# INVESTIFICATION IN THE HOUSING MARKET: EXPLORATORY STUDY IN SANTIAGO DE CHILE.

INVESTIFICATION EN EL MERCADO DE LA VIVIENDA: ESTUDIO EXPLORATORIO EN SANTIAGO DE CHILE .

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El presente estudio aborda el fenómeno de la *investificación* en el mercado de arriendo del Gran Santiago. Para ello se utiliza un enfoque metodológico cuantitativo por regresiones geográficamente ponderadas. A través de la recopilación y análisis de datos de transacciones y de indicadores urbanos, se exploran los patrones de localización de inversiones residenciales con relación a funciones urbanas específicas a nivel de zonas censales. El análisis revela que la proximidad a instituciones de educación superior, la estabilidad en los precios de arriendo y la presencia de personas mayores son factores determinantes en la selección de propiedades para inversión. Estos hallazgos evidencian la transformación del paisaje urbano como espacios de renta para el capital y destaca la creciente segmentación socioespacial, subrayando así la necesidad de regulaciones que atiendan las implicancias del *investification* en la dinámica urbana del Gran Santiago.

**Palabras clave:** *investification*, arriendo, vivienda, Santiago de Chile, renta

This study uses a quantitative methodological approach with geographically weighted regressions to address the phenomenon of investification in the Greater Santiago rental market. Using the collection and analysis of transaction data and urban indicators, the location patterns of residential investments are explored for specific urban functions at the census tract level. The analysis reveals that proximity to higher education institutions, stability in rental prices, and the presence of older adults are determining factors in the selection of investment properties. These findings evidence the transformation of the urban landscape as rental spaces for capital and highlight the growing socio-spatial segmentation, thus underlining the need for regulations that address the implications of investification in the urban dynamics of Greater Santiago.

**Keywords:** investification, rent, rental, housing, Santiago de Chile, rent.

# I. INTRODUCTION

The current Chilean housing model, despite supposedly successful policies, has not seen substantial changes over time and has strong similarities with the one seen in the dictatorship (Ducci, 1997; Greene & Lawner, 2022; Rodríguez & Sugranyes, 2005; Vergara-Perucich et al., 2020). In this sense, 38.5% of families still live in camps. This problem might be due to high rental costs (TECHO, 2023), with Greater Santiago having the highest vulnerability (Fuentes et al., 2020; Link et al., 2019), although it is evident that the housing shortage leads many to settle in camps since they do not have enough resources for other alternatives.

In this context, it is imperative to understand the underlying dynamics behind this situation since, in a privatized housing market, price is decisive in accessing housing in Chile (Mau, 2023). This link between price and access becomes clearer still when one considers that housing costs are rising faster than wages, generating a significant disparity, which, combined with the lack of transparency in the real estate sector (Vergara-Perucich et al. (2023), generates a favorable context for tacit price collusion (Vargas, 2016).

Another critical aspect of access to housing is the remarkable 70% increase in households in marginal neighborhoods. This phenomenon is attributed to several factors, such as migration, educational barriers, and economic factors (Vergara-Perucich, 2022b). As a result, it is clear to all that the housing crisis in Chile requires urgent solutions. Hence, there is a need to review the relationship between ownership and housing as a right (Hermida et al., 2018; IEUT, 2018; Vergara-Perucich & Nuñez, 2019).

Another aspect, the "investification" phenomenon proposed by Hulse and Reynolds (2018), analyzes how investors buy up housing in low-income urban areas to profit from the housing needs of less affluent classes, displacing households with fewer resources. In Chile, this strategy is known as "cash cows," which consists of buying inexpensive properties to rent them continuously and, in this way, capitalize and valorize the assets (Yaluff, 2016). This trend, which real estate agencies have promoted on social networks (López Morales & Orozco Ramos, 2019), is evidence of a little-studied social problem in the country.

