

MANAGING INFORMATION PROCESSES IN REAL ESTATE INVESTMENT UNDER CONDITIONS OF DEMOGRAPHIC CHANGE

Ewald Andreas Nover

University of Library Studies and Information Technologies

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Abstract: *Demographic change presents a growing challenge for residential real estate investment, yet the literature offers limited insight into how demographic data are operationally embedded within the actual internal decision-making processes. This paper addresses that gap by investigating how demographic indicators are processed, interpreted, and applied in investment-related information systems. Drawing on fifteen expert interviews with firms from the German real estate sector, the study explores three inter-related dimensions: demographic data integration, analytical capacity of firms, and the analytical infrastructure. The findings basically confirm the perceived relevance of demographic information but reveal considerable variation in terms of its systematic use across the different firms. While some firms employ structured planning tools and advanced forecasting methods, others rely largely on knowledge gained from general experience or on relatively basic tools and methods for investment analysis. Key barriers include limited staff expertise, inconsistent data systems, and technological or other resource constraints. The research further shows that demographic data serve dual purposes: They are used both for a more socially oriented service alignment and for return-driven investment approaches.*

Keywords: *Demographic Change; Residential Real Estate; Information Processes; Analytical Capabilities*

INTRODUCTION

While the importance of demographic data in residential real estate investment is widely acknowledged (Alda, Hirschner 2016), the literature offers limited insight into how such data are concretely used within internal decision-making processes. As such, it remains unclear how demographic indicators are processed, interpreted, and applied within organizational information systems and investment routines; but also which organizational resources and capabilities are required for this task. It can be argued that this lack of detail constitutes a relevant research gap, which is particularly relevant in the context of demographic change (Krämer 2016; Schroven 2015).

This study addresses the research gap by investigating the role of demographic data in information processes related to residential real estate investment. Using data from expert interviews, a focus on three dimensions has been selected: data integration, analytical capacity, and digital infrastructure. The paper is structured as follows: Section 2 outlines the theoretical background, followed by Section 3, which presents the methodology, followed by empirical findings and a discussion. Finally, Section 5 concludes key results and implications.

LITERATURE REVIEW

This chapter provides the theoretical foundation for analyzing how demographic data are addressed within information processes in residential real estate investment. It is divided into two parts. Section 2.1 outlines the general role of information processes in real estate decision-making, focusing on data sources, analytical procedures, and the integration of digital tools. Section 2.2 builds on this foundation by examining the specific relevance of demographic data. It discusses how demographic trends such as aging, migration, and household singularization are integrated into location screening, market analysis or other analytical tools of real estate investment analysis.

Information Processes in Real Estate Investments

Information processes represent a foundational component of investment decision-making and have

become increasingly strategic in the context of residential real estate. Typically, such processes begin during the planning phase, where information is gathered systematically from internal and external sources, followed by stages of evaluation, decision, implementation, and post-investment monitoring (Becker, Peppmeier 2022). From a management perspective, information processes must be handled potentially across all organizational functions (Spindler 2022) in order to prevent risks and to optimize opportunities (Ertle-Straub 2019).

In real estate investment, these processes are formalized through real estate research, which provides market-relevant intelligence and supports investor decision-making through structured analysis. Real estate research serves as a critical input for strategic portfolio management, as it enables the anticipation of market developments, assessment of site-specific opportunities, and optimization of investment performance (Ertle-Straub 2019). Information management, in this sense, spans the entire investment lifecycle, which ranges from the identification of viable properties through financing and operation, and extends to exit strategies.

