

FINANCIALIZATION OF THE HOUSING MARKET AND DEMOGRAPHIC CHALLENGES ON THE EXAMPLE OF VOIVODESHIP CAPITALS IN POLAND

Aleksandra Ostrowska¹, Anna Wichowska^{2*}

¹Department of Finance, University of Warmia and Mazury in Olsztyn, ul. Oczapowskiego 4, 10-720 Olsztyn, Poland, e-mail: aleksandra.ostrowska@uwm.edu.pl, ORCID: 0000-0001-5814-0530

²Department of Theory of Economics, University of Warmia and Mazury in Olsztyn, ul. Prawocheńskiego 9, 10-720 Olsztyn, Poland, e-mail: anna.wichowska@uwm.edu.pl, ORCID: 0000-0003-2862-4424

* Corresponding author

ARTICLE INFO	ABSTRACT
Keywords: financialization, real estate market, demographics, natural increase	This article examines the relationship between the financialization of the housing market and demographic processes of voivodeship capitals in Poland. The research is motivated by the growing role of financial mechanisms in shaping housing availability, prices, and investment patterns, influencing people's decisions about starting families and procreation. The study aimed to identify the relationship between the process of housing market financialization and the natural increase in the years 2011–2024 in 16 voivodeship capitals using panel econometric models. The dependent variable was natural increase per 1000 population, while the explanatory variables reflected key dimensions of housing market financialization. The results indicate that rising housing prices may lead to a decline in natural increase in Polish voivodeship capitals, a phenomenon that intensified after 2020. The supply of new housing supported a natural increase before the COVID-19 pandemic, but this relationship reversed in 2020–2024 amid rising prices, interest rate hikes, and increased investment demand. Demographic (control) variables behave as expected. The results suggest that the financialization of the housing market may contribute to urban depopulation. The added value of this article lies in linking the financialization of the housing market with demographic processes using panel econometric models.
JEL Classification: J11, R21, R23, R31	
Citation:	
Ostrowska, A. & Wichowska, A. (2026). Financialization of the housing market and demographic challenges on the example of voivodeship capitals in Poland. <i>Real Estate Management and Valuation</i> , 34(3), 33-43. https://doi.org/10.2478/remav-2026-0023	

1. Introduction

Housing needs are among the basic human needs (Parysek, 2022). One way to satisfy them is to purchase a home, making the housing market, of all types of real estate markets, the closest to society (Belej & Gwiazdzińska-Goraj, 2025). In recent years, residential real estate markets in various geographic regions have been subject to phenomena that have led to their financialization. This process is gaining increasing popularity among both public authorities and academics (Çelik, 2023). Financialization, in its essence, is a multidimensional process of political and economic transformation from industrial to financial profits, which began in the 1970s (Vanatta, 2024), originating in American corporations. It primarily involves the

penetration of financial market characteristics into the economy, such as short-termism, volatility, risk, and a focus on profit maximization. In this respect, it is also evident in the residential real estate market. According to Aalbers (2008), this is the most financialized sector in the economy. It is worth noting that this process impacts the market in various countries, regardless of their financial structures, social welfare systems, or housing market sizes (Dancygier & Wiedemann, 2025). This may be because housing construction is capital-intensive, and therefore its development has always been and continues to be dependent on finance. However, under conditions of financialization, this dependence intensifies (Aalbers, 2017).

The penetration of financial logic into the real estate market is conditioned by many interrelated factors,

stemming not only from the functioning of the financial sector but also from the specific nature of the real estate market, which is multidimensional and systemically conditioned (Radzewicz & Wiśniewski, 2011). At the same time, this market is susceptible to inadequate state policies and regulations introduced at the central and local government levels. The growing housing supply is still insufficient to meet the needs of average households (Martyniak, 2025). A lack of affordable housing may lead to overcrowding and housing poverty, which can be one of the factors explaining the relationship between the financialization of housing and low natural population growth (Ćwiek et al. 2024; Ćwiek et al., 2025).

In the financial sector, instruments such as mortgages and their securitization are developing, intensifying the process of financialization. The state is considered as a decisive actor, as changes in macroprudential, planning, and property rights regulations reduce the risk of financial investments in the local real estate market (Lapavitsas, 2013). Measures forcing financialization in the housing sector include, in particular, the lack of adequate support for real estate purchases. Solutions such as loan subsidies and down payment financing deepen this process by increasing demand for mortgages. Mortgage regulation in Poland can be divided into two historical periods. The first was associated with a liberal approach to lending, exemplified by the negative consequences of foreign currency loans. This was facilitated by relatively low interest rates and the example of the American economy, which led to the global financial crisis (Domańska et al., 2020). The second was the period following the global financial crisis in 2008, after which financial risks related to the housing market became the focal point of macroprudential regulations worldwide (Gil Garcia & Martínez López, 2023). Poland also saw a period of intensified credit regulation, including through Recommendation S of the Polish Financial Supervision Authority, which more strictly regulated foreign currency loans, the LTV ratio, and the maximum loan term. Despite these recommendations, the dynamics of both the number and value of mortgage loans granted are increasing. An exception was the period of rapid increase in the reference interest rate by the National Bank of Poland (NBP), from 0.50% in October 2021 to 6.75% in September 2022 (*Archive of Basic Interest Rates...*, 2025). Following Brzezicka et al. (2022), it can be observed that the Polish housing market, after the global financial crisis, was characterized by relatively low price cycle asymmetry compared to the American market, which the authors

attribute to cautious bank lending policies, stable income growth, and the strong position of the development sector, which was not forced to make sudden price reductions.

