Veikka Lento

The impact of new housing construction on rental housing market in 2020s Helsinki

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Author: Veikka Lento
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ABSTRACT:

The popularity of rental housing has grown steadily throughout the 2000s and today more than half of all households in Helsinki live in rented accommodation. From a landlord's point of view, determining the right rent level is of primary importance when renting an apartment. In the big picture, the key factor in determining the rent is the amount of demand in relation to supply. Many factors affecting supply and demand can be identified and taken into account. In the case of new construction, the difficulty in identifying the impact is that new construction not only increases the supply of housing in the area but may also increase the attractiveness of the area.

The impact of new construction on rents for nearby housing has been studied in several US cities. The results of previous studies have varied from city to city, and different results have also been obtained in the same cities. Findings have ranged from a 7% increase in rents to almost a 7% decrease in rents for apartments within a few hundred meters of new construction. Since the impact of new construction is difficult to generalise due to the regional nature of the housing market, this study fills a gap in the research on the impact of new construction on rents of nearby dwellings in Helsinki. This study also adds to previous studies in this area by the fact that during the period of the study, significant macroeconomic events have taken place that have led to an oversupply of rental housing in the market.

Five professionals working in the real estate sector are interviewed to formulate the hypotheses of the research problem and to gain an in-depth understanding of the topic. In the statistical analysis of the study, the hypotheses are tested using the quasi-experimental difference-in-differences method, which is well established in studies of the subject. The method uses a regression model to compare a dummy variable describing the interaction between the treatment and control groups before and after the completion of the new construction. The advantage of this approach is that it removes biases due to group differences and external factors. The dataset consists of new buildings constructed in Helsinki in 2022 and 2023, and rent observations within a radius of one kilometre around the new buildings from 2021 to 2024, with a sample size of 12 960.

The results show that new construction increases rents for dwellings within 400 meters by 5,8% compared to dwellings within 400-1000 meters. The results are explained by the dominant demand effect. New housing attracts households, which in turn attracts new amenities and as a result the demand for the whole area increases. However, the analysis does not include discount campaigns, which were given more to dwellings close to new buildings. Therefore, rents in the area around new buildings have actually increased less because tenants have been attracted by one-off discounts instead of a permanent reduction in the monthly rent.

KEYWORDS: Rental housing, Housing supply, Helsinki, Regression analysis

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TIIVISTELMÄ:
Vuokra-asumisen suosio on kasvanut tasaisesti koko 2000-luvun ja nykyään jo yli puolet Helsingin asuntokunnista asuu vuokralla. Vuokranantajan näkökulmasta oikean vuokratason määrittäminen on ensisijaisen tärkeää asunnon vuokraamisessa. Isossa kuvassa vuokran määrityksessä keskeistä on kysynnän määrä suhteessa tarjontaan. Monet kysyntään ja tarjontaan vaikuttavat tekijät osataan tunnistaa ja ottaa huomioon. Uudisrakentamisen kohdalla vaikutusten tunnistamisesta vaikeaa tekee se, että uudisrakentaminen ei ainoastaan lisää alueen asuntojen tarjontaa, vaan se saattaa myös lisätä alueen vetovoimaa.

Uudisrakentamisen vaikutuksia lähialueen asuntojen vuokriin on tutkittu useissa Yhdysvaltojen kaupungeissa. Aikaisempien tutkimusten tulokset ovat olleet vaihtelevia kaupungin mukaan ja erilaisia tuloksia on saatu myös samoista kaupungeista. Havainnot ovat vaihdelleet 7 % vuokria nostavasta vaikutuksesta lähes 7 % vuokria laskevaan vaikutukseen muutaman sadan metrin säteellä uudesta rakennuksesta sijaitsevissa asunnoissa. Koska uudisrakentamisen vaikutuksia on hankala yleistää asuntomarkkinoiden alueellisuuden takia, tämä tutkimus täyttää tutkimusaukon uudisrakentamisen vaikutuksista läheisten asuntojen vuokriin Helsingissä. Lisäpanoksen tämä tutkimus antaa aihepiirin aikaisempii tutkimuksiin myös sillä, että tutkimuksen ajanjaksolla on tapahtunut merkittäviä makrotalouden tapahtumia, jotka ovat johtaneet vuokra-asuntojen ylitarjontatilanteeseen markkinoilla.

Viittä kiinteistöalalla työskentelevää ammattilaista haastatellaan tutkimusongelman hypoteesien muodostamista varten ja aiheen syvällisen ymmärtämisen saavuttamiseksi. Tutkimuksen tilastollisessa analyysissä hypoteesit testataan aiheen tutkimuksissa vakiintunutta kvasikokeellista difference-in-diffecenses -menetelmää käyttämällä. Menetelmän avulla regressiomallissa verrataan koe- ja vertailuryhmän vuorovaikutusta kuvaavaa dummy-muuttujaa ennen ja jälkeen uudisrakennuksen valmistumisen. Tämän lähestymistavan etuna on, että se poistaa ryhmien eroista ja ulkoisista tekijöistä johtuvat vääristymät. Aineisto koostuu Helsingissä vuosina 2022 ja 2023 rakennetuista uusista rakennuksista sekä vuokrahavainnoista kilometrin säteellä uudisrakennusten ympäriltä vuosilta 2021–2024, otoskoon ollessa 12 960.

Tulokset osoittavat uudisrakennusten nostavan 400 metrin säteellä sijaitsevien asuntojen vuokria 5,8 % verrattuna 400–1000 metrin säteellä sijaitseviin asuntoihin. Tuloksia selittää hallitseva kysyntävaikutus eli, uudet asunnot houkuttelevat kotitalouksia, joka puolestaan houkuttelee uusia palveluita ja lopputuloksena koko alueen kysyntä paranee. Analyysi ei kuitenkaan ota huomioon alennuskampanjoita, joita oli annettu enemmän uudisrakennusten lähellä sijaitseville asunnoille. Näin ollen uudisrakennusten lähialueella vuokrat ovat nousseet todellisuudessa vähemmän koska, vuokralaisia on houkuteltu kertaluontoisilla alennuksilla kuukausivuokran pysyvän alentamisen sijaan.

AVAINSANAT: Vuokra-asunnot, Asuntotuotanto, Helsinki, Regressioanalyysi

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1 Introduction

The first part of this study provides a comprehensive overview of the research subject, outlining the key background information and highlighting the research gap identified. In addition, the research questions, objectives and limitations of the study are discussed, and the methodology and data collection techniques used are described. Finally, the structure of the study is presented to guide the reader through the following chapters.

1.1 Research background

In housing, the trend in the 2000s has been an increase in demand for rental housing. This has been driven by factors such as urbanisation and changes in housing habits. Today, more than half of all households in Helsinki live in rented accommodation according to Official Statistics of Finland (2024d). The important thing for landlords in rental housing is to set the right rent level to attract tenants, but also to make it financially viable. The rent of dwellings in the rental housing market is ultimately determined by the level of demand relative to supply.

The early 2020s have been shaped by major macroeconomic events such as COVID-19 pandemic and Russian invasion of Ukraine. These events have had an impact on all sectors of the economy. The real estate sector is one of the sectors where macroeconomic factors have influenced, for example, the supply and demand for housing. The real estate sector is typically sensitive to reflect changes in the economy which makes it difficult to predict the amount of supply needed to meet the rapidly changing demand. An additional challenge is the rigidity and lag of changes in housing supply. Optimally, the number of new dwellings constructed will match housing demand. Unexpected changes in the macroeconomy make forecasting even more difficult. According to KTI (2023) market review, the rapid growth in the supply of rental housing in the Helsinki Metropolitan Area has led to an oversupply of housing on the market. They stated that occupancy rate has dropped significantly after the COVID-19 pandemic, and at the same time a large number

of short-term rental properties have been released onto the market for long-term rentals. Due to the current market environment and the high level of housing supply, finding out the impact of new construction on rents is relevant information for market participants.

Determining the right rent level using information on demand and supply factors is possible due to the large amount of data available in the market. For many factors, the impact on rent is known and well-studied. For example, an increase in migration is known to raise rents in the area (Laakso, 2000). However, analysing the impact of new construction is difficult. The difficulty is that new construction not only increases the supply of housing in the area but may also increase the attractiveness of the area and thus the demand for it (Asquith et al., 2020). The impact on rents depends on whether the supply or demand effect is dominant.

Asquith et al. (2020) examined the impact of new housing on rents in 11 US cities. Rents fell by 6% near the new construction, compared to those between 250 and 600 meters away. The researchers hypothesise that if there is a demand effect, it is minimal due to the stronger supply effect. Increased housing supply can lead to lower house prices and rents if the supply effect dominates (Liao, 2024,). Li (2022) observe in his study that a 10% increase in the housing stock is associated with a 1% reduction in rents within a 150-meter radius in New York. He finds out that supply effect is dominant causing reductions in the rents of residential properties locating near new housing construction. However, Damiano and Frenier (2020) found that rents for rental housing near new construction were 6,6 percent higher than rents for the comparison group further away in Minneapolis. Also Singh (2020) note that a 2,3% increase was observed in the rents of existing properties in response to the addition of a rental unit within a 150-meter radius. Singh's study was carried out in New York, as was Li's study, which had mixed results.

Previous studies show that the results are not consistent and vary from city to city. Even within the same city, results have varied depending on the survey data, time period and delimitations. To my knowledge, no similar study has been conducted in Helsinki. Bratu

et al. (2023) studied the impact of new construction on moving chains and found an increase in housing affordability outside the sub-markets where new building is taking place. However, the study does not explain what the impact will be on the immediately surrounding residential areas or what the impact is in monetary terms. The impact of new housing construction in Helsinki has been studied regarding housing prices. Jantunen (2017) found that new construction within a 300-meter radius raises house prices in Helsinki by 0,9%. However, Hilber and Mense (2021) found that the correlation between house prices and rents is questionable and varies by location. Furthermore, Loewenstein and Willem (2023) stated in their study that any analysis of the housing market must take into account data on both housing prices and rents. For these reasons, research gap can be identified.

