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SOCIAL DIMENSIONS OF HOUSING HETEROGENEITY: A PATHWAY TO UNDERSTANDING MARKET MECHANICS AND VALUATION

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ABSTRACT

The composition of the housing market is shaped by the social dimensions of buyer heterogeneity, prompting households to prioritize housing development to fulfill their needs efficiently. Both quantitative and qualitative dimensions of housing heterogeneity in transactions stem from the different characteristics, needs, and incomes of residents in different areas. The relevance of this research lies in understanding the social dimensions driving housing diversity among buyers and sellers. In a market economy, meeting the evolving needs of market participants is crucial. Consequently, stakeholders in the housing market focus on understanding buyer needs, changing trends, and adapting to the heterogeneity of the housing options. The housing market, characterized by significant information asymmetry, underscores the importance of comprehensively studying the social dimensions of housing diversity, particularly its impact on market value and transaction prices. Viewing households as heterogeneous social systems highlights the dominance of the social dimension in the housing market, necessitating a comprehensive exploration of its quantitative and qualitative aspects. Findings can inform managerial decisions to mitigate information asymmetry, improve housing availability, stabilize prices, and improve the market value of properties.

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1. Introduction

The social dimension of housing heterogeneity, including its composition and manifestation, has a significant impact on housing price changes and their effects throughout economic cycles. Decisions made by credit institutions and the Bank of Latvia during times of notable increases in housing prices demonstrated this. A disproportionate rise in loans compared to deposits was caused by information asymmetry among home buyers and credit institutions' profit-driven behavior (Banka, 2023). This emphasizes the significance of prompt monetary policy interventions and the dissemination of information on cyclical fluctuations in housing prices (Kauskale et al.,, 2022).

The fluctuation of housing prices in EU countries and beyond is significantly influenced by government decisions that often fail to align with market dynamics, thereby directly and indirectly affecting the overall demand and supply at any given time and place. Price surges in the housing market are further exacerbated by inadequate financial system regulations (Amadeo, 2022) driven by the profit-maximizing motives of credit institutions and their reckless treatment of borrowers (Ramskogler, 2015) which frequently overlook borrowers' creditworthiness and changes therein during loan repayment. Research into both the internal and external dynamics of the housing market often reflects a mechanistic approach (Brausewetter et al. 2022; Gibson et al., 2011; Adebimpe & Asanot, 2021). The inadequacies in financing housing market participants are typically rooted in systemic

deficiencies within the financial system itself and the lack of relevance in decision-making processes by its stakeholders. Consequently, government decisions made within the framework of financial system oversight often fail to address the prevailing threats in both internal and external environments, resulting in measures intended to stimulate housing supply that are out of sync with the actual growth in housing offerings on the market.

The relevance lies in its direct correlation with the distinctive nature of the commodities of the housing market and the pronounced information asymmetry among buyers, factors that significantly contribute to the increased volatility witnessed in the housing markets of Latvia, other Baltic states, the European Union, and various other nations. This volatility manifests itself in substantial fluctuations in housing prices occurring within relatively brief periods in different countries. Eurostat data spanning from 2015 to 2021 reveal notable increases in housing prices. Latvia experienced a 1.62-fold increase, Estonia 1.52-fold, and Lithuania 1.63-fold. Remarkably, Turkey exhibited the most rapid growth in housing prices at a level 2.45 times higher than those in 2015, followed by Hungary at 2.08 times and Czechia at 1.84 times. On the contrary, Italy saw minimal growth at only 3%, Cyprus at 4%, and Finland at 10%. Finland's neighbor - Sweden, on the other hand, witnessed a staggering 34.5% increase, significantly outpacing its Finnish counterpart (Eurostat, 2023 House price index (2015 = 100) - annual data, 2024). In the EU, the discrepancy between the highest and lowest housing price increases exceeds 60 times, highlighting the imperative for heightened scrutiny from policymakers and researchers to comprehend the drivers behind these price escalations.

The purpose of the study is to investigate the ways in which different social factors affect housing prices. It aims to pinpoint the most important quantitative and qualitative aspects of social housing diversity by using systemic approach methodologies. Using this analysis, the research hopes to reduce cognitive differences among those involved in the housing market and offer information that can help in housing transaction decision-making. Furthermore, the study intends to address information asymmetry in the housing sector, specifically for policymakers, to enhance their understanding of market dynamics and execute strategies for price stability. All things considered, the research aims to offer insightful information about the social aspect of housing diversity, with useful implications for both market players and legislators.