The process of financialization affects the housing market in various ways, shaping housing availability, ownership structure, and spatial policy. Generally, financialization leads to treating housing not as a place to live, but as an object of investment, speculation, and loan collateral (Fernandez & Aalbers, 2016; Dancygier & Wiedemann, 2025; Norris & Lawson, 2023). As Waldron and Wijburg (2025) point out, three interwoven research approaches can be distinguished regarding the effects of real estate market financialization: focusing on mortgage loans, including securitized mortgages, investment in rental housing, and financing urban construction. One manifestation of the financialization of the housing market is the need to finance property purchases with mortgage-backed loans, due to their high value and relatively low incomes. This obligation increases households' dependence on the banking sector.

Another context for financialization is the growing role of developers and other entities, as well as the involvement of foreign entities. Developers appeared in Poland after 1989 (Bryx et al., 2023). According to the National Bank of Poland (NBP, 2024) the total involvement of foreign investors in the Polish real estate market amounted to PLN 119.4 billion, comprising PLN 52.7 billion in shares and other forms of equity participation, and PLN 66.7 billion in loans to capital groups. In the residential sector, the financial industry has not only increased its role in the mortgage market, but also institutional investors are now directly involved in the purchase, ownership, and rental of homes. Real estate investment trusts (REITs), which emerged in the United States in the 1960s, gained popularity after the global financial crisis (Harrison & Butcher, 2025). Developers and REITs aim to maximize profits, which favors the concentration of investments in the largest cities. Investments in smaller cities tend to be less profitable. This results in uneven spatial development, i.e., an oversupply of housing in metropolitan areas and a shortage in peripheral areas.

A key consequence of financialization is the rise in real estate prices, a result of growing demand for housing. In many countries, real estate prices have risen faster than incomes, which, over time, has reduced housing affordability (Lima et al., 2023). This price increase is caused, among other things, by an increasing number of buyers purchasing properties for investment purposes rather than for personal use

(Benetton et al., 2022), which also leads to rising rents. Another cause lies in excessive mortgage lending. The literature emphasizes that financialization contributes to income inequality (Khatatbeh & Moosa, 2022; Lee & Siddique, 2022). This also has implications for the housing market, leading to inequalities in access to owner-occupied housing. Financialization has made housing costs more sensitive to mortgage policies, credit supply, and fluctuations in property prices, increasing inequality between income groups (Lima et al., 2023).

At the same time, the literature notes that the financialization of the housing market can influence the demographic dynamics of cities, including natural increase and internal migration. This is reflected in the life cycle of residents: acquiring real estate for one's own needs and those of one's family at a young age, and subsequent changes in the way the real estate market is used (in addition to the financialization process) also shape housing prices and the availability of housing in cities (Francke & Korevaar, 2025). In recent years, Poland has experienced depopulation, resulting in a systematic decline in its population – primarily due to natural population decline. Regional depopulation should not be reduced solely to demographic changes. It is a complex issue that goes beyond simply having "fewer people" in a given place (Hartt, 2019), and generates significant social, economic, and environmental impacts (Jelonek & Mazur, 2024). Depopulation is a common trend in European countries and post-industrial cities (Sahebgharani et al., 2024). Consequently, policies aimed at counteracting depopulation, particularly in rural areas, have recently garnered interest among researchers and policymakers (Cuadrado-Roura, 2023). Due to its multifaceted nature, the process of urban depopulation is studied from the perspective of various determinants, including the real estate market (Follain, 2011; Żróbek-Róžańska, 2019). In the context of urban depopulation and the mechanisms presented above, the financialization of the housing market is empirically associated with demographic changes observed in urban areas, which may be associated with population outflows from cities, reduce the availability of mortgages and apartments, lead to land being sold to developers, and thus limit the available urban land that could be designated for recreational and green areas. In the absence of income growth, this pattern may intensify.

It is worth emphasizing here that research on demographic processes rarely considers the context of

the financialization of the housing market. This constitutes a research gap and was also the motivation for this study. This research can contribute to the literature on the subject by linking the financialization of the housing market with the demographic state of cities. Its results may indicate theoretical connections between these processes, and on the other hand, provide insights into the development of the existing urban landscape.

2. Materials and methods

Econometric panel models were used to examine the relationship between selected manifestations of the financialization of the housing market and population processes in 16 voivodeship capitals in Poland. Voivodeship capitals in Poland are cities that serve as the administrative centers of the country's regions. In most of these cities, a declining population and a negative natural increase have been observed since 2020. The time-cross-sectional nature of the available statistical data necessitated this approach. The dependent variable was natural increase per 1000 population (Y). The explanatory variables included variables describing selected manifestations of housing market financialization, understood as indicators of increased investment-oriented and market-based activity in the housing sector which are directly or indirectly related to demographic processes:

- X_1 – dynamics of the mean transaction price of dwellings (primary and secondary markets),
- X_2 – dynamics of the number of dwellings completed for sale or rent,
- X_3 – dynamics of the number of developers,
- X_4 – dynamics of the number of transactions on the housing market.

These variables describe the process of financialization of the housing market, focusing on changes in demand, supply, and prices. The control variables were:

- X_5 – net migration per 1000 population,
- X_6 – number of marriages per 1000 population,
- X_7 – share of working-age population in the total population.

The above variables are demographic in nature and are most closely related to the dependent variable.

Annual statistical data from 2011 to 2024 were collected from the National Bank of Poland's (NBP) reports entitled "Reports on the situation on the residential and commercial real estate market in Poland." To ensure the robustness of the obtained results, various estimators were used: OLS (Ordinary

Least Squares method), FE (fixed-effects) and RE (random-effects). Furthermore, the research period was divided into two subperiods: 2011-2019 and 2020-2024, which were determined by the crises occurring in the global and Polish economies, including the COVID-19 pandemic and the escalation of the Russian-Ukrainian conflict. These crises affected the national

economy but were also visible at the regional level, including in voivodeship capitals. The calculations were performed using the GRETL software.