Lange (2019) mentions eight key subprocesses in the information processes that are relevant for real estate investments, each of which requires specific information flows. These include market and location analysis, alignment with investor objectives, tenant needs, development forecasting, project planning, business case development, assessment management reporting, and reassessment analysis of the property. These information loops provide a systematic foundation for aligning investment goals with operational action and can serve to enhance portfolio efficiency and strategic fit. However, the quality and relevance of the underlying data significantly influences the usefulness of information processes. Here, a fundamental distinction must be drawn between primary and secondary data (Brauer 2018). Secondary data, such as statistics from government agencies or market reports by consulting firms, are typically easier to obtain but may lack specificity or timeliness. Primary data, on the other hand, are gathered directly via surveys or observations and allow for tailored, high-resolution insights, albeit at higher cost and effort (Grimmer 2014). The decision to engage in primary research therefore depends on the adequacy of existing secondary information. Furthermore, a broad array of data sources informs residential real estate decisions, ranging from macroeconomic and demographic statistics to site-level documents and transaction data can be used. These include public registers (e.g., land ownership), real estate platforms (e.g., ImmobilienScout24), credit institution databases (e.g., Pfandbrief-bank transaction records), architectural data, energy performance certificates, and user preference surveys (Arnold 2017; Krüger, Rosdücher 2017; Scharmanski, Wiencke 2017). Here, the relevance of the data depends on the nature of the investment and whether it concerns development, acquisition, refurbishment, or a portfolio realignment.

Information gathering typically begins in the early project phases, such as during site selection or transaction due diligence (Brauer 2019; von Erdély 2022). In the case of revitalization or repurposing projects, the information needs may resemble those of new developments due to the substantial redesign involved (Kurzrock 2017). Continuous data collection also remains essential throughout the holding period and forms the basis for real estate controlling practices, such as performance monitoring, reporting, and portfolio optimization (Krüger, Rosdücher 2017). Typical metrics used for investment monitoring include vacancy rates, rental levels, tenant turnover, maintenance costs, and cash flow indicators. These are compiled and analyzed within asset management systems to support investor decisions regarding capital allocation, renovation timing, or divestment strategies. Increasingly, more advanced analytical tools are applied to interpret such data, including statistical models and digital dashboards (de Vor, de Groot 2011; Ho et al. 2021). Generally, the integration of digital technologies plays a central role in enhancing the efficiency and transparency of information flows. Enterprise software and facility management platforms enable real-time tracking of maintenance schedules, budget adherence, or compliance (Ehrenheim 2017; Lange 2019). These tools also bridge operational and financial perspectives, and allow for a broader management at the level of the operational asset but also with respect to strategic concerns. More recently, machine learning algorithms have emerged as valuable tools in property valuation and investment forecasting. Here, various methods and techniques can model complex relationships between property features, market trends, and demographic variables, thereby outperforming conventional appraisal methods in certain contexts (Ho et al. 2021; Pérez-Rave et al. 2019). These approaches are particularly useful for institutional investors managing large, diverse portfolios that require scalable and automated valuation solutions (Hjort et al. 2022; Steurer

et al. 2021). Demographic data can be integrated into these models to improve predictive accuracy and guide development planning (Ho et al. 2021; Rafiei, Adeli 2016).

Despite these advancements, several barriers limit the consistent and effective use of information processes in practice. Key challenges include incomplete or inconsistent data, legal and technical constraints on data access, and integration difficulties when combining disparate data sources (Ehrenheim 2017; Gehring, Gabriel 2022). Also, organizational and technological limitations can hinder progress as well. High implementation costs, limited digital literacy amongst staff, and poor interoperability between IT systems reduce the effectiveness of new information infrastructures (Oluwunmi, Agara 2023; Ullah, Sepasgozar 2018). For example, communication gaps between technical and non-technical personnel have been mentioned as a key constraint, particularly in cross-functional decision environments (Gehring, Gabriel 2022).

In response to these issues, several best practices have been proposed in the literature. These include the implementation of robust data governance frameworks, staff training programs in digital tools, the adoption of scalable open-source platforms, and the creation of interdisciplinary project teams (Huang 2022; Reinhartz-Berger et al. 2024). For example, an early involvement of end users in system designs and roll-out phases can improve acceptance and effectiveness.

Demographic Data in Information Processes within Real Estate

Demographic change in Germany constitutes a long-term structural trend with substantial implications for residential real estate markets. Current developments include population aging, singularization trends, regional and international migration but also a shift in housing preferences that can partly be explained by demographic changes (BAMF 2023; Waizenegger et al. 2020; Wilke 2019; Ziesemer et al. 2021). This in turn shapes demand patterns, location attractiveness and design requirements. For example, aging and declining household sizes are reinforcing the demand for compact, accessible, and flexible housing solutions (Marešová et al. 2015; Scharmanski, Wiencke 2017).