2. Methodology

The social aspect of housing heterogeneity and its influence on Latvian housing market values are examined in this study, which makes use of the experience of 24 real estate industry professionals. Three types of housing options are taken into consideration: mansion houses, terraced houses, and apartments in multifamily residential buildings. On a scale ranging from 1 to 10, experts rate different components that represent the social dimension quantitatively; scores signify the extent of influence. IBM SPSS is used for the analysis of data obtained from structured questionnaires. Ethical considerations guarantee participant confidentiality and informed consent. The study intends to offer insightful information about the dynamics of the housing market, supporting decision-making in the real estate sector and advancing knowledge of the social aspects of housing heterogeneity, notwithstanding possible limits on generalizability and bias.

3. Literature Review

3.1 Social Dimension of Housing Heterogeneity in Scientific Research – Critically Analytical Evaluation

To achieve research objectives, significant focus has been placed on examining the results of scientific studies that investigate social systems and the behavior of individuals within those systems. The study of subject behavior in various systems garnered increased attention from researchers in the mid-twentieth century.

Throughout this study, a content analysis has been conducted to uncover the elements that contribute to the social dimension of the heterogeneity of the housing system. A multitude of research findings on social systems dating from the mid-20th century to the present day have been meticulously evaluated. Noteworthy contributions include works by (Ackoff, 1971; Harary & Batell, 1981; Viskovatoff, 1999; Leydesdorff, 2002; Mair & Seelos, 2021). These scholarly articles have provided valuable insight into achieving the research objectives and have unearthed unique observations about systems.

Regarding the idea that a human activity system is a notional system that expresses some intentional human activity, Peater Checkland's perspective is pertinent in the critical approach framework on social systems (Checkland, 1982). However, this viewpoint

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does not entirely align with practicality, since systems are comprised of elements rather than mere occurrences. Furthermore, human activity is inherently intertwined with social systems, each possessing its distinct purpose that aligns with the broader social system's objectives. Conversely, Ackoff R. contends that a system constitutes two or more interrelated objects or entities with interdependent parts (Ackoff, 1971), presenting a fundamentally different stance compared to P. Checkland. V. Bertalanffy's viewpoint is most relevant when exploring the social dimension and housing heterogeneity of housing within social systems. Bertalanffy defines a system as a collection of interacting units with relationships among them, a notion further elaborated as "A system may be defined as a set of elements standing in interrelation among themselves and with the environment" (Von Bertalanffy, 1972). The proliferation of system theory in the late twentieth century led to a surge in academic research applying its principles to various aspects of social systems (Tarrazo, 2021; Tsai & Brusilovsky, 2021). This includes investigations into housing heterogeneity (Whieldon & Ashqar, 2022; Shuster et al., 2014), real estate valuation and the behavior of housing market participants (Espinoza et al., 2018). Such research updates existing knowledge and offers a deeper understanding for appraisers of various processes in the housing market, helping to determine transaction prices.

The research findings of (Kidwai and Saraph, 2016) shed light on the archetypes of social systems, which align significantly with the need to establish housing archetypes to assess the value of the property market. Housing archetypes are extensively utilized in practice, streamlining the appraiser's task by applying accumulated knowledge about housing archetypes' characteristics and their impact on market value. These results help identify key elements of the social dimension within the heterogeneity of housing crucial for determining market value. The concept of housing archetypes and its practical applications are not new in social sciences. Various studies explore archetypes of homeowners and residents, analyzing housing social dimensions to understand their influence on energy consumption (Famuyibo et al,, 2012), resource management (Azian et al., 2022; Mmako et al., 2019), and urban planning (Borges et al., 2022).

However, existing research exhibits fragmentation concerning the impact of the social dimension on housing market value. Although attention is often given to isolated elements, the holistic view of the social dimension within housing heterogeneity is often overlooked. For example, (Espinoza et al., 2018) examine how housing location affects buyer attitudes, integrating social factors with economic and environmental dimensions. However, the dominant factor in decision making remains social – reflecting buyers' cognitive reactions to housing options.

