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Homeownership and Business Development

Master's thesis

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Abstract

This paper examines the relationship between homeownership rates and entrepreneurial activity at the level of administrative districts of municipalities with extended powers (ORP) in the Czech Republic. Based on a combination of spatial data from OpenStreetMap, demographic data from the 2011 census, and geographic data from ArcČR, it tests the hypothesis that higher homeownership rates may limit the emergence of new businesses in the spirit of the NIMBY theory. The results of the regression analyses do not indicate a systematic relationship but point to spatial differences that deserve further research.

Declaration

I declare that I have independently prepared the thesis on the topic of Homeownership and business development under the supervision of Assoc. Prof. Ing. Štěpán Mikula, Ph.D. and have cited all literary and other professional sources used in accordance with legal regulations, internal regulations of Masaryk University and internal acts of the management of Masaryk University and the Faculty of Economics and Administration of MU.

Brno March 1, 2025 .....

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Glossary

ORP	– Municipalities with Extended Jurisdiction (Czech: Obce s rozšířenou působností)
NIMBY	- Not In My Backyard
OSM	- OpenStreetMap
SLDB	- Population and Housing Census (Czech: Sčítání lidu, domů, bytů)
CZSO	- Czech Statistical Office
Q1 / Q4	- First / Fourth Quartet (used in temporal business data)
EPSG	- European Petroleum Survey Group (Coordinate Reference System Code)
HC1	- Heteroskedasticity – Consistent Standard Errors (Type 1)

1 Introduction

Entrepreneurship is one of the key factors of regional and economic development. The emergence of new companies, the development of small and medium-sized enterprises and innovative activities are often considered indicators of a healthy and dynamic business environment. Entrepreneurship creates new jobs, supports the diversification of the local economy and contributes to strengthening social cohesion. From the perspective of local government, entrepreneurial activity is an important factor that affects not only tax revenues and employment, but also urban development and the viability of cities and municipalities.

However, in recent years, topics related to obstacles to growth have increasingly appeared in discussions on the support of entrepreneurship and regional development. In addition to the usual factors such as bureaucracy, insufficient infrastructure or difficult access to finance, attention is also starting to turn to cultural and social aspects. One of the phenomena that can indirectly limit the development of entrepreneurial activities is the so-called "Not in my backyard" (NIMBY) effect, i.e. the attitude of residents who support a general form of development but reject it in the immediate vicinity of their residence.

In the literature, owner-occupier housing is often associated with a tendency to strive to maintain the status quo. Property owners have often invested significant resources and their motivation to protect the value of their property may be reflected in a negative attitude towards new projects that may disrupt the existing residential character of the neighbourhood, increase traffic congestion or bring new actors to the location. The NIMBY effect has so far been studied mainly in connection with the construction of infrastructure, social housing or environmentally risky facilities. However, its application in the field of business has not yet been sufficiently explored.

This work is motivated by the hypothesis that a higher share of owner-occupied housing in a given area may be associated with lower entrepreneurial activity precisely because of the greater resistance of residents to change. Such a relationship could result from cultural and economic motives associated with living on their property: owners often prefer stability, are more sensitive to changes in their surroundings and become active actors in local politics. Such a situation can slow the

emergence of new companies, hinder changes in the spatial plan or complicate business plans within the construction management framework.

This work's basic research question is: Does the level of owner-occupied housing affect entrepreneurial activity in Czech municipalities? The aim is to determine whether a statistically demonstrable relationship exists between the share of people living on their own property and the level of entrepreneurial dynamism measured by the share of newly established businesses. The spatial dimension of this relationship is also an important aspect since it is assumed that the relationship may not be homogeneous across the entire country.

This work brings several advantages. First, it links the concept of the NIMBY effect with economic indicators of entrepreneurial activity, a topic that has not yet been explored in the Czech academic environment. Second, it develops the application of spatial analysis and the combination of data from open geographic sources (OpenStreetMap) with official statistical data (SLDB 2011, ArcČR). Third, it relies on robust econometric models that verify the validity of the relationships under different conditions and in different spatial configurations.

The analytical part of the work is based on data for ORP (municipalities with extended jurisdiction), which are medium-sized territorial units that combine sufficient spatial resolution with data availability. The spatial resolution allows for identifying the general trend and possible local deviations across regions or types of municipalities. The combination of numerical and cartographic outputs provides a comprehensive picture of how the relationship between housing and entrepreneurship can manifest in the Czech environment.

Although the analysis relates to a single point in time (2011), its methodological procedure is easily replicable and can be extended to include time-dynamic changes. This work's conclusions can serve as a starting point for urban policies that seek a balance between the stability of residential neighborhoods and the support of the business environment. At the same time, they open up space for a deeper reflection on the role of ownership and local involvement of residents in urban development.

2 Literature Review

2.1 NIMBY Effect Theory

Home ownership has long been seen as one of the key pillars of individual economic stability and social embeddedness. Traditionally, the promotion of home ownership has been seen as having a positive impact on community development, greater civic engagement and overall economic prosperity. This narrative has been supported by public policy in many countries, including post-communist states such as the Czech Republic. However, a growing body of empirical research over the last two decades has begun to challenge this assumption, particularly in relation to entrepreneurial dynamism, labour mobility and territorial development.

In particular, the relationship between home ownership and entrepreneurial activity has attracted the attention of economists, urban planners and political scientists. Preliminary evidence suggests that home ownership may act as a double-edged sword: on the one hand it provides financial security, but on the other it creates obligations that may reduce the willingness to take additional risks, such as starting a business. This chapter focuses on an analysis of the literature on the socio-economic consequences of home ownership, with an emphasis on its impact on entrepreneurial activity and spatial dynamics, with a particular focus on the "not in my backyard" (NIMBY) theory.

One of the most cited studies on this topic is that of Bracke, Hil-ber and Silva (2012), which uses longitudinal data from the British Household Panel Survey (BHPS) to examine the relationship between home ownership decisions and subsequent entrepreneurial behaviour. The authors find that home ownership reduces the likelihood of starting a business by about 20-25%, with this effect being more pronounced for those with a mortgage (Bracke et al. 2012). The conclusion is interpreted in terms of portfolio theory: investing in real estate significantly reduces disposable capital and the incentive to take additional risks.

This hypothesis was further developed by these authors in a subsequent paper (2013), which presents a formal model of career choice that integrates housing and entrepreneurial decisions. The model predicts that high mortgage debt increases risk aversion, which in turn reduces

the likelihood of starting a business, especially in industries with high uncertainty (Bracke et al. 2013).

Similar conclusions are reached by Overman (2012), who also challenges the popular notion that rising house prices stimulate entrepreneurship through higher mortgage values. On the contrary, he argues that home ownership leads to greater caution, especially if it is acquired with high debt (Overman 2012).

While the above studies focus on the individual level, some work examines the regional externalities of ownership. Laamanen (2019) analyses data from Finland and uses an exogenous shock caused by the deregulation of the rental housing market to measure the impact of changes in ownership on entrepreneurship. Surprisingly, the study finds that higher regional ownership rates can lead to increased entrepreneurial activity. This effect is explained by weak labour market opportunities – if property owners cannot easily change their place of residence due to low mobility, they may be more motivated to start a business (Laamanen 2019).

These findings indicate that the relationship between ownership and entrepreneurship is intricate and influenced by the macroeconomic and spatial context. In regions with vibrant labor markets, ownership may stifle entrepreneurship, whereas in less desirable locations, entrepreneurship can emerge as a necessary alternative for livelihood.

The "not in my backyard" (NIMBY) theory, which emerged in the 1980s in Anglo-American literature, refers to the attitude of residents who, while generally supporting a certain type of development (such as new businesses, infrastructure, or social housing), fundamentally reject its location in the immediate vicinity of their homes. This phenomenon has become particularly visible in urban and suburban areas, where high levels of homeownership are associated with higher levels of civic participation—but also with higher levels of resistance to spatial change (Dear 1992).

According to Fischel (2001), homeowners are major actors in urban politics because they have a strong incentive to protect the value of their property. Their local voting is often focused on maintaining the status quo and blocking projects that would increase population density, worsen traffic conditions, or change the "character of the neighbourhood." This phenomenon is described as the "home voter hypothesis" and has been empirically documented in many cases in American and European cities (Fischel 2001)

However, NIMBY attitudes are not necessarily irrational. They are linked to real concerns about the loss of quality of life, safety, environmental standards, or property values. Research in environmental justice shows that NIMBY effects can lead to spatial inequality—while wealthier property owners effectively resist undesirable changes, less wealthy residents are exposed to higher levels of externalities (Schively 2007).

Specifically, in the business world, the NIMBY effect manifests itself in resistance to new businesses, startups, or commercial investments, especially when they involve noise, traffic, or spatial changes. Areas with higher levels of ownership and civic engagement are more likely to cancel building permits, block zoning changes, or face other forms of legal and administrative barriers (Pendall 1999).

The NIMBY effect thus represents a potential barrier to development, especially in locations where residential functions dominate over commercial ones. Empirical analysis of these relationships is complicated because attitudes towards NIMBY are not directly measurable – they are often reflected only in the outcomes of planning and regulatory processes.

The findings from foreign studies have important implications for the Czech Republic, where homeownership rates are above the EU average. Post-communist transformations led to privatising a large part of the housing stock, resulting in a high share of home ownership even in less urbanised areas. Given that these areas often show lower entrepreneurship rates, there is scope for a deeper analysis of whether and how ownership acts as an obstacle to entrepreneurial dynamism. It is also necessary to consider how regional and municipal policies influence the business environment depending on the ownership structure. If cities and municipalities are controlled by voters who prefer stability over growth, they may deliberately restrict new projects, indirectly affecting the business climate.

In this context, the concept of "NIMBY zones" is attractive for research: identifying spatial units with above-average homeownership rates, low entrepreneurial activity rates and high resistance to change can reveal new barriers to economic development.

2.2 The Relationship Between Homeownership and Entrepreneurial Activity

The debate about the effects of home ownership on economic dynamism has a long history, which has been significantly intensified since the publication of the so-called Oswald hypothesis. Formulated initially by Andrew Oswald in the 1990s, this idea claims that high homeownership rates lead to higher unemployment. The argument is since homeowners are less mobile, less able to adapt to changes in the labour market and slow down the allocation of labour. Although the hypothesis was initially formulated for unemployment, in recent years, its application has expanded to the field of entrepreneurship and broader economic dynamics.

Blanchflower and Oswald (2013) examine whether home ownership can also affect the rate of entrepreneurship. In their study, they analyse data from the United States and the United Kingdom and conclude that regions with higher homeownership rates experience lower mobility and innovation, which can negatively affect the creation of new firms (Blanchflower and Oswald 2013). They argue that homeownership acts as an “anchor” that reduces people’s willingness to abandon the status quo, thereby indirectly limiting entrepreneurial activity.

This argument is supported by the work of Lisi (2019), who analysed micro-level data in the Italian context and found that homeowners are less willing to start a business, especially if they are also burdened by a mortgage. Lisi shows that the impact of homeownership on entrepreneurship is not only a result of credit constraints but is closely linked to the psychology of risk and the preference for stability (Lisi 2019).

An interesting approach is also provided by the study by Lindh and Ohlsson (1996), who analysed Swedish data and identified a negative correlation between the level of ownership and the establishment of new businesses. They point out that ownership functions as a form of capital lock-in – investment in housing reduces the individual's ability to invest in business. According to them, this effect is more potent in regions with a rigid labour market and limited possibilities for liquidating real estate (Lindh and Ohlsson 1996).

Another dimension is brought by the analysis of social ties. Ownership is associated with a higher level of embeddedness in the community and the building of social capital. According to DiPasquale and Glaeser (1999), owners are more involved in community activities, which can have a dual effect: positive in that they contribute to the quality of life

and security, but at the same time they can create social pressure against the changes that entrepreneurship often brings (DiPasquale and Glaeser 1999).

Further empirical evidence is provided by Sierminska and Doorley (2013), who analyse European data from the EU-SILC household survey and find that households in owner-occupied housing are less likely to start a business than those in rented housing. This difference is partly explained by differences in property status, but even after controlling for these variables, the effect of ownership remains statistically significant (Sierminska and Doorley 2013).

On the contrary, some studies point to situations where ownership can be stimulating. For example, Disney and Gathergood (2009) argue that under certain conditions, ownership can act as collateral when drawing a loan to start a business. However, this effect is strongly conditioned by the structure of the credit market and the general availability of financing (Disney and Gathergood, 2009).