Table 1 presents the basic descriptive statistics of the variables and their expected direction of influence on the dependent variable.

Table 1

Descriptive statistics of the variables used in the study						
Variables	Unit	Mean	Std. dev.	Min	Max	Expected direction of influence
Dependent variable						
Y	-	-1.313	2.733	-10.000	4.200	
Independent variables						
X ₁	%	105.770	6.576	91.648	125.900	-
X ₂	%	2.102	1.943	-7.787	7.981	+
X ₃	%	4.634	14.734	-60.211	73.810	+
X ₄	%	8.503	35.671	-49.748	315.61	+
X ₅	-	0.020	2.903	-5.900	9.000	+
X ₆	-	4.678	0.580	3.200	6.200	+
X ₇	%	16.247	1.103	14.100	19.400	+

Source: own study.

As a result of conducting the Levin-Lin-Chu test for stationarity of the variables, it was possible to conclude that all variables exhibited stationary levels. The next step was to analyze the correlation between variables. For this purpose, the Pearson r linear correlation coefficient was used. According to Schober et al. (2018), a strong correlation exists when the correlation coefficient is 0.70 or higher. In no case did the obtained correlation coefficients exceed the limit values. Therefore, the variables were included in one model.

The following model was adopted for the OLS approach (Kufel, 2011):

$$y_{it} = x_{it}\beta + v_{it}, \quad (1)$$

where:

y_{it} – dependent variable,

x_{it} – independent variable (in general, the vector of independent variables),

β – vector of the N dimensions of the models' structural parameters,

v_{it} – total random error composed of the purely random part ε_{it} and individual effect u_{it} pertaining to the specific i-th unit of the panel ($v_{it} = \varepsilon_{it} + u_{it}$).

The model with fixed effects FE assumed the form:

$$y_{it} = x_{it}\beta + u_i + \varepsilon_{it} \quad (2)$$

Furthermore, the model with random effects RE looked as follows:

$$\hat{\beta}_{RE} = (X^T \Omega^{-1} X)^{-1} X^T \Omega^{-1} y, \quad (3)$$

where:

$\hat{\beta}_{RE}$ – generalized estimator of the least squares of structural parameters,

X – matrix of independent variables,

y – vector of dependent variables,

Ω – is a reversible matrix of variance and covariance of the total random error.

The validity of the models was assessed with the Wald, Breusch-Pagan and Hausman tests.

3. Results

3.1. Modelling results for 2011-2024

To ensure the robustness of the results, modeling was performed using the OLS estimator, incorporating both fixed and random effects. Next, due to the perceived shortcomings of the estimated models, robust HAC standard errors were imposed on the FE estimators. The modeling results for the entire study period, from 2011 to 2024, are presented in Table 2.

According to the Wald test results (p-value = 0.000 < 0.05), the hypothesis that the OLS model is appropriate should be rejected in favor of the alternative hypothesis that the fixed-effects model is more appropriate. The Breusch-Pagan test results (p-value = 0.000 < 0.05) indicated that the hypothesis that the OLS panel model is appropriate should be rejected in favor of the alternative hypothesis that the random-effects model is more appropriate. The Hausman test results (p-value = 0.005 < 0.05) indicated that the fixed-effects model is appropriate. After selecting the estimator, the model was assessed for cross-sectional

correlation, autocorrelation, and heteroscedasticity. The CD-Pesaran test results (p value = 0.000 < 0.05) indicated a problem with cross-sectional dependence. The results of the Wooldridge test (p -value = 0.00 < 0.05) indicated the presence of autocorrelation. The

results of the Wald test (p -value = 0.000 < 0.05) indicated a heteroscedasticity problem. Therefore, robust HAC standard errors were imposed on the FE estimator, and the model was re-estimated.

Table 2

Model estimation, dependent variable: Natural increase per 1000 population, 2011-2024					
Variable	OLS	FE	RE	FE robust HAC	VIF
Const.	-15.210*** (0.000)	1.460 (0.624)	-3.085 (0.277)	1.460 (0.683)	-
X ₁	-0.152*** (0.000)	-0.109*** (0.000)	-0.121*** (0.000)	-0.109*** (0.000)	1.537
X ₂	0.218*** (0.002)	0.175*** (0.002)	0.197*** (0.000)	0.175** (0.030)	1.529
X ₃	0.014* (0.062)	0.012** (0.033)	0.013** (0.026)	0.012** (0.044)	1.030
X ₄	-0.002 (0.574)	0.001 (0.629)	0.001 (0.834)	0.001 (0.501)	1.021
X ₅	0.182*** (0.000)	0.199*** (0.002)	0.215*** (0.000)	0.199* (0.067)	1.574
X ₆	1.451*** (0.000)	1.318*** (0.000)	1.265*** (0.000)	1.318*** (0.000)	1.082
X ₇	1.394*** (0.000)	0.131 (0.502)	0.502*** (0.004)	0.131 (0.638)	1.475
Number of observations	224	224	224	224	
F-Stat./LSDV F-Stat.	61.350 (0.000)	47.072 (0.000)	-	-	-
R ² / LSDV R ²	0.665	0.837	-	-	-
Adj. R ² / Within R ²	0.655	0.563	-	-	-
Wald test	-	14.188 (0.000)	-	-	-
Breusch-Pagan test	-	-	178.263 (0.000)	-	-
Hausman test	-	-	20.139 (0.005)	-	-
CD-Pesaran test	-	21.743 (0.000)	-	-	-
Wooldridge test	-	45.463 (0.000)	-	-	-
White test	-	13.715 (0.620)	-	-	-

Source: own study.