Studies like those by (Torresin et al., 2018; Shuster et al., 2014) explore residents' responses to surrounding environments, influencing their comfort levels. Additionally, the COVID-19 pandemic's uneven effects on housing prices (Afxentiou et al., 2022; Luo et al., 2022) highlights the non-uniform distribution across territories and housing types. (Brittin et al., 2015) propose a system dynamics model to simulate measures for reducing health risks for homeowners and potential buyers. However, limited applicability of governmental decisions based on past event-based models arises due to the evolving nature of threats and behaviors, necessitating adaptive decision-making frameworks.

To improve market value accuracy and identify elements of the housing social system (Glynn et al., 2022) research on data importance in governmental decision-making offers insights. Addressing information asymmetry effects on market value determination and transactions (Ambrose & Diop, 2021), this research aids in assessing housing heterogeneity's dimensions, especially in environments with varying social manifestations. Understanding the social dimension of housing heterogeneity involves analyzing quantitative and qualitative characteristics influencing resident behavior and neighborhood dynamics (Liu et al., 2022). Models developed by (Guo et al., 2021) reveal opportunities for neighbor collaboration in enhancing external environments, thereby increasing market value and resident satisfaction. These findings underscore the importance of social identity in shaping neighborhood dynamics and unified efforts to meet social needs.

3.2 Influence of Social Dimension on Housing Heterogeneity

To understand how housing diversity is shaped, it is crucial to examine the significance of the social dimension. Within any social system, the dominant element plays a key role in determining management procedures, content, participants' roles, and their rights and responsibilities in addressing various issues. Often, government decisions involve all relevant

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members of the social system, including household members, regardless of age, reflecting a high degree of democracy. However, exploring decision making in larger systems goes beyond the scope of this research, which focuses on how housing location and architectural features are influenced by residents, who are integral to the social element of the system.

These findings on the impact of the social element on shaping housing uniqueness have led to the development of the Heterogeneity Model, illustrated in Figure 1.

Figure 1 illustrates the elements that contribute to the heterogeneity of housing, organized according to their impact on both quantitative and qualitative aspects of heterogeneity. Lying at the foundation is the social element, reflecting the diverse individuals within a household who collectively agree on a unique living arrangement. Next in significance is the surrounding environment, which is inherently tied to the location of the housing plot within nature. This environmental context ensures that each housing location differs from others, even in areas with similar urban landscapes dominated by standardized multi-story residential buildings. The technical element follows, ensuring the building's technical compliance with population density requirements.

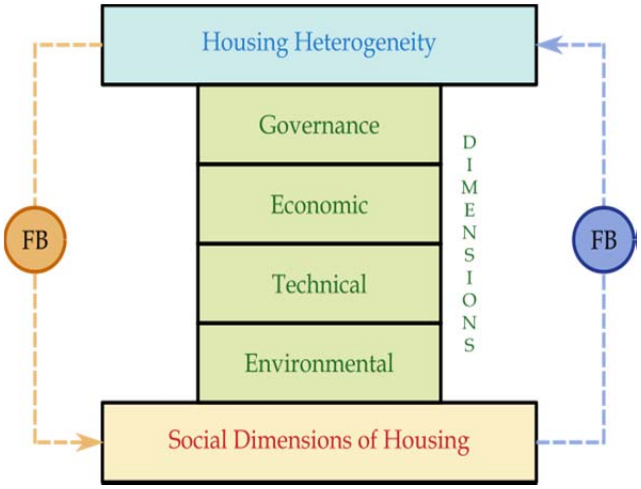


Fig. 1. Housing Heterogeneity and Social Dimensions (developed by the author). *Source*: own study.