In the Czech context, similar research has so far been rare. However, given the extremely high ownership rate and low labour mobility, Oswald's hypothesis and related approaches could offer a relevant framework for interpreting spatial differences in entrepreneurial activity. Data from the Czech Statistical Office show that regions with higher ownership rates (e.g., smaller cities and rural areas) have lower per capita rates of new firm creation, even after controlling for factors such as municipality size and distance from metropolitan centres.

However, it is important to note that the causal relationship is not always clear. Some theories argue that entrepreneurs may later purchase real estate as a form of stabilization so that causality may also be reversed. These questions are addressed using methods such as instrumental variables or fixed effects in panel models.

In short, the literature shows a predominantly negative relationship between ownership and entrepreneurship at the micro level, although there may be exceptions in some macroeconomic and institutional contexts. The relationship is mediated by both economic factors (mortgage burden, limited liquidity) and socio-psychological aspects (risk aversion, preference for stability, community pressure).

2.3 Regional and Urban Aspects of Business and Ownership

The relationship between homeownership and entrepreneurship cannot be fully understood without careful consideration of the spatial context in which these phenomena occur. Entrepreneurship rates are not evenly distributed across regions, nor are homeownership rates. Land use, regulatory frameworks, and local political structures play key roles in determining where and under what conditions firms can emerge and grow. This chapter focuses on how concepts such as land use planning, urban governance, and the availability of spatial resources influence the entrepreneurial environment—and how the role of property owners as local power actors is exercised.

Land use—the zoning of land for different purposes (residential, commercial, industrial)—is a key urban policy tool that directly influences the location of businesses. In many countries, particularly the United States, land use is rigid and explicitly restricts mixed land use. Glaeser (2004) and Gyourko (2009) point out that strict zoning regulations reduce the availability of commercial space, lengthen permitting processes, and increase the cost of starting a business.

In areas with high homeownership rates, residents are more likely to support regulations that prevent land use changes—leading to the emergence of so-called exclusionary zoning (Pendall et al. 2006). This type of zoning is often used to preserve the "character" of a neighborhood, but it has the effect of stifling entrepreneurial activity, especially new forms of business such as start-ups, coworking spaces, or small service businesses.

The concept of urban governance describes how urban governance is organised and the mechanisms by which decisions are made about the development of the area. Property owners are key players here. Fischel (2001) shows in his work on the "home voter hypothesis" that local politics are dominated by voters who own homes – and they have the incentive to maintain property prices and the status quo. This means that local governments often make policy decisions in line with the preferences of this group, which can be conservative towards spatial and economic changes.

From a business perspective, this means that where owner-occupied housing dominates, it is more challenging to enforce zoning changes, allocate new land for business purposes or simplify

administrative barriers. This phenomenon has a significant spatial dimension: while city centres or brownfield zones may be more open to business activities, peripheral areas with predominant family ownership tend to be resistant.

Business requires space – physical premises for premises, offices, warehouses or shops. Where the area is strongly oriented towards residential use and where the zoning plan restricts mixed-use, access to space is significantly more difficult. Evans (2004) and Cheshire (2014) argue that the lack of available and flexible spatial capacities is one of the main barriers to entrepreneurship in cities with restrictive regulations.

The startup and innovation scene requires a dynamic environment with the possibility of flexible development. If local regulation does not support such an environment, entrepreneurial activities move elsewhere - or do not arise at all. This effect is particularly noticeable in urban agglomerations, where various interests collide - from residential to commercial to environmental.

In the urban planning context, the NIMBY attitude manifests itself in a strong resistance to new projects that could change the structure of the area. This applies not only to housing construction (e.g. social housing) but also to entrepreneurial activities. For example, the construction of new offices, service establishments, or even coworking centres may encounter resistance from residents if they perceive that it will threaten their quality of life, increase traffic, or disrupt the "community character" of the neighbourhood. Shively (2007) describes that the reason for resistance is not only irrational fears but also legitimate feelings of loss of control over the space, which is stronger among owners than among tenants. This creates an asymmetry in local political power – owners not only have a greater voice, but also a greater incentive to exercise it.

Many urban theories of the 21st century – including concepts such as smart growth, new urbanism or urban resilience – support mixed land use as a path to higher economic dynamism. Glaeser (2011) argues in his work "The Triumph of the City" that it is precisely the diversity of functions and spatial density that led to higher levels of innovation, cooperation and entrepreneurial activity.

The role of municipalities and regional planning authorities is also important in this context. If their approach is focused on supporting entrepreneurship (e.g. by simplifying spatial planning, offering startup spaces or revitalizing brownfields), this can significantly reduce barriers to entry into entrepreneurship. Where these steps are missing or

blocked by the ownership public, so-called "entrepreneurial wastelands" arise – spaces without innovation where dynamic activities are displaced by residential stability. The spatial planning system in the Czech Republic is highly decentralized. Each municipality can define its own spatial plan, which, in practice, leads to considerable heterogeneity in the approach to entrepreneurship. Some municipalities actively designate business zones, while others deliberately restrict them.

Spatial data analysis shows that municipalities with a higher rate of owner-occupied housing and a lower share of mixed-use zones have lower rates of business activity. This may be related to urban regulations and local resistance to business projects. In smaller cities and rural areas, we often encounter a conservative approach, where business is perceived as a disruptive element.

2.4 Property Ownership, Mobility, and the Institutional Context

Expanding the literature on the relationship between property ownership and entrepreneurial activity requires considering the broader institutional and social framework that influences both ownership decisions and the willingness to take entrepreneurial risk. This chapter focuses on the interactions between property ownership, occupational and geographical mobility, labour market structure, and the institutional environment in which households make economic decisions.

Economic theory has long considered labour mobility a key factor in the efficient functioning of labour markets and dynamic development. However, property ownership is often cited as a factor that limits mobility. This relationship was first systematically formulated in Oswald's hypothesis, according to which high levels of property ownership lead to lower geographic mobility, which increases unemployment and reduces labour market adaptability (Oswald 1996).

The empirical literature partially confirms this relationship. For example, Green and Hendershott (2001) find that homeowners are less likely to move for work than renters, even after controlling for socioeconomic factors. Research across European countries (e.g. Böheim and Taylor 2002; van Leuvensteijn and Koning 2004) shows that this effect is consistent. However, its strength varies depending on the institutional

framework, including mortgage market regulations and tenant protection.

The impact of ownership on economic behaviour cannot be understood in isolation. Institutional factors such as the availability of mortgages, the flexibility of the rental market, the tax advantages of ownership, or the regulatory framework for building policy play an important role. For example, Andrews and Sánchez (2011) show in their analysis of OECD countries that in countries with rigid rental markets and high ownership rates, mobility is lower and entrepreneurial activity is less dynamic.

Cultural norms also shape attitudes towards ownership. In some countries (e.g. Germany or Switzerland), long-term rental housing is common and socially accepted. In contrast, in others (e.g. Eastern Europe), ownership is seen as a sign of success and security. This cultural internalization of ownership as a norm may lead to a higher aversion to the risks associated with entrepreneurship (Kemeny 2005).

Research shows that homeowners are less willing to take risks associated with income uncertainty. Robert Dietz and Alan Saunders (2006) document that homeowners with a mortgage prefer jobs with a fixed income and lower risk. This aversion to uncertainty contributes to more conservative economic behaviour, which may reduce the likelihood of starting a business.

Households with mortgages may also be disadvantaged in obtaining business loans—banks consider their indebtedness a risk factor. This restriction of access to capital can significantly impact new entrepreneurs who often rely on their own property as collateral (Holtz-Eakin et al. 1994).

Ownership is often associated with a certain life cycle stage—in particular, with stabilization after starting a family. This temporal aspect influences not only the propensity to migrate but also entrepreneurship. According to US studies (Fairlie 2005; Blanchflower 2000), the probability of starting a business is highest in the age group of 30–45—precisely the period when many households also purchase their own home. This can lead to a temporal conflict between two important financial decisions that influence each other.

Ownership also impacts intergenerational mobility. In families with their own homes, children are more likely to take over the property and remain in the region, which can affect the spatial distribution of entrepreneurial activity and the demographic structure of regions. This

phenomenon is particularly pronounced in rural and smaller cities (Black et al. 2005).

The uneven distribution of ownership within regions leads to spatial inequalities in access to opportunities. In areas with high ownership rates and weak labour markets, implementing business plans is more difficult due to low real estate liquidity and lower consumer demand.

This effect can lead to "stagnation traps", where a region closes itself off to new initiatives and economic stagnation occurs. According to Rodríguez-Pose (2013), one of the key determinants of regional stagnation is the lack of dynamism in the labour and property markets – closely related to high ownership rates.

2.5 Empirical Approaches and Methodological Challenges

Studying the relationship between home ownership and entrepreneurship is methodologically challenging. This relationship is influenced by many factors that are interconnected, difficult to measure, and often endogenous. This chapter focuses on the approaches that have been used in the literature to assess this relationship and highlight the main methodological challenges (including the problem of endogeneity, selection bias, spatial autocorrelation, and the role of fixed effects).

One of the biggest challenges is the question of causality. Homeownership can affect entrepreneurship, but entrepreneurship can also affect the decision to buy a house. This bidirectional relationship means that simple correlational analysis may not yield the correct conclusions. For example, entrepreneurs may be more motivated to buy a house due to the need for a stable environment, while homeowners may delay starting a business due to the fixed costs associated with a mortgage.

To address this issue, authors such as Bracke et al. (2012) and Lisi (2019) use instrumental variable (IV) methods that allow for the isolation of exogenous variations in home ownership. For example, Bracke et al. (2013) use longitudinal data from the BHPS and consider only changes in ownership status while retaining individual characteristics. Lisi (2019) used a variable as an instrument to indicate sudden changes in mortgage availability that were exogenous to individual household characteristics.

Another effective strategy is to use panel data with fixed effects. This approach allows us to control for unmeasured individual characteristics that are constant over time—for example, personality traits, risk-taking propensity, or cultural norms. Studies such as Bracke et al. (2013) and Sierminska and Doorley (2013) use this approach to separate the actual effect of ownership from the effect of unmeasured variables.

The advantage of fixed effects is that they eliminate biases caused by unmeasured constants, but they also require sufficient variability in the observed variable (in this case, the change from renting to owning) across respondents. In practice, this means that the research is limited to cohorts that have experienced a change in ownership status, which may reduce external validity.

The relationship between ownership and entrepreneurship is not just a matter of individual choice but is strongly influenced by the spatial context. Regional differences in infrastructure, cultural norms, or the availability of credit can significantly affect ownership and entrepreneurship rates. Ignoring these spatial effects can lead to erroneous conclusions and underestimate the heterogeneity of the relationship.

Studies such as Laamanen (2019) or Hilber and Vermeulen (2016) use spatial econometric models (e.g., SAR, SEM, or GWR), which allow for autocorrelation in residuals or variability of coefficients across geographical space. This approach is particularly important when aggregating data at the level of municipalities, counties, or regions where neighbouring units are assumed to be non-independent.

In the Czech context, where there is substantial regional differentiation, spatial analysis can be particularly useful. The use of data at the level of ORP (municipality with extended jurisdiction) allows for relatively fine spatial granularity and the potential for the application of spatial autoregressive models.

Another significant problem is selection bias. Entrepreneurs who succeed may have different characteristics than those who never started a business or who quit early. This can lead to upward bias if we only analyse surviving businesses. A solution may be to use survival analyses or Heckman-type selection models that correct for unobserved determinants of entrepreneurial choice.

Measuring entrepreneurial activity itself can be problematic. Many studies use an indicator based on new business start-ups, which may not reflect the broader entrepreneurial culture or informal economy. Home ownership is also often measured in a binary manner (owner vs. renter),

which loses nuance between different types of ownership (e.g. mortgage-free vs. indebted owner). Studies such as those by DiPasquale and Glaeser (1999) and Glaeser and Shleifer (2001) recommend multilevel measurement that considers both housing type and form of financing. This finer operationalization allows for a better understanding of how different aspects of ownership influence economic behaviour.

3 Data and Variables

3.1 Description of the Geographical Unit of Observation (ORP)

The geographical framework of this analysis is the administrative districts of municipalities with extended powers, abbreviated as ORP. These units represent an intermediate level in the Czech administrative system between individual municipalities and regions. ORPs were established in 2003 as part of the public administration reform, and their task is to exercise the delegated powers of the state administration within larger administrative units. Each ORP includes one or more municipalities and is usually named after the seat of the given administrative district (e.g. ORP Brno, ORP Tábor, etc.).

