

SUMMARY

The dissertation examines the relationship between urban environmental quality, particularly air quality, and the functioning of the residential real estate market in Poland. Environmental conditions constitute an important component of living standards in large urban areas and may influence not only the well-being of residents but also the economic decisions of households. Due to its strong connection with location and surrounding conditions, the residential property market provides an appropriate framework for analysing the economic effects of environmental factors.

The main objective of the dissertation was to empirically assess the impact of changes in air pollution concentration levels on the functioning of residential real estate markets. The analysis focused on two key dimensions of market activity: transaction prices of dwellings and the number of transactions concluded on both the primary and secondary housing markets. The study covered three Polish agglomerations – Gdańsk, Kraków, and Warsaw – which are characterised by some of the highest residential property prices in the country while simultaneously differing in their environmental conditions. The analysis was conducted for the period 2010–2022, allowing the identification of relationships over a relatively long-time horizon.

The theoretical framework of the dissertation is based on classical demand–supply relationships in real estate markets, supplemented by concepts derived from environmental economics, ecological economics, and sustainable development. In the empirical part of the study, a sequential analytical approach was applied, combining cluster analysis, principal component analysis, and Generalised Regression Models (GRM). This methodological framework enabled the identification of complex relationships between air pollution levels and both housing prices and transaction activity, including interactions and differences between market segments.

The results confirm the existence of relationships between environmental factors and the functioning of residential real estate markets. At the same time, the character and intensity of these relationships were found to vary between the analysed agglomerations and market segments. In Gdańsk, the influence of environmental factors was primarily reflected in changes in transaction volumes, without a significant effect on housing prices. In Kraków, air pollution affected both prices and transaction activity, with nitrogen dioxide (NO₂) playing a particularly important role. The most complex pattern of relationships was observed in Warsaw, where changes in air quality were associated with both price reactions and variations in the number of transactions.

Based on the empirical findings, three mechanisms through which air quality affects residential real estate markets were identified: an economic mechanism related to the reflection of environmental conditions in housing prices; an urban mechanism in which certain pollutants indirectly indicate locational attributes and the intensity of urban functions; and a behavioural mechanism related to how environmental conditions are perceived by market participants. The verification of research hypotheses confirmed the importance of environmental factors in shaping both housing prices and transaction activity, although the scale and nature of these relationships differed across the examined agglomerations.

The dissertation contributes to research on real estate markets by integrating economic and environmental perspectives in the analysis of market processes. The applied methodological approach extends traditional studies based on hedonic models by enabling the identification of more complex and non-linear relationships between environmental factors and residential property markets. The results also highlight the growing importance of environmental quality as a factor differentiating local housing markets, which may have important implications for urban policy and spatial planning.

Keywords: residential real estate market, urban environmental quality, air quality, air pollution, housing transaction prices, transaction activity, environmental economics, ecological economics, sustainable development, generalized regression models (GRM), principal component analysis (PCA), cluster analysis.