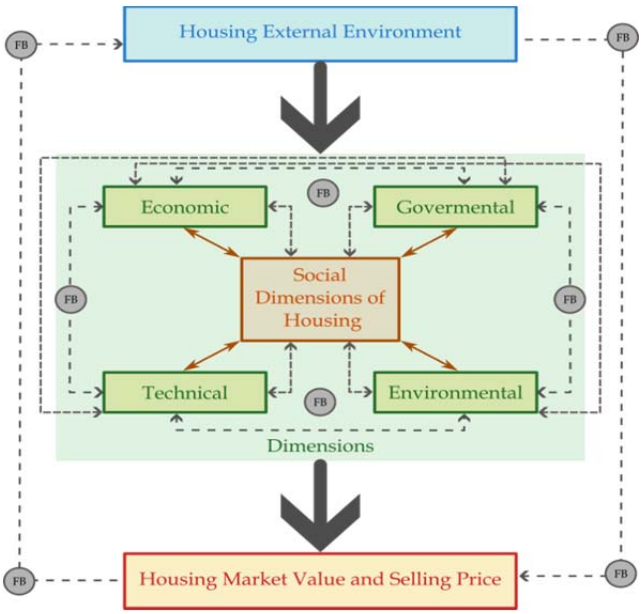


Fig. 2. Housing systemic model with the dominating social dimension (developed by author). *Source*: own study.

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Once a building is commissioned, it gains housing status, and the heterogeneity model expands to include economic and governance elements. The economic element encompasses the resources needed for the maintenance, operation, and needs of the residents, resulting in variations even between the houses built from the same project. At the pinnacle of the hierarchy is the governance element, which encompasses features that contribute to the uniqueness of the housing.

The heterogeneity model incorporates two feedback loops that facilitate continuous adjustments to heterogeneity features. However, elements at each step of the model change at different rates and have varying impacts on the value of the housing market. These feedback loops connect internal and external housing environments, empowering residents - shapers of the social dimension - to understand the prevailing threats.

Based on the literature review, Figure 2 presents the housing systemic model with dominating social dimensions. The pivotal element within the housing systemic model depicted in Figure 2 is the social dimension, which remains in continuous interaction with other elements shaping the housing system.

This implies that each constituent element of the housing system not only affects the internal housing environment, but also determines the quantitative and qualitative aspects that make up the technical, economic, and governance dimensions. Following this principle of social system functioning, it has been established that the quantitative and qualitative aspects shaping the social dimension are largely determined by the residents of the houses, considering their demographic, cognitive and psychological characteristics, in continuous interaction with the external environment. While other elements contributing to housing heterogeneity also play a role in shaping the content of the housing social dimension, their influence differs.

The elements that form the housing system are subject to varying influences from the external environment, encountering both threats and opportunities therein. Consequently, the internal housing environment is shaped by the mutual interaction of the elements of the housing system, as well as by the housing itself and its inhabitants interacting with the surrounding environment. The social element predominates in the formation of the internal environment, exerting a constant influence on decisions made within the framework of the governance element of the housing environment. Moreover, the social element and its constituent subjects react significantly to changes in the external environment, frequently adjusting their position between the available objects in both the housing internal and external environments.

The systemic model is enriched with various feedback loops. Through these feedback loops, housing residents continuously obtain data and information, which is then transformed into knowledge about changes in the internal environment and/or the behavior of the residents. Subsequently, this knowledge is utilized to foster understanding among the entities shaping the housing management elements regarding potential reasons for changes and their potential impact on the stability of the housing internal environment. The acquired data, information and knowledge are used to make the most appropriate management decisions aimed at maintaining the stability of the internal environment or effecting necessary changes to mitigate threats to stability and/or their influence on undesirable resident behavior.

Following democratic principles, all housing residents participate in housing governance and decision-making processes. However, these methods may be inefficient when core values of the internal housing environment and fundamental behavioral principles are jeopardized. Through skillfully designed feedback mechanisms and judicious use of available data and information, the likelihood of conflict arising within the housing is reduced. However, conflicts are inevitable due to the interaction between the external and internal environments and the limited ability of entities that shape the housing management elements and other residents to influence the prevailing threats in the external environment. It is essential to acknowledge that threats do not have an absolute and unequivocal value; what constitutes a threat to one may present an opportunity to another.

3. Results and Findings

To elucidate the content of the social dimension of housing heterogeneity, the study uses the expertise of 24 professionals from the real estate industry. The objective is to determine the influence of various elements comprising the social dimension on the formation of values in the housing market. The housing options considered within the study span across Latvia and can be classified into three groups: apartments in multifamily residential buildings,

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apartments in terraced houses, and apartments in mansion houses.