There is a total of 206 of these administrative units in the Czech Republic. The capital city of Prague, which is not a classic ORP, but is divided into city districts and city districts, occupies a specific position. However, in this work, Prague is included as a separate unit to be able to compare its characteristics with other regional centres.

The choice of ORP as the unit of analysis was made deliberately. Compared to municipalities, which number over six thousand, ORPs represent a territorial unit that is sufficiently aggregated and, therefore, better covered by data, but at the same time, still relatively small to capture interregional differences. From a public policy perspective, ORPs also play an important role as basic units for the provision of public services, development planning and management of local projects. The results regarding the ORP level are, therefore, also of practical importance for decision-making at the regional level.

From a practical point of view, the work was limited to those ORPs for which complete data was necessary for calculating business activity, and the rate of owner-occupied housing and other control variables were available. The resulting analytical set thus includes 172 ORPs, with some units excluded due to missing or extreme values or as outliers (e.g. very low or, conversely, improbably high values of the share of owner-occupied housing above 100%, which could be the result of inaccuracies in the original data). Prague was processed separately and subsequently aggregated to the level of the city-wide average to be included in the comparison. The selection of these geographical units thus made it possible

to combine research needs (enough observations, data availability, spatial variability) with the actual structure of public administration, thereby ensuring both analytical accuracy and practical relevance of the results.

3.2 Data Sources

This work uses a combination of three primary data sources: OpenStreetMap (OSM), the 2011 Census of Population, Housing and Dwellings (SLDB 2011) and geographic data from ArcČR. Each of the sources plays a specific role in constructing variables for the analysis of the relationship between the rate of owner-occupied housing and entrepreneurial activity at the level of administrative districts of municipalities with extended jurisdiction (ORP). The selected combination of spatial, demographic and administrative data is based on the key requirements of temporal consistency (year 2011), spatial resolution to the ORP level and high relevance to the research objective of this work – verification of the existence of the NIMBY effect through the relationship between the rootedness of the population (measured by owner-occupied housing) and the rate of entrepreneurial activity. All three data sources are publicly available, which contributes to the transparency and replicability of the research.

3.2.1 OpenStreetMap (OSM)

OpenStreetMap is a key source of spatial data for capturing business activity in this work. OSM is a collaborative project that provides geographic data based on voluntary mapping. Due to its openness and wide coverage, it is a suitable tool for capturing finely spatially differentiated characteristics of the territory.

For the purposes of this work, quarterly data from 2011 (Q1–Q4) were chosen, which allowed the compilation of an indicator of the rate of newly established businesses for the calendar year. The data were filtered according to the amenity, land use a shop attributes, which indicates objects serving the public. Only those amenity objects that can be unambiguously interpreted as business entities or facilities providing services to the public were included in the analysis. Objects of public administration, education, healthcare or religious institutions were

excluded because they are not business entities in the classical sense of the word.

Specifically, only those facility attribute values that could be clearly interpreted as commercial premises were included in the analysis. The selection was based on an attempt to capture a wide range of business activities, including food and beverage services, retail, entertainment, cultural facilities, shops, and other commercial activities.

The following table clearly summarizes the selected facility types according to their thematic categories:

Selected OSM Tags Representing Business Activity	
OSM Attribute	**Included Values**
amenity	bar, biergarten, cafe, fast_food, food_court, pub, restaurant, car_rental, car_wash, fuel, parking, bank, brothel, casino, cinema, community_centre, events_venue, exhibition_centre, love_hotel, music_venue, nightclub, planetarium, stage, stripclub, studio, swingerclub, theatre, post_depot, clock, public_bath
shop	shop, supermarket
landuse	factory, warehouse, industrial

Table 1 – Seleted OSM Tags for Business Activity : Author's processing in R based on OpenStreetMap data (2011)

3.2.2 Population and Housing Census 2011 (SLDB)

The 2011 Population and Housing Census (SLDB) is the primary official source of demographic and housing information in the Czech Republic. It is organized by the Czech Statistical Office (CZSO) and is conducted once every ten years. The 2011 Population and Housing Census provides a detailed overview of the population, housing structure, ownership relationships, economic activity of the population and household size with high spatial resolution – including the level of municipalities with extended jurisdiction (ORP), which was a key criterion for its use in this work.

For the purposes of this work, the following key variables from the 2011: SLDB were used:

Selected Variables from the 2011 Population and Housing Census (SLDB)	
Variable Name	Description
dwell_private	Number of occupied privately owned dwellings
dwell_ownhouse	Number of occupied single-family houses owned by individuals
dwell_total	Total number of occupied dwellings
econ_active	Number of economically active persons
pop	Total number of inhabitants in a given ORP

Table 2 - Selected Variables from the 2011 Population and Housing Census (SLDB: Author`s processing in R based on data from the Czech Statistical Office (SLDB 2011)

3.2.3 ArcČR – Geographical Data

The spatial identification and display of territorial units in this work was ensured using the ArcČR 500 dataset, which is a standardized geographic vector data product provided by the Czech Surveying and Cadastral Office (ČÚZK). ArcČR 500 contains generalized boundaries of administrative and statistical units of the Czech Republic and is primarily used for visualization and spatial analysis at the national and regional levels.

In my work, I primarily used the boundaries of municipalities with extended jurisdiction (ORP), which form the central geographic unit of observation. These boundaries served to spatially connect different types of data (e.g. demographic data from the census, housing and apartments, business activity data from OpenStreetMap) and enabled uniform aggregation and subsequent analysis.

The ArcČR file was used in several key steps of data processing:

- for spatial filtering and feature selection from OpenStreetMap data (using geometric intersection),
- for calculating the centroids of individual ORPs, which were further used as spatial variables in regression models (longitude and latitude coordinates),

- and finally, for visualizing the analysis results using thematic maps created in the map package.

The ArcČR data was transformed into the WGS 84 coordinate system (EPSG:4326) for working with OpenStreetMap data and subsequently into the S-JTSK / Krovak East North system (EPSG:5514), which is the standard for cartographic displays in the Czech Republic.

The use of ArcČR ensured an accurate and consistent spatial definition of each observation, thus enabling the correct connection and analysis of data from different sources within a unified geographic structure.

3.3 Construction of Key Variables

Based on a combination of spatial, demographic and administrative data, key variables were created that form the basis for the quantitative analysis in this work. These variables include both an explanatory variable (the entrepreneurial activity rate) and a main predictor (the owner-occupied housing rate) and a set of control variables for a more robust interpretation of the results.

3.3.1 3.3.1 Rate of New Businesses (rate_new_firms)

This variable serves as a proxy for entrepreneurial activity and expresses the relative increase in the number of establishments (e.g. restaurants, cafes, services, etc.) between the first and fourth quarters of 2011. It was created based on data from OpenStreetMap (OSM), which was obtained quarterly.

Equation:

$$\text{rate_new_firms} = \frac{(Q4 - Q1)}{Q4}$$

where:

- Q1 - number of enterprises in selected categories in the ORP in the 1st quarter of 2011
- Q4 - number of enterprises in the ORP in Q4 2011
- Rate_new_firms ∈ [0,1] - higher value indicates higher business dynamics

3.3.2 Ownership Rate (owner_share)

This key independent variable captures the share of people who own and use a given property. The data were obtained from the 2011 SLDB database and aggregated to the ORP level. The variable is calculated as the share of occupied dwellings owned by individuals (including houses) to the total number of occupied dwellings.

Equation:

$$dwell_total = \frac{(\text{dwell}_{\text{private}} + dwell_{ownhouse})}{\text{dwell_total}}$$

where:

- dwell_private = number of privately owned apartments
- dwell_ownhouse = number of family houses owned by individuals
- dwell_total = total number of occupied apartments

3.3.3 Firm Density (firm_density)

The firm density variable captures the total number of business establishments in each ORP in the 4th quarter of 2011 per 1,000 inhabitants. It expresses the level of economic infrastructure and is a control variable for economic activity.

Equation:

$$firm_density = \frac{\text{Q4}}{\text{pop}} x1000$$

3.3.4 Economically Active Population (econ_active)

The variable econ_active represents the number of economically active persons (i.e. the sum of employed and unemployed) in each ORP. It serves as a control variable for the labor force and entrepreneurial potential. The data comes from the SLDB 2011.

3.3.5 Population (pop)

The variable pop expresses the total number of inhabitants of a given ORP in 2011 according to the SLDB. It is used as a control variable and as

a basis for recalculating relative values (e.g. business density). In regression models, it is tested both in its original form and in a logarithmically transformed form:

$$\log(pop)$$

3.3.6 Categorical Size of the Municipality (urban_size)

The variable urban_size categorizes ORPs according to the size of the settlement. The classes were created according to the quantiles of the population distribution and include the categories: small, medium, large, very_large. This variable is used to test interactions with ownership rate and as an alternative to the continuous variable pop.

3.3.7 Region (region)

The factor variable region identifies the affiliation of each ORP to one of the 14 regions of the Czech Republic. It is used as a fixed effect to control for unstructured regional differences.

3.3.8 Geographical Location (longitude, latitude)

The coordinates of the center (centroid) of each ORP were calculated from spatial data (ArcČR). The spatial variables longitude and latitude and their quadratic terms:

$$longitude^2, latitude^2$$

are used to control for spatial heterogeneity that could affect entrepreneurial activity (e.g. differences between central and peripheral areas).

4 Descriptive Statistics and Visualization

This chapter provides a basic descriptive view of the variables used in the analysis of the relationship between owner-occupied housing and entrepreneurial activity in the Czech Republic. The aim is first to present the range of values of individual variables, their dispersion and possible extreme values that could distort statistical conclusions. Subsequently, a visualization of the spatial distribution of key indicators will be performed.

The basis of this analysis is a merged dataset at the administrative districts of municipalities with extended jurisdiction (ORP), which includes all 172 observations, including Prague. The data come from three primary sources – OpenStreetMap (OSM), the 2011 Population, Housing and Dwelling Census (SLDB) and geographic data from ArcČR – and have been consistently spatially harmonized (WGS 84 coordinate system), cleaned of missing or extreme values and expanded with spatial variables (longitude and latitude calculated from the centroids of the ORP territory).

The following table summarizes the basic characteristics of the selected variables – mean, standard deviation, minimum and maximum – for the entire country:

Descriptive Statistics

Variable	Mean	SD	Min	Max
rate_new_firms	0.21	0.26	-0.04	1.00
owner_share	0.52	0.20	0.16	0.96
firm_density	0.69	1.00	0.01	8.52
pop	52921.90	47467.12	8712.00	385913.00
longitude	15.67	1.54	12.57	18.74
latitude	49.81	0.53	48.70	50.94

Table 3 – Descriptive Statistics of Main Variables: Own elaboration in R.

The table summarizes the basic statistical characteristics of the main variables used in the regression analysis at the level of administrative districts of municipalities with extended jurisdiction (ORP). These are variables measuring entrepreneurial activity (rate_new_firms), owner-occupancy rate (owner_share), firm density (firm_density), population size (pop) and spatial location (longitude, latitude).

Interpretation:

- The new firm rate has an average value of 0.21, which means that newly established enterprises, on average, account for approximately 21% of all registered business units in the last monitored quarter (Q4). The range of values from -0.04 to 1.00 indicates outliers (probably caused by a small base in the denominator).
- The owner share has an average value of 0.52, i.e. 52% of occupied apartments are owned by natural persons. The range from 0.16 to 0.96 indicates significant inter-municipal variability.
- The density of firms is, on average, 0.69 (firms per km^2), but the high maximum (8.52) compared to the minimum (0.01) indicates an intense concentration of firms in some regions, especially urban ones.
- The number of inhabitants (pop) has very scattered values - the average size of the ORP is 52,922 inhabitants, but the standard deviation almost corresponds to the average. The smallest ORP has approximately 8,700 inhabitants, the largest over 385,000 (probably Prague).
- The geographical variables (longitude and latitude) show a reasonable range corresponding to the geographical distribution of the Czech Republic.

The table thus confirms the heterogeneity of ORPs in terms of demographic and economic characteristics, which is an important prerequisite for testing the effect of home ownership on entrepreneurial activity.'

4.1 Histograms of Key Variables

To provide a basic overview of the distribution of the main variables used in the regression models, histograms were created that visualize their

frequency distribution across all administrative districts of municipalities with extended jurisdiction (ORP).

