12	0.120	5	42.5%	12	15.4%	10
Average	37.8%		0.132		36.3%		14.5%	

Figure 1. Comparison of provincial performance rankings, the Netherlands 2017–2018.

Note: the measures of [2] housing inadequacy and [3] dwelling dissatisfaction referred to the data of Netherlands Housing Survey in 2018 (WoON 2018). [1] The proportion of households having insufficient income for accessing adequate housing. This measure used the eligibility threshold of social housing as the socially agreed level of sufficient income for adequate housing in the Dutch context. The threshold of social housing refers to taxable household incomes, which was 36,798 euro in 2017. [2] The proportion of households having one or more problems with room density, drafts, mould and heating. [3] The proportion of households who responded as “very dissatisfied,” “dissatisfied,” or “not satisfied, but not dissatisfied either” with current dwelling (out of the five-level Likert scale).

disparity between the two evaluation spaces. Utrecht and Flevoland populations experience similar levels of housing adequacy (9th and 8th, respectively), yet their MHD-f index rankings differ significantly (1st and 12th, respectively).

Another uncertainty is the difference from satisfaction measures, as having fewer housing disadvantages can imply a higher chance of achieving the housing situation they value, thereby leading to greater housing satisfaction. However, conflicting rankings are observed again in Figure 1. For instance, Friesland’s population has the highest level of housing satisfaction (almost the same as in the top-ranked Zeeland) but is one of the most multidimensionally disadvantaged groups (10th by the MHDs-f).

Information on Coerced Housing Choice and Inequality in Capability

The breakdown of the MHD-f index in Figure 2 illustrates the extent of inequality among household types, age groups, and employment types. The result shows a substantial inequality between latent and multi-person households. While multi-person households’ capability is constrained to only 0.086, which is close to zero, latent households’ capability is constrained to 0.574,

more than six times higher than that of multi-person households. In general, housing data have been collected and analysed at the household level, and information on latent households—adults living with housemates or other family members—has largely been concealed. Their substantial inequality in MHDs-f highlights, the housing issues of latent households may have been considerably underestimated in policy discussions.

The measurement outcome reveals that the most intensely disadvantaged groups are latent households and youths aged 18–29, indicating that their housing capability is constrained at the 0.574 and 0.385 levels, while the other compared groups' capabilities are constrained in the range of 0.086–0.275 levels. Recent studies on younger generations in the Netherlands, as well as in other European countries, have found that younger generations tend to live with housemates or parents for a longer period than previously (Arundel and Lennartz 2017; Arundel and Ronald 2016; Bobek, Pembroke, and Wickham 2021). This is presumably due to barriers to securing a home independently; however, some people may have deliberately chosen to live with their housemates or parents because it is a valued option. How can a measurement differentiated them? When each subgroup is broken down according to the number of coupled disadvantages (Figure 3), the housing situation of those disadvantaged in all three dimensions is most likely to be a coerced choice. Figure 3 shows that nearly 20% of latent households have

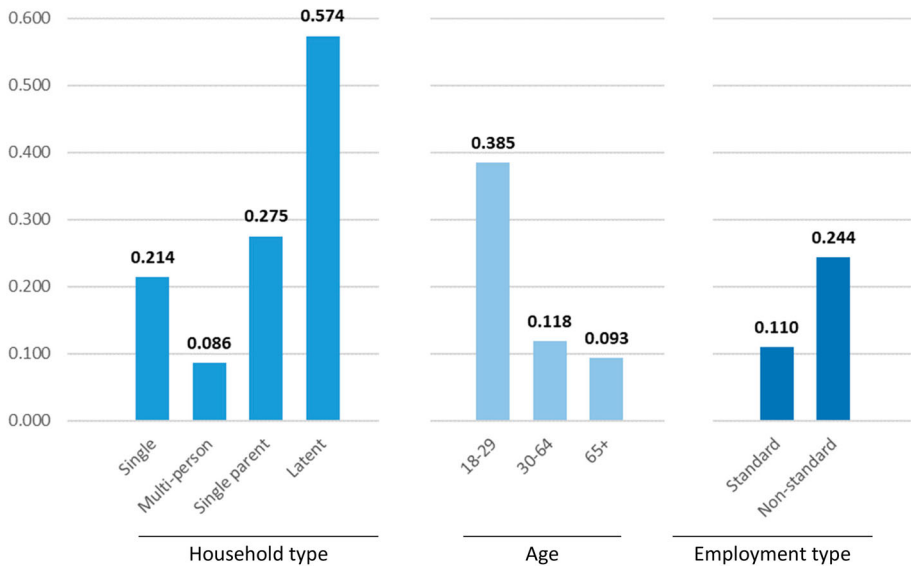


Figure 2. Inequality in the capability for housing: MHDs-f by household type, age groups, and employment type, the Netherlands 2017 ($k = 2/3$).