Generally, demographic data play a key role for the real estate investment process. At the macro level, such data is used in location screening, although it also plays a vital role at the micro level of the investment as well. Here, it can assess tenant structures, market capacity, and the fit between the unit and the relevant tenant preferences (Alda, Hirschner 2016; Scharmanski, Wiencke 2017; Schneider, Völker 2002). It is therefore used for market analysis as well as for the analysis of the functional use of the property (Alda, Hirschner 2016; Kilb, Weigold 2017). Here, general population trends basically translate into architectural and spatial planning decisions, which may include the development of multigenerational housing, accessible design features, or adaptable floor plans (Kurzrock 2017).

Given the role of demographic data so far with respect to location, market, and usage concepts, it can be stated that there is also an impact on economic feasibility assessments. As demand structures shift due to population changes, assumptions regarding occupancy, turnover, or operating costs are subject to change and must be adjusted accordingly. This in turn might impact revenue expectations or unit cost structures, thus cash flow projections and return metrics, which are used in economic feasibility assessments (Alda, Hirschner 2016; Farragher, California 2008). Beside that, there is a further potential impact on portfolio management as well, as data are assessed on their qualitative, strategic, and operational impact on the real estate portfolio (Brendgen, Pannwitz 2011; Lange 2019).

Therefore, although demographic variables are clearly recognized as investment-relevant across different types of analysis, there is no standardized framework for how this information should be processed, evaluated and included in the investment decision-making process. This gap highlights a key limitation in current practice, which is not yet adequately addressed. Also, the topic becomes even more relevant with the advent of the technological advances in data analysis that have been observed in the recent past (Ho et al. 2021).

RESEARCH METHODOLOGY

To explore how demographic data are managed within real estate firms, this study applied a qualitative methodology centered on expert interviews. This approach was chosen in the context of doctoral research

in order to gain insight into the design and the routines of internal decision structures and the role of information systems, while also considering the challenges and opportunities in the context of existing organizational capacities. With respect to the interviews, the core objective was to understand how demographic information are used in practice and how they are embedded into the data environments, analytical routines, and the decision-making logic.

For this purpose, a total of fifteen interviews were conducted with professionals from various segments of the residential property sector to provide for some variety in the sample. The sample includes firms of different sizes, geographical focuses, or business objectives. Participants were selected randomly and considered suitable if they had an industry affiliation and the corresponding experience in the market. The search for eligible interview partners was made via an industry list of German firms with contact being made directly with the firms after the selection. Interviews were carried out between December 2024 and February 2025 via telephone, using a semi-structured interview guide. The interview guide covered core themes related to the role of demographic data in the information processes for real estate investments. The analysis of the data was made via content analysis with transcripts of the interviews being reviewed, while thematic categories were addressed in order to obtain the sufficient insights. Themes specifically include (1) the integration of demographic variables in the decision-making processes, (2) the role of specialized personnel and analytical capabilities, and (3) the configuration or design of information systems.

FINDINGS/DISCUSSION

The interview findings are presented across three thematic domains: (1) the integration of demographic data into decision-making processes, (2) the availability and role of specialized personnel, and (3) the use of analytical tools and information systems. These themes correspond to the core assumptions of the empirical investigation.

Integration of Demographic Data into Decision-Making Processes

Across all firms interviewed, demographic data was generally recognized as a relevant determinant for investment-related planning and analysis. Specific influences such as age structures, household compositions, or migration flow impacts are thus considered important inputs for a better understanding of long-term future demand dynamics and location development potential. In this regard, the respondents emphasized the role of demographic information for such types of analysis, including the calculation of scenarios:

“[D]emographic data is especially relevant when calculating scenarios and identifying opportunities and risks.” (Interview#13)

The quote above can be taken as evidence for a structured analytical approach to data analysis. However, other participants described demographic data use as being implemented in a more informal manner based on localized knowledge or on prior experience:

“Our main sources are empirical values from previous projects.” (Interview#5)

Despite this recognition, the actual integration of demographic indicators into decision-making procedures varies. Some respondents have pointed to uncertainties, especially in the case of suddenly changing parameters:

“Demographic developments play an important role; however, accurate forecasts are often difficult because the parameters can change unexpectedly and rapidly. Migration, in particular, should be mentioned here, as we did not anticipate it in this form many years ago.” (Interview#4)

Additionally, the underlying purpose of using demographic data was reported to differ slightly

depending on the unique organizational focus. This focus can include a more demand-driven and service-oriented approach in providing relevant residential units to tenants but also a focus that is more directed towards investment risk management objectives.