The histograms include four key variables:

- Rate of new firms (rate_new_firms),
- Share of owner-occupied dwellings (owner_share),
- Firm density (firm_density),
- and Population size (pop).

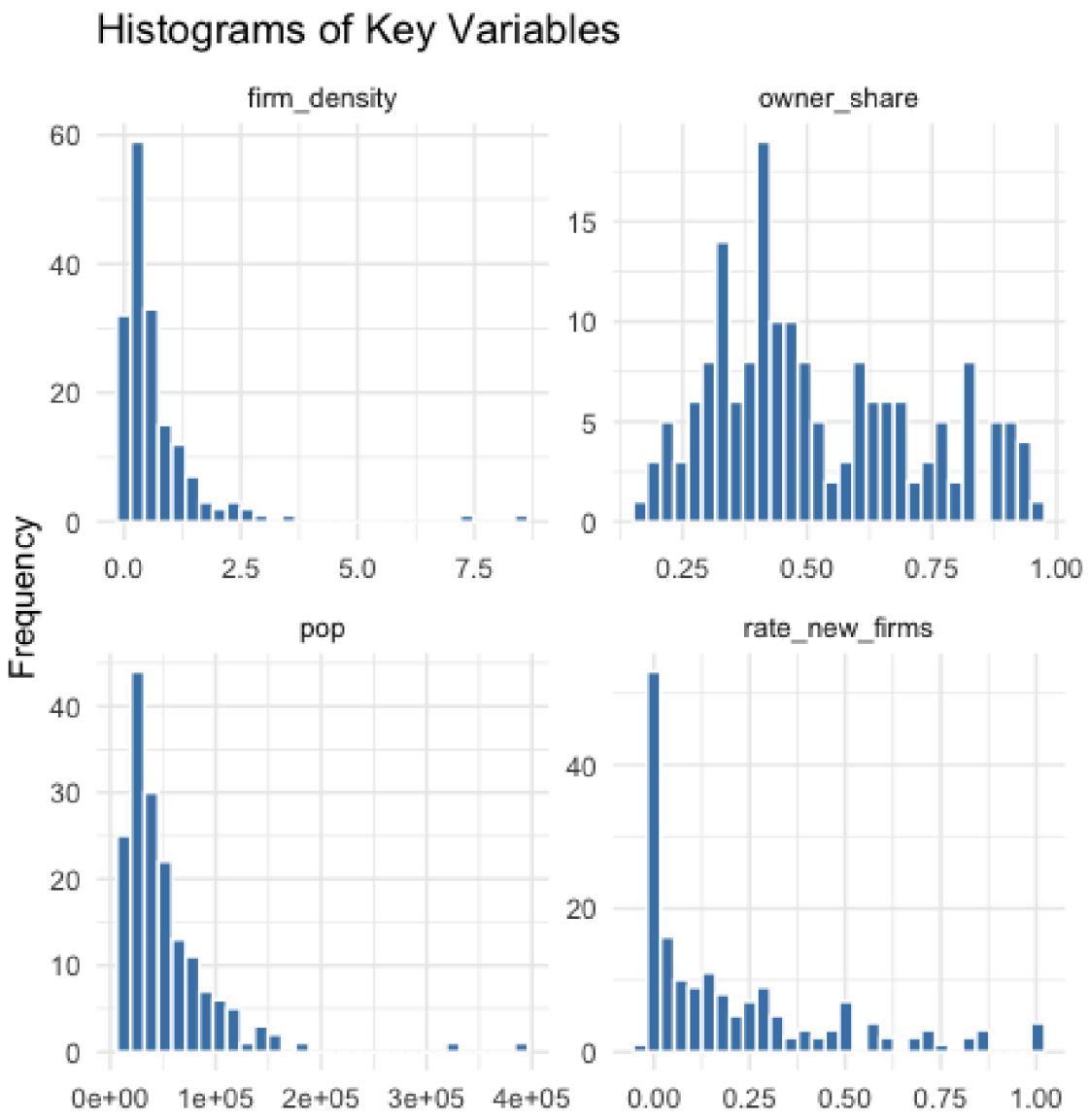

Figure 1 – Histogram : Own elaboration in R.

Histograms of key variables provide a basic overview of their distribution across the surveyed territories of municipalities with extended powers (ORP). It is clear from the graphic representation that most variables do not show a normal distribution but are characterized by a significant skewness or uneven dispersion of values.

The firm_density variable, expressing the density of enterprises in the territory of a given ORP, has a strongly right-skewed distribution. Most observations are concentrated around low values, while a few units show a very high density of business entities. This reflects the expected difference between smaller rural areas and large urban centres that function as natural business centres.

For the owner_share variable, i.e. the share of residents living in their own homes, the distribution is approximately symmetrical with a peak around the value of 0.5. This suggests that in many ORPs, owner-occupied housing accounts for approximately half of all occupied units, which corresponds to a relatively balanced ownership situation. Higher and lower values occur less frequently but are not exceptional.

The distribution of the variable "number of inhabitants" is strongly skewed to the right. Most ORPs have relatively small populations, while only a few units (e.g. Prague, Brno, Ostrava) significantly exceed the others in size. Such a skewed distribution is standard in the context of an urban hierarchy, where a smaller number of centres have significantly higher population concentrations.

The rate of new firms (rate_new_firms) also shows a strong skew to the right. Most ORPs have a relatively low share of new firms (e.g. below 0.25), while high values are rare. This may reflect both the business climate and differences in the absolute numbers of existing firms to which the newly established firms are compared.

Overall, the histograms confirm that most variables have a nonlinear distribution, which is important to consider when choosing appropriate statistical methods. For example, logarithmic transformation or robust regression models can help compensate for skewness and extreme values that could otherwise distort the results of the analysis.

4.2 Correlation Matrix

The correlation matrix provides an overview of the strength and direction of linear relationships between the main continuous variables. Pearson correlation coefficients can be used to identify potential problems with multicollinearity and to understand the internal structure of the data better. The following variables were included in the correlation matrix: new_firm_rate, share_of_owners, firm density, population size (pop), and spatial coordinates (longitude, latitude).

Visualizing the correlation matrix makes it easier to interpret the relationships between variables and helps to reveal which variables are strongly related and which behave independently. This information is important for building regression models - for example, it allows to avoid redundant variables and better understand how geographic and socioeconomic factors affect entrepreneurial activity in individual ORPs.

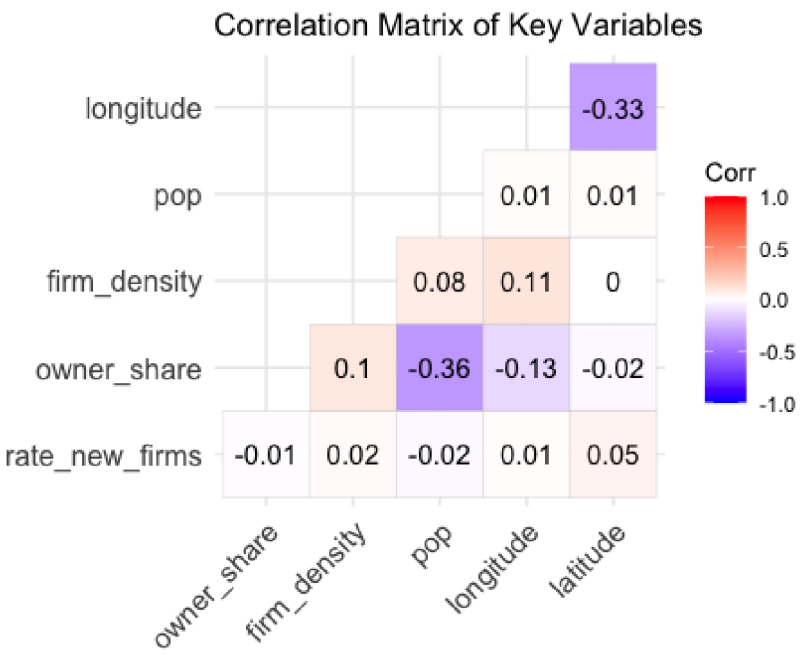

Figure 2 – Correlation Matrix of Key Variables : Own elaboration in R.

The correlation matrix shows the strength and direction of the linear relationships between the key variables in the study. Most of the correlation coefficient values are close to zero, indicating weak or no linear

relationships between most of the variables. However, the following relationships deserve special attention:

- Ownership_share × Population: The correlation of -0.36 indicates a slightly stronger negative relationship between the share of owner-occupied housing and population size. This relationship may reflect a general trend where rental housing is prevalent in larger cities, while ownership is more common in smaller municipalities.
- Ownership_share × Longitude: The correlation of -0.13 indicates a weak negative relationship, which may indicate a geographical trend, where the eastern part of the Czech Republic (higher longitudes) has slightly lower owner-occupied housing rates.
- Longitude × Latitude: The correlation of -0.33 indicates a stronger spatial pattern – municipalities located further east tend to be further south. This relationship is not problematic but confirms the spatial clustering in the data.
- rate_new_firms has weak correlations with all other variables, including owner_share (−0.01), which tentatively suggests that there is no strong linear relationship between the two variables – however, this result will be further investigated using regression models.

Overall, the matrix does not indicate any serious problems with multicollinearity between the included variables. Therefore, the selection of variables for the regression analysis remains valid, and the relationships will be subjected to deeper quantitative analysis.

4.3 Boxplots of Key Variables

Boxplots were created for each key variable to better understand the distribution and occurrence of outliers. These plots visualize the variance of the data, the median, quartiles, and possible outliers. Plots were created for the variables rate_new_firms, owner_share, firm_density, and pop.

Boxplots provide a straightforward way to compare scales and variability between variables with different units and ranges. Due to the variables' different scales, a separate axis (scale faceting = "free") was used for each boxplot to allow for interpretation of each distribution in its own context.

This visualization complements the previous histograms and correlation analysis and helps quickly identify potential asymmetries or extreme values that could affect regression modelling or the interpretation of results.

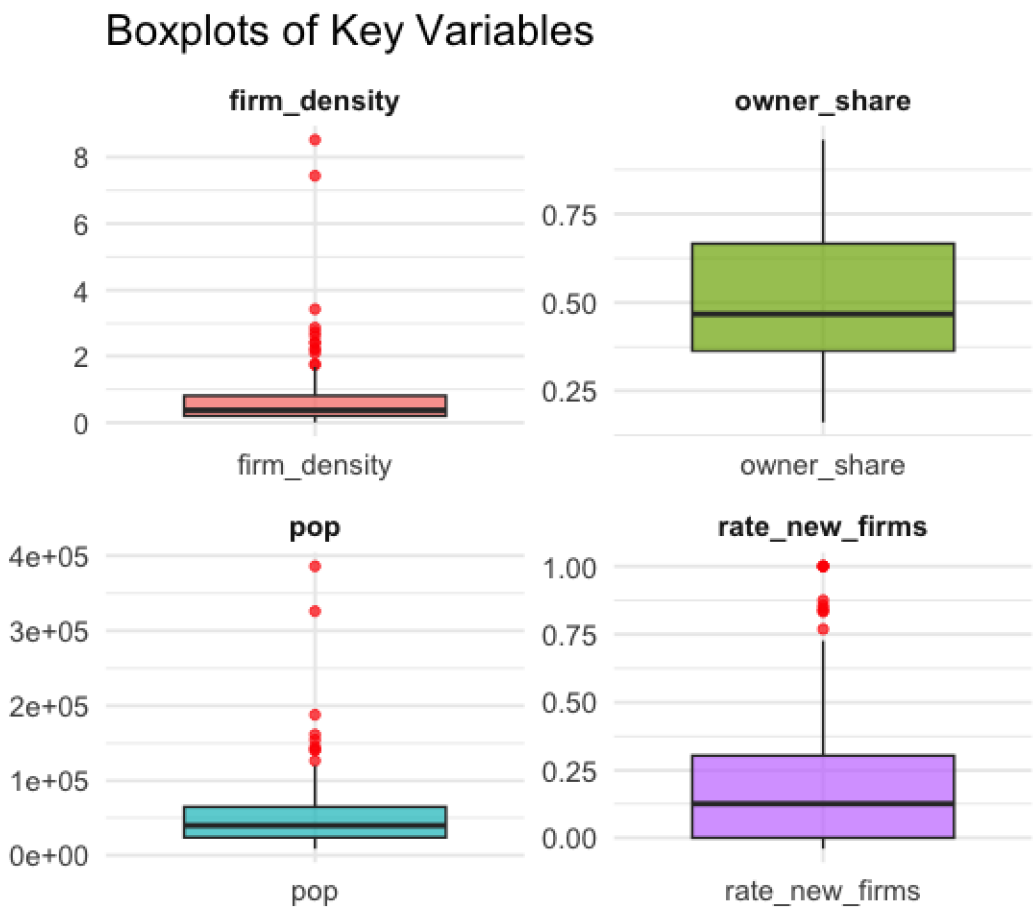

Figure 3 – Boxplot: Own elaboration in R.