Note: The employment types were identified according to the contract types (either permanent contract or temporary basis contract). The temporary basis work includes stand-by-work, temping, and self-employment in this study.

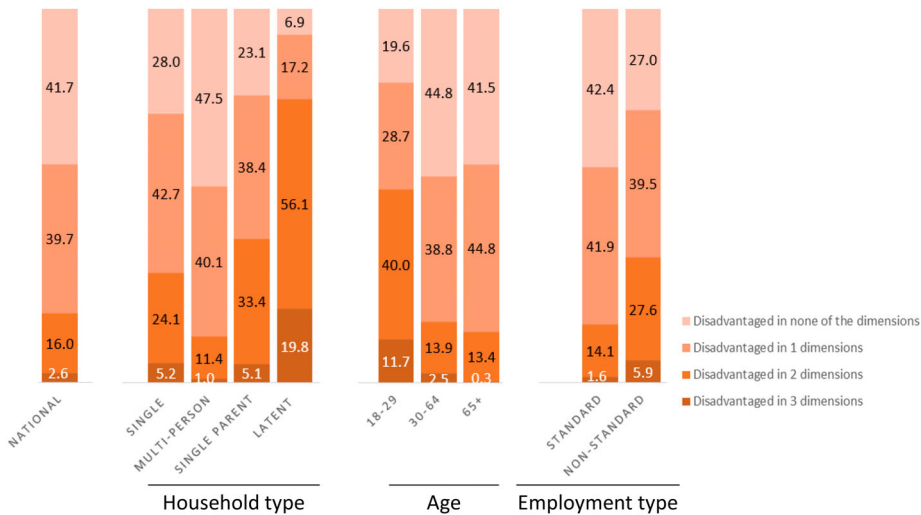


Figure 3. The number of simultaneous housing disadvantages by sub-groups, the Netherlands 2017.

disadvantages in all three dimensions, and 7% have disadvantages in none of the dimensions; those in the 20% bracket are likely to have no other choice than to live with housemates or other family members, whereas those in the 7% bracket have deliberately chosen to live with others. With an MHDs measurement, we could draw information on whose housing situation is likely a coerced choice or a deliberate choice and, thereby, the inequality in freedom to achieve valued housing options.

Insights into Policy Priorities

One purpose of evaluating inequality is prioritising policy target groups and identifying the necessary public interventions. A great benefit of the index by the Alkire-Foster method is that the intensity of disadvantages the population faces (A) can be considered when discussing policy priorities, not merely the number of disadvantaged populations (H). When two different groups have the same MHD-f score ($Mo = H \times A$), the priorities of public intervention can differ because one group may have a higher intensity score (A) but a lower headcount of disadvantaged persons (H). In such a case, the group with a higher A value must be prioritised for public concern.

If a policy needs to determine the priority between single and single-parent households based on Figure 2, it may prioritise single-parent households by referring to their MHDs-f score, which is 0.275 higher than the 0.214 of single households. However, when considering the intensity of the disadvantages, the priority can be reversed. Figure 4 illustrates how different subgroups contribute to the national MHD-f level and overall multidimensional headcount (H). Here, the percentage contribution of single households to the

national MHDs-f score (dark blue bar) is higher than their contribution to the headcount ratio (H; light blue bar) because of the higher intensity of disadvantages (A); however, the percentage contributions of single-parent households to the MHDs-f and H are almost at the same level. The housing capability of single households is more constrained, even though their numbers are lower than those of single-parent households.