Amid the housing complexities and the lack of studies on rentals in Chile, this article explores "investification" in Greater Santiago using advanced statistical techniques. A geographically weighted regression identifies factors such as proximity to universities and rental values that influence investification. The findings not only expand upon understanding of the phenomenon but offer insights into housing and regulation policies that seek to enrich the debate on urban studies (Hulse & Reynolds, 2018; López et al., 2019; Yaluff, 2016).

# II. THEORETICAL FRAMEWORK

**Critical characterization of the chilean real estate market**

According to a recent study conducted by Alberto Hurtado University (2017), the security of housing tenure is a priority for Chileans. This has been strongly supported by policies that favor homeownership (Navarrete & Navarrete, 2016), leading to 62.9% of families owning or acquiring a home, while only 22% rent (Ministry of Social Development and Family, 2021).

After the 2008 crisis, credit regulations tightened (Harvey, 2012), housing prices rose, and real estate sales fell precipitously. Cummings and Di Pasquale (1997) argue that Chilean politics generates spatial distortions that benefit the richest in the rental market since the real estate market is oriented more toward profitability than housing provision. In addition, due to the constant demand and structural deficit (Vergara-Perucich, 2021), the market allows prices to be established due to poor competitiveness (Vargas, 2016).

Households allocate 56% of their income to rent, transport, and food, exceeding financial recommendations (Vergara-Perucich, 2019). Between 2009 and 2015, the households with the highest income derived from renting increased by a significant 22.98% (Vergara-Perucich & Aguirre, 2020). However, the literature warns about the growing difficulty in the Chilean housing market regarding the challenges of renting in terms of income and long-term sustainability (Herrera & López, 2021).

In this context, rental market challenges fall within stability and sustainability. In this vein, Pakhomova and Novikov (2019) mention problems in private-private relations, while Nthite (2005) highlights risks associated with income volatility and tenant variability. Contrary to the common belief of financial security offered by property investment, renting for income does not always guarantee stability. Safeguard measures often generate resistance, and according to the UN (2015), rent controls can discourage investment. Allen et al. (2009) find no evidence that an increase in supply reduces prices, while Appelbaum and Gilderbloom (1983) question the impact on supply and prices by deregulating land use. These

| Variable | Inclusion Criterion | Source of justification |
|---|---|---|
| Older people | Older people need more affordable spaces to live in life-long rental models after retiring. | Bates et al. (2020) |
| Universities and higher education institutions | People looking to live near where they spend much of their daily life. | Wilkinson & Greenhalgh (2022) |
| Established health centers and shops | People looking to live near where they spend much of their daily life. | Zhan et al. (2023) |
| Educational centers | Households with children who are looking for some proximity to quality educational centers. | Kuroda (2022) |
| International immigrants | People who come to live in a nation with no property and their only formal alternative is to rent. | Sharpe (2019) & Saiz (2007) |
| Public transport stations | Proximity to mass transport means to central spaces, with emphasis on metro typology. | Lin & Chung (2017). & Morawetz & Klaiber (2022). & Efthymiou, D., & Antoniou, C. (2015). |
| Rental prices in the sector | Attraction value of real estate capital investment and for those looking for rents with high capital gains. | Vergara-Perucich & Aguirre-Nuñez (2020) |
| Clustering and overcrowding | The strategy of reducing expenses by sharing with other people, households, or overcrowding a housing unit. | Bogolaski et al. (2021) & Toro et al. (2017) & Margarit Segura et al. (2022) |

**Table 1.** Inclusion criterion of variables using the theoretical framework to develop statistical exploration and modeling. Source: Preparation by the authors.

findings raise the need to explore alternative solutions, an aspect little investigated in the Chilean context.