Box plots show the distribution of values of the four main variables in the dataset and help identify their median, range, variance and possible outliers:

- firm_density (firm_density): The distribution is strongly skewed to the right, with many municipalities showing low firm density while a few areas reaching significantly higher values. The red dots show numerous outliers, with the maximum exceeding 8 firms per square kilometre.

- ownership_share (ownership_share): The distribution is fairly symmetrical, with a median of around 0.5. The relatively low variance, with no extreme outliers, indicates a balanced ORP dispersion. The variable is suitable for regression models.
- population: This variable shows a strong skew to the right – most municipalities have a relatively low population, while only a few (e.g. Prague, Brno) reach very high values (up to almost 400,000). Outliers are significant and confirm high heterogeneity within territorial units.
- rate_new_firms: The distribution is also significantly shifted to the right. Most ORPs show relatively low rates of new firms, while some areas (probably larger cities) show high entrepreneurial dynamism. Outliers are present, which is important to consider in econometric modelling.

Overall, the boxplots confirm that the dataset contains considerable variability, and several variables show strongly asymmetric distributions, which should be considered when interpreting the model results and choosing appropriate regression specifications.

4.4 Scatter Plots: Entrepreneurial Activity and its Key Determinants

In this part of the analysis, scatter plots visualize the relationships between the rate of new firms (rate_new_firms) and the two main predictors of interest – the share of homeowners (owner_share) and the density of firms (firm_density). These plots aim to provide an intuitive overview of the direction and strength of the relationship between the variables before the actual econometric modelling.

The plots use a regression line obtained by the ordinary least squares (OLS) method, allowing us to assess whether a linear relationship between the variables visually appears. This visualization is a valuable diagnostic tool, especially for identifying nonlinearities, outliers, or group patterns that could affect the results of the regression models.

In the next step, the quantitative nature of these relationships will be tested using regression models.

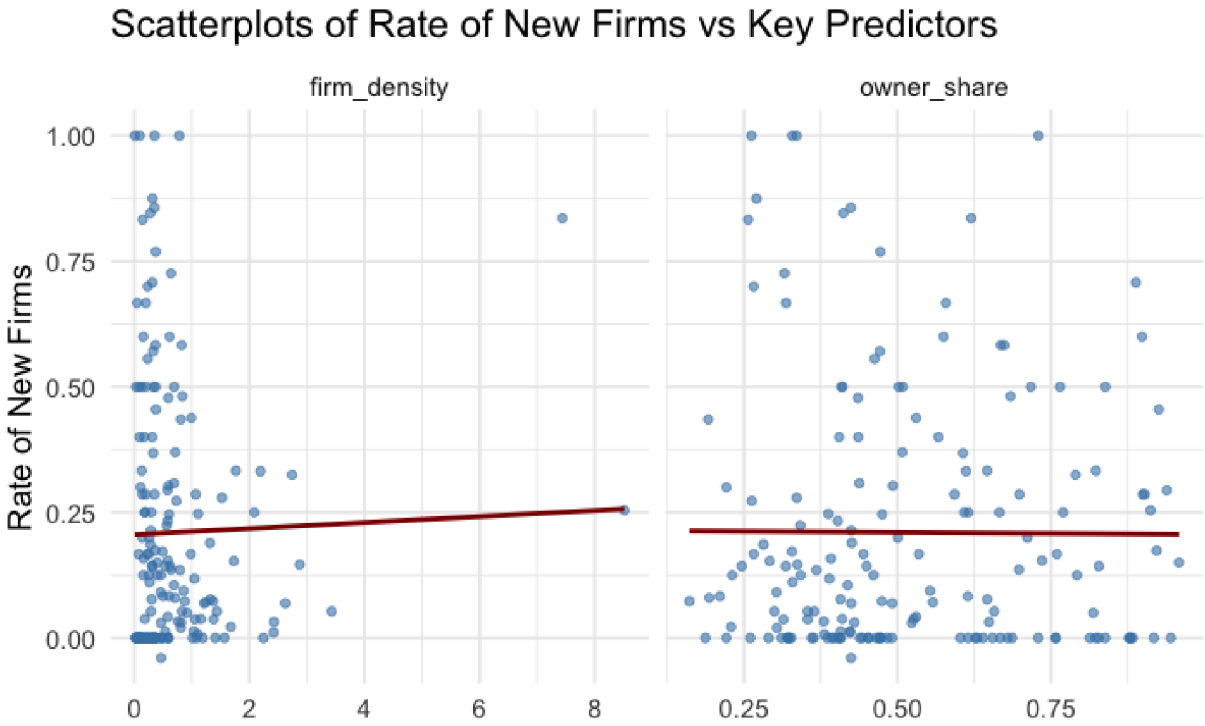

Figure 4– Scatter Plot: Own elaboration in R.

Both scatter plots illustrate the relationship between the rate of new firms (rate_new_firms) and two key predictors: firm density (firm_density) and owner-occupancy share (owner_share). A regression line (red line) has been added to the plot to show the trend relationship between the variables.

4.4.1 Relationship between firm_density and rate_new_firms:

- Most observations are concentrated in very low firm density (up to 2).
- The regression line slopes slightly upwards, indicating a weak positive association – higher firm density is slightly associated with higher new business rates.

- Despite this weak positive trend, the relationship remains visually scattered, without a strong linear pattern.

4.4.2 Relationship between owner_share and rate_new_firms:

- The relationship between owner-occupancy share and the rate of new firms does not show any clear linear trend. The regression line is almost horizontal.
- The data are highly dispersed, with a significant concentration of observations at lower values of rate_new_firms.
- This visual result suggests that the share of homeowners may not have a strong linear effect on the rate of entrepreneurial activity, which will be further verified by regression analysis.

Overall, the scatter plots show that the two predictors alone explain only limited variability in the rate of new businesses. These findings support the need to control for additional variables in multivariate regression to identify any relationships consistent with the NIMBY hypothesis more precisely.

4.5 The Visualization of the Share of Owner-Occupied Housing in Municipalities with Extended Jurisdiction (ORP) in 2011

To visualise the spatial distribution of the variable of owner-occupied housing share, a map was created at the level of municipalities with extended jurisdiction (ORP). The data were converted into the uniform coordinate system S-JTSK (EPSG:5514), which is the standard for the territory of the Czech Republic. The map uses a quantile distribution for the colour grading of the variable owner_share, where a higher intensity of blue indicates a higher share of housing units occupied by their owners.

This visualization allows us to identify spatial patterns and regional differences in the rate of owner-occupied housing across the country. The map shows that a higher share of owner-occupied housing is more typical for more minor and more peripheral ORPs, while in larger urban agglomerations, this share is usually lower.

A more detailed analysis of the share of owner-occupied housing in regional cities – including the capital city of Prague – will be carried out using a summary table. This table will offer a comparison of individual metropolises and allow us to place their values in a broader context.

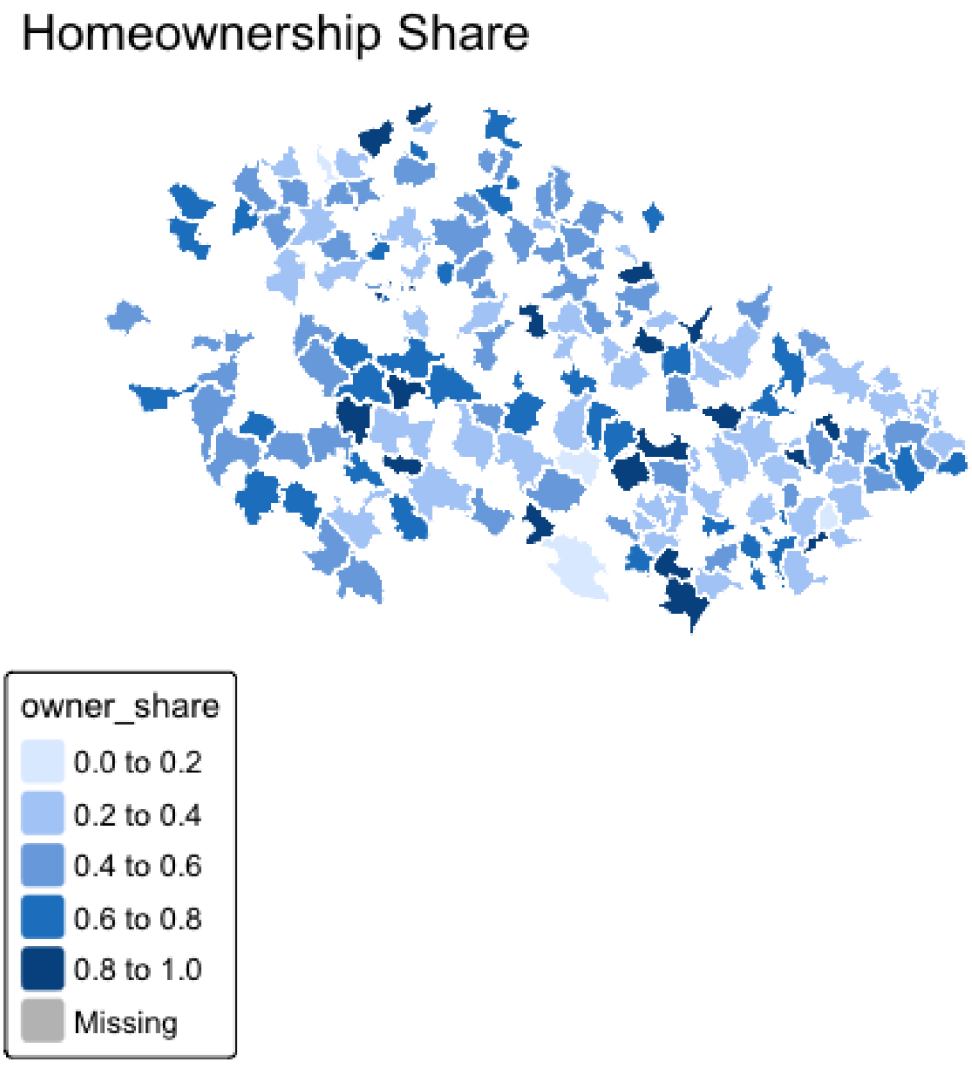

Figure 5 – Map: Owner-Occupied Housing Share by ORP Own elaboration in R.
The map "Share of Housing Ownership" shows the share of housing units owned by individuals (ownership) in individual districts of municipalities with extended jurisdiction (ORP) in the Czech Republic in 2011. The rate of owner-occupied housing ranges from less than 20% to more than

80%, with darker shades of blue representing higher values of this indicator.

The map shows considerable spatial variability. Higher shares of owner-occupied housing are more common in smaller ORPs, especially in the southeast and northeast of the country, while lower shares are concentrated in more urbanized areas and large cities such as Prague, Brno and Ostrava. This spatial pattern reflects differences in the availability of rental housing, historical development factors and the possible role of urban policy in the housing stock.

The substantial regional differences, evident from the cartographic representation, will be further analysed in more detail in the table focusing on regional cities. This will allow us to compare the share of owner-occupied housing in the most significant urban centres and provide a context for examining the relationship to entrepreneurial activity.

4.6 Homeownership Share in Regional Capitals

To complement the spatial representation of owner-occupied housing rates, this subsection offers a more detailed comparison between 13 regional capitals of the Czech Republic, including Prague. These cities represent the most urbanized and administratively significant areas in the country and are, therefore, key to understanding the spatial variability of the share of owner-occupied housing in the context of urban development and potential business activity.

The following table shows the average share of physically owned dwellings in the territory of each regional capital based on data from the 2011 Census of Population and Housing. The values are ranked from highest to lowest and point to significant differences between individual cities. This comparison serves as a starting point for assessing the extent to which patterns of owner-occupied housing in large cities correspond to the national trend.

At the same time, this comparison provides a framework for identifying urban areas with potentially higher susceptibility to NIMBY effects, as a high share of owner-occupied housing combined with low

levels of business activity may signal resistance to new commercial construction.