Personally, as a career aspirant in the real estate sector, it is important for me to be able to provide more information to the sector and fill a research gap identified there. In addition, learning about previous literature, trends and phenomena in the field will increase my professional knowledge. The choice of the research topic was motivated by my current role as an analyst in the industry. This research will allow me to make use of what I have learned in the past, while learning new things and providing practical benefits to both my employer and the industry in general.

1.2 Research questions and purpose

The study is initially motivated by the need for a property management company to investigate the variables affecting rent as one of the most important tasks of a such company is to determine the correct rent level. The right amount of rent will keep occupancy rates high and thereby maintain and increase the profitability of the property. With a large amount of market information and years of experience, the determination of rents can be done reasonably accurately. However, there are variables whose impact is not fully known, due to a lack of data or the difficulty of modelling the impact. The impact of new construction on rents by distance is one variable that has not been accurately

modelled in Helsinki. Purpose of this study is to fill this research gap with the fairly recent data from 2020s. Based on previous research and empirical experience, new construction is assumed to have an impact on rents in most of the cities. According to Official Statistics of Finland[1] (2024e), Helsinki has the largest rental housing market in Finland, so it is reasonable to conduct the first study of the subject there.

The research problem is formulated on the basis of the research background and purpose of the study. How does new construction affect nearby rents based on the distance between the new building and the existing dwelling? From the research problem, three practical research questions are outlined. The research questions for the study are as follows:

Q_1: How does the construction of new housing affect rents at different distances between new and old housing?

Q_2: What factors influence the extent of the impact of new construction on rents for older dwellings at different distances?

Q_3: Does the region have an impact on the effect of new construction on rents?

The first question is the most important and is examines the general impact. The first question answers to the research problem on what the impact of new housing construction on nearby rents is. The other two research questions are minor questions that support and provide additional information to the first one. The second research question focuses on other influencing factors besides distance that may increase or decrease the impact. Such a factor could be, for example, the type of dwellings. The last question is to

[1] The Official Statistics of Finland is a government agency whose purpose is to guarantee the availability of reliable statistical information and to enhance the principles that govern the collection, processing, utilisation and storage of statistical information, while promoting the use of statistical information in research (Ministry of Justice, 2024b).

investigate regional differences. It is an important part of a holistic understanding of the research problem.

1.3 Objectives and delimitations

The first objective of the study is to examine the topic related to the research problem through a comprehensive literature review. The aim is to familiarise the reader with the subject and to introduce and explain key concepts by reference to previous literature. The objective of the methodology section is to present the data and methods used in the study. The research philosophy of the study is positivism, as it is the most commonly used form of research in business disciplines for decades (Dudovskiy, 2024). According to him, positivist research is usually statistical analysis and result in testing phenomena, which makes it suitable for this study. According to this philosophy, inductive reasoning is used to develop hypotheses to be tested during the research process, so the empirical phase will start by collecting primary data from interviews with real estate professionals, with the objective of gaining insights into their practical experiences and formulating hypotheses for the research questions.

In the quantitative phase, the approach is deductive in line with the positivist research philosophy, so the known phenomenon is tested under given circumstances. The objective of the quantitative research in the empirical phase is to test the hypotheses formed on the basis of the interviews and to obtain answers to the research questions. The quantitative part is conducted through a statistical analysis. The statistical tools used are regression analysis and difference-in-differences method. The use of regression analysis is appropriate because it enables the simultaneous examination of the relationships between several independent variables and the dependent variable to be explained. In addition, difference-in-differences is well suited for examining causal effects. Secondary data for quantitative research is provided by two different companies operating in the field of real estate. Finally, the objective of the conclusion chapter is to reflect on and

generalise the results of the study. Based on the limitations of the results, the aim is to suggest topics for further research.

The study has delimitations to facilitate data management and to narrow the scope of the study. The main limitations are time and place. The data is collected from 2021 to 2024, and time period has been chosen because the last four years provide the most data and the timeframe of the study ensures a similar kind of market environment for the whole period. Minimising the change in the market environment over the period of the study reduces the impact of external factors. The research is limited in scope to the city of Helsinki, and all data have been gathered exclusively from there. It has been chosen because it has the largest rental housing market in Finland. The city of Helsinki has also the largest amount of data available which increases the validity of the research. The type of old dwellings and new construction is limited to apartment buildings, as they represent the majority of rental housing market (Official Statistics of Finland, 2024e).

1.4 Structure of the research

The structure of the thesis consists of five chapters, starting with the introduction, which sets the stage by outlining the research background, questions and purpose. This chapter also defines the research objectives and delimitations, helping the reader to understand the scope of the study. This is followed by a literature review that introduces the rental housing market in Helsinki and its characteristics. In addition, macroeconomic events that have affected the housing market in the 2020s are presented referencing to previous studies, placing the study in the broader context. This is followed by an examination of the current state of the rental housing market in Helsinki. Previous studies on the topic of this study are reviewed in the end of literature review section. The review includes works whose findings support both rent increases and rent decreases as a result of new housing construction, providing a basis for the possible outcomes of the analysis and the research.

The methodology section presents the data, units of analysis and process steps of the study. Methodology part also introduces regression analysis and difference-in-differences method as a statistical tool used to process the data. The results chapter reports the findings of the empirical study, addressing the research questions in detail. Qualitative findings are used to create research hypotheses, and quantitative findings are used to test the hypotheses and answer the research problem. Finally, the conclusion summarises the key findings, generalises the results and explores potential future research opportunities.

2 Literature review

The rental housing market in Helsinki and Finland is discussed in this chapter. Information from previous literature is linked to the research topic and problem of the study to improve understanding of the research. The first section reviews the history and development of the Finnish rental housing market. After that demand and supply subsidies used in Finland are investigated. This is followed by an examination of how the macroeconomic events of the 2020s have affected the market. Then the current state of the rental housing market in Helsinki is examined. The last section discusses previous studies on the research problem.

Housing represents the single most important asset for a significant proportion of households (Kiyotaki et al., 2024). The housing market is defined as the place where supply and demand for housing meet and over time, price differences tend to narrow due to shifts in the consumption patterns of potential buyers and the reactions of sellers to these changes (Smith, 2012). According to Smith (2012) the term "rental housing" is defined as residing in a dwelling that is owned by another individual or entity.

The housing market in general is characterised by strong cyclical fluctuations over time (Czerniak & Rubaszek, 2018; Laakso, 2000). According to Laakso (2000), a key explanation for this phenomenon is the inflexibility of supply in the context of the volatility and rapidity of shifts in demand, which are largely driven by external factors beyond the influence of the rental housing market. Supply rigidities are caused, for example, by the slowness of construction and its planning (Mach et al., 2020). He stated that the typical construction period from the granting of a building permit to the project's completion and subsequent commissioning is approximately 22 months. The level of demand is influenced by a number of external factors, including interest rates, income levels, amenities in the area, migration patterns and demographic trends (Laakso, 2000).

2.1 History and development of the rental housing market in Finland

Laakso (2000) writes in his study that migration in Finland has for decades been directed from rural areas to the Helsinki region and to other large cities. He says that migration to Helsinki has been strong in the 1970s and 1980s, but that in the late 1980s the overheating of the housing market slowed down migration to Helsinki. The overheating of the housing market is also reflected in Official Statistics of Finland (2009) data on average rents for 1964-2008. The average rent per square meter increased by over ten percent in both 1980 and 1981, in comparison to the previous year. In contrast, the percentage change in 1987 was negative, at minus half a percent.

It can be argued that the trend of urbanisation in Finland started in the 1970s and has continued to the present day (Tervo, 2019). Migration to cities and especially to Helsinki, or urbanisation, can be seen in Figure 1, which shows population growth over the last three decades in Helsinki and eight provinces. The population of Helsinki has exhibited a consistent growth trend, in contrast to the experiences of provinces, which have demonstrated either stability or a slight decline in population. As the rental housing market is very regional, migration and hence urbanisation play a major role in studying the Finnish rental housing market.

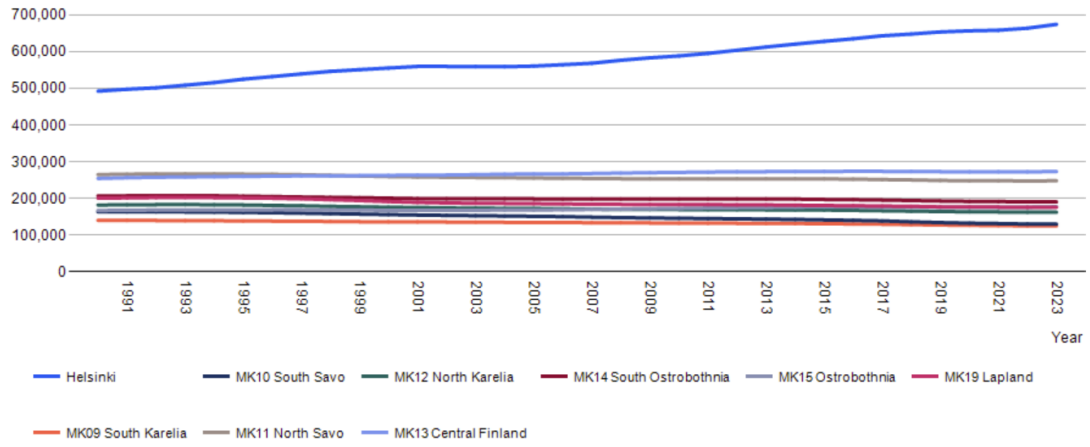

Figure 1. Population of Helsinki and 8 provinces in Finland 1990-2023 (Official Statistics of Finland, 2024f).