In Latin America, real estate markets face the challenge of having insufficient political and legal support for rental housing, prioritizing ownership over this (Blanco et al., 2014; Pomeroy & Godbout, 2011). This situation has resulted in an underdeveloped rental market, with limited financing and a lack of security for tenants (Ruiz, 2018). However, renting can satisfy diverse housing needs (Blanco et al., 2014) since financial capital plays a crucial role in housing (Aalbers, 2019; Farha, 2017). Linking financial capital with financing has exacerbated a crisis of tenure security (Rolnik, 2017), leaving tenants vulnerable to the interests of landlords focused on profitability.

Several studies have analyzed the relationship between rental profitability and socio-spatial factors in Chile. In Bates et al. (2020), it is suggested that, with aging, people migrate from their properties to renting smaller size and lower-quality alternatives. On the other hand, Wilkinson and Greenhalgh (2022) emphasize that the increase in university enrollment tends to boost rental markets close to such educational institutions. Along the same lines, research conducted in China and Japan has identified that proximity to health centers, shops, and schools influences rental prices (Zhan et al., 2023; Kuroda, 2022). In addition, proximity to public transport stations also affects rental prices (Efthymiou & Antoniou, 2015; Lin & Chung, 2017; Morawetz & Klaiber, 2022). Regarding the impact of migration on prices, research results show a mixed influence (Sharpe, 2019; Saiz, 2007). In this way, it is evident that all these variables are key factors for making location-based real estate investment decisions.

At a national level, it has been identified that the rental price in an area is fundamental for successful real estate

investment (Vergara-Perucich & Aguirre-Nunez, 2020), as well as strategies that seek proximity to central urban areas, such as overcrowding or clustering (Bogolaski et al., 2021; Margarit Segura et al., 2022; Toro et al., 2017). In Chile, "clustering" refers to multiple households in a dwelling or additional people joining a family nucleus.

To summarize, Table 1 shows the variables of the study based on the literature reviewed.

In Chile, where free, deregulated competition governs social norms (McCawley, 2012), individualism prevails. The purchasing power of individuals defines the socioeconomic structure of neighborhoods, promoting financialization and prioritizing the commercial value of housing over its utility (Santana-Rivas, 2020). This impacts the perception of security, with private property essential to face a risky neoliberal financial environment (Brenner et al., 2012).

## III. CASE STUDY

The study focuses on Greater Santiago, a city of 7 and a half million inhabitants, home to much of the Chilean population (National Statistics Institute, 2018). There are 34 communes, socioeconomically segregated by purchasing power, with autonomy in governance and resource management, which determines an ideal urban space to explore the contradictions of urban development in contexts of high socio-spatial inequality (Agostini et al., 2016; Figueroa et al., 2021). The context of Santiago, as the centrality of Chile's power, is added to in that it is the city that concentrates the most significant amount of real estate and financial activity in the country, along with the urban space with the largest aggregate housing deficit in the nation.

## IV. METHODOLOGY

According to Hulse and Reynolds (2018), "investificated" refers to a property part of an owner's real estate investment portfolio. With this definition, this study categorizes housing investors as those who own three or more homes. The data collection was carried out using three sources. The first is the Santiago Land Registrar's Office, with information collected by InCiti SpA. This company has exclusive and detailed access to data on housing transactions, providing details about the type and the sale values. This way, buyers with three or more homes between 2009 and 2019 were identified.
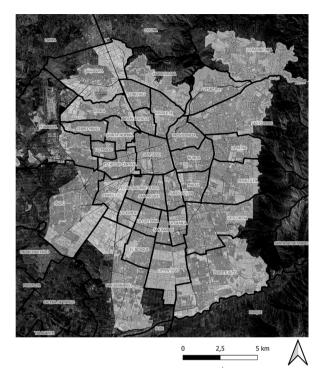


**Figure 1.** Greater Santiago. Source: Preparation by the authors with data from the National Institute of Statistics 2018.