Specialized Personnel and Analytical Capabilities

The second thematic focus concerned the availability of internal expertise for the analysis and interpretation of demographic information within a firm. Some interviewees amongst the larger firms or the institutional investors confirmed that dedicated personnel with data-related competencies are critical in terms of turning demographic insights into actionable planning parameters:

“Our research team plays a crucial role in identifying core parameters for economic viability.”
(Interview#1)

“[Market research] uses various methods to evaluate the demographic impacts on housing markets.” (Interview#13)

Nevertheless, other experts reported a reliance on experience-based knowledge and acknowledged that data expertise is generally lacking within their firms or remains underdeveloped:

“Market analyses are currently mainly experience-based. Building more data expertise in the future would be beneficial.” (Interview#3)

This is to be considered a limiting factor as well:

“Qualified staff is essential, but we often lack the resources for in-depth analysis.” (Interview#4)

Despite the constraints by the lack of qualified personnel, some interviewees described current efforts to strengthen internal capabilities through training and digital skill development:

“We see digitization as an opportunity for more efficient processes and are actively developing the relevant skills through training.” (Interview#6)

Overall, the findings for this theme support the assumption that human capital plays a central role in contributing to proper decision-making processes via demographic data analysis. Also, where analytical capacity is limited by organizational constraints and the lack of resources, the integration of demographic insights tends to be superficial or informal.

Use of Analytical Tools for Systematic Information Processes

The third thematic area covers the role of digital tools and analytical infrastructure with respect to the analysis of demographic data. Here, some of the experts reported on the use of forecasting models, planning software, or database systems to support investment analysis.

“We use advanced analytical tools models for market and portfolio analysis.” (Interview#1_Q11)

It was even mentioned that there is a use of complex methods in the realm of artificial intelligence that are mentioned in the literature (e.g. Ho et al. 2021) are selectively applied in order to obtain economic value from superior insights:

“In addition, we have been using AI-based approaches for some time now, particularly cluster analyses and predictive modelling, to detect changes in housing demand at an early stage. For example, we analyze large datasets on household structures, mobility, and income to identify regional growth markets. Furthermore, neural networks are employed to derive more accurate forecasts for rental and purchase price developments based on historical market data.” (Interview#15)

However, despite the identification of the existence of these sophisticated approaches, many firms indicated that their technological setup remains rather basic. Standard tools such as Excel, internal templates, or administrative datasets were commonly used especially by smaller firms that operate within a limited geographical range. This in turn clearly shows that, while the use of sophisticated methods of analysis becomes more available, there is also a rather wide spread in terms of sophistication and actual integration. Generally, the use of demographic data becomes more systematic, where advanced tools and digital workflows are available, but this condition is not yet met on an industry-wide basis.

Discussion

The empirical findings clearly provide evidence for an inherent analytical value of demographic data in residential real estate investment decisions. Across all interviews, demographic variables were thus acknowledged as important inputs for economic or risk assessment. However, the actual use of the data was observed to be very different across the firms. While several organizations reported on using demographic data within structured planning and forecasting routines, others still rely primarily on a rather experience-driven approach rather than on proper data analysis. This points towards a discrepancy across the firms concerning their analytical approach. Related to this, a dual function of demographic data was detected; as well as some firms using it in order to align the services with the needs of the tenants, while others are using it with a stronger focus on return objectives. It can thus be stated that the use of demographic data analysis varies not only in scope but also in purpose.