The influence of income and employment levels on the housing market is considerable, as evidenced by the Finnish recession of the 1990s (Kuismanen et al., 1999). For example, the rise in house prices caused by the liberalisation of financial markets in Finland led to an overheating of the economy, which eventually became a recession (Kiander, 2001; Kuismanen et al., 1999; Laakso, 2000). Kinder (2001) notes that the liberalisation of financial markets meant deregulating lending and making it easier to grant loans. Kiander (2009), Kuismanen et al., (1999) and Laakso (2000) write that during the 1991-1993 recession, GDP fell by more than 10% and the unemployment rate rose by more than 10%. As a consequence of these factors, there was a significant decline in demand for housing, which subsequently resulted in a collapse in house prices all over Finland. However, the data in Figure 2 from Official Statistics of Finland (2024a) indicates, that the average rental prices per square meter for properties in the Helsinki metropolitan area have increased consistently throughout the 1990s despite the recession. After the removal of rent regulation in Finland in 1995, i.e. the regulation where the authority sets a maximum rent for a dwelling, landlords increased rents that had remained low because of the regulation, regardless of the recession (Laakso, 2000). He also noted that higher interest rates were reflected directly in rents. According to Cournède et al. (2019) and Kofner (2014), rent regulation, rent subsidy systems and the low levels of home ownership and the high share of private landlords protects renters against undesirable changes and shocks in the economy.

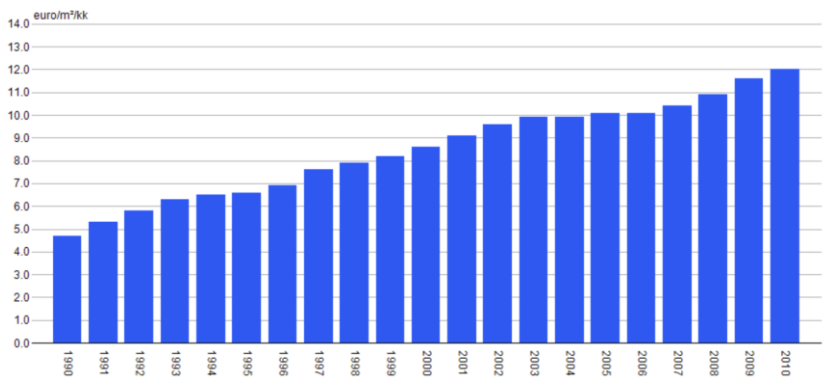

Figure 2. Average dwelling rents per square meter in the Helsinki metropolitan area from 1990-2010 (Official Statistics of Finland, 2024a).

The popularity of rental housing has increased in many cities since the recession of the 1990s for several reasons (Pellervo economic research PTT, 2019). In the 1990s, the popularity of rental housing was temporarily boosted by factors such as over-indebtedness, economic uncertainty and housing traps, which caused households to move away from owner-occupation (Laakso, 2000). The popularity of rental housing in Helsinki in the early 2000s has been driven in particular by strong urbanisation, high prices for owner-occupied housing and changing housing preferences that value flexibility (Kuparinen & Vihavainen, 2013).

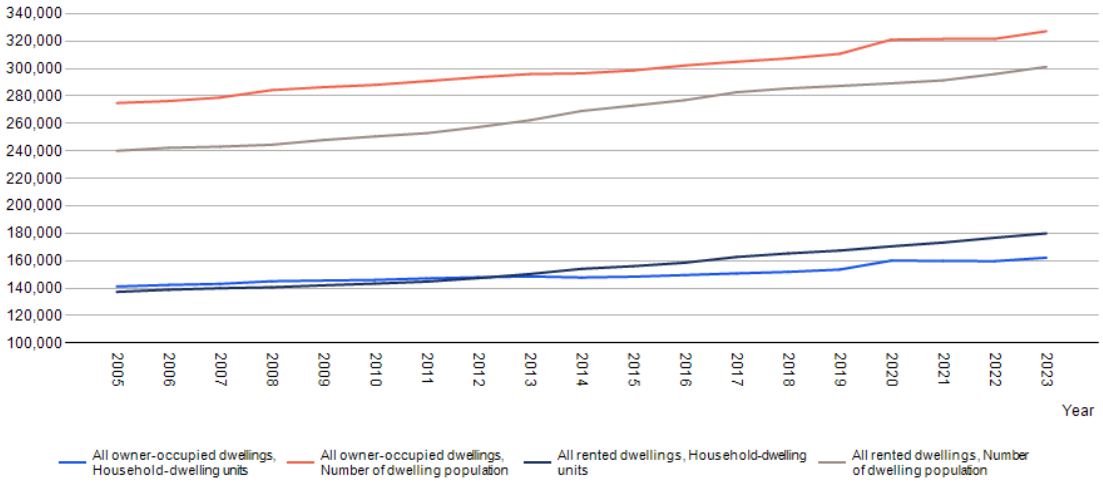

Figure 3. Household-dwelling units and dwelling population by tenure status in Helsinki (Official Statistics of Finland, 2024d).

According to Pellervo economic research PTT (2019), the period between 2000 and 2010 was steady rise in the popularity of rental housing. In 1996, 50,3% of households in Helsinki lived in owner-occupied dwellings and 46,5% in rented dwellings, while in 2011, 47,9% lived in owner-occupied dwellings and 47,2% in rented dwellings (Kuparinen & Vihavainen, 2013). The proportion of rental household-dwelling units within the total dwelling units increased at a faster rate during the 2010s (Pellervo economic research PTT, 2019). This observation is supported by statistics from Official Statistics of Finland (2024d) in Figure 3, which shows how during 2012 the number of rental household-dwelling units in Helsinki exceeded the number of owner-occupied household-dwelling units. The term "household-dwelling unit" is used to describe all individuals who are

permanently resident in the same dwelling unit (Official Statistics of Finland, 2024d). Although the number of households living in rented accommodation in large cities may have exceeded the number of households living in owner-occupied accommodation, owner-occupation is still the most common form of housing in Finland.

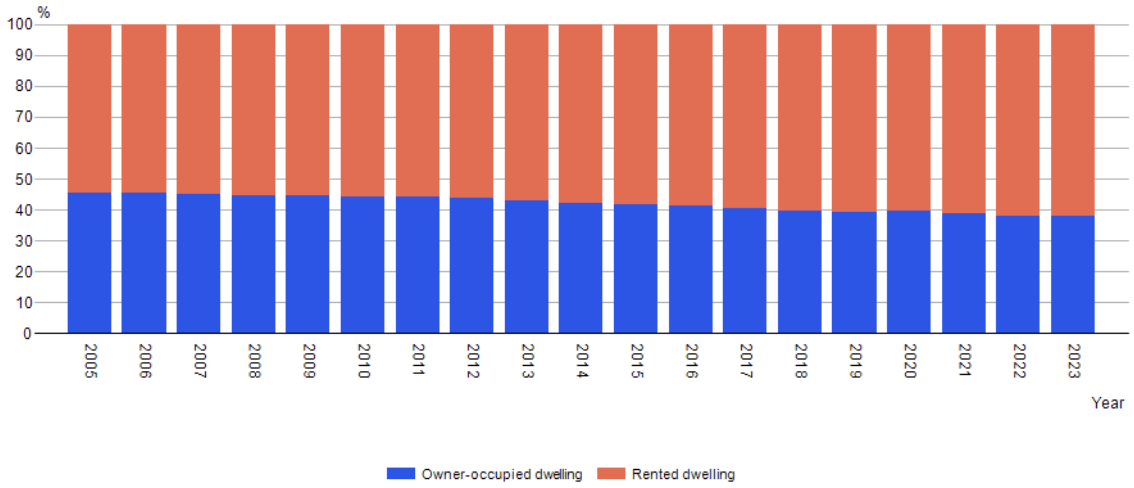

Figure 4. Tenure status for single-person household dwellings in Helsinki (Official Statistics of Finland, 2024d).

In the 2010s, there was a notable decline in the average floor area of apartment buildings (Official Statistics of Finland, 2021). According to Putkuri (2020) there was a shift in preference towards smaller dwellings which contributed to a reduction in the size of new dwellings. This explain the phenomenon in Figure 3, where the number of rental household-dwelling units exceeded the number of owner-occupied household-dwelling units, even though population living in rental housing is less than population living in owner occupied housing. In Helsinki single-person household-dwelling units accounted for almost 50% in 2012 (Kuparinen & Vihavainen, 2013). This, combined with the Official Statistics of Finland (2024d) findings in Figure 4, which show that the majority of single-person households live in rented accommodation, has led to an increase in the construction of studio apartments in Helsinki and at the same time to a reduction in the average size of new apartment buildings. Furthermore, the decrease in the average size of apartment buildings during the 2010s cannot be explained only by the increased production of smaller apartment types, as the floor area per apartment type has also decreased

(Official Statistics of Finland, 2021). With apartment buildings being the most common type of rental housing according to Official Statistics of Finland (2024d), this development had a major impact on the rental housing market as a whole.

In addition to changes in demand trends, the supply of rental housing has been affected by many other factors over the years. Rental housing became a competitive investment after rent regulation was abolished and this increased the supply of rental housing in the 1990s (Laakso, 2000). The strong growth in the supply of rental housing in the 1990s led to a decline in supply in the 2000s (Kuparinen & Vihavainen, 2013). However, in the years following the 2008-euro crisis, housing investment has become increasingly popular and since 2010, the number of new apartment buildings in particular has almost doubled in the largest cities (Pellervo economic research PTT, 2019). As returns on other investments fell, housing was seen as a moderate but stable return generator. Furthermore, the increased popularity of residential investment has resulted in a broader range of landlords and various types of rental housing entering the market.

In conclusion, the rental housing market in Finland and Helsinki and its development have been driven by deregulation, urbanisation, the recession of the 1990s and the resulting economic uncertainty, the growing popularity of rental housing, changes in housing habits and a reduction in the average size of dwellings. The trend in rents in Helsinki has been upwards for decades. In addition to increased demand, the supply of rental housing has been boosted by its growing popularity as a competitive, steady return investment instrument. Understanding the cyclicality of the rental housing market and the impact of supply and demand factors improves understanding of the topic under study. Furthermore, in order to study the rental housing market in Helsinki and its current state, it is essential to know which trends have led to the current situation.