The results of the estimated model parameters for the entire study period showed, regardless of the estimator used, that dynamics of the mean transaction price of dwellings (primary and secondary markets) were significantly and negatively associated with the natural increase in the Parameters of voivodeship cities related to other variables describing the financialization of the housing market, i.e., dynamics of the number of dwellings completed for sale or rent, and the dynamics of the number of developers exhibited a statistically significant positive relationship with natural increase. However, the dynamics of the number of transactions on the housing market proved to be insignificant. Furthermore, all control variables were found to correlate positively and significantly with natural increase.

3.2. Modeling results for 2011-2019

A similar procedure was used for the entire study period (2011–2019, a period preceding the COVID-19 pandemic). The modelling results are presented in Table 3.

The interpretation of the tests is analogous to that for the entire research period described in the previous section. The results of the estimated parameters for the years 2011-2019 showed a statistically significant association between the dynamics of the mean transaction price of dwellings (primary and secondary markets) only for the OLS estimator. Regardless of the estimator used, the estimated relationship was negative. The dynamics of the number of dwellings completed for sale or rent were significant only for the OLS and FE estimators. The dynamics of the number of developers proved to be insignificant but were

characterized by a positive sign of the estimated parameter. However, the dynamics of the number of transactions on the housing market were significant only in the case of the model with robust standard errors. However, the parameter value was relatively low. In the case of control variables, statistically significant positive relationships were identified for the number of marriages per 1000 population and the share of working-age population in the total population. Net

migration per 1000 population displayed a positive association, reaching statistical significance only in the case of the OLS estimator.

3.3. Modeling results for 2020-2024

The modeling results for the period following the outbreak of the COVID-19 pandemic (2020-2024) are presented in Table 4.

Table 3

Model estimation, dependent variable: Natural increase per 1000 population, 2011-2019					
Variable	OLS	FE	RE	FE robust HAC	VIF
Const.	-25.004*** (0.000)	-7.963*** (0.000)	-10.636*** (0.000)	-7.963*** (0.001)	-
X ₁	-0.065*** (0.004)	-0.012 (0.254)	-0.019 (0.103)	-0.012 (0.360)	1.283
X ₂	0.388*** (0.000)	0.084 (0.119)	0.130** (0.023)	0.084 (0.133)	1.670
X ₃	0.003 (0.670)	0.003 (0.335)	0.003 (0.340)	0.003 (0.240)	1.056
X ₄	-0.001 (0.748)	0.001 (0.340)	0.001 (0.507)	0.001* (0.095)	1.029
X ₅	0.128*** (0.005)	0.025 (0.594)	0.043 (0.356)	0.025 (0.545)	1.749
X ₆	1.072*** (0.000)	0.612*** (0.000)	0.597*** (0.000)	0.612*** (0.007)	1.336
X ₇	1.557*** (0.000)	0.359*** (0.008)	0.563*** (0.000)	0.359** (0.012)	1.527
Number of observations	144	144	144	144	
F-Stat./LSDV F-Stat.	42.949 (0.000)	96.056 (0.000)	-	-	-
R ² / LSDV R ²	0.689	0.946	-	-	-
Adj. R ² / Within R ²	0.673	0.552	-	-	-
Wald test	-	38.326 (0.000)	-	-	-
Breusch-Pagan test	-	-	171.984 (0.000)	-	-
Hausman test	-	-	36.517 (0.005)	-	-
CD-Pesaran test	-	9.455 (0.000)	-	-	-
Wooldridge test	-	10.196 (0.006)	-	-	-
White test	-	86.506 (0.000)	-	-	-

Source: own study.

Table 4

Model estimation, dependent variable: Natural increase per 1000 population, 2020-2024					
Variable	OLS	FE	RE	FE robust HAC	VIF
Const.	-32.410*** (0.000)	1.040 (0.910)	-16.419*** (0.002)	-1.040 (0.885)	-
X ₁	-0.014 (0.734)	-0.053** (0.015)	-0.046** (0.050)	-0.053*** (0.002)	1.172
X ₂	-0.454*** (0.000)	-0.071 (0.297)	-0.225*** (0.001)	-0.071 (0.127)	1.321
X ₃	0.008 (0.535)	0.004 (0.492)	0.006 (0.374)	0.004 (0.454)	1.056
X ₄	-0.013* (0.088)	-0.013*** (0.001)	-0.013*** (0.001)	-0.013*** (0.000)	1.175
X ₅	0.044 (0.605)	-0.092 (0.407)	0.131 (0.167)	-0.092 (0.371)	2.063
X ₆	0.957***	-1.251***	-0.515*	-1.251***	1.356

	(0.001)	(0.000)	(0.075)	(0.000)	
X_7	1.618*** (0.000)	0.434 (0.437)	1.257*** (0.000)	0.434 (0.331)	1.697
Number of observations	88	88	88	88	
F-Stat./LSDV F-Stat.	27.006 (0.000)	55.159 (0.000)	-	-	-
R^2 / LSDV R^2	0.724	0.955	-	-	-
Adj. R^2 / Within R^2	0.697	0.480	-	-	-
Wald test	-	19.562 (0.000)	-	-	-
Breusch-Pagan test	-	-	52.412 (0.000)	-	-
Hausman test	-	-	35.311 (0.000)	-	-
CD-Pesaran test	-	2.288 (0.022)	-	-	-
Wooldridge test	-	0.516 (0.484)	-	-	-
White test	-	901.543 (0.000)	-	-	-

Source: own study.