Homeownership Share in Regional Capitals		
City	Homeownership Share	Rank
Karlovy Vary	64.6%	1
Praha	62.5%	2
Liberec	50.8%	3
Plzeň	47.4%	4
Hradec Králové	40.7%	5
Olomouc	38.9%	6
Pardubice	38.1%	7
Zlín	35.4%	8
Ústí nad Labem	32.8%	9
Jihlava	31.4%	10
Brno	29.2%	11
České Budějovice	28.2%	12
Ostrava	22.9%	13

Table 4 – Owner-Occupied Housing Share in Regional Capitals: Own elaboration in R.

The table shows the average share of owner-occupied housing in 13 regional capitals of the Czech Republic in 2011. The cities are sorted by the share value in descending order, with the shade of colour indicating intensity - and darker shades indicating higher values.

The highest share of physically owned housing was recorded in Karlovy Vary (64.6 %) and Prague (62.5 %), which may be related to the higher representation of privately owned apartments or family houses, but also to historical and socio-economic factors of these cities. These cities, like Liberec (50.8 %) or Pilsen (47.4 %), fall into the upper half of the ranking and theoretically may show a higher potential for the occurrence of the NIMBY phenomenon - i.e. resistance of residents to new business activities in their surroundings.

At the opposite end of the scale are cities such as Brno (29.2 %), České Budějovice (28.2 %) and Ostrava, with only 22.9 % showing the lowest rate of owner-occupied housing among regional cities. These values may indicate a higher rate of rental housing or a greater representation of public and cooperative housing stock. From the perspective of the hypothesis of the relationship between ownership and entrepreneurial activity, a lower incidence of NIMBY behaviour could therefore be expected here.

Overall, the table shows considerable variability in the share of owner-occupied housing across regional cities, which may result from differences in demography, housing policy, urban structure and historical development of the regions. These differences are key for interpreting spatial patterns of entrepreneurial activity and contribute to understanding the possible connection between the housing structure and the population's economic behaviour.

4.7 Map of the Rate of New Business Creation

The second thematic map shows the spatial distribution of the rate of new business creation (rate_new_firms) across the administrative districts of municipalities with extended jurisdiction (ORP) in the Czech Republic. This variable captures the share of new businesses created between the first and fourth quarters of 2011 in relation to the total number of business entities registered in the fourth quarter. This indicator serves as a proxy for the dynamics of entrepreneurship in each area.

The map uses a quantile distribution of values and a YlOrRd (yellow-orange-red scale) colour spectrum, allowing easy visual identification of areas with the highest and lowest values. As in the previous case, the boundaries of territorial units are shown by a thin white line, with the legend placed to the right outside the map.

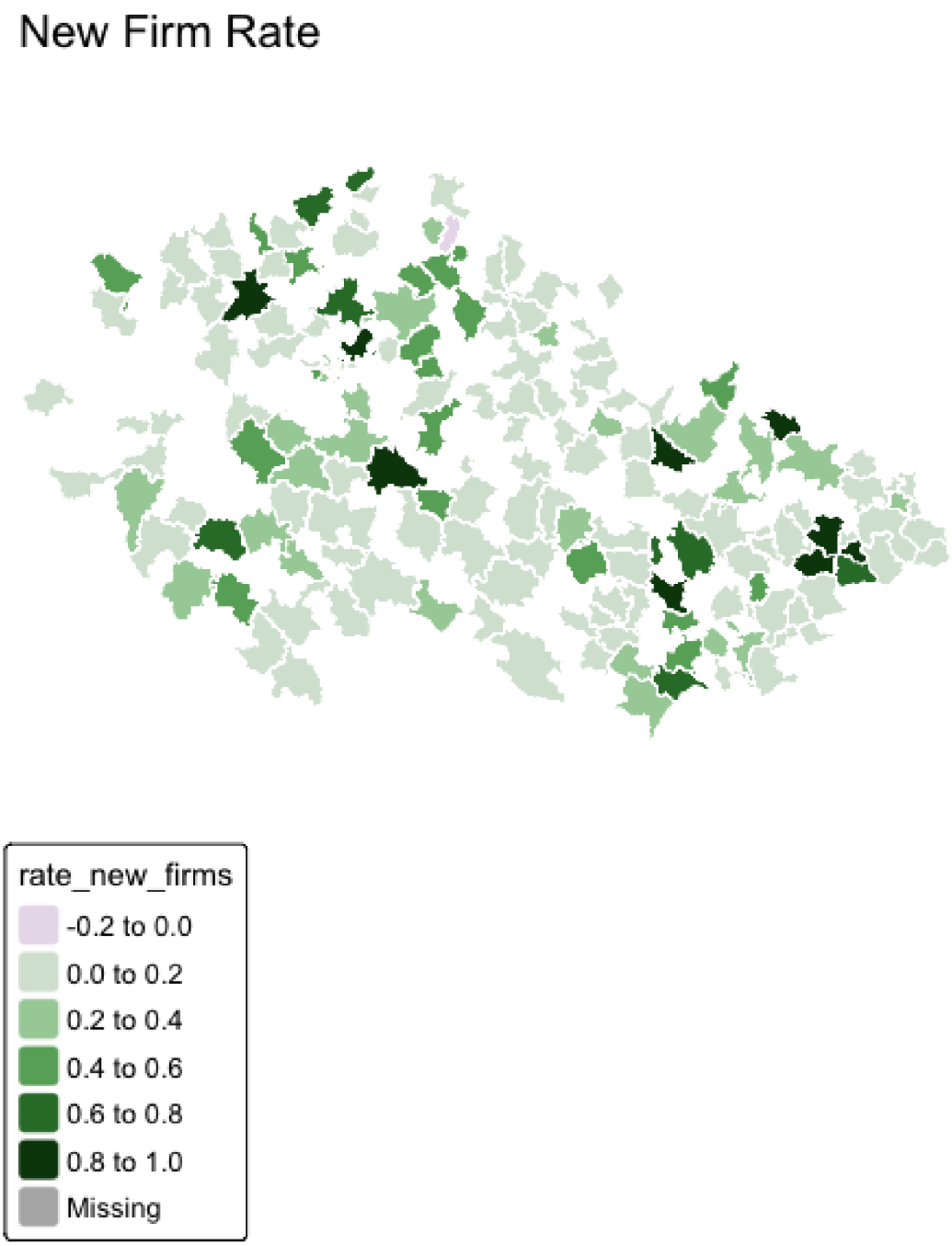

Figure 6 – Map: Rate of New Firms by ORP: Own elaboration in R.

The map "Rate of newly established enterprises" shows the spatial distribution of newly established enterprises in individual administrative districts of municipalities with extended jurisdiction (ORP) in 2011. The colour shades from light green to dark green (and in rare cases also light purple) correspond to the quantile distribution of the values of the variable rate_new_firms, which expresses the share of newly established enterprises about the total number of enterprises in the 4th quarter of 2011.

The map clearly shows that the highest entrepreneurial dynamics—i.e., the largest share of newly established enterprises—is concentrated mainly in larger urban agglomerations and their hinterlands, such as Brno, Hradec Králové, České Budějovice, Pilsen, or Zlín. These areas show values of the share of newly established enterprises in the range of 0.4 to 1.0, as indicated by the dark shades of green.

On the contrary, a large part of the Czech Republic, predominantly rural and peripheral ORP, shows a low level of entrepreneurial activity – light areas (especially in the southeast and in parts of the Vysočina and Karlovy Vary regions) indicate that in these areas the share of new firms each year was very low or zero.

The map thus points to the unevenness of the country's business environment and confirms the expectation that new firms are created more often in larger urbanized centres with higher population density and better infrastructure.

4.8 Share of New Businesses in Selected Regional Cities

For a more detailed examination of spatial differences in entrepreneurial activity, the following table summarizes the average share of new businesses (rate_new_firms) in individual regional cities in the Czech Republic. This variable captured the dynamics of entrepreneurship in 2011. It is defined as the share of newly established businesses each year (measured by the difference in the number of businesses between the 4th and 1st quarter) compared to the total number of businesses in the 4th quarter.

The values are expressed in percentages, and the colour scale in the table highlights the differences between cities—a darker shade of green indicates a higher rate of new businesses. This clear table

complements the previous map and allows for a more precise comparison between individual regional centres.

Rate of New Firms in Regional Capitals	
City	New Firm Rate
Liberec	37.0%
Praha	21.9%
České Budějovice	18.6%
Ústí nad Labem	17.2%
Brno	15.3%
Olomouc	11.8%
Karlovy Vary	7.7%
Plzeň	7.3%
Zlín	5.3%
Jihlava	3.7%
Ostrava	2.2%
Hradec Králové	1.3%
Pardubice	0.7%

Table 5 – Rate of New Firms in Regional Capitals : Own elaboration in R.

The table shows the average rate of new business start-ups in the Czech Republic's regional capitals. The value of the variable rate_new_firms is expressed in percentages and indicates the share of newly registered businesses during 2011, specifically between the first and fourth quarters.

The results show that Liberec (37%) showed the highest entrepreneurial dynamics, followed by Prague (21.9%) and České Budějovice (18.6%). These cities show a higher rate of new business start-ups, which

may be related to their economic structure, support for entrepreneurship, higher population concentration, or availability of services.

On the opposite side of the spectrum are cities such as Pardubice (0.7%), Hradec Králové (1.3%) and Ostrava (2.2%), which show a very low rate of business renewal. These values may indicate stagnation or a more conservative market with a lower rate of new entities entering the business environment.

Overall, the table shows significant differences between cities and highlights the importance of regional specificities in analysing entrepreneurial activity. Combined with the previous map visualization, it provides an important clue for identifying cities with higher or lower entrepreneurial dynamics, which is also key for further investigating the connection with the structure of apartment ownership.

4.9 Spatial Identification of Potential NIMBY Zones

This map visualizes the preliminary identification of potential NIMBY zones at the level of municipalities with extended jurisdiction (ORP) in the Czech Republic. Based on the "Not in my backyard" (NIMBY) principle, areas were classified as potential NIMBY zones if they simultaneously met two conditions:

- above-average share of residents living in owner-occupied housing,
- below-average rate of new business start-ups.

The aim of this binary classification was to identify areas that potentially show lower tolerance for new economic or infrastructure activities—mainly due to the higher stability and protection of the residential environment usually associated with owner-occupied housing.

The map provides a first insight into the spatial distribution of this phenomenon. It forms the basis for further analyses, such as regression models examining the relationship between the structure of housing ownership and business dynamics.

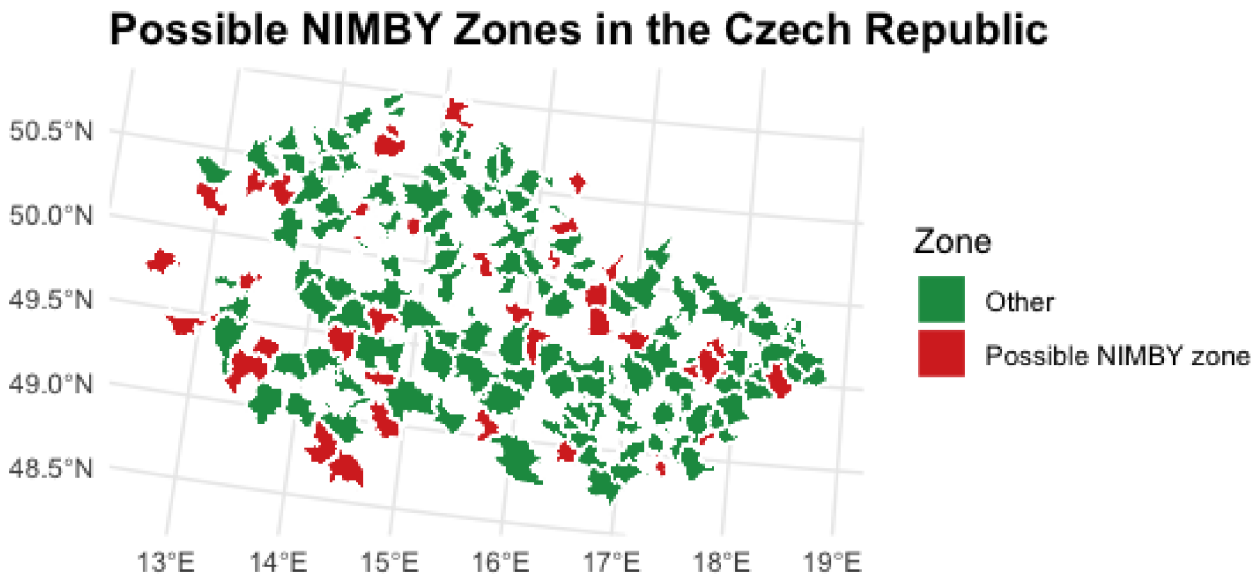

Figure 7 – Map: Potential NIMBY Zones by ORP : Own elaboration in R.