The second source consisted of a set of properties offered for rent in 2019 through three real estate platforms: económicos.cl, portalinmobiliario.cl, and toctoc.com. This evaluates the ability of residents to pay the rental rate and the gap between this and the sale price. It also highlights the capital gains associated with investing in homes intended for rental, as it is assumed that people who buy three or more homes are looking for profitability, not residence. Based on this premise, individuals with "investification" characteristics were identified by their ID, resulting in, of the 49,914 transactions, 9,987 specific cases were located with owners who own three or more homes in 1,213 census tracts out of a total of 1,885 in the Metropolitan region.

Finally, the third data source was the CASEN 2017 survey, taking information that allowed calculating the average household income according to education by commune, which is related to urban uses and services, as shown in Table 2. Finally, these data were obtained from the walkability study in Greater Santiago (Correa-Parra et al., 2020) and are based on the matrix in Table 1.

The resulting model will identify sectors conducive to new investification processes based on current urban projects, summarized by census tract and commune. The data will be analyzed by a multiscale geographically weighted

regression using the MGWR software (Oshan et al., 2019), which analyzes how the relationship between a response variable and explanatory variables varies geographically. This technique models relationships at different scales, allowing variability in the relationship by geographical areas. The models are adjusted using optimization, selecting ideal coefficients for each area. The mathematical formula of MGWR is as follows:

$$Y_i = \beta_0(x_i) + \beta_{i1}(x_{i1})X_{i1} + \beta_2(x_i)X_{i2} + ... + \beta_k(x_i)X_{ik} + \varepsilon_i$$

Where Yi is the observed value of the response variable in i; β0, β1, ..., βk are regression coefficients; Xi1, Xi2, ..., Xik are values observed at point i; εi is the random error in i, and xi are geographical coordinates of i. In MGWR, the coefficients β0, β1, ..., βk are local functions of xi. Instead of global coefficients, MGWR estimates local coefficients for each point. Finally, a spatial Kernel function is used to assign weights to points based on distance.

## V. RESULTS

After carrying out the data systematization stage in the analysis geographical matrix, the results indicate the presence of housing concentrations intended for investment in each census area. Their visual representation can be seen in Figure 2, where the intensity of the blue reflects the magnitude of the grouping of investification cases. A higher intensity of the color indicates a more significant concentration of such cases.

A more detailed analysis allows identifying the trend where the investification cases tend to be concentrated along the north-south axis of the city, formed by Avenida Independencia, San Diego, and Gran Avenida José Miguel Carrera. It is important to note that Metro Lines 2 and 3 are also located along this axis, which is a structuring transport reference. Another significant group of areas with investification is located around pericentral communes, within the Américo Vespucio ring road, which can also be seen in Figure 2.

Similarly, the patterns observed in Figure 2 do not suggest interactions between the urban economy, access to transportation, and residential preferences of different socioeconomic groups. However, areas with high investification near the metro lines raise the possibility of a correlation between transport accessibility and the perceived value of properties. In turn, this could influence the displacement of certain socio-economic groups and attract others. The study was conducted using MGWR to review the statistical weight of these spatial relationships.

| Item | Values |
|---|---|
| Type of modeling | Gaussian |
| Number of observations | 1635 |
| Dependent variable | Cases of investification by census area |
| Number of co-variants | 11 |
| Covariants | Number of older people |
| | Proximity to universities |
| | Proximity to health centers |
| | Proximity to education centers |
| | Number of immigrants |
| | Number of clusters |
| | Number of overcrowded |
| | Proximity to metro stations |
| | Rental price (UF/m2) |
| | Proximity to street markets or supermarkets |

**Table 2.** Descriptive summary of the dataset used for the MGWR model. Source: Preparation by the authors.
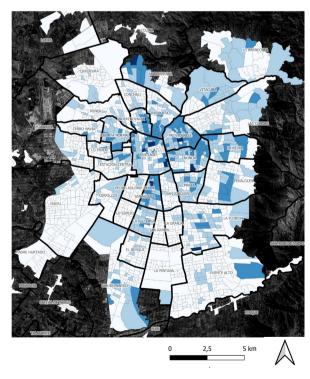