Similarly, priorities for provincial interventions may differ. Figure 5 shows how much each province contributes to the national MHD-f score and overall multidimensional headcount ratio (H). From the graphs, we can learn that the five provinces of Gelderland (0.147; ranked eighth), Noord-Holland (0.147; ninth), Friesland (0.155; 10th), Zuid-Holland (0.159; 11th), and Flevoland (0.161; 12th) have a higher contribution to the multidimensional headcount ratio (H) than we would expect from their population share—thus, the first tier of propriety group. Then, out of these five provinces, Noord-Holland (9th) and Flevoland (12th) appear to be in high need of public attention given that they have a higher intensity of simultaneous disadvantages—in Figure 5, their percentage contributions to the MHDs-f score appears higher than that to the headcount ratio (H). According to the provincial ranking by the overall score (Figure 1), Friesland (10th, 0.155) was considered more in need of intervention than Noord-Holland (9th, 0.147). However, the extent of capability is more limited among disadvantaged persons in Noord-Holland, and they need more urgent support.

The high intensity of housing disadvantages in Noord-Holland and Flevoland seems to be associated with the characteristics of the urban population,

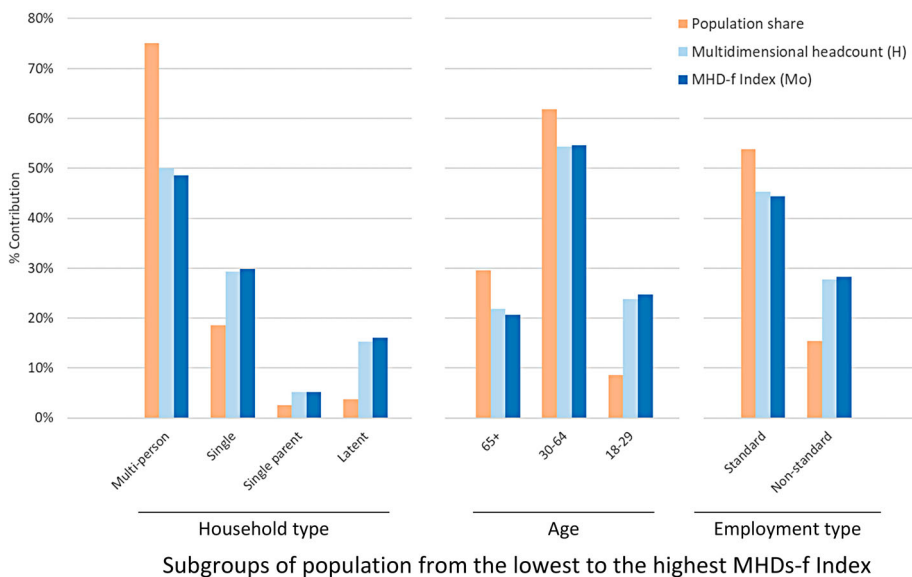


Figure 4. Percentage contribution of each sub-group to the national MHDs-f, the Netherlands 2017 ($k = 2/3$).

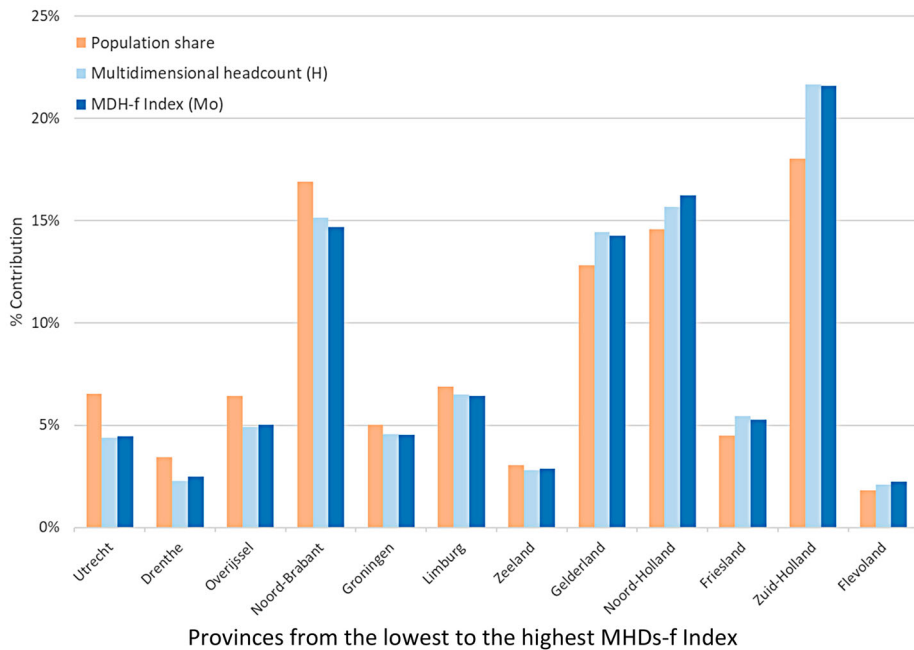


Figure 5. Percentage contribution of each province to the national MHDs-f, the Netherlands 2017 ($k = 2/3$).