The inferences based on the statistical test results for the period following the COVID-19 pandemic outbreak are similar to those for the previous subperiods. The estimated parameter results for 2020-2024 indicated that the dynamics of the mean transaction price of dwellings (primary and secondary markets) were significantly and negatively associated with the natural increase in voivodeship cities. The OLS estimator was an exception. The parameters determining the dynamics of the number of dwellings completed for sale or rent were characterized by a negative relationship, unlike in the previous subperiod. This may be due to a faster increase in housing prices. Despite their greater availability, rising prices did not allow for purchase. Furthermore, this period saw lower fertility rates, temporary migration of young people due to sanitary restrictions and the possibility of remote work, as well as a dynamic increase in interest rates, leading to higher mortgage costs and lower creditworthiness. In addition to the above, the escalation of the Russian-Ukrainian conflict led to the development of the rental property market, driven by increased migration. Another variable, the dynamics of the number of developers, showed no significant association with natural increase despite its positive sign. The dynamics of the number of transactions on the housing market proved to be a significant variable negatively associated with the natural increase in each model. The increase in the dynamics of the number of transactions on the housing market could have resulted from increased investment demand, which, while leading to higher housing prices, does not lead to a natural increase. Furthermore, control variables, such as the number of marriages per 1000 population and the share of working-age population in the total population, showed a significant positive association with natural increase. This suggests that demographic

factors have a significant influence on the natural increase. No significant relationship was observed in the case of net migration per 1000 population.

4. Discussion

Research shows that the financialization of the housing market is a significant factor influencing a natural increase in Poland's voivodeship cities. Among the analyzed variables, the rising dynamics of the mean transaction price of dwellings (primary and secondary markets) are the most significant negative determinant, resulting in a decline in natural increase. It has also been pointed out that the availability of rental housing is more dependent on supply trends and rental price fluctuations than on household income (Derkacz & Cehan, 2025). Pricing has become particularly important during the COVID-19 pandemic and the escalation of the Russian-Ukrainian conflict, which has led to an increase in real estate price dynamics. Despite expectations, real estate prices have not declined during the COVID-19 pandemic (Belej, 2021), and the displacement of millions of people from Ukraine to neighboring countries has caused a sudden increase in demand for housing in cities hosting refugees, resulting in higher rents and prices (Głuszak & Trojanek, 2025). The financialization of the housing market, by treating apartments as investment assets, leads to rising prices. In such circumstances, households often forgo or postpone childbearing due to the lack of stable housing conditions. Furthermore, households' economic security decreases due to the increasing burden on budgets from the increased expenses associated with purchasing, renting, and maintaining a home. The negative impact of rising housing prices on natural increase was also demonstrated by Dettling and Kearney (2014) and Liu et al. (2020).

An interesting observation is the change in the direction of the dynamics of the number of dwellings completed for sale or rent, from positive in 2011-2019 to negative in 2020-2024. Between 2011 and 2019, this relationship can be described as classical. During this period, the increase in housing supply had a positive impact on natural increase, which can be attributed to the growing availability of housing, the intensification of housing construction, and the relative financial stability of households. These results are consistent with those obtained by other authors, who indicate that reproductive decisions, especially for the first child, are dependent on good housing conditions (Kotowska-Wójcik, 2024).

The change in these trends between 2020 and 2024 resulted from the convergence of several simultaneous processes. First, the COVID-19 pandemic led to a decline in fertility, which was associated with increased economic uncertainty, worsening living conditions, and the postponement of decisions to have children. Second, despite the increased supply of new apartments, the real availability of housing for families was limited due to the dynamic price increases and the sharp increase in interest rates in 2021-2022 by the National Bank of Poland. Housing supply began to increasingly reflect investment demand rather than the housing needs of the urban population. The increase in the number of units designated for the institutional rental market, combined with the investment nature of some transactions, contributed to the fact that the increase in supply did not translate into improved housing conditions for families, and therefore did not support an increase in fertility. War migration was also a significant factor between 2022 and 2024. The influx of people from Ukraine increased rental demand and contributed to a further decline in housing availability. However, in the short term, it did not raise the natural increase, which is consistent with previous findings on migrants' reproductive behavior. As a result, the increase in housing supply during this period may have been correlated with a deterioration in the situation of local families, and therefore with a negative impact on natural increase. To fully understand the interdependencies that influenced the residential real estate market in the five years analyzed, it is also necessary to mention the "First Apartment" program and, along with it, the "Safe 2% Mortgage" program introduced at the end of 2022. Some researchers estimate that these programs increased housing prices by several to a dozen or so percent in large cities (Szelągowska, 2024).

Another variable describing the financialization of

the housing market, the dynamics of the number of developers, did not demonstrate a significant impact on natural increase in either subperiod. However, the dynamics of the number of transactions on the housing market proved significant. They negatively affected the natural increase in the 2020-2024 subperiod, which may be related to its impact on real estate price dynamics. These factors can be considered indirect, as they have no significant impact on the natural increase.

Among the control variables, net migration per 1000 population demonstrated a positive impact on natural increase, particularly in the long term, confirming the role of population inflow as a factor rejuvenating the demographic structure of cities. In turn, the number of marriages per 1000 population and the share of working-age population in the total population strengthen natural increase, which is consistent with basic demographic mechanisms.

Based on the conducted research, recommendations were formulated for housing policy that consider possible solutions to limit the financialization of the housing market. As Alexandri and Janoschka (2025) point out, this is a dynamic process, dependent on the way various actors interact and mutually define power relations in housing matters. First, if the reason for the financialization of the housing market is the increase in speculative demand for housing, it is important to limit it by introducing regulations for developers and entities owning multiple investment apartments. As Podlińska and Bogusz (2025) point out, citing the National Bank of Poland (NBP), in 2017, at least 30% of the demand for apartments on the primary market in Poland was investment demand. Second, it is crucial to develop affordable housing, such as municipal housing. Third, it is advisable to support individuals purchasing their first apartment.