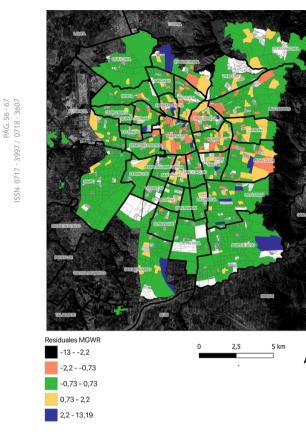**Figure 2.** Concentration of investification cases in Greater Santiago. Source: Preparation by the authors

**Figure 3.** Residuals of the multiscale geographically weighted regression model. Source: Preparation by the authors.

| Tests | Global regression | Geographically weighted regression | Comparative variation |
|---|---|---|---|
| Residuals of the sum of the squares | 938,689 | 765,754 | 18.42% |
| Log-likelihood | -1866.323 | -1699.86 | 8.92% |
| Aikaike criterion | 3754.646 | 3495.364 | 6.91% |
| R2 | 0.426 | 0.532 | 24.88% |
| R2 adjusted | 0.422 | 0.518 | 22.75% |

**Table 3.** Comparative table of statistical results between a global regression and a geographically weighted regression with the model's data. Source: Preparation by the authors

| Variables | Mean Beta | Standard error | P-value (average) | T-statistic (average) |
|---|---|---|---|---|
| Interception | 0.021 | 0.245 | 0.216819377 | 0.205794612 |
| Proximity to universities*** | 0.433 | 0.002 | 7.645E-103 | 23.23671032 |
| Rental price (UF/m2)** | -0.178 | 0.011 | 3.54681E-13 | -7.725542281 |
| Number of older people** | 0.136 | 0.012 | 1.03202E-06 | 5.322046247 |
| Proximity to health centers* | 0.125 | 0.036 | 0.002289052 | 4.76068731 |
| Number of clusters* | -0.113 | 0.007 | 7.14996E-05 | -4.066670417 |
| Number of immigrants* | 0.056 | 0.007 | 0.016817447 | 2.476286388 |
| Proximity to metro stations | 0.038 | 0.003 | 0.083879771 | 1.74504804 |
| Number of overcrowded | 0.083 | 0.14 | 0.14532245 | 1.685832768 |
| Proximity to street markets or supermarkets | -0.044 | 0.004 | 0.106232192 | -1.635595853 |
| Proximity to education centers | -0.005 | 0.014 | 0.665875336 | -0.187710246 |

**Table 4.** Results of multiscale geographically weighted regression. Source: Preparation by the authors

Table 3 exclusively compiles the census areas organized by communes with the highest concentrations of investification cases. It provides detailed information, including the number of areas, number of investificated buildings, average household income, average rental price, the income-to-rent ratio, dominant socioeconomic group, presence of "clustering", number of inhabitants, and presence of international migrants. A potential interconnection between investification and the socioeconomic dynamics of Greater Santiago is highlighted.

In addition, Table 3 compares the results of a global regression and another geographically weighted regression. The geographically weighted regression shows a lower sum of squared residuals (765,754 vs. 938,689), a higher log-likelihood (-1699.86 vs. -1866.323), a lower Aikaike criterion (3495.364 vs. 3754.646), and higher adjusted R2 and R2 values (0.532/0.518 vs. 0.426/0.422). This indicates that the geographically weighted model provides a better fit and explanation of the data.
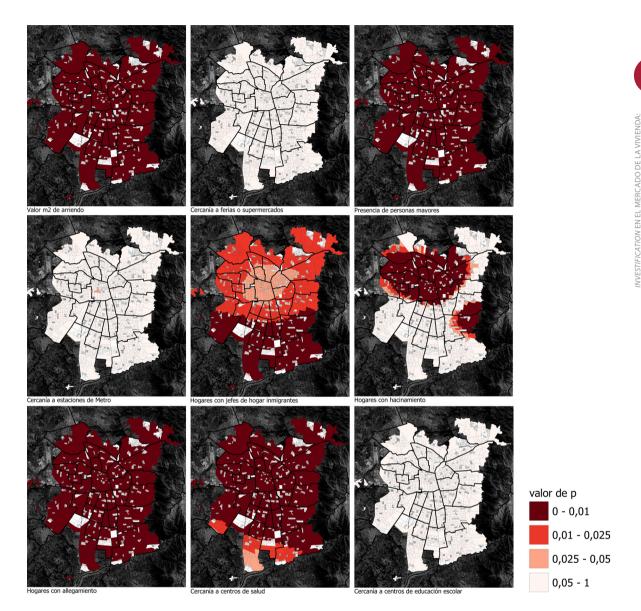
**Figure 4.** Representations of p-values for the statistical relationship between research cases and variables analyzed in the MGWR model. Source: Preparation by the authors.