Expert evaluations are quantitatively expressed on a scale ranging from 1 to 10, where a score of 1 signifies negligible influence and 10 denotes the most significant impact. The collected evaluations are then aggregated and analyzed using IBM SPSS (Statistical Package for the Social Sciences).

The research findings highlight the most consequential elements of both the external and internal environments that shape the social dimension of housing. These results are presented in Table 1.

Expert analysis of various factors relevant to our research topic has led to the application of a valuation interval that aligns with the majority opinion of experts. The findings, outlined in Table 1, indicate that quantitative elements comprising the social dimension within both the internal and external environments of housing exert a more significant influence on the market value of apartments in multifamily residential buildings, whereas their impact is comparatively smaller for mansion houses. This can be attributed to the greater degree of separation between residents in individual houses compared to those in multifamily or terraced settings. Additionally, disparities in household income levels among residents of multifamily, terraced, and mansion houses must be considered. The absolute income and accumulated wealth of household owners largely shape individual behavior, housing location preferences, and societal attitudes toward other entities.

When analyzing how the social dimension components of the housing heterogeneity affect market value, it is clear that people prefer to live in more aesthetically pleasing environments with landscaping that improves well-being and minimizes disturbances as household income rises. Consequently, properties located near city parks, water bodies, or other attractive landscapes, tend to command higher market values. Empirical evidence suggests that apartments situated on higher floors within multifamily residential buildings often fetch higher transaction prices compared to ground-floor units. This underscores the value that individuals place on desirable views, reflecting in their willingness to pay a premium for such housing.

In contemporary society, there exists a segment of people for whom securing affordable housing takes precedence over other considerations. As a result, they gravitate towards cheaper options, predominantly found in multi-family residential buildings in urban or rural areas. This dynamic significantly contributes to the social dimension disparities observed among multifamily, terraced, and mansion houses, although exceptions do exist.

Table 2 presents the research findings related to the internal environmental elements that shape the structure of the social dimension of housing heterogeneity.

Table 1

Most Significant Quantitative Elements of the Social Dimension

Quantitative elements of the social dimension	Apartment	Terraced House	Mansion House
	Border indicators of the influence		
Elements of social dimension content forming content in the internal environment			
Household size in the housing – number of persons	10	6-9	6-7
Number of children in the household	8-10	7-9	5-6
Number of people of working age in the household	7-10	8-9	8-9
Number of unemployed persons in the household	8-10	6-8	6-7
Number of pensioners in the household	7-10	6-8	5-6
Number of persons with special needs in the household	7-10	6-7	5-6
Number of accepted guests a week/month/year	5-8	6-7	4-5
Number of ex-convicts and other social content elements in the household	6-9	7-8	6-7
Social Dimension Content Formation Elements in the external environment			
Intensity of the flow of people next to the house	8-10	7-9	7-8
Number of neighbors	9-10	8-9	7-9
Number of residents in the external housing environment, potential buyers	9-10	9-10	8-9
Demographic composition of residents in quantitative units in the external housing external environment	8-10	7-9	9-10
National composition of residents in quantitative units in the external housing external environment	7-9	7-8	6-7
Number of persons with special needs in the external housing external environment	7-9	6-7	5-6
Number of unemployed persons in the external housing external environment	8-9	7-8	6-7

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Number of criminal cases in the housing external environment	8-10	8-9	6-8

Source: Table developed by the authors based on the research results.

Table 2

Most Significant Qualitative Elements of the Internal Social Dimension

Qualitative elements of the social dimension	Apartment	Terraced House	Mansion House
	Border indicators of the influence		
Household size in the housing – number of persons	8-10	7-8	6-7
The behavior traditions of the residents of the housing in the internal environment	9-10	8-9	8-9
Spiritual and material interests of housing residents, their interaction effect	8-10	8	7-8
Legal awareness level of housing residents – attitude towards the procedure regulation in the housing	9-10	8-9	7-8
Moral consciousness level of housing residents – moral values and their respect in the attitude with others	7-9	7-8	6-7
Cognitive development level of the housing residents	9-10	8-9	6-8
Characteristic of information asymmetry for the housing residents on the value of the housing market value and its changes	8-9	7-9	6-7
Respect of the housing residents to others and self-respect, other elements	8-10	7-8	6-7

Source: Table developed by the authors based on the research results.