The map shows potential NIMBY zones in the Czech Republic, identified as administrative districts of municipalities with extended jurisdiction (ORP), which show an above-average share of residents living in owner-occupied housing and a below-average rate of new business start-ups. This combination is often interpreted in the literature as an indicator of potential resistance to new investments or business activities, typical of the NIMBY phenomenon ("Not in my backyard").

The map shows that potential NIMBY zones (highlighted in red) are not evenly distributed across the entire territory but instead concentrated in some regions – for example, in the southwestern part of the country, in the Vysočina region, partly around Pilsen or in Central Moravia. On the contrary, most ORPs in the eastern part of the country (e.g. in northeastern Moravia) and larger urban agglomerations (such as Ostrava or Brno) do not belong to zones with high NIMBY potential.

This visualization is a basis for a deeper econometric analysis that further tests whether the share of owner-occupied dwellings is a statistically significant predictor of entrepreneurial activity in different spatial contexts.

4.10 The Presence of Potential NIMBY in Regional Cities

This section focuses on whether there are differences in the probability of occurrence of so-called NIMBY zones between regional cities. Following on from the previous map visualization that identified areas with a high share of owner-occupied housing and low rates of new business start-ups, it is examined here whether some regional metropolises exhibit these characteristics collectively.

Using the binary indicator variable nimby_zone, it is determined for each regional city whether at least one of its ORP units meets the conditions for a potential NIMBY area. The result is a table that colour-codes the presence or absence of this phenomenon in individual cities. This summary helps the reader identify regional patterns within larger urban areas, guiding interpreting possible socioeconomic barriers to business development in different parts of the Czech Republic.

Possible NIMBY Zones in Regional Capitals		
City	NIMBY_zone	Possible NIMBY Zone
Brno	FALSE	No
Hradec Králové	FALSE	No
Jihlava	FALSE	No
Karlovy Vary	TRUE	Yes
Liberec	FALSE	No
Olomouc	FALSE	No
Ostrava	FALSE	No
Pardubice	FALSE	No
Plzeň	TRUE	Yes
Praha	TRUE	Yes
Zlín	FALSE	No
Ústí nad Labem	FALSE	No
České Budějovice	FALSE	No

Table 6 – Presence of NIMBY Zones in Regional Capitals s : Own elaboration in R.

The table "Possible NIMBY zones in regional centres" shows in which regional centres at least one ORP unit is identified as a possible NIMBY zone. These zones are defined as areas with an above-average share of owner-occupied housing and, at the same time, a below-average rate of new business establishment.

Out of thirteen regional centres, only three meet this condition: Karlovy Vary, Pilsen and Prague. These cities therefore have at least one ORP unit that bears the characteristics of a possible NIMBY effect. On the contrary, no such zone was identified in the remaining ten regional centres. These findings may indicate that in selected cities, a higher rate of homeownership may play a role in dampening entrepreneurial activity, in line with the theoretical expectations of the NIMBY (Not In My Backyard) model.

It is also important to observe the regional distribution – for example, Prague and Pilsen are in densely populated and economically strong areas where higher entrepreneurial activity would be expected, which makes the presence of the NIMBY effect in these cities particularly notable.

5 Regression analysis

This part of the article presents the main econometric approach used to test the relationship between the rate of owner-occupied housing and entrepreneurial activity at the level of ORP in the Czech Republic. The primary method chosen is multiple linear regression estimated by the ordinary least squares (OLS) method, extended by spatial variables and fixed effects. The feels () function from the first package was used to estimate the models, which allows for efficient work with fixed effects and heteroskedasticity.

The aim is to test the hypothesis that a higher rate of owner-occupied housing is negatively correlated with the dynamics of entrepreneurial activity, which is in line with the NIMBY theory. The regression equations have the general form:

$$rate_{new_{firms}} = \beta_0 + \beta_1 * owner_{share} + X_\gamma + \varepsilon$$

Where:

- Rate_new_firms - is the share of newly created businesses
- Owner_share - is the share of natural apartment owners
- X - is a vector of control variables (e.g. location, size of municipality, density of companies, number of economically active inhabitants),
- ε - denotes the random error

5.1 Models:

5.1.1 Model 1: No Control Variables

The basic model tests the direct relationship between the share of owner-occupied housing and the rate of new business formation:

$$rate_{new_{firms}} = \beta_0 + \beta_1 * owner_{share} + \varepsilon$$

5.1.2 Model 2: Spatial Variables

The second model extends the previous one by geographic coordinates and their squares as an approximation of the spatial trend:

$$rate_{new_{firms}} = \beta_0 + \beta_1 * owner_{share} + \beta_2 * lon + \beta_3 * lat + \beta_4 * lon^2 + \beta_5 * lat^2 + \varepsilon$$

5.1.3 Model 3: Region Fixed Effects

The third model controls for unmeasured regional characteristics using region fixed effects:

$$rate_{new_{firms}} = \beta_0 + \beta_1 * owner_{share} + \delta + \varepsilon$$

Where δ denotes the fixed effect of the region.

5.1.4 Model 4: Controlling for population size (continuous)

$$rate_{new_{firms}} = \beta_0 + \beta_1 * owner_{share} + \beta_2 * pop + \cdots + \varepsilon$$

5.1.5 Model 5: Categorical Settlement Size

Here, the city size variable is entered as a factor variable:

$$rate_{new_{firms}} = \beta_0 + \beta_1 * owner_{share} + \beta_2 * urban_size + \cdots + \varepsilon$$

5.1.6 Model 6: Extended Model

The final model includes, in addition to the variables mentioned above, the logarithm of the population, the density of firms, and the number of economically active persons:

$$rate_{new_{firms}} = \beta_0 + \beta_1 * owner_{share} + \beta_2 * \log(pop) + \beta_3 * firm_{density} + \beta_4 * econ_{active} + \cdots + \varepsilon$$

This model is the most comprehensive and best captures the relationship between the dependent and explanatory variables within the available data. In addition, heteroskedasticity-robust standard errors (HC1) are estimated for this model.

5.2 Results and interpretation

This chapter presents the results of a regression analysis focused on the relationship between the rate of owner-occupied housing and

entrepreneurial activity at the level of municipalities with extended jurisdiction (ORP) in the Czech Republic. Six linear models were estimated, which gradually extend the basic regression to include spatial, demographic and economic variables and fixed effects of regions. The results are discussed both in terms of the direction and magnitude of the effects, and in terms of their statistical significance.

Regression Results: Effect of Homeownership on Business Formation

Variable	1. No controls	2. Spatial controls	3. Region FE	4. Pop. (cont.)	5. Urban size (cat.)	6. Extended
(Intercept)	0.214*** (0.054)	34.590 (170.360)		32.647 (170.997)	26.132 (171.274)	44.101 (156.758)
owner_share	-0.008 (0.097)	-0.002 (0.099)	-0.004 (0.069)	-0.012 (0.106)	0.006 (0.108)	0.045 (0.103)
longitude		0.004 (0.280)		0.002 (0.281)	0.015 (0.282)	0.054 (0.253)
latitude		-1.410 (6.825)		-1.331 (6.851)	-1.077 (6.861)	-1.841 (6.277)
I(longitude^2)		0.000 (0.009)		0.000 (0.009)	0.000 (0.009)	-0.001 (0.008)
I(latitude^2)		0.014 (0.069)		0.014 (0.069)	0.011 (0.069)	0.019 (0.063)
pop				0.000 (0.000)		
urban_sizemedium					-0.230 (0.267)	
urban_sizevery_large					-0.008 (0.044)	
log(pop)						0.088* (0.042)
firm_density						0.008 (0.026)
econ_active						0.000* (0.000)

Table 7– Regression Results: Basic and Extended Models: Own elaboration in R.

The basic model (Model 1), which includes only the variable owner_share, shows a negligible and statistically insignificant negative relationship between the share of owner-occupied dwellings and the rate of new firms. This result suggests that home ownership in a municipality is not a sufficiently strong predictor of entrepreneurial dynamism.

After adding spatial controls (longitude, latitude, and their quadratic forms) in Model 2, the relationship between owner_share and rate_new_firms changes slightly but remains insignificant. The spatial variables themselves also do not show statistically significant coefficients, suggesting that the geographical location of municipalities in this specification does not significantly affect entrepreneurial activity.

Model 3 includes fixed effects of regions (counties), thereby controlling for structural differences between administrative areas. The effect of home ownership remains insignificant here as well. This confirms that differences in entrepreneurial activity are not explained by regional variability in home ownership.

Model 4, which adds population size as a control, also does not find a significant effect of owner_share but shows that the size of the municipality has a weak positive effect, although statistically insignificant.

In Model 5, the size of the municipality is modelled as a categorical variable (urban_size). Here, a weak adverse effect appears for medium-sized municipalities compared to small ones, but this effect does not reach statistical significance. The relationship between ownership and entrepreneurship still does not gain strength.

Only Model 6, extended with economic controls (log(pop), firm_density, econ_active), shows some statistically significant results. The log(pop) coefficient is positive and significant at the 5% level, indicating that more new businesses are created in larger municipalities. The variable econ_active, representing the number of economically active residents, is also significant, although with a minimal coefficient, which somewhat reflects a scale effect. On the other hand, owner_share takes on a larger positive value here for the first time (0.045), but this relationship is not statistically significant either.

Overall, in all specifications, there is no reliable evidence that the rate of owner-occupied housing systematically affects the rate of new business start-ups. The municipality's size and the population's activity play a more significant role. While these results do not completely refute the NIMBY hypothesis, they show that any effect is challenging to capture in aggregate data and can be strongly influenced by other factors.

6 Robustness tests

A set of additional robustness tests was performed to verify the stability and reliability of the basic regression models' results. These tests examine whether the observed relationships between home ownership and entrepreneurial activity persist even with alternative model specifications or when using a different estimate of standard errors.

6.1 Bootstrapped Standard Errors

The first test performed was applying the bootstrap method to estimate robust standard errors. Instead of analytical calculation, the bootstrap relies on repeated random sampling (in this case, 1,000 replications), which allows for estimating the distribution of regression coefficients and their precision without strict assumptions about the normal distribution of residuals. The results showed that the standard errors of the bootstrapped estimates differ only slightly from the classical estimates, confirming the stability of the main coefficients.

6.2 Robust standard errors (HC1)

The next step was to use robust (White) standard errors (denoted as HC1), which consider the possibility of heteroskedasticity – i.e. uneven dispersion of residuals across observations. The model with these adjusted standard errors confirmed that the basic coefficients are not significantly affected by possible heteroskedasticity, while the coefficient of the variable owner_share remains statistically insignificant.

6.3 Interaction between Owner-Occupied Housing and Municipality Size

The analysis also included an interaction model that tested whether the relationship between the share of owner-occupied housing and entrepreneurial activity varies by settlement size. Specifically, an interaction between the variable owner_share and the categorical variable urban_size (small, medium, and very large municipalities) was introduced.

The aim was to determine whether ownership rates play a different role in different urban environments. The results indicate a slight variability in the effect, but the interaction effects were not statistically significant.

6.4 Logarithmic transformation of population

Given that the population size distribution is significantly skewed to the right, a logarithmic transformation of the variable pop was alternatively included in the model. The aim was to verify whether the nonlinear effect of the population can bias the results and affect the estimate of the effect of owner-occupied housing. The results showed that the introduction of log(pop) does not change the direction or significance of the leading explanatory coefficient, which strengthens the robustness of the primary relationship.