Table 4 shows the results of the multiscale geographically weighted regression, including coefficients (Beta), standard error, p-value, and T-statistic. Among the results, the variables "Proximity to universities," with a positive Beta of 0.433, which indicates a positive correlation with investification, and "Rental price (UF/m2)", whose Beta is -0.178, which shows a negative correlation, stand out. Other variables, such as "Number of older people," "Proximity to health centers," and "Number of immigrants," have positive significant coefficients, while "Number of clusters" is negative. As for the variables such as "Proximity to metro stations," "Number of overcrowded," and "Proximity

to street markets or supermarkets," no statistical significance was observed in their coefficients.

The geographically weighted regression's ability to fine-tune the metric interpretation, in contrast to the global regression, highlights the spatial heterogeneity typical of Greater Santiago, which is reflected in the variability of the local responses of the variables examined. Therefore, when formulating urban planning interventions, it is essential to consider this multiscale character. Thus, the policies developed based on these findings should be adaptive, recognizing the particularities of each area and avoiding

generalized solutions that do not consider spatial specificities.

In another aspect, Figure 3 illustrates the statistical significance of the model in much of the analyzed city. In general, the spaces with high residual values (those that are not green) are attributed to the low presence of investification cases, which is the variable to be explained. This was an expected result in some of these census tracts, as it underlines the importance of geographical variability in the interpretation of MGWR modeling results. In this sense, this mapping of residuals already suggests key areas for interpreting results.

Concerning Figure 4, the statistical weights of the variables are presented, measured spatially by their p-value. The darker areas on the maps indicate areas with greater statistical significance in Santiago, especially for variables such as the rental value per m2 and the presence of older people and households with clusters, evidencing a remarkable significance in extensive parts of the city. In this context, the application of the MGWR model is relevant. However, some variables, such as proximity to street markets, supermarkets, and educational centers, do not show consistent significance throughout the metropolis. These patterns of significance offer crucial insights for interpreting the results and their application in urban policies and decisions.

In summary, the study reveals specific geographical patterns in Santiago linked to diverse socioeconomic and urban variables. The areas with the highest statistical significance, represented by the darkest colors, show areas where the variables have a stronger relationship with the phenomenon studied. In particular, variables such as the rental value per m2 highlight the influence of the real estate market in certain areas. Likewise, the significant presence of older people in certain sectors may affect urban design and service planning. In addition, the significant importance of households with clusters highlights socioeconomic tensions and disparities in access to housing. These results are fundamental to guide urban policies and address the specific needs of different areas of Santiago.

## VI. DISCUSSION

In this study, a socio-spatial characterization of the investification process in Santiago was carried out by analyzing census tracts and statistical variables. The analysis confirmed the existence of investification and its relationship with high rental values, aligning with the theories of Hulse and Reynolds for Australia. Among the main influences for this phenomenon is the location of higher education centers,



**Figure 5.** Investification case ranges and rental price variances of each indexed census area. Source: Preparation by the authors

which suggests that investors prefer university areas and that these areas attract complementary urban functions. The rental price is the second most important covariant, validating studies on rent and housing vulnerability, which is related to the increase of migrant households in camps, as the presence of immigrants is another significant covariant. Future qualitative research could explore the location of immigrants in investificated areas.