2.2 Demand and supply subsidies in the Finnish rental housing market

Article 19(4) of the Finnish Constitution states that it is the duty of public authorities to promote the right of everyone to housing and to support the independent arrangements for housing (Ministry of Justice, 2024a). The objectives of Finland's housing policy include the right to affordable housing for everyone, a supply of housing that meets different needs and supports the vitality of the regions, stability of rents in the housing market, and the balancing of the housing market cycles (Ministry of the Environment, n.d.). The objectives support the balanced development of the housing market, reduce inequalities, promote the development of the labour market and secure the development of housing conditions in different locations in Finland. Ministry of the Environment (n.d.), which manages housing policy in Finland, reports that housing policy objectives and housing in general are supported by demand and supply-side subsidies.

The majority of demand subsidies for rented dwelling households are paid in the form of housing allowances (Viren, 2013). Another form of demand subsidy is, for example, the tax deductibility of interest payments, but this is targeted at owner-occupiers (Matala, 2018). General housing allowance in Finland is paid and administered by Kela. Kela (n.d.) explains that the purpose of the general housing allowance is to help pay for housing costs and that it can be granted for both rented and owner-occupied housing. However, from the beginning of 2025 it will no longer be granted for owner-occupied housing (Kela, n.d.). The subsidy is granted to people on low incomes. General housing allowance is up to 70% of the cost of housing and can be used to pay rent (Kela, n.d.). Housing benefit is a transfer of income paid monthly by Kela to the beneficiary.

Kela (n.d.) states that general housing allowance amounted to 1 684 million euros in 2023 in Finland and that there were over 400 thousand beneficiaries at the end of the year. Matala (2018) writes that the amount of housing subsidy paid has increased over the last decade. He writes that in 2008, the general housing allowance in Finland was paid 428 million euros. In addition to the fact that the amount of subsidies paid was only a quarter, he mentions that in 2008 the number of beneficiaries was lower, at 140

thousand. The same trend can be seen in Helsinki, where general housing allowances paid for rental housing have roughly quadrupled this century, according to data provided by Kela (2024). Figure 5, based on data from Kela, confirms Matala's (2018) finding of a strong increase in the number of housing allowances paid in the last decade.

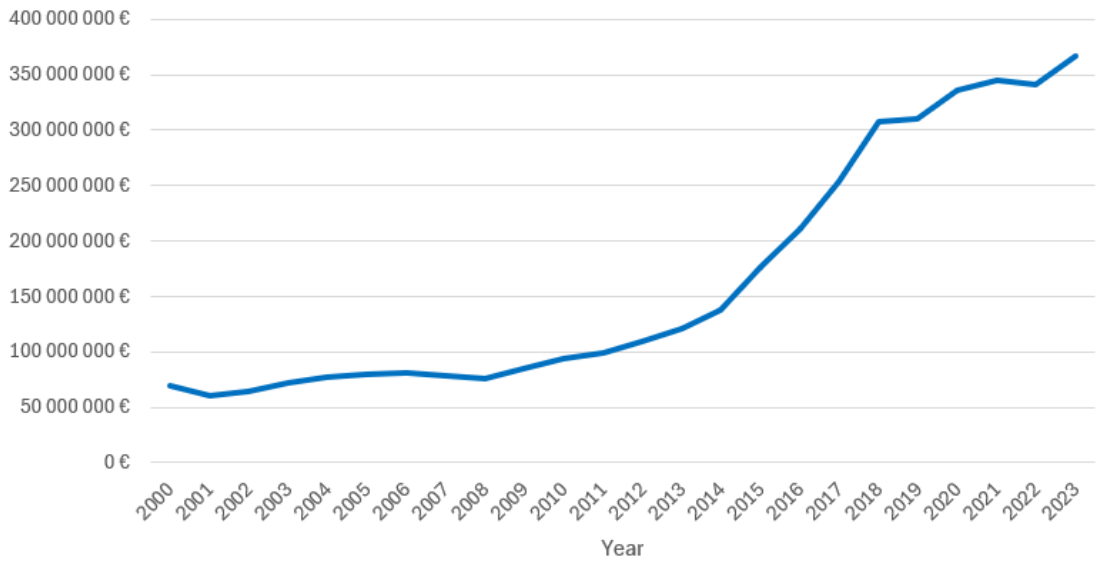

Figure 5. Expenditure on general housing allowance for rental housing in Helsinki 2000-2023 (adapted from Kela, 2024).

The effects of demand subsidies and especially housing allowance on rents have been studied by Viren (2013) and Eerola and Lyytikäinen (2021). The Viren (2013) study found that up to more than thirty percent of subsidies go into rents, but at the same time subsidies increase the demand for rental housing more than the income effect. Thus, subsidies work as intended. However, Eerola and Lyytikäinen (2021) do not find an effect of housing allowance on rents in their study. They argue that the internal validity of their study is higher than Viren (2013) study. Furthermore, they mention that a possible impact of the subsidy on demand and thus on rent levels cannot be ruled out. The Ministry of the Environment (n.d.) notes that in the case of housing subsidies, demand subsidies have been heavily concentrated in recent years, while supply subsidies have declined due to low interest rates, and a moderate increase in the amount of supply subsidies would therefore be justified.

The Finnish housing market can be divided into privately financed housing and state-subsidised housing (Oikarinen, 2007). He writes that while privately financed housing can be rented at market rates without restrictions, the rents of subsidised housing are controlled and regulated. He also mentions that despite their differences, both sectors influence each other's housing stock, prices and rents. Alho et al. (2018) mentions that the most important supply-side subsidies are construction subsidies, such as subsidised loans for rental housing, state guarantees and land sales at below-market prices. According to them, other types of supply-side subsidies include rights of occupancy dwellings, start-up grants and investment in housing for people with special needs. Right-of-occupancy housing is an alternative form of housing to owner-occupied and rented housing, where the tenant pays a one-off right-of-occupancy fee and a monthly charge for use (Ara, 2024a).

The Housing Finance and Development Centre of Finland (Ara) is a government agency implementing housing policy under the Ministry of the Environment (Ara, 2024a). Its tasks include granting construction subsidies, monitoring the use of subsidised housing and producing housing market reports. Government-subsidised housing is called 'Ara' housing and most of it is rental housing. The official Ara website mentions that there are always restrictions on access to Ara housing. Other restrictions also apply to Ara housing. Long- and short-term subsidised or guaranteed loans are available for the construction of Ara rental housing, and the type of loan determines the restrictions on the management and occupation of the housing. Restrictions on rental housing are fixed term. The Housing Finance and Development Centre of Finland (Ara) does not own Ara housing, the housing is owned by welfare districts, municipalities and non-profit organisations (Ara, 2024a). However, the current Ara will be discontinued, and its statutory functions will be transferred to the Ministry of the Environment's new Centre for State Supported Housing in 2025.

According to Eerola et al. (2024) about 160 thousand new Ara dwellings have been built in the 2000s and almost two thirds of them are ordinary rental dwellings. Since 2008,

subsidised housing production has been between 6 and 8 thousand and construction has been concentrated in the largest urban areas. In the 2010s, up to half of new subsidised housing has been rental housing for people with special needs. Eerola et al. (2024) also write that in 2010, 125 thousand Ara dwellings have been freed from restrictions and sold, for example to investors.

In 2023, there were 355 000 Ara rental dwellings in Finland, of which 68 thousand were in Helsinki, according to Ara (2024a). Figure 6 shows how the subsidised rental housing stock in Helsinki has developed over the last ten years. The size of the housing stock has remained almost unchanged and has even fallen at times. According to the findings of Eerola et al. (2024), this is because more older Ara dwellings have been freed from restrictions than new ones have been built. Their finding of an increase in rental housing for special groups is also reflected in Figure 6, and the number of subsidised rental dwellings for special groups in Helsinki has increased slightly as a proportion of the total.

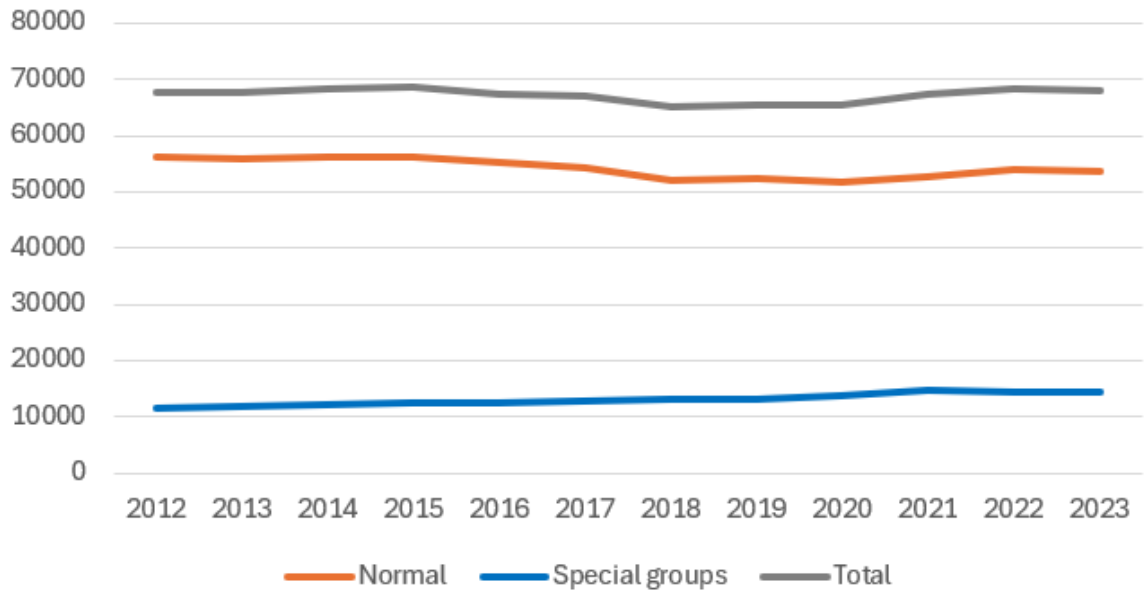

Figure 6. Subsidised rental housing stock in Helsinki 2012-2023 (Adapted from Elinympäristön tietopalvelu Liiteri, n.d.).

