Towards Visualising the Scottish Housing System: An Exploratory Heuristic Model to Support Policy and Practice

Working Paper

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Abstract

The term 'housing system' is increasingly used in housing debates but remains comparatively underdefined, underexplored and under-visualised. Moreover, policy and practice tend to favour a siloed tenure-based approach, contributing to system-level incoherence and unequal and unintended housing outcomes. This is problematic in the context of the Scottish housing emergency[1]. A key challenge in addressing these limitations is that the housing system is complex and difficult to conceptualise and comprehend.

Adopting a systems perspective, this paper responds to the challenge through the development of a heuristic model of the Scottish housing system, which can help policymakers and practitioners to visualise and better understand the system as a whole, ultimately allowing for more coherent interventions and practice.

The model brings together sources of demand and supply, system levers and support mechanisms, system barriers, and detrimental housing outcomes within a single visual framework. The model is intended as an exploratory heuristic framework designed to support housing system visualisation and policy discussion, while presenting opportunities for future development and comparative application.

Keywords: Housing System; Systems Thinking; Heuristic Modelling

Introduction

The term 'housing system' has entered the policy, academic and practitioner vernacular, suggesting a degree of popular understanding and familiarity with the interconnected institutions, actors and processes that shape housing outcomes. However, despite decades of macro-level housing systems scholarship (Ball, 1986; Forrest & Murie, 1988; Kemeny, 1992), Stephens (2020, p. 521) asserts that:

> '*Understanding how housing systems function and change is one of the most enduring challenges in housing studies.*' (Stephens, 2020, p. 521)

[1] A housing emergency has been declared by the Scottish Government and multiple local authorities.

Moreover, while there is emerging consensus across much of housing discourse that housing should be viewed and treated as a 'system', policy and practice tend to operate almost entirely on a siloed tenure-based basis. These siloes have emerged legitimately over time in response to varying social, economic and political drivers, and can convey advantages. Specifically, the compartmentalisation of policy, regulation, and finance into differing tenures can reduce complexity, improve institutional clarity, and create centres of specialism and expertise. However, they can also produce less desirable effects. For example, policy designed to respond to tenure-specific challenges can lack coherence, resulting in system-level coordination failures, and leading to unequal and unintended outcomes. Similarly, siloed practice can lead to inter-tenure friction and seldom produces mechanisms for identifying and sharing best practice.

These and other pressures have become increasingly acute in the context of the Scottish housing emergency, which is characterised by an extreme imbalance between supply and demand. To respond to these myriad of challenges, there is a need to better understand housing as an integrated system, rather than a collection of tenures, in order to enable more coherent systems-level policy and practice.

Given existing limitations, this is no easy task. However, Gibb and Marsh (2019, p. 4 & 17) argue that the adoption of a *'systems perspective*' and the use of '*tools and techniques*' drawn from '*systems thinking*', can '*encourage better analysis and might help avoid errors that arise from siloed thinking*'. As systems thinking draws from multiple theoretical perspectives spanning numerous disciplines (Meadows, 2008; Senge, 2006; Von Bertalanffy, 1968) and does not offer a '*well-defined homogeneous approach*' (p. 4), this suggests that there is space for the emergence of more pragmatic and exploratory approaches to housing system analysis, particularly those that translate abstract systems concepts into applied, policy-facing tools.

Traditionally, a systems approach involves defining system boundaries, identifying core system components and their interdependencies, recognising feedback loops, and anticipating unintended consequences. It is common to visually represent these observations via systems maps, causal loop diagrams and other diagrammatic methods. However, there have been relatively few attempts to explicitly visualise or map the structural architecture of housing systems, particularly at a national level[2]. Furthermore, although systems maps can aid visual understanding, they can also become extremely complex, making them difficult to interpret (particularly in the case of causal loop diagrams), which renders them of limited use to non-specialists including policymakers and practitioners. It is difficult to envisage how siloed policymakers and practitioners can respond to Scotland's system level challenges without visual tools to help them conceptualise housing at the system level.

The purpose of this short working paper is to address this shortfall through the development of a heuristic-based model of the Scottish housing system, comprising sources of supply and demand, system levers and support mechanisms, system barriers and detrimental housing outcomes. It is hoped that the model can help policymakers and practitioners to visualise and better understand the system as a whole, including the myriad of challenges it faces, ultimately leading to more coherent interventions and practice (Figure 1).