In the framework of the study on investification made by Hulse and Reynolds in Australia, some negligence of investors was observed regarding the spatial and housing quality of the purchased homes. In the case of Chile, this situation could be even more drastic considering the deregulation of the housing market. Namely, the existence of nano-apartments, as housing units of less than 20 m2 have been called, at a high price, could be explained by the presence of the investification phenomenon since it is possible that those who buy these homes do not live in them, but use them only to invest and extract income from lower-income households.

In areas with a high incidence of investification, a stabilization of the rental value can be seen. According to what is shown in Table 4, in a range of 7 to 99 cases of investification, the variability of the rental price decreases. On the other hand, the investification arises in response to an increased demand for renting, driven by the increase in the immigrant population and the rise in housing prices compared to family incomes. This could lead to a greater concentration of properties in the

hands of high-income investors, generating impacts on housing security for middle-income sectors or those who do not have access to credit.

The graph in Figure 5 reinforces the discussion on investification in Santiago, as it reflects a statistically relevant relationship between the presence of investification and stability in rental prices. The areas with more investification cases (7 to 99) show a lower variance in the rental price, which could be interpreted as stabilization or uniformity in prices. This is consistent with the idea that investification, as a phenomenon linked to real estate investment, seeks to stabilize and maximize returns. However, this stabilization does not necessarily mean that renting is affordable; in fact, the demand for renting is boosted by the increase in immigrants and housing prices compared to family income. This situation can favor owners with high incomes, as it would allow them to acquire multiple properties, while the middle sectors or those without access to credit face difficulties securing housing. This dynamic reinforces the need for more inclusive and equitable housing policies to counteract the adverse effects of investification.

## VII. CONCLUSIONS

The objective of this article was to provide results that arise from the methodological proposal on the investification phenomenon by Hulse and Reynolds (2018). After performing the analysis and obtaining the results, its empirical applicability has been demonstrated in Chile. During this work, adaptations have been made using data and variables that are easy to find in Chile and allow replicability. In this sense, the characterization of Santiago in this interpretative framework of the rental housing market indicates that there is an investification process that deserves the expert world's attention to review how to cope with its potential social consequences. Therefore, possible future research can focus on comparing the spatial-specific effects between the cases of Greater Santiago and Sydney, the case behind the theoretical approach mentioned. Likewise, there are no studies in the literature that link the presence of higher education institutions and investors who buy housing to rent in Greater Santiago, which opens a specific research space.

Other studies can also be made from these results. On the one hand, it seems valuable to review the relationship between international immigration and housing rental prices, with special emphasis on the typological aspects against the demographic variables of such migration,

to identify whether the available rental space for these migrants allows them to live following the parameters established in the international human rights treaties that Chile has signed. Another research possibility could be looking closer at the location patterns of these homes in the city, based on daily mobility, to generate an approximation from the dynamics of people flows in the city.

On the other hand, the role of higher education institutions in this process opens a new panorama of study. Traditionally seen as drivers of local development, these centers may inadvertently be contributing to real estate speculation and the displacement of low-income residents. It is essential, then, to review urban and housing policies concerning these urban functions, looking for ways to ensure that their presence benefits the surrounding communities equitably and sustainably.

Finally, the relevance of the investification process in Santiago lies not only in its identification but also in its social and urban implications. While investification may initially be seen as a simple market dynamic, its effects on a city's socio-spatial structure can be profound. As specific sectors become more desirable for investment, original residents may find themselves displaced or face increasing economic barriers to staying in their communities. This can lead to a more marked urban segmentation, where areas of high investification become inaccessible enclaves for the majority, altering the social cohesion and diversity that characterizes vibrant metropolises.

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