The findings presented in Table 2 highlight the significant impact of qualitative elements within the internal environment on the social dimension structure of housing heterogeneity, irrespective of housing type, whether multi-family, terraced, or mansion. However, the influence varies between different residential settings. In larger cities, there is often a clear territorial division between multi-family residences and terraced or mansion houses, leading to distinct environmental conditions within each type of housing. For instance, while terraced and mansion houses may benefit from inner yards enhancing their internal environment, such amenities are typically absent in multifamily residential buildings. Additionally, the internal environment of apartments in multi-family residences is intertwined with that of neighboring units, resulting in issues like noise disturbance and other communal effects. These findings suggest that the internal environment plays a more significant role in determining the market value of apartments in multifamily residences compared to terraced and mansion houses.

The research results on the qualitative elements of the external environment, as described in Table 3, echo the patterns observed within the internal environment. In particular, the elements shaping the social dimension structure of housing heterogeneity in the external environment closely resemble those within the internal environment. This correlation is not coincidental; rather, it stems from the behaviors and attitudes of residents toward their neighbors and the surrounding community. Similarly, these elements hold greater importance for multifamily residences, although their impact diminishes with lower population densities.

Table 3

Most Significant Qualitative Elements of the Social Dimension External Environment

Qualitative elements of the social dimension	Apartment	Terraced House	Mansion
	Border indicators of the influence		
The behavior traditions of the residents of the surrounding territory in the external environment	9-10	8-9	7-9
Level of legal awareness of residents of the surrounding territory - attitude towards regulatory enactments	9-10	8-9	7-9
Moral consciousness level of the residents of the surrounding territory - moral values and their respecting in the mutual interaction	8-10	8	8-9
Cognitive development level of the residents of the surrounding territory residents	8-9	8-9	7-8
Information asymmetry, its changes and manifestations	10	8-9	7-8
Respect of the surrounding territory residents to others and self-respect, other elements	8-9	9-10	7-9
Attitude of the residents of the surrounding territory towards nature and objects of nature	8-10	8-9	8-9

Source: Table developed by the authors based on the research results.

Interestingly, the study reveals minor discrepancies in residents' attitudes toward nature across different housing types. Although nature enthusiasts often showcase their affinity for the outdoors by cultivating plants and keeping pets, residents of terraced and mansion houses tend to have more opportunities to

incorporate nature into their living spaces, thereby enhancing the market value of these properties. It is noteworthy that the presence of flowers and plants in a housing unit typically isn't a standard feature during sale transactions unless agreed upon by both the buyer and seller.

Table 3 highlights that qualitative factors in the external environment significantly impact the social dimension of housing heterogeneity, thereby affecting the value of the housing market irrespective of its technical engineering aspects. However, it is crucial to note that housing valuation should not overlook these elements and their practical manifestations. Thus, when determining housing value, it is imperative for analysts to identify and assess elements within both internal and external social environments to ensure they are factored into the final valuation.

These research findings on housing heterogeneity can be instrumental in determining market values for various types of housing. In particular, the behaviors of social factors leave a lasting imprint on the internal environment of a property, often persisting even when the property is put up for sale. On the other hand, elements within the external environment are shaped by the interactions between various factors and objects present in that environment. This includes infrastructure elements of the national economy and commercial entities, all of which contribute to both positive and negative influences on the value of the housing market.

5. Conclusions

Based on the research findings and their analysis, the respective key conclusions have been drawn. First, the research objectives aimed at enhancing the understanding of the factors that influence the dynamics of the housing market and mitigating information disparities between stakeholders. It was evident that significant fluctuations in housing prices are primarily attributable to information asymmetry among market participants and inadequate decision making by governmental bodies.

The social dimension plays a crucial role in shaping both the quantity and the quality of housing heterogeneity. Despite this, it is often overlooked in practice. Quantitative factors exert a substantial influence on market values, particularly for apartments in multifamily residences. On the contrary, qualitative factors significantly affect market values across various housing types, with the greatest impact observed in multifamily residences. This discrepancy can be attributed to the higher degree of interaction among residents in such settings. In addition, income disparities among households that reside in different housing types contribute to this variation.