[2] A recent example is work by the Sipher Consortium who map the interaction between housing and health. See: https://www.gla.ac.uk/research/az/sipher/systemsmapping/housing-systemsmap/#collaborativecreationofhousingsystemsmaps

Methodology

Couched in pragmatism, this work adopts a 'systems perspective' (Gibb & Marsh, 2019) which draws insights from a number of diverse works related to systems thinking (Meadows, 2008; Senge, 2006; Von Bertalanffy, 1968), re-interpreting them for application within the Scottish housing system. Rather than developing a formal systems model, the approach is interpretive and heuristic, seeking to synthesise system components into an accessible visual structure.

The first iteration of the model was created as part of a City of Edinburgh Housing System Review (Report forthcoming). The creation of this model followed an iterative and abductive five-stage process. In the first stage, the author identified key system components through an iterative synthesis of sector knowledge and an in-depth review of data across a range of socio-economic, stock profile, and system performance measures, obtained via national statistics, grey literature and local authority data. This stage involved triangulating multiple data sources to identify recurring system pressures and structural features. In the second stage, the author attempted to visualise the system. The first iterations were sketched manually, allowing different visual formats to be explored expediently. In the third stage, the author attempted to translate shortlisted ideas into computer-based software (Microsoft Visio). This introduced a range of functional and graphical limitations, which shifted the design to a more process-driven layout. In the fourth stage, the design was iteratively improved over several versions. In the fifth stage, the model was revisited, revised and expanded to represent the housing system at the national level.

Operationalising the model

Framed by a typical two-dimensional housing structure, the model runs from top to middle and bottom to middle linking demand and supply dimensions to Scotland's housing mix, respectively. It also runs from left to right linking Scotland's housing mix to detrimental system outcomes. In total, the model includes eight key elements as follows:

Demand 1 and Supply 1

These elements (shaded green) relate to how demand and supply are supported (and moderated). They reveal the system levers and mechanisms that either help households access the housing system or encourage the supply of new housing. For completeness, the demand element also includes examples of specific actors who provide system support, whereas the supply element includes examples of organisations who enable or lobby for supply.

Demand 2 and Supply 2

This element highlights sources of housing demand (shaded blue) and sources of housing supply (shaded purple) respectively. The former is split across three categories: demand groups, demand sources, and institutional/competing demand. The latter is split between new supply, re-use and mixed supply.

Demand 3 and Supply 3

These elements (shaded orange) identify demand and supply barriers that constrain the ability of households to access housing or limit the supply of homes.

Housing Mix

This element sits at the intersection of demand and supply and highlights the extent of Scotland's housing mix. This includes the distribution of different housing tenures, stock types and forms of occupancy across the system.

Detrimental System Outcomes

This element highlights detrimental system outcomes (shaded red) over seven categories: housing market outcomes, housing access & system pressure; social & household outcomes; public service impacts; economic impacts; housing condition impacts; and political outcomes.

Taken together, these elements highlight the complexity of the housing system and the extent to which housing pressures are interconnected across different parts of the system and can lead to a range of detrimental housing and socio-economic outcomes.

Model limitations

It should be noted that the model represents an early attempt to visualise Scotland's housing system. A number of design and presentation choices limit both the model's scope and presentation, while the need to visually organise a highly complex system means that some interdependencies and feedback loops are less pronounced. The model should not therefore be considered exhaustive, but rather as a starting point for further discussion, refinement and application.

Conclusion and way forward

Responding to limited visualisation of housing systems within the literature, the siloed nature of housing policy and practice in Scotland, and numerous system-level challenges, this short paper set out to design a heuristic-based model of the Scottish housing system. The resultant model seeks to highlight not only the interconnectedness of the system but also the significant pressure it is under. The volume and range of the detrimental outcomes identified are large and have broad repercussions for those within the system, and those seeking to enter or transition within it. They also illustrate the wider impact of housing outcomes on a wide range of socio-economic factors.