Production subsidies are indirectly visible to households, as they are expected to be reflected in below-market rents (Matala, 2018). According to Ara (2024b), ara-rents in Helsinki are around 30% lower than market rents. Hence, at least regionally, subsidised housing has a downward effect on the rent level of the housing market, although not everyone has access to subsidised housing. However, due to rising interest rates and costs, in 2024 cost-based ara-rents increased by 6% in Helsinki. In addition to rising costs, the subsidised rental housing market in Helsinki, among other places, is under pressure and demand exceeds supply (Ara, 2024b). Therefore, the proposal of the Ministry of the Environment (n.d.) to increase the supply subsidies moderately is reasonable.

Eerola and Saarimaa (2018) study the impact of supply subsidies on demand subsidies. They discovered that, on average, the rent savings in a subsidised apartment in Helsinki exceed the amount of housing benefit. On the other hand, the savings were badly targeted at low-income earners and the per capita housing benefit was only slightly less in subsidised than in non-subsidised rented housing. Alho et al. (2018) examine whether subsidised housing has a displacement effect on non-subsidised housing. Their study showed that in the long run, the displacement effect in Finland's largest cities is on average 39% so one subsidised housing increases the total housing stock by 0,6 apartment. This means that subsidised housing stock is still able to increase the total housing stock.

The market solution is not the social optimum in housing, which is why the public sector is trying to improve the situation through demand and supply subsidies, Lahtinen et al. (2014) write. They continue that housing subsidy systems must be assessed as part of a broader economic and social policy framework. Clear objectives and responsibilities are difficult to achieve, but a necessary requirement for good housing policy. Demand and supply-side subsidies play a key role in the rental housing market. They have an impact on rents, housing production and have shaped the rental housing market in Finland and Helsinki for several decades and will continue to do so in the future.

2.3 COVID-19

One of the most significant macroeconomic events of the 2020s was the global COVID-19 pandemic. COVID-19 is a viral disease that started in China at the end of 2019 and spread rapidly around the world (World Health Organization, 2024). The World Health Organisation (WHO) declared it a pandemic in 2020, and after three years in 2023 it was declared no longer an international health threat. The impact of the disease on the economy and on people's lives was high due to the highly susceptible infectivity of COVID-19. According to Ling et al. (2020), the hardest hit sectors of the pandemic were hotels, restaurants and retail. This was due, for example, to restrictions on movement. COVID-19 did not affect the housing sector as strongly according to Duca et al. (2021) and house price developments varied by region. They found that, especially in areas not dependent on tourism, house prices were resilient due to low interest rates environment, government subsidies and people's behaviour.

Duca et al. (2021) point out that at least in the US, rents have come under downward pressure, as a result of COVID-19, as people have been seeking larger homes in less densely populated areas. As rental housing is often located in densely populated urban areas and is on average smaller, reduced demand would explain the downward pressure on rents. Koren and Pető (2020) also mention that a reduction in agglomeration, i.e. the benefits of having businesses and people close to each other, after a pandemic can make densely populated urban areas unattractive, which in turn might decrease rents in urban areas according to Ling et al. (2020). Kuk et al. (2021) studied the impact of COVID-19 on rents in 49 major urban areas in the US during the early stages of the pandemic, and they discovered a reduction in mean and median rents. However, there were large differences between socio-economic neighbourhoods, with rents falling in black and Latino areas, for example, while those in majority white neighbourhoods rose.

Toivonen et al. (2023) conducted a study on the impact of COVID-19 on the real estate market in Finland by interviewing 19 experts in the field. Based on the interviews, the prevailing sentiment during the pandemic was caution and, despite the regional nature

of the housing market, the market sentiment of industry players reflected the global situation. They report that this caution was reflected, for example, in the launch of new projects and new rent agreements. The majority of respondents felt that COVID-19 had an impact on rental market procedures and that there will be a future focus on ensuring tenants' ability to pay, monitoring key performance indicators and more active tenant interaction. Despite the challenges posed by the pandemic, new business opportunities, increased cooperation between actors, increased resilience and more comprehensive risk management were cited as positive impacts on the Finnish housing market (Toivonen et al., 2023).

Hypo (2020) estimates in its 2020 Housing Market Review that rental difficulties due to COVID-19 are unlikely to be seen in Finland but rent increases will slow down. The market review notes that short-term rentals have collapsed, resulting in thousands of AirBnB apartments being transferred to the conventional rental housing market, especially in Helsinki, which has increased supply of rental housing. The KTI (2020) market review also finds that the Finnish rental housing market has survived with little impact from COVID-19, but increased supply in major cities is slowing down rent increases. In contrast to studies conducted around the same time in the US, KTI (2020) sees strong demand for rental housing in Finland's major cities despite the pandemic.

A global trend resulting from COVID-19 is the appreciation of space at the expense of location, and according to the KTI 2020 market review, the demand for rental housing in Finland has shifted to larger dwellings in areas with lower rents. The KTI (2021) market review, written a year later, reports that COVID-19 has caused a small surge in demand for rental housing, but that rent increases are still non-existent due to a rapid increase in supply caused by the completion of new properties and the conversion of short-let properties to long-term rental use. Figure 7 shows the change in the rent index from the previous quarter in Uusimaa, which is the region of Helsinki. The index confirms the findings of a slowdown in rent increases A significant downward effect of the pandemic on rents was also not observed by real estate professionals interviewed by Toivonen et al.

(2023), but instead an effect on the rental agreement terms was found. They argue that future contracting practices in the real estate sector should consider shocks such as the pandemic to increase flexibility.

Kaklauskas et al. (2021) studied the impact of COVID-19 on construction. They identified major impacts on the construction sector. During the first wave of the pandemic, construction companies were only operating at around 25-30% capacity and restrictions, security procedures and travel bans caused labour shortages and disruption to supply chains. This led to material shortages, layoffs and cost increases (Kaklauskas et al., 2021). Hromada (2021) notes that the shortage of foreign labour resulting from COVID-19 will be replaced by local workers, leading to higher construction costs. According to him, the situation is also slowing down the construction of new housing. In the global real estate construction market at the beginning of 2021, all property types except apartments suffered a decline (Kaklauskas et al., 2021). However, office and retail properties suffer the steepest decline. For example, in Germany during the pandemic, heavy investment in residential renovation and new construction boosted the construction sector, but commercial constructions suffered from the lack of investments Gornig et al. (2021) write. Kaklauskas et al. (2021) observed a rapid change in investors behaviour which appeared in the construction sector as bigger demand in larger homes increased, driven by remote working.

KTI (2020) market review reports that construction volumes in Finland will fall as a result of the pandemic. The review also writes that the high construction volumes in the years leading up to COVID-19 were expected to start declining even before the pandemic, but this will further accelerate the pace of the downturn. However, the KTI (2021) market review states that COVID-19 caused only a quick dip, and that construction is recovering rapidly. The short-term dip in construction during 2020 can be seen in Figure 7 in the number of building permits granted and construction projects started. The rapid recovery in construction is also evident in the figure. The recovery in residential construction in Finland is being boosted by the popularity of real estate investments, as interest rates

are low, and rental housing is seen as an attractive investment due to stable demand. On the other hand, as in global studies, construction costs are seen rising due to shortages of building materials and labour.

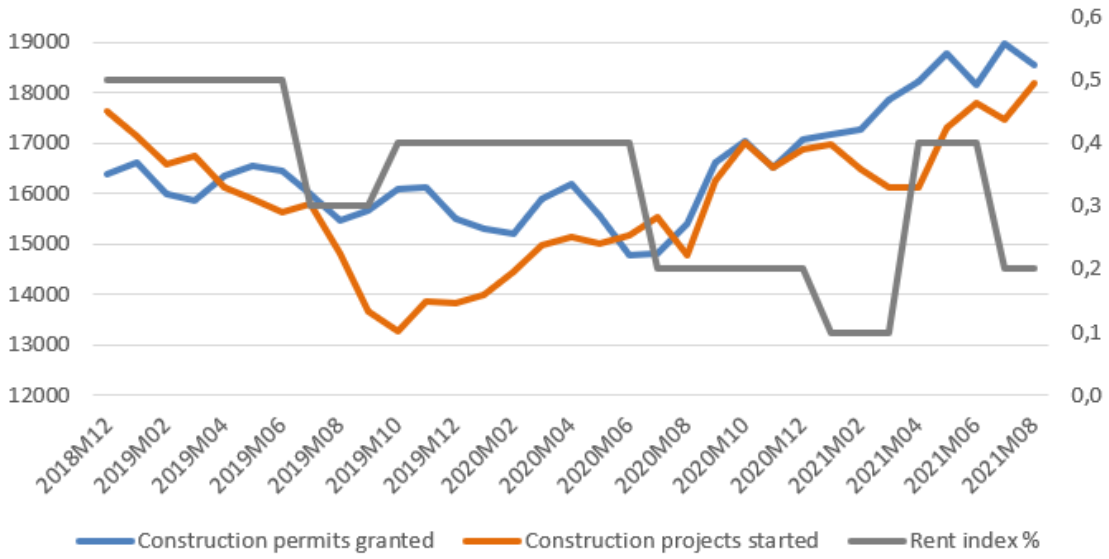

Figure 7. Construction volume on apartment buildings and change in the rental index compared to the previous quarter in Uusimaa (Adapted from Official Statistics of Finland, 2024b; Official Statistics of Finland 2024g).