These findings are relevant to real estate appraisers, regulatory institutions, and households alike. By addressing information disparities, we can promote stability in the housing market and ensure that appraisal practices align with the prevailing market conditions. Overall, this research provides valuable insights into the quantitative and qualitative dimensions of housing heterogeneity, helping people make informed decisions to optimize their use of the available resources.

References

Ackoff, R. L. (1971). Towards a system of systems concepts. *Management Science, 17*(11), 661–671. https://doi.org/10.1287/mnsc.17.11.661

Adebimpe, A. & Asanot, B. K. (2021). A Critical Evaluation of Conventional Methods of Appraisal and its Materiality on the Growth Explicit Models of Valuation. 9(2), pp. 36–47.

Adebimpe, O. A., & Asanot, B. K. (2022). A critical evaluation of conventional methods of appraisal and its materiality on the growth explicit models of valuation. *Covenant Journal of Research in the Built Environment, 9*(2), 36–47. Retrieved from https://journals.covenantuniversity.edu.ng/index.php/cjrbe/article/view/2811

Afxentiou, D., Harris, P., & Kutasovic, P. (2022). The COVID-19 housing boom: Is a 2007–2009-type crisis on the horizon? *Journal of Risk and Financial Management, 15*(8), 371. Advance online publication. https://doi.org/10.3390/jrfm15080371

Ambrose, B. W., & Diop, M. (2021). Information asymmetry, regulations and equilibrium outcomes: Theory and evidence from the housing rental market. *Real Estate Economics, 49*, 74–110. https://doi.org/10.1111/1540-6229.12262

Azian, F. U. M., Ernawati Mustafa Kamal[1], Nor'Aini, Y., Syarifuddin, N. & Ismail S. (2022). The challenges of property management companies in managing high-rise residential buildings during COVID-19 pandemic. *International Journal of Academic Research in Economics and Management and Sciences, 11*(1), 142–153. https://doi.org/10.6007/IJAREMS/v11-i1/12240

Banka, L. (2023). *Macroeconomic developments report*. https://datnes.latvijasbanka.lv/mnp/MNP_2023_september_EN.pdf

Von Bertalanffy, L. (1972). The history and status of general systems theory. *Academy of Management Journal, 15*(4), 407–426. https://doi.org/10.2307/255139

Borges, P., Travesset-Baro, O., & Pages-Ramon, A. (2022). Hybrid approach to representative building archetypes development for urban models – A case study in Andorra. *Building and Environment, 215*(February), 108958. https://doi.org/10.1016/j.buildenv.2022.108958

Brausewetter, L., Thomsen, S. L., & Trunzer, J. (2022). Explaining regional disparities in housing prices across German districts. *SSRN* Electronic Journal, (15199). https://doi.org/10.2139/ssrn.4114772

Brittin, J., Araz, O. M., Nam, Y., & Huang, T. T.-K. (2015). A system dynamics model to simulate sustainable interventions on

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chronic disease outcomes in an urban community. *Journal of Simulation, 9*(2), 140–155. https://doi.org/10.1057/jos.2014.16

Checkland, P. B. (1982). Book review: Systems thinking, Systems practice. *Engineering (London), •••*, 3.

Espinoza Garcia, J. C., & Alfandari, L. (2018). Robust location of new housing developments using a choice model. *Annals of Operations Research, 271*(2), 527–550. https://doi.org/10.1007/s10479-017-2750-6

Eurostat, 2023 House price index (2015 = 100) - annual data (2024). Available at: https://ec.europa.eu/eurostat/databrowser/view/prc_hpi_a/default/table?lang=en

Famuyibo, A. A., Duffy, A., & Strachan, P. (2012). Developing archetypes for domestic dwellings - An Irish case study. *Energy and Building, 50*, 150–157. https://doi.org/10.1016/j.enbuild.2012.03.033

Gibson, M., Thomson, H., Kearns, A., & Petticrew, M. (2011). Understanding the psychosocial impacts of housing type: Qualitative evidence from a housing and regeneration intervention. *Housing Studies, 26*(4), 555–573. https://doi.org/10.1080/02673037.2011.559724