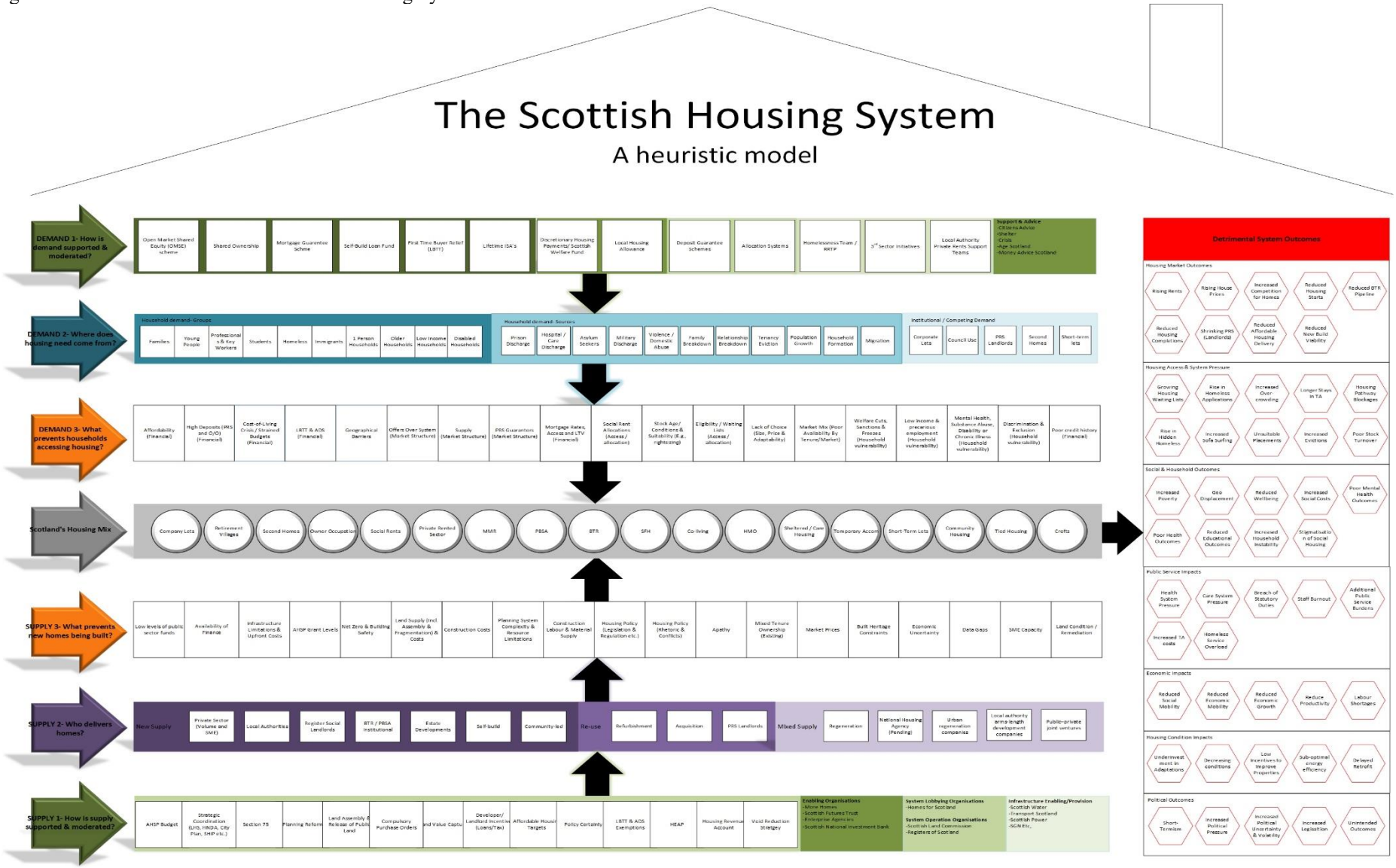
In short, the model is intended to provide a tool through which policymakers and practitioners can visualise the full extent of the system and the true extent of the challenges faced, supporting the identification and examination of opportunities for positive intervention and change. More broadly, the model highlights the extent to which housing pressures and outcomes are interconnected across different parts of the system, reinforcing the limitations of siloed tenure-based approaches to housing policy and practice.

The next stage of development is to obtain feedback from a range of stakeholders, which can be used to address gaps and improve the model's form and function, particularly regarding interdependencies and causal relationships.

Longer term, the model could be expanded to examine how the housing system interacts with wider social and economic systems in more detail. It may also be possible to adapt the model for use in different local or national housing system contexts.

The author welcomes feedback on all aspects of the model and can be reached at andrew.watson.2@research.gla.ac.uk

Figure 1: A Heuristic Model of the Scottish Housing System



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