The COVID-19 pandemic had major macroeconomic impacts, hitting sectors like hospitality and retail hard while the housing market showed resilience. However, there were far-reaching changes in the rental housing sector, affecting the demand and supply of rental housing in Finland and globally even today. Demand for larger dwellings in less populated areas increased as remote working became more preferred. The supply of housing increased as AirBnB apartments, which had been in short-term rentals, moved into long-term rentals and low interest rates attracted investors to build new residential buildings. On the other hand, the restrictions caused by COVID-19 increased cost pressures as labour mobility became more difficult and problems in supply chains pushed up the prices of construction materials.

2.4 Russian invasion of Ukraine

Alongside COVID-19, the world faced another major macroeconomic event in the early 2020s. On 24 February 2022, Russia started a full-scale military invasion of Ukraine (Madlovics & Magyar, 2023). They write that Russia's aim was to quickly occupy key cities and gain control of its neighbouring country. However, strong Ukrainian resistance prevented a quick takeover, and the war has escalated into a complex global conflict. While the global community has condemned the attack and imposed sanctions on Russia, Ukraine is receiving substantial financial, humanitarian and military support. Despite this support, there is no end in sight to the conflict. What makes the conflict special for Finland is its location as a neighbouring country of Russia and the 1300 km border it shares with it.

Trojanek and Gluszak (2022) and Hebdzyński (2024) have studied the effects of the war on rental housing market in Poland and Sauer et al. (2023) have studied its effects on the German rental housing market. Trojanek and Gluszak (2022) discovered in their study that the number of refugees who came to Poland from Ukraine because of the war caused a demand shock in the housing market and this, combined with limited housing availability, led to a significant increase in rents. In the months after the start of the war, rents rose by more than 16% in some regions, they write. Hebdzyński (2024), on the other hand, observed a rent increase of up to almost 30% in the city of Poznan in Poland in the four quarters since the outbreak of the war. What makes the situation difficult for Ukrainian refugees is that Sauer et al. (2023) show in their study that affordable rent is even more important than the regional unemployment rate when choosing a location for Ukrainian refugees. This contrasts with the regional rent increases caused by refugees. Housing prices react more moderately in the research (Trojanek & Gluszak, 2022). The findings are in line with the Ahiadu et al. (2024) study, where capital values invested in housing were found to be less sensitive to uncertainty than rents.

In Finland, the impact of Russia's invasion on house prices has also been found to be weak (Karlsson, 2023). In the KTI (2022) spring market review, the war was not found to have a strong direct impact on the Finnish real estate market. Indirectly, however, the

war is predicted to have an impact through increased uncertainty and a weakening economic outlook. On the other hand, increased uncertainty may increase the demand for rental housing (KTI, 2022). Rents in Helsinki, which increases had already slowed down during COVID-19, will continue to rise slowly after the start of the conflict, but elsewhere in Finland rents have risen faster and the war does not seem to have had any impact, the KTI 2022 market review reports. According to the market review, despite increased uncertainty, the war of aggression did not slow down active trading in the real estate market, with trading volumes in the first half of 2022 almost doubling compared to the same period a year ago. Russia's invasion of Ukraine has contributed to a rise in inflation and interest rates, as noted in the European Central Bank (ECB) (2023) annual report, which, according to KTI (2022), darkens the future outlook for the housing market.

Energy resource prices rose drastically as a result of the war, as did the cost of other materials and commodities needed for construction (Ari et al., 2022). According to Hebdzyński (2024), rising energy and material costs had a negative impact on housing construction in Poland. Yudaruddin and Lesmana (2024) writes about the negative reaction of the global market to Russia's invasion of Ukraine, and in particular the impact of rising energy prices on construction and its rising costs. Furthermore, they found that members of the North Atlantic Treaty Organisation (NATO) reacted stronger than the rest of the global market. This is also relevant for Finland, which joined NATO in April 2023.

Rising energy prices, challenges in the availability of building materials and general cost increases are also reflected in the Finnish construction market (KTI, 2022). According to Official Statistics of Finland (2024b), the number of building permits and construction projects started to decline from the peak at the 2021, but KTI (2022) mentions that the decline started even before the conflict, although this will intensify the decline. Number of apartment building permits granted in the first half of 2022 fell by more than 15 percent compared to the same period in 2021 in Uusimaa region (Official Statistics of Finland, 2024b).

The global real estate market has reacted negatively to Russia's invasion of Ukraine. There are notable regional variations, with more pronounced effects observed in Ukraine's neighbouring countries, such as Poland, with regard to rents in rental housing markets. However, the impact on rents in Finland has been negligible. The impact on construction has been great both in the global and in Finland. The war has increased the cost of energy and materials, which is directly reflected in construction. In addition, the indirect effects of the war, such as increased uncertainty, are apparent in the housing market and in construction. The uncertainty caused by the war is fuelling inflation and rising interest rates, which are contributing to the fall in construction volumes. In conclusion, Russia's invasion of Ukraine has affected the volume of new construction during the time period covered in this study.

2.5 Interest rates and inflation

Loose monetary policy following the 2008 financial crisis, weak productivity growth and an ageing population, for among other things, brought interest rates down to historically low levels in the 2010s (ECB, 2021). For example, the 12-month Euribor interest rate commonly used for mortgages was negative for long periods in 2010s and the average rate over the period was close to zero (Bank of Finland, 2024).

In his research, Liu (2023) finds that interest rates are positively correlated with rental rates. This means that rising interest rates reduce the supply of rental housing but increase the demand for it and vice versa. This finding is supported by Oikarinen (2005) research on the Finnish housing market, which finds that rising interest rates are reducing demand for owner-occupied housing, due to high interest rates on loans and he mentions that the Finnish housing market is sensitive to interest rate fluctuations. This results in an increase in demand for rental housing, as rental housing is more flexible than owner-occupied housing. With the Confederation of Finnish Construction Industries RT (CFCI) (2021) confirming that rising interest rates are reducing construction, Liu (2023) finding that rising interest rates are reducing the supply of rental housing seems to apply

also in Finland. Thus, inversely, construction has been strong in large cities in Finland during a period of low interest rates (Official Statistics of Finland, 2024b). On the other hand, despite low interest rates, the trend towards renting has also increased the demand for rental housing in large Finnish cities (Official Statistics of Finland, 2024d).

Inflation is known to mean an increase in the general level of prices, and this also applies to rents for housing. Annual rent reviews often link the rent increase to inflation, i.e. the consumer price index (CPI) (Orava & Turunen, 2020). The impact of inflation on housing markets has been widely studied, but with mixed results. For example, Christou et al. (2018) state that the impact of inflation varies and that studies should be carried out regularly with the latest data. The impact of inflation on rents may remain moderate, for example, if there is a lot of supply on the market and therefore no rent index increases are made for fear of losing the tenant. It should also be noted that any impact from inflation will be delayed due to the annual rent review. Inflation remained low for most of the 2010s (Official Statistics of Finland, 2024c).

Negative interest rates and weak inflation had strong impact on supply growth in the Finnish rental housing market. In the 2020s, macroeconomic events such as COVID-19 and Russia's invasion of Ukraine in turn had a major impact on inflation and interest rates. In 2020, economic activity in the euro area contracted significantly due to the COVID-19 pandemic, inflation slowed to close to zero and interest rates remained low due to monetary policy easing (ECB, 2021). In 2021, the euro area economy began to recover from the shock of the pandemic, inflation accelerated year-on-year to an average of 2,6% but interest rates were kept low due to the slow economic recovery (ECB, 2022).

The year 2022 was a turning point in euro area monetary policy and the inflation outlook changed suddenly (ECB, 2023). European Central Bank (2023) annual report outlines the impact of pandemic and war on the economy. The economic growth, which had already begun to recover after pandemic, weakened again in 2022, with inflation soaring by 8,4% due to war-induced increases in the price of energy and materials. With inflation rising

sharply, the era of low interest rates came to an end and the ECB tightened monetary policy after a break of more than a decade. Supply in the rental housing market, which had increased during a period of negative interest rates, turned into a steep decline as demand for construction investment weakened due to high interest rates and supply declined due to increased construction costs and inflation (ECB, 2023).

The economic events of recent years are and will continue to be reflected in the Finnish rental housing market. Some changes in monetary policy and the economy have a lagged effect and therefore things that have happened in the recent past can have a major impact today. Changes in interest rates and inflation have had a significant influence on the data used in the study, such as the volume of new construction. Furthermore, it is important to understand the potential impact of variables excluded from the study on the research problem. Examining recent economic changes will also support the understanding of the theoretical framework of the study.

2.6 The present state of the rental housing market in Helsinki

Research so far has focused on the past, but as the late scientist Dr. Carl Sagan said, “You have to know the past to understand the present.”. This is also true for the housing market and history helps to understand what is happening in the market at the moment. This section discusses the latest statistical and market data, in order to unpack the current state of the Finnish rental housing market. Helsinki as a location and the 2021-2024 timeframe of the research data is at the centre of the review.

In 2023, around 300 thousand people lived in rented accommodation in Helsinki, representing 46% of Helsinki's resident population (Official Statistics of Finland, 2024d). However, due to the large number of studio flats and the smaller average size of rental dwellings, just over half of all household-dwelling units are rentals in 2023. As shown in Table 1, less than forty percent of renters lived in subsidised housing.

Table 1. Rental household-dwelling units and rental dwelling population in Helsinki (Official Statistics of Finland, 2024d).

Helsinki	2020	2021	2022	2023
Household-dwelling units				
Subsidised	64 587	64 706	60 998	60 580
Non-subsidised	105 869	108 465	115 669	119 290
Number of dwelling population				
Subsidised	121 479	120 950	114 050	113 675
Non-subsidised	167 756	170 434	181 909	187 572

The number of people living in subsidised rental housing has been on a downward trend in the 2020s, while the trend for people living in non-subsidised rental housing is upward. Demand for larger apartment dwellings has grown slightly more relative to studio apartments and one-bedroom apartments, and in 2021 the number of people living in studio apartments and one-bedroom apartments in Helsinki fell. This can be explained by a change in preferences due to the increased demand for space caused by the pandemic. According to Official Statistics Finland (2024d), migration to Helsinki is positive and the city's population has increased in the 2020s. The population is also expected to grow in the future, which is a fundamental factor supporting the demand for rental housing.