It has been noted that limited housing availability and rising household costs may indirectly influence childbearing decisions, thereby contributing to a decline in the natural increase, particularly in the largest cities. It should be emphasized, however, that implementing various measures is often ineffective or impossible. As Koszel et al. (2025) demonstrated in their research, the demand-side policy instruments implemented in Poland between 2008 and 2023 enabled households that otherwise would not have had such an opportunity to purchase housing. Similarly, Podlińska and Bogusz (2025) note that the effectiveness of housing support programs is contingent upon the phase of the business cycle and structural supply constraints.

In the context of demographic research, this means that measures to improve housing availability should be designed to minimize the risk of further price increases, which could negatively impact decisions to have children. Therefore, actions are important not only on the demand side but also on the supply side of the real estate market. Maintaining or lowering price levels is also challenging, as increasing the attractiveness of a given location through urban spatial policy instruments enhances the quality of life, thereby accelerating real estate demand and price increases (Cellmer et al., 2024). Moreover, as Aalbers (2017) points out, in some cases, states are more interested in supporting mortgage markets than in directly supporting property owners, developers, and investors in housing construction, at the expense of tenants. This is possible by enabling the use of instruments such as securitization, including loans, and facilitating access to the real estate market for funds through so-called REITs, popular in Western countries (Gil García & Martínez López, 2023).

Despite varying intentions, the solutions employed produce the same long-term effect: an increase in residential property prices. It should also be emphasized that this is not always caused by government action. A case in point is the recent years in the Polish economy, which saw a rapid acceleration in inflation due to external factors, which subsequently translated into an eleven-fold increase in official interest rates by the National Bank of Poland. This led to higher interest rates on loans as well as higher loan installments, and reduced the creditworthiness of potential borrowers (Nowak, 2024).

5. Conclusions

The conducted research confirmed that associations between selected manifestations of housing market financialization and demographic processes, particularly natural increase, exist. However, the strength and direction of this relationship change over time, depending on the socioeconomic context. Throughout the study period, the dynamics of the mean transaction price of dwellings (primary and secondary markets) were consistently and significantly associated with a declining natural increase in voivodeship cities. Variables reflecting investment supply, such as the dynamics of the number of dwellings completed for sale or rent and the change in the number of enterprises in property developers, were generally positively associated, although their

significance varied between estimators.

In the first subperiod (2011–2019), the positive relationship of the dynamics of the number of dwellings completed for sale or rent and the dynamics of the number of developers was weaker and not as statistically significant. In the second sub-period (2020–2024), the negative association of prices remained strong, and the direction of the relationship of housing supply reversed, likely reflecting rapid price growth, lower fertility, migration, and higher borrowing costs. During this period, the dynamics of the number of transactions on the housing market were also significantly and negatively associated, suggesting that the increase in investment activity did not translate into improved demographic conditions. The significant, positive association of demographic factors, i.e. the number of marriages per 1000 population and share of working-age population in the total population on the natural increase, remains a consistent finding across all analyses. At the same time, net migration per 1000 population played a limited and unstable role.

The results indicate that, among the variables analyzed, rising housing prices are the most persistent and strongest variable associated with lower natural increase in voivodeship cities, suggesting that public authorities – both central and local – should treat housing policy aimed at stabilizing prices as an element of demographic policy. At the same time, the shift in the relationship of housing supply after 2020 shows that construction intensification – when combined with investment demand and rising borrowing costs for purchasing housing stock – should also be considered important. In turn, efforts made by public authorities to improve the availability of financing for housing purchases in an environment of inelastic supply lead to price increases, which may further undermine reproductive decisions. The demographic situation may be exacerbated – in addition to rising housing prices – by macroeconomic factors such as inflation, interest rate increases, and rising costs of living, which reduce creditworthiness and households' willingness to expand their families, further fostering financialization and urban depopulation.

The conducted research had its limitations. One of these is the use of a limited set of explanatory variables. Future research could expand this set of variables to include additional factors, such as income, unemployment rates, and variables that describe the state of the natural environment. Another direction for future research is to assess the impact of the financialization of the housing market on other

demographic variables, such as net migration or the number of marriages. It would also be advisable to divide the studied cities into those experiencing depopulation and those experiencing population growth. Another approach is to use dynamic panel models that incorporate lagged variables: the dependent variable and the explanatory variable. It is also advisable to conduct surveys among young adults to identify the preferred form of assistance for purchasing a home, as exemplified by the study by Kim and Jang (2025) conducted in South Korea.