Glynn, P. D., Chiavacci, S. J., Rhodes, C. R., Helgeson, J. F., Shapiro, C. D., & Straub, C. L. (2022). Value of Information: Exploring Behavioral and Social Factors. *Frontiers in Environmental Science, 10*(May), 805245. https://doi.org/10.3389/fenvs.2022.805245

Guo, B., Zhou, R., & Li, Y. (2021). Systemic research on owner participation in old residential community management from the perspective of identity - A case study of a typical old residential community in Xi'an, China. *Systemic Practice and Action Research, 34*(6), 607–634. https://doi.org/10.1007/s11213-020-09549-2

Harary, F., & Batell, M. F. (1981). What is a system? *Social Networks, 3*(1), 29–40. https://doi.org/10.1016/0378-8733(81)90003-4

Kauskale, L., Zvirgzdins, J., & Geipele, I. (2022). The real estate market and its influencing factors for sustainable real estate development: A case of Latvia. *Baltic Journal of Real Estate Economics and Construction Management, 10*(1), 171–199. https://doi.org/10.2478/bjreecm-2022-0012

Kidwai, A., & Saraph, A. (2016). Use of archetypal structures in urban dynamics. *Systemic Practice and Action Research, 29*(6), 583–595. https://doi.org/10.1007/s11213-016-9382-7

Leydesdorff, L. (2002). The communication turn in the theory of social systems. *Systems Research and Behavioral Science, 19*(2), 129–136. https://doi.org/10.1002/sres.453

Liu, Y., Zuo, J., Pan, M., Ge, Q., Chang, R., Feng, X., Fu, Y., & Dong, N. (2022). The incentive mechanism and decision-making behavior in the green building supply market: A tripartite evolutionary game analysis. *Building and Environment, 214*(February), 108903. Advance online publication. https://doi.org/10.1016/j.buildenv.2022.108903

Luo, W., Sandanayake, M., Hou, L., Tan, Y., & Zhang, G. (2022). A systematic review of green construction research using scientometrics methods. *Journal of Cleaner Production, 366*(July), 132710. https://doi.org/10.1016/j.jclepro.2022.132710

Mair, J., & Seelos, C. (2021). Organizations, social problems, and system change: Invigorating the third mandate of organizational research. *Organization Theory, 2*(4). Advance online publication. https://doi.org/10.1177/26317877211054858

Mmako, N. J., Capetola, T., & Henderson-Wilson, C. (2019). Sowing social inclusion for marginalised residents of a social housing development through a community garden. *Health Promotion Journal of Australia, 30*(3), 350–358. https://doi.org/10.1002/hpja.225 PMID:30536663

Ramskogler, P. (2015). Tracing the origins of the financial crisis. *OECD Journal: Financial Market Trends, 2014*(2), 47–61. https://doi.org/10.1787/fmt-2014-5js3dqmsl4br

Shuster, W. D., Dadio, S., Drohan, P., Losco, R., & Shaffer, J. (2014). Residential demolition and its impact on vacant lot hydrology: Implications for the management of stormwater and sewer system overflows. *Landscape and Urban Planning, 125*, 48–56. https://doi.org/10.1016/j.landurbplan.2014.02.003

Tarrazo, M. (2021). The talk about "the system" - Clarifying objective performance and subjective perceptions in our economic-political-social systems. *Journal of Education for Business, 96*(6), 387–401. https://doi.org/10.1080/08832323.2020.1842309

Torresin, S., Pernigotto, G., Cappelletti, F., & Gasparella, A. (2018). Combined effects of environmental factors on human perception and objective performance: A review of experimental laboratory works. *Indoor Air, 28*(4), 525–538. https://doi.org/10.1111/ina.12457 PMID:29468738

Tsai, C. H., & Brusilovsky, P. (2021). *The effects of controllability and explainability in a social recommender system, user modeling and user-adapted interaction*. Springer Netherlands., https://doi.org/10.1007/s11257-020-09281-5

Viskovatoff, A. (1999). Foundations of Niklas Luhmann's theory of social systems. *Philosophy of the Social Sciences, 29*(4), 481–516. https://doi.org/10.1177/004839319902900402

Whieldon, L., & Ashqar, H. I. (2022). Predicting residential property value: A comparison of multiple regression techniques. *SN Business & Economics, 2*(11), 178. Advance online publication. https://doi.org/10.1007/s43546-022-00358-4