Rent trends have been weak in Helsinki in the 2020s (Official Statistics of Finland, 2024g). As can be seen in Figure 8, rents have not increased much and have even fallen for momentarily. However, the KTI (2024) market review notes that the rental housing market is picking up and rents and occupancy rates are rising as construction volumes slows. Rents have only started to rise in 2023 and the increase in Ara rents has been stronger than in non-subsidised housing. The rise in market rents has been slowed by the oversupply of rental housing on the market but rising interest rates and rising costs have forced cost-based Ara communities to raise rents substantially (Ara, 2024b; KTI, 2024). Annual rent growth in Helsinki in the third quarter of 2024 was below one percent in non-subsidised and over six percent in subsidised housing, but Ara rents still remained more than 30% more affordable (Official Statistics of Finland, 2024g). Regardless of the

subsidy, rents rose most for larger dwellings. It is also worth noting that Figure 8 does not include possible discount campaigns.

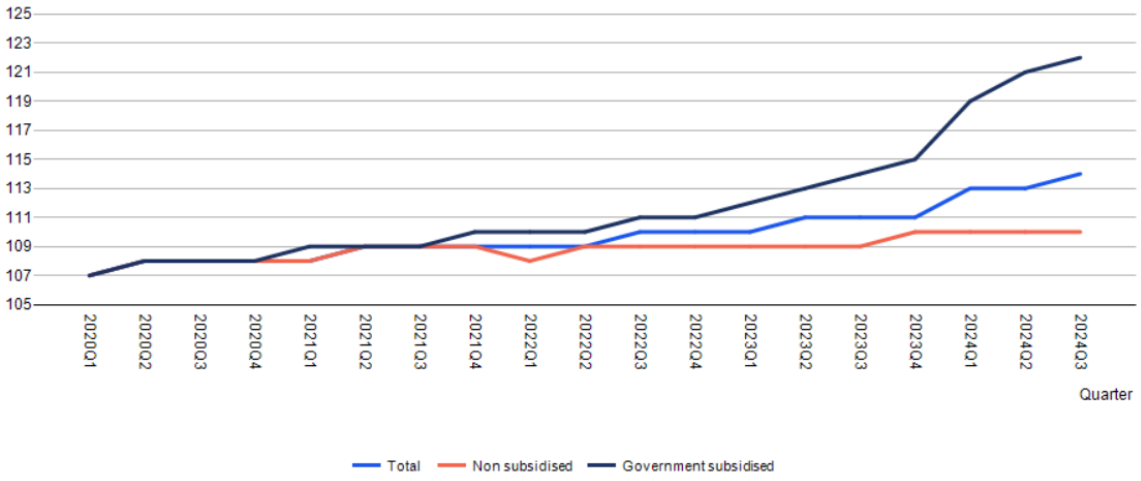

Figure 8. Rent index (2015=100) in Helsinki from year 2020 (Official Statistics of Finland, 2024g).

The cyclical construction sector has undergone a major shift in the 2020s. The long period of zero interest rates before 2022 was a time of strong construction, but after that the sharp rise in costs and interest rates caused a turnaround as seen in Figure 9. According to the Confederation of Finnish Construction Industries (CFCI) (2024) Business Outlook, building investment and building permits in Finland have been in continuous decline since the turnaround. They say that in recent times only counter-cyclical subsidised construction has slowed down the contraction in construction, while market-based construction has almost stopped, but in 2025 subsidised housing production will also halve. The construction trend is expected to turn positive thanks to slowing inflation, falling costs and declining interest rates, but this is mainly due to the poor comparative period (CFCI, 2024). KTI (2024) notes that the recovery in new housing production is also slowed by the oversupply of housing on the balance sheets of developers, which has arisen in previous years.

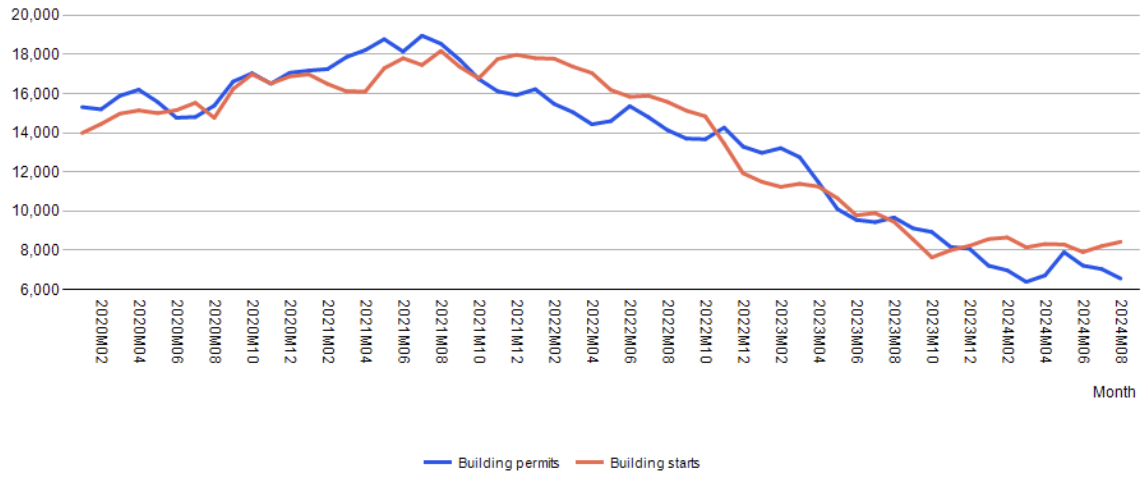

Figure 9. Construction of apartment buildings in Uusimaa in the 2020s (Official Statistics of Finland, 2024b).

Table 2 shows the number of rental dwellings produced and completed annually in Helsinki in the 2020s. An average of 3 000 new rental dwellings have been completed in Helsinki annually between 2020-2023 according to City of Helsinki (2024). On average, one third of dwellings have been subsidised dwellings. The number of dwellings completed in the table does not yet reflect a stagnation in construction sector. For example, due to the construction time, 2023 is the year with the highest number of dwellings completed, which is due to the fact that 2021 was the peak year for building permits issued and projects started as shown in Figure 7 and Mach et al., (2020) mentioned an average construction time of 22 months. The number of completed dwellings will decrease in the future as building permits and starts have plummeted.

Table 2. New rental housing production, number of new apartment dwellings completed in Helsinki 2020-2023 (City of Helsinki, 2024).

Helsinki	2020	2021	2022	2023
Subsidised	1173	1117	855	1518
Non-subsidised	1503	2557	1241	2268
Total	2676	3674	2096	3786

The ECB's latest Annual Report of 2023 reports on the diminishing impact of the shocks caused by the pandemic and the Russia's invasion of Ukraine. Tight monetary policy and falling energy prices led to a slowdown in inflation (ECB, 2024). Interest rates were still being increased in 2023, but since the annual report, interest rates have started to fall. The Ministry of Finance's (2024) Economic Survey forecasts that Finland's economy will grow in 2025 and 2026 as inflation and interest rates decrease and investment and consumption increase. The recovery in housing construction is also expected to have a strong impact on the recovery of the Finnish economy. The survey reports that the impact of macroeconomic events in Finland has been greater than the euro area average and that the recovery from recession has been slower than the euro area average.

2.7 Previous studies on the topic

The impacts of new construction on rents have been studied in previous academic literature. The most common motivation for the studies has been to explore ways to increase affordable housing. Increasing market-rate construction is seen as one potential solution (Mast, 2023). This would create a so-called supply effect, which would put downward pressure on rents as a result of increased supply (Glaeser & Gyourko, 2018). On the other hand, some argue that new market-rate construction means increased demand in the neighbourhood, inviting high-income households and new amenities, which will ultimately drive up neighbourhood rents (Been et al., 2019). The relative magnitude of this phenomenon, known as the demand effect, and the supply effect has proved to be a difficult empirical question to study (Damiano & Frenier, 2020). Another key challenge in studies is identifying cause-and-effect relationships, as developers tend to build in areas where reputation, amenity and demand are already changing and growing. There are differences in the results of previous studies between regions, although most studies have been carried out in the United States. This chapter reviews the results of the studies presented in Table 3.

Asquith et al. (2020), Bratu et al. (2023), Li (2022) and Pennington (2021) studies show that new construction has a decreasing effect on the rent of surrounding dwellings. Asquith et al. (2020) studied the impact of new market-rate housing in low-income neighbourhoods and found it reduced rents for nearby housing by 5-7%. They also find evidence of a demand effect, but its effects are offset by a larger supply effect. It is worth noting from their study that the sample does not include new affordable housing, single-family homes, or large building complexes, but rather individual buildings.

To my knowledge, the only study on the impact of new construction on rents in Finland and in the Helsinki metropolitan area is the study by Bratu et al. (2023). However, they do not directly investigate the impact of construction on rents, but on the migration chains it causes. Their study finds that the city-wide impact of new construction is likely to increase affordability, but they cannot provide results on the impact of new construction on immediately surrounding neighbourhoods. Their study provides valuable insight for hypothesis formulation but leaves a research gap on the impact of construction on rents of nearby apartments in Helsinki. Li (2022) and Pennington (2021) also found evidence of a rent-reducing effect in their studies. The results of their studies were very similar, and both showed a reduction of a few percent in rents less than 200 meter from a new completed construction. These studies have been conducted with varying methods and data, but the results have been similar despite the fact that, for example, Asquith et al. (2020) studied low-income areas and Li (2022) found effects in New York in an expensive residential area.