References

- Aalbers, M. B. (2008). The financialization of home and the mortgage market crisis. *Competition & Change*, 12(2), 148–166. [The Financialization of Home and the Mortgage Market Crisis - Manuel B. Aalbers, 2008](https://doi.org/10.1080/10439860802328633)
- Aalbers, M. B. (2017). The variegated financialization of housing. *International Journal of Urban and Regional Research*, 41(4), 542–554. <https://doi.org/10.1111/1468-2427.12522>
- Alexandri, G., & Janoschka, M. (2025). Local housing policies and corporate social financial logics: Insights from the financialization of housing in Barcelona. *Housing. Theory and Society*, 42(1), 41–59. <https://doi.org/10.1080/14036096.2024.2328633>
- Alzain, E., Alshebami, A. S., Aldhyani, T. H., & Alsubari, S. N. (2022). Application of artificial intelligence for predicting real estate prices: The case of Saudi Arabia. *Electronics (Basel)*, 11(21), 3448. <https://doi.org/10.3390/electronics11213448>
- Archiwum podstawowych stóp procentowych NBP od 1998. (2025). Retrieved from <https://nbp.pl/podstawowe-stopy-procentowe-archiwum/>
- Belej, M. (2021). Housing price forecasting in selected Polish cities during the COVID-19 pandemic. *Geomatics and Environmental Engineering*, 15(4), 59–80. <https://doi.org/10.7494/geom.2021.15.4.59>
- Belej, M., & Gwiazdzińska-Goraj, M. (2025). Quantitative and spatial aspects of the real estate markets in the Warmian-Masurian Voivodeship, Poland. *Real Estate Management and Valuation*, 33(4), 1–14. <https://doi.org/10.2478/remav-2025-0031>
- Benetton, M., Bracke, P., Cocco, J. F., & Garbarino, N. (2022). Housing consumption and investment: Evidence from shared equity mortgages. *Review of Financial Studies*, 35(8), 3525–3573. <https://doi.org/10.1093/rfs/hhab119>
- Bryx, M., Rudzka, I., & Sobiera, J. J. (2023). The housing market in Poland during the COVID-19 pandemic. *Archives of Civil Engineering*, 69(4), 393–411. <https://doi.org/10.24425/ace.2023.147666>
- Brzezicka, J., Łaszek, J., Olszewski, K., & Wisniewski, R. (2022). The missing asymmetry in the Polish house price cycle: An analysis of the behaviour of house prices in 17 major cities. *Journal of Housing and the Built Environment*, 37(2), 1029–1056. <https://doi.org/10.1007/s10901-021-09861-w>
- Çelik, Ö. (2023). The roles of the state in the financialisation of housing in Turkey. *Housing Studies*, 38(6), 1006–1026. <https://doi.org/10.1080/02673037.2021.1928003>
- Cellmer, R., Belej, M., & Trojanek, R. (2024). Housing prices and points of interest in three Polish cities. *Journal of Housing and the Built Environment*, 39(3), 1509–1540. <https://doi.org/10.1007/s10901-024-10124-7>
- Cuadrado-Roura, J. R. (2023). Population imbalances in Europe. Urban concentration versus rural depopulation. *Regional Science Policy & Practice*, 15(4), 713–716. <https://doi.org/10.1111/rsp3.12670>
- Ćwiek, M., Sadko, M., & Ulman, P. (2025). *Sytuacja mieszkaniowa w Polsce i innych krajach europejskich*. Uniwersytet Ekonomiczny w Krakowie.
- Ćwiek, M., Ulman, P., & Sadko, M. (2024). Evaluation of housing conditions in Europe using the TOPSIS method. *Ekonomista*, 3, 275–298. <https://doi.org/10.52335/ekon/189393>
- Dancygier, R., & Wiedemann, A. (2024). The financialization of housing and its political consequences. *American Journal of Political Science*, 69, 1354–1373. <https://doi.org/10.1111/ajps.12928>
- Derkacz, A. J., & Cohen, V. (2025). Housing rental availability index: A tool for addressing supply-demand challenges in rental markets. *International Journal of Strategic Property Management*, 29(6), 437–448. <https://doi.org/10.3846/ijspm.2025.25136>
- Detting, L. J., & Kearney, M. S. (2014). House prices and birth rates: The impact of the real estate market on the decision to have a baby. *Journal of Public Economics*, 110, 82–100. <https://doi.org/10.1016/j.jpubeco.2013.09.009>
- Domańska, A., Kucharska-Stasiak, E., Miklaszewska, A., Złoty, M., & Żelazowski, K. (2020). *Kierunki zmian instytucjonalnych na rynkach nieruchomości (Directions of institutional change in real estate markets)*. Wydawnictwo Uniwersytetu Łódzkiego.
- Fernandez, R., & Aalbers, M. B. (2016). Financialization and housing: Between globalization and varieties of capitalism. *Competition & Change*, 20(2), 71–88. <https://doi.org/10.1177/1024529415623916>
- Follain, J. R. (2011). A study of real estate markets in declining cities. *Research Institute for Housing America Research Paper*, 1101. Retrieved from https://www.mba.org/docs/default-source/research---riha-reports/10296_research_riha_shrinkingcities_report.pdf?sfvrsn=5b4dbcca_1
- Francke, M., & Korevaar, M. (2025). Baby booms and asset booms: Demographic change and the housing market. *The Journal of Finance*, 80(5), 3021–3056. <https://doi.org/10.1111/jofi.13480>
- Gil García, J., Martínez López, M. A. (2023). State-led actions reigniting the financialization of housing in Spain. *Housing, theory and society*, 40(1), 1–21. <https://doi.org/10.1080/14036096.2021.2013316>
- Głuszak, M., & Trojanek, R. (2025). War in Ukraine, the refugee crisis, and the Polish housing market. *Housing Studies*, 40(5), 1043–1065. <https://doi.org/10.1080/02673037.2024.2334822>
- Harrison, K., & Butcher, S. (2025). Financialization, affordable housing and urban governance: A spatio-temporal analysis of four South African REITs. *Urban Geography*, 46(9), 2109–2134. <https://doi.org/10.1080/02723638.2025.2486995>
- Hart, M. (2019). The prevalence of prosperous shrinking cities. *Annals of the American Association of Geographers*, 109(5), 1651–1670. <https://doi.org/10.1080/24694452.2019.1580132>
- Jelonek, M., & Mazur, S. (2024). Depopulation as a long-term policy problem: From dilemmas to strategies. *Horyzonty Polityki*, 15(51), 287–306. <https://doi.org/10.35765/hp.2522>
- Khatatbeh, I. N., & Moosa, I. A. (2022). Financialization and income inequality: An extreme bounds analysis. *The Journal of International Trade & Economic Development*, 31(5), 692–707. <https://doi.org/10.1080/09638199.2021.2005668>
- Kim J. Y., & Jang, M. (2025). Evaluating housing policy effects on childbirth intentions in South Korea: Preferences, benefits, and policy implications. *Population, Space and Place*, 31(4), e70036. <https://doi.org/10.1002/psp.70036>
- Koszel, M., Mazurczak, A., & Strączkowski, Ł. (2025). Effects of the implementation of selected housing policy instruments in Poland in 2008–2023. *Zeszyty Naukowe Politechniki Śląskiej. Seria Organizacji i Zarządzanie*, 216, 207–224. <https://doi.org/10.29119/1641-3466.2025.216.14>