The findings have further confirmed that human capital in the form of analytical experience or capabilities assumes a decisive role in enabling data-based information processes. Here, firms with internal research departments or analytics capacity are better positioned to process demographic trends systematically. This supports the assumption that digital transformation in real estate investment is not only a technological challenge but also an organizational challenge that relies heavily on the role of resources. Regarding the use of sophisticated analytical tools, an equal divide between the firms was identified. Therefore, the adoption of such tools remains inconsistent. While some firms experiment with complex models, others continue to rely on traditional tools, e.g. by using spreadsheets for analysis. This finding hereby mirrors the finding already obtained for the role of staff qualification and analytical capability. Therefore, the findings are in line with the constraints that are mentioned in the literature, particularly in terms of staff qualifications and digital infrastructure, which serve as key barriers (Gehring, Gabriel 2022; Ullah, Sepasgozar 2018).

In summary, the results equally show the relevance of demographic information in residential real estate while also highlighting the gap in its actual use in practices. This has both theoretical and practical implications. Conceptually, it suggests a need to refine existing models of information processing in real estate under conditions of demographic change (particularly with respect to the needs and capabilities of different types of firms). Practically, it points to the importance of investing in analytical skills, IT infrastructure and related resources.

Concerning the limitations, it can be stated that the present study does not allow for an in-depth investor-type variation. Although differences between investor types are clearly visible, this difference was not systematically analyzed. Therefore, a more targeted research approach would be required to explore this issue in depth. Future research could particularly focus on typologies of investor behavior or the organizational maturity level in demographic data integration.

CONCLUSION

This paper has evaluated how demographic data are integrated and analyzed within information

processes in residential real estate investment firms based on the empirical evidence from expert interviews with industry representatives. It was shown that the actual use of demographic information for the purpose of decision-making in the residential real estate sector is in some part inconsistent and to a large extent shaped by organizational aims, resource constraints and corresponding capabilities.

The analysis was performed along three central themes. First, it was evaluated what general role demographic data assumed within the investment process. Second, the presence of qualified personnel was investigated. It was found that such presence significantly influences whether and how demographic information is used in the information processes of the firms, with smaller firms generally lacking necessary resources. Third, the state and role of analytical tools was evaluated regarding their potential for a systematic data use of demographic information. Here, a gap in the sophistication of the analytical approach was detected.

The findings therefore highlight a visible divide between the perceived importance of demographic information and their structural operationalization within the information systems of real estate firms. While some firms are characterized by a rather high proficiency in terms of raw analytical capability, others still rely on manual practices and implicit knowledge gained mostly from experience. This heterogeneity of firms has yet not been properly addressed in the literature and also provides practical implications towards the role of analytical capabilities, training, or the role of improvements in data infrastructure.

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УПРАВЛЕНИЕ НА ИНФОРМАЦИОННИТЕ ПРОЦЕСИ В ИНВЕСТИЦИИТЕ В НЕДВИЖИМИ ИМОТИ В УСЛОВИЯТА НА ДЕМОГРАФСКИ ПРОМЕНИ

Резюме: Демографските промени представляват все по-голямо предизвикателство за инвестициите в жилищни недвижими имоти, но литературата предлага ограничена информация за това как демографските данни се интегрират в реалните вътрешни процеси на вземане на решения. Настоящата статия запълва тази празнина, като проучва как демографските показатели се обработват, интерпретират и прилагат в информационните системи, свързани с инвестициите. Въз основа на 15 интервюта с експерти от сектора на недвижимите имоти в Германия проучването разглежда три взаимносвързани измерения: интегриране на демографските данни, аналитичен капацитет на фирмите и аналитична инфраструктура. Резултатите потвърждават основно възприеманата значимост на демографската информация, но разкриват значителни различия по отношение на нейното систематично използване в различните фирми. Докато някои фирми използват структурирани инструменти за планиране и усъвършенствани методи

за прогнозиране, други разчитат до голяма степен на знания, придобити от общия опит, или на относително основни инструменти и методи за инвестиционен анализ. Основните пречки включват ограничената експертиза на персонала, несъгласуваните системи за данни и технологичните или други ограничения на ресурсите. Проучването показва още, че демографските данни служат за две цели: те се използват както за по-социално ориентирано съгласуване на услугите, така и за подходи към инвестициите, насочени към възвръщаемост.

Ключови думи: *демографски промени; жилищни недвижими имоти; информационни процеси; аналитични способности*

Евалд Андреас Новер, докторант
Университет по библиотекознание и информационни технологии
E-mail: lux-gruppe@web.de