Robustness Checks – Regression Estimates			
Variable	**Model 1: Robust SE**	**Model 2: Log(Pop)**	**Model 3: Interaction**
(Intercept)	30.345 (163.644)	42.441 (156.743)	23.454 (161.459)
owner_share	-0.017 (0.106)	0.042 (0.104)	-0.063 (0.139)
longitude	0.013 (0.254)	0.020 (0.258)	0.017 (0.260)
latitude	-1.242 (6.551)	-1.744 (6.276)	-0.965 (6.463)
I(longitude^2)	0.000 (0.008)	0.000 (0.008)	0.000 (0.008)
I(latitude^2)	0.013 (0.066)	0.018 (0.063)	0.010 (0.065)
pop	0.000 (0.000)		
firm_density	0.006 (0.026)		
econ_active	0.000 (0.000)		
log(pop)		0.029 (0.027)	
urban_sizemedium			-0.204*** (0.057)
urban_sizevery_large			-0.103 (0.122)
owner_share × urban_sizevery_large			0.200 (0.213)
Num.Obs.	172	172	172
R^2	0.005	0.008	0.013
Adj. R^2	-0.044	-0.028	-0.036
RMSE	0.25	0.25	0.25
Std. Errors	HC1	HC1	HC1

Table 8 – Robustness Test: Bootstrapped and HC1 Standard Errors, Interaction Own elaboration in R.

The three tested models extend the primary analysis with alternative approaches and control variables.

- Model 1 (Robust SE – HC1) shows a negative but statistically insignificant relationship between the share of homeownership and the rate of new business start-ups. The other control variables also do not show significant effects, which may indicate the model's high heterogeneity and low predictive power ($R^2 = 0.005$).
- Model 2 (Logarithm of population) replaces the linear population with its logarithmic transformation, thus better capturing the nonlinear relationships between population size and entrepreneurial activity. The log(pop) coefficient is positive but insignificant (0.029), confirming previous results with low explanatory power.
- Model 3 (Interaction: Owner × City Size) tests whether the effect of homeownership varies by municipality size. The results show that the share of owner-occupied housing in medium-sized municipalities is significantly negatively associated with entrepreneurial activity ($p < 0.001$, coefficient -0.204). The interaction with huge cities (e.g. Prague, Brno) is insignificant. This result may indicate that the influence of owner-occupied housing is more pronounced outside the metropolis.

Overall, however, all three models achieve very low R^2 values (0.005–0.013), which suggests that the explanatory variable—the rate of new business start-ups—is influenced by several other factors outside the model. Robust standard errors help to increase the credibility of the significance tests but do not change the main conclusions.

6.5 Exploratory Analysis: Model Focused on Areas with High Potential for the NIMBY Effect

The final test focused on a specific subgroup of observations – regional cities, for which the visual analysis identified a high potential for the NIMBY effect. These were the cities of Prague, Pilsen and Karlovy Vary. A separate model was created to verify the relationship between owner-occupied housing and the rate of business start-ups only in these areas. In this case, the relationship was also positive but without statistical significance. More importantly, the finding is that the very structure of the

relationships in these areas differs in some respects, which supports the hypothesis of the possible presence of a localized NIMBY-type effect.

Regression Results for High-NIMBY Potential Cities	
Variable	**Estimate (SE)**
(Intercept)	-2664.520 (17358.958)
owner_share	0.307 (0.428)
log(pop)	-0.012 (0.130)
firm_density	-0.009 (0.033)
econ_active	0.000 (0.000)
longitude	-3.748 (13.578)
latitude	107.770 (694.747)
I(longitude^2)	0.140 (0.496)
I(latitude^2)	-1.080 (6.954)
Num.Obs.	18
R^2	0.212
Adj. R^2	-0.488
AIC	-1.3
BIC	6.7
RMSE	0.14
Std. Errors	Heteroskedasticity-robust

Table 9 – Regression Model for Selected Cities (Prague, Pilsen, Karlovy Vary) : Own elaboration in R

This model focuses exclusively on three regions with a potentially strong NIMBY effect – Prague, Pilsen and Karlovy Vary – and attempts to determine whether different relationships between owner-occupancy rates and entrepreneurial activity apply here.

- The coefficient for the share of owners (0.307) is positive, indicating a positive relationship between owner-occupancy rates and the rate of new business formation. However, its standard error is relatively high (0.428), so the result is statistically insignificant.
- Control variables such as logarithmic (log(pop), firm density, economic activity, or spatial variables (longitude, latitude) also do

not show a significant effect, which may be due to the tiny sample size (n = 18).

- Although the value of $R^2 = 0.212$ suggests that the model explains about 21% of the variability in entrepreneurial activity, the negative value of the adjusted R^2 (-0.488) shows that the model with this number of variables is not suitable for such a small data set – overfitting has occurred.
- The significant standard errors and low power of the model mean that the results should be interpreted cautiously and viewed as an exploratory addition rather than a robust conclusion.

7 7. Discussion

This work aimed to examine the relationship between property ownership and entrepreneurial activity in the territory of Czech municipalities with extended jurisdiction (ORP) in 2011. A descriptive and econometric analysis was performed based on spatial data from OpenStreetMap (OSM), demographic information from the Census of Population, Housing and Apartments (SLDB 2011) and geographic data from ArcČR. Although the NIMBY theory ("Not In My Backyard") and foreign literature suggest that a high level of property ownership may be associated with lower entrepreneurial dynamism, findings in the Czech context do not fully confirm this hypothesis.

Regression analysis showed that the variable owner_share has a statistically insignificant effect on the rate of new firm formation in both the basic and extended models. Population size (log(pop)) also had a statistically significant effect, and to some extent, also the variable econ_active. The interaction of the parameter owner_share with the size of the municipality showed that in medium-sized municipalities, owner-occupied housing could have a negative impact on entrepreneurial activity. However, the total explained variability of the models (R^2 up to 0.02) was very low.

This work's findings align with several international studies that point to the complexity of the relationship between housing and entrepreneurship. For example, the work of Bracke et al. (2012, 2013), Lisi (2019) or Sierminska and Doorley (2013) identify a negative impact of owner-occupied housing on entrepreneurial activity, but this relationship often depends on the context (e.g. mortgage burden, regional mobility, labour market).

However, in the Czech environment, where a high share of owner-occupied housing is a long-term consequence of the transition period, these relationships may not be identical to the contexts of countries such as the USA or the UK. Laamanen's (2019) findings are also partly consistent, showing that ownership can motivate entrepreneurship in weaker regions as an alternative to precarious employment.

The conclusions of this work must be interpreted with the awareness of several fundamental limitations that affect the scope and reliability of the knowledge gained. First, it concerns the temporal staticity of the data – all the information used in the analysis comes from one year

(2011), making it impossible to follow time trends or test causality. The results thus only capture the state at a certain point in time, and long-term dynamics cannot be derived from them.

Another limitation is the measurement of entrepreneurial activity itself. The source was the OpenStreetMap (OSM) database, which, although it provides broad spatial coverage, is not an official statistical tool. OSM may be burdened by random or uneven recording of objects depending on the activity of volunteers and the degree of coverage of the given area. However, the business infrastructure was carefully selected according to equipment, land use, and shop attributes, and data cleaning and standardization were performed so that they relevantly reflected the business environment.

It should also be noted that the relationship between homeownership and entrepreneurial activity may not be linear. Therefore, The linear regression models may not capture nonlinear relationships that may be present – for example, a threshold of a certain level of ownership above which entrepreneurship slows down significantly.

A specific problem is the significant heterogeneity between RUP units in size, urbanization, and social structure. This variability makes aggregation difficult and may hide local effects that might be more apparent in finer territorial divisions or time series. This variability probably also contributes to the very low value of the explained variability in most models (R^2), suggesting that entrepreneurial activity is influenced by a number of other factors that the model does not capture.

Although no clear and statistically significant relationship was found between home ownership and the rate of new business creation, important implications can be drawn from the limited results. The analysis identified specific locations – notably Prague, Pilsen and Karlovy Vary – where a high share of owner-occupied dwellings is combined with low business activity. This raises the hypothesis of a possible NIMBY effect (Not in My Backyard), where citizens with property ownership relationships can actively prevent new investments in a given area.

From the perspective of spatial administration and planning, several recommendations are offered:

- Promote a functional mix in spatial plans – i.e. a combination of residential and commercial functions, thereby reducing the risk of spatial exclusion of business activities.

- Simplify administrative processes for small entrepreneurs, especially in the areas of building management, land use changes or access to commercial premises.
- When deciding on the location of new establishments, consider not only economic factors but also the social composition of the population and the level of citizen involvement, which may be related to ownership status.
- Increase transparency and participation in decision-making on spatial development to prevent the dominance of property rights groups over the social benefits of business projects.

The results of this work serve as a starting point for a broader debate on how to balance the stability of residential neighbourhoods with the need to support a dynamic business environment. In this regard, good spatial planning, regulatory frameworks, and municipalities' proactive approach to supporting entrepreneurship play an important role. An urban environment that offers enough space for new businesses, flexible use of real estate, and openness to change is key to the emergence of new economic activities.

Although the hypothesis of a negative impact of the share of owner-occupied housing on entrepreneurship has not been confirmed as a systematic phenomenon, the work shows that the socio-spatial context and urban structure significantly impact the local business climate. This should be considered when setting regional development policies, creating spatial plans and formulating strategies to support small and medium-sized enterprises.

8 Conclusion

This work aimed to determine whether there is a relationship between the share of owner-occupied housing and entrepreneurial activity in the territory of Czech municipalities with extended jurisdiction (ORP) and whether features of the NIMBY (Not in My Backyard) phenomenon can be identified in this relationship. Specifically, the work sought to verify the hypothesis that a higher rate of owner-occupied housing is associated with a lower rate of new business establishment. At the same time, this relationship may be a consequence of the negative attitude of residents towards new economic activities in their surroundings.

Based on a quantitative analysis that combined spatial, demographic and entrepreneurial data from three main sources (SLDB 2011, OpenStreetMap and ArcČR), no systematic statistical relationship was found between the share of physical homeowners and the rate of entrepreneurial activity in most ORPs. Regression models that successively controlled for spatial, population and economic variables show that population size and the number of economically active residents play a significant role. In contrast, home ownership itself does not show a consistent or statistically significant effect. This conclusion applies to the overall sample and a subset of regional cities.

However, spatial visualization and additional analysis of several specific areas (e.g. Prague, Pilsen, Karlovy Vary) have shown that in some localities, a combination of high ownership and low entrepreneurial activity may occur. These findings suggest that the NIMBY phenomenon may manifest itself at the micro-city level and should be the subject of further research.

This work brings several new contributions to the Czech and international discussion on the relationship between property ownership and economic dynamics. First, it expands the existing empirical literature with a case study of the Czech Republic, which is characterized by a very high ownership rate and uneven entrepreneurial activity. This topic has so far been analyzed only marginally in the domestic environment. Second, the work connects spatial analysis with economic theory and creates an indicator of entrepreneurial activity based on OpenStreetMap data aggregated for the ORP territory. This methodology may inspire other research projects combining official statistical data with open geographic sources. Third, the analysis identifies spatial heterogeneity,

which is often neglected in territorially aggregated research. It has been shown that even within a single country, locations can have different dynamics of ownership and business relations, which has a significant impact on the shape of public policy.

Secondly, it is advisable to expand data sources. OpenStreetMap provides valuable, but unofficial information. For greater accuracy and comparability, administrative databases (e.g. trade or commercial registers) could be used. These contain precise data on the establishment of business entities.

From a methodological point of view, it is advisable to consider the use of more advanced statistical methods. An alternative may be generalized additive models (GAM), which allow capturing nonlinearities, or spatial econometric models. These then work better with dependencies between neighboring territorial units. The use of machine learning methods, which can be applied to identify complex patterns and interactions in large data sets, could also be of significant benefit.

In addition to the quantitative approach, it would be beneficial to expand the research to include a qualitative component. Interviews with local entrepreneurs, representatives of local governments, urban planners or residents in areas with a high rate of owner-occupied housing and low entrepreneurial activity. This could shed light on attitudes that cannot be captured by purely statistical methods.

From a practical application perspective, it would also be possible to distinguish between the impacts on different types of business. It would be appropriate to examine whether the level of ownership affects, for example, business in the service sector differently than in industry or in the cultural or creative industries. While some sectors may be more disruptive to residential stability, others can be considered a natural part of it.

In conclusion, it can be said that the relationship between owner-occupied housing and entrepreneurial activity is complex. It is strongly dependent on the local and institutional context and cannot be clearly generalized without a thorough multidisciplinary approach. Although this work did not provide direct evidence of the negative impact of ownership on entrepreneurship at the ORP level, it did show that spatial barriers to growth may be manifested in some locations, which are related to the stability of the residential structure. The work thus opens up space for critical reflection on spatial planning, local government decisions and economic strategies aimed at supporting local development. In this

regard, it can serve as a methodological and interpretative basis for further research and practical interventions in public policies.

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