- Kotowska-Wójcik, O. (2024). Uwarunkowania decyzji prokreacyjnych o pierwszym dziecku i kolejnych (Determinants of procreative decision about first child and the next ones). *Roczniki Nauk Społecznych*, 52(2), 7–26. <https://doi.org/10.18290/rns2024.0023>
- Kufel, T. (2011). *Ekometria: rozwiązywanie problemów z wykorzystaniem programu GRETl (Econometrics: Problem Solving with GRETl)*. Wydawnictwo Naukowe PWN.
- Lapavistas, C. (2013). *Profiting without Producing: How Finance Exploits Us All*. Verso Books.
- Lee, K. K., & Siddique, M. A. B. (2022). Financialization and income inequality: An empirical analysis. In *International Income Inequality* (pp. 49–73). Routledge, <https://doi.org/10.4324/9781003329084-3>
- Lima, V., Hearne, R., & Murphy, M. P. (2023). Housing financialisation and the creation of homelessness in Ireland. *Housing Studies*, 38(9), 1695–1718. <https://doi.org/10.1080/02673037.2022.2042493>
- Liu, J., Xing, C., & Zhang, Q. (2020). House price, fertility rates and reproductive intentions. *China Economic Review*, 62, 101496. <https://doi.org/10.1016/j.chieco.2020.101496>
- Martyniak, M. (2025). Problems of the real estate market – assessment of government programs for financial support for the purchase of residential real estate. *Scientific Papers of Silesian University of Technology. Organization and Management Series*, 228, 347–357. <https://doi.org/10.29119/1641-3466.2025.228.20>
- Norris, M., & Lawson, J. (2023). Tools to tame the financialisation of housing. *New Political Economy*, 28(3), 363–379. <https://doi.org/10.1080/13563467.2022.2126447>
- Nowak, K. A. (2024). Miejska polityka mieszkaniowa a rola rynku w zaspokajaniu potrzeb mieszkaniowych (The urban housing policy and the role of the residential market in meeting housing needs). *Polityka i Społeczeństwo*, 22(1), 274–296. <https://doi.org/10.15584/polispol.2024.1.18>
- Parysek, J. J. (2022). Tu rośnie dom, tam rośnie dom, z godziny na godzinę... (A house grows here, a house grows there, hour by hour...). *Prace i Studia Geograficzne*, 67(2), 149–154.
- Podlińska, O., & Bogusz, M. (2025). Effectiveness of housing policy in Poland: The impact of public interventions in a macroeconomic context. *Acta Scientiarum Polonorum. Oeconomia*, 24(3), 31–45. <https://doi.org/10.22630/ASPE.2025.24.3.11>
- Radzewicz, A., & Wiśniewski, R. (2011). Niepewność rynku nieruchomości (The uncertainty of real estate market). *Studia i Materiały Towarzystwa Naukowego Nieruchomości*, 19(1), 47–57.
- Sahebgharani, A., Wiśniewski, S., Borowska-Stefańska, M., Kowalski, M., & Mokoei, K. (2024). Analyzing the effect of depopulation on the spatial structure of the city of Łódź, Poland: Development and application of an integrated land use and transportation model. *Habitat International*, 143, 102992. <https://doi.org/10.1016/j.habitatint.2023.102992>
- Schober, P., Boer, C., & Schwarte, L. A. (2018). Correlation coefficients: Appropriate use and interpretation. *Anesthesia and Analgesia*, 126(5), 1763–1768. <https://doi.org/10.1213/ANE.0000000000002864>
PMID:29481436
- Swianiewicz, P. (2024). Depopulation In Rural Areas of Central and Eastern Europe and its Consequences. Proposed Research Agenda. *Географіку Позгляду. Geographical Reviews*, 56-57, 23–34. <https://doi.org/10.37658/GR2456-57023s>
- Szelągowska, A. (2024). Bezpieczny kredyt 2% oraz konto mieszkaniowe jako nowe instrumenty polityki mieszkaniowej w Polsce (2% Safe Mortgage and Home Savings Account as new housing policy instruments in Poland). *Studia BAS*, 76(4), 55–84. <https://doi.org/10.31268/StudiaBAS.2023.30>
- Vanatta, S. H. (2024). The financialization of US public pension funds, 1945–1974. *Review of Social Economy*, 82(2), 261–293. <https://doi.org/10.1080/00346764.2023.2270458>
- Waldron, R. & Wijburg, G. (2026) Housing precarity and the financialization of renting. In A. Friendly and A.P Pimentel Walker (Eds.) *The Handbook of Precarious Housing*, Routledge.
- Żróbek-Różańska, A. (2019). Depopulation of cities and housing decisions of University Graduates. *Real Estate Management and Valuation*, 27(4), 105–113. <https://doi.org/10.2478/remav-2019-0040>