Singh (2020) results of the study are the opposite. She presents results showing rent increases of 2,3% within 150 meters of a new building. She attributes this to the dominant demand effect. Like Li (2022), the study was conducted in New York City, but for new construction, the study used tax-exempt buildings instead of market-rate buildings. Damiano and Frenier (2020) also found evidence of a rent-increasing effect. In their study, the results depended on whether the housing was affordable or expensive. Within 300 meters of new construction, rents for low-cost housing rose by 6,6%, but rents for high-

cost housing fell by 3,2% compared to a comparison group 300-800 meters away. They note that both geographic and qualitative submarkets influence the impact of new construction on rents. In contrast to other studies, Anenberg and Kung (2020) find that increasing housing supply has no significant effect on neighbourhood rents. They find that the demand effect and the supply effect balance each other out, so no impact of new construction on rents is observed.

Despite the different results, common to all studies on new construction and the surrounding area is the observation by Diamond and McQuade (2019) that the spatial spillover effects of new construction on dwellings are limited to a relatively small radius. Another common finding is that the effects of new construction on rents are noticeable same year or at least a year after completion and they continue for at least a few years (Asquith et al., 2020; Bratu et al., 2023; Damiano & Frenier, 2020; Li, 2022). A third unifying factor in several studies is the research methods used, as can be seen in Table 3.

Similar studies have also been carried out on house prices instead of rents. For example, González-Pampillón (2022) and Liao (2024) found in their studies that house prices had risen as a result of new supply. Demand and the amenity effect pushed up house prices by up to 12% (González-Pampillón, 2022). The impact of new construction on house prices in Finland has been studied by Jantunen (2017), who found a small upward effect of around 1%. However, according to Hilber and Mense (2021), the correlation between house prices and rents is questionable.

This study contributes to the growing literature on the impact of new construction on local rental housing markets and rents, by exploring a region where similar research has not yet been done. In addition, this study has been carried out on a period in which significant macroeconomic events have taken place. The impact of the 2020s crises is not yet reflected in the data from previous studies. Given the cyclical and regional nature of the rental housing market, local and recent studies are an important contribution to the literature on the subject.

Table 3. Summary of previous studies.

No	Authors	Title	Objective	Methods	Findings	Location
1	Anenberg & Kung (2020)	Can more housing supply solve the affordability crisis? Evidence from a neighbourhood choice model	Examine the extent to which new housing supply can increase housing affordability	Neighbourhood choice model with two-step estimation procedure	Marginal reduction in supply restrictions **will not have a significant impact on rents**	10 cities in the U.S.
2	Asquith et al. (2020)	Supply Shock Versus Demand Shock: The Local Effects of New Housing in Low-Income Areas	Examine the impact of new market-rate housing on rents and migration in low-income areas	Quasi-experimental difference-in-differences methods: spatial, temporal and triple-difference comparison	New housing **decreases rents of apartments by 5-7% within 250 meters** compared to those further away	11 cities in the U.S.
3	Bratu et al. (2023)	JUE Insight: City-wide effects of new housing supply: Evidence from moving chains	Examine the city-wide effects of the supply of new, centrally located, market-rate housing, using a metropolitan area geo-coded population register data	The research method is a chain-tracking analysis of housing market dynamics and socioeconomic groups	Market rate supply improves affordability (**decrease rents**) outside the sub-markets where new construction is taking place	Helsinki Metropolitan Area, Finland
4	Damiano & Frenier (2020)	Build baby build?: Housing submarkets and the effects of new construction on existing rents.	Examining how new market-rate construction will affect rents in the near neighbourhood in the short term	Quasi-experimental difference-in-differences methods. Spatial and temporal comparison	Rents for **inexpensive dwellings within 300 meters of new construction increased by 6,6%** compared to those within 300-800m, but **rents for expensive dwellings decreased by 3,2%**	Minneapolis, U.S.
5	Li (2022)	Do new housing units in your backyard raise your rents?	Examine the impact of new market-rate apartment buildings on rents of nearby apartments	Quasi-experimental difference-in-differences methods: spatial and temporal comparison	Rents of expensive and medium-priced rental building **decreased by 1,6%** within a 150 meter of completed new apartment building	New York City, U.S.
6	Pennington (2021)	Does Building New Housing Cause Displacement? The Supply and Demand Effects of Construction in San Francisco	Examine the causal effects of new construction on rents, displacement and gentrification in the neighbourhood	The study uses building fires as an exogenous source of variation to determine the location of new construction projects to ensure that existing rental trends do not confound the results	**Rents decreased by 2%** within 100 meter or 1,2-2,3% withing 500 meter of new market rate construction and impacts were reduced to zero within 1,5 kilometres	San Francisco, U.S.
7	Singh (2020)	Do Property Tax Incentives for New Construction Spur Gentrification? Evidence from New York City	Examine the impact of the construction of new tax-exempt housing on rents in the area	Quasi-experimental difference-in-differences methods: spatial and temporal comparison	Rents in an existing rental building **increased by 2,3%** due to the construction of a new tax-free unit 150 meter away	New York City, U.S.

3 Methodology

This chapter describes the research methodology, in other words, what and how data is processed and analysed. The data collecting methods are also presented in this chapter. The research uses a mixed method approach, so both qualitative and quantitative methods are used. The research strategy is to create hypotheses for the research questions from the qualitative primary data obtained from the interviews. The hypotheses are then tested with quantitative secondary data using statistical methods. This will result in answers to the research questions.

3.1 Semi-structured interviews

In quantitative research, the research questions are often accompanied by a hypothesis (Knapp, 2017). According to him, a hypothesis is an assumption based on a background theory that the research is intended to test. In this research the background theory has been gathered from previous literature and semi-structured interviews. Semi-structured interviewing, a qualitative research method, was chosen for this study because it allows to obtain holistic and in-depth information about a phenomenon from a concentrated set of interviewees (Adams, 2015). Another reason for choosing this method is that it can increase the detail of quantitative data when used in combination, such as in a mixed method (Adams, 2015; Adeoye-Olatunde & Olenik, 2021). Furthermore, according to, Adams (2015) semi-structured interviews are well suited to situations where you want to leave room for follow-up questions and give the interviewees a lot of latitude. The choice of this method is an important part of the analysis and provides complementary information to the research questions. For these reasons, semi-structured interview as data collection method is well suited to this study of a complex and context-sensitive phenomenon.

Adeoye-Olatunde and Olenik (2021) mention that the validity of survey results depends largely on the participants' knowledge of the subject. The choice of interviewees was

made with a focus on maximising the validity of the results. There are five interviewees in total as seen in Table 4. To increase validity, interviewees were selected from three different companies, from different positions and from different level of experience. The interviewees range in age from 27 to 57 years old and have a range of experience in the industry from over 3 years to over 30 years. Interviewees were contacted via Teams and email. In the contact phase, study and its purpose and how the interview would be carried out was briefly introduced. Once an interview time had been agreed, interviewees were given the questions in Appendix 1 to review. The interview questions are divided into three parts, the first to validate the interviewee, the second to focus on the research problem and the third to provide additional information.

Table 4. Summary of interviewees.

No	Title	Age	Years in the industry	Company
1	Development Director	36	5+ years	A
2	Account Manager	57	30+ years	A
3	Economist	28	4+ years	B
4	Director Investments	51	20+ years	C
5	Real Estate Analyst	27	3+ years	A

The interviewees are listed in Table 4 in interview order, and they took place between 22.11.2024 and 3.12.2024. Interviews 1, 2, 3 and 5 were conducted via Teams meeting and interview 3 was conducted via phone. A transcript of all the meetings held in Teams was recorded for later review and to increase validity and rigor. Summary of responses from third interview were send via email after interview for later review. The appendix of questions guided the interviews, but the interviewees were given time to provide comprehensive answers and further questions emerged from the answers during the interviews. After the first interview, one question was removed as redundant, and the order was changed to a slightly more logical final format which can be seen in Appendices 1 and 2. The duration of the interviews ranged from 30 minutes to 40 minutes. All the interviews were conducted in Finnish.

After the interviews, the transcripts were reviewed, written out clean, translated into English and stored for later analysis of the data. Responses were categorised according to the research questions to facilitate the aggregation of findings. The end result was a hypothesis for each research question based on the interviewees' responses and additional in-depth information useful for the study. The qualitative data collected has also limitations. First, the phenomenon under study is complex, making it difficult to generalise the answers due to the different answers resulting from the highlighting of certain issues. Second, the experiences and views of the interviewees may have been based only on properties and areas under their own administration, which is not representative of the whole Helsinki region. Lastly, no construction company or state actor was interviewed, so their views are missing.

3.2 Data on new construction and rents

The quantitative data consist of two datasets. One dataset contains the new buildings constructed and the other the rents of existing buildings. The list of new buildings is provided by KTI Kiinteistötieto Oy, which delivers comprehensive and up-to-date, unbiased real estate market information to real estate operators. They have access to the largest real estate databases in Finland. The rent data is provided by Retta Management, a professional services company specialising in property management. Retta Management manages and maintains thousands of rental apartments around Finland. Both companies were pleased to provide information to support research in the field.

New buildings initial data contained 378 buildings completed after 2017 in the city of Helsinki. The dataset contained information on the name of the construction projects, completion date estimated to within one quartal, exact address, property type, number of dwellings and name of the investor. Limitations were placed on the analysis sample to ensure that the data served the objectives of the study. The first restriction applied to the data was a limitation on the type of property. Only rental dwellings were included and commercial properties, offices, hotels and shopping centres, which are irrelevant for

the study of the rental housing market were excluded, after which 210 buildings remained. Secondly, renovated buildings were excluded from the data, so that only 192 new buildings remained. Thirdly, the data were limited to new buildings completed in 2022 and 2023, of which there were 59 new buildings left. This delimitation was done to ensure that rental data are available before and after the completion of new construction. Of the remaining sample, 36 buildings were freely financed, and 23 buildings were subsidised affordable housing. The study focuses on freely financed, non-subsidised new buildings, as their rent is determined by market conditions and is more suitable to