such as higher rates of young people and non-standard workers whose MHD-f scores appeared to be much higher than those of those aged 30 and over, and standard workers (Figure 2). Amsterdam, the most urbanised city in the Netherlands, is located in the province of Noord-Holland, and the population of Flevoland is concentrated in the city of Almere, adjacent to Amsterdam. In Almere City, the population ratio of those under 25 years is the highest in the Netherlands, approximately 33% higher than the national average of 25% (Statistics Netherlands 2017).

Regarding housing issues in cities, policy discussions consider the shortage of affordable housing and income inequality as the key drivers of housing inequality, thus prioritising the provision of social housing and housing benefits. However, the MHDs' measures highlight that urgent housing interventions could be something else for different population groups.

The MHDs-f measure showed that latent households, non-standard workers, and youths had the lowest level of capability for housing (Figure 2). In the datasets of this study, 77% of latent households and 60% of nonstandard workers were youths aged 18–29 years. Together with the results in Figure 2, the group struggling in the Netherlands to pursue a suitable housing option comprises young latent households with precarious jobs. In Figure 1, we observe that the population with high levels of MHDs-f is not necessarily the population with high levels of need for social housing—those with an income below the

eligibility threshold (see the example of Flevoland in [Figure 1](#)). Considering the indicators of the MHDs-f ([Table 1](#)), the necessary public measures could be, for example, designing accessible housing financing for youth in precarious jobs, adjusting the system that determines formal or informal entitlements to different tenure options, providing educational programmes on financial knowledge and budget planning, and providing safeguard measures through a quick-bridge fund to support housing costs while the target group is recovering from temporary shocks. For some population groups, the urgent housing agenda could be removing structural constraints by adjusting housing systems rather than providing housing and social benefits.

Conclusions

This study addresses the challenge of incorporating the capability approach's idea of freedom into inequality measurement. The capability approach's concern about freedom is essentially about enabling people to pursue their valued life options by removing constraints on life choices, enhancing abilities to expand feasible life options, and eliminating unfair situations that limit the life options. Reflecting this essence, the study has proposed to shift the evaluation focus from the *achievements of what people value* to the *constraints on people's choices* in accessing valued options. This shift has the strength of addressing structural drivers of inequality, for which information is highly useful for drawing policy implications. The study applied this idea to the housing domain, and suggested evaluating the conditions that constrain or expand housing choices at least in three dimensions: opportunity, security, and ability. This concept was operationalised as a measurement of multidimensional housing disadvantages shaped by financial terms (MHDs-f), using the Alkire-Foster method.

The measurement outcome of the MHDs-f showed several properties contributing to the proposed evaluation approach. First, it could reveal whose housing choices are more likely to be constrained and thus have less freedom to pursue a housing option suitable for them. In the Netherlands, young latent households with precarious jobs are the most constrained group, particularly those in Amsterdam and its nearby cities. Notably, this result highlights the constrained housing situations of latent households—adults living with housemates or family—which have been overlooked in policy research, as they have traditionally analysed housing data at the household level as a whole. Second, the MHDs-f measure was able to inform housing situations that were more likely to be coerced choices or deliberate decisions. Third, this evaluation approach provides information on capabilities that differ from the information of functionings. The MHDs-f index suggests policy priorities that are different from those identified by the measure of living in adequate housing (basic housing functioning). Finally, the measurement outcome could

provide information on unequal structural conditions (e.g. entitlements to different tenure options). MHDs-f indicated the need for more varied policy interventions than social housing and housing benefits.

There is scope for further research on these dimensions and indicators. This study did not measure housing inequality with an exhaustive list of indicators, nor did it claim that specific indicators must be measured. The list of indicators varies by the study context, and housing surveys incorporating capability considerations are still lacking. Further research and surveys are required.

While this study focused on a single-country case of the Netherlands, its methodology and findings have broader implications. Policy concerns regarding housing inequality are growing worldwide. This study's evaluation approach has merits of highlighting the constraints on housing choices, illuminating the underlying structural drivers of housing inequality. Further research and applications would contribute to addressing the acute problem of housing inequality and inform public deliberations on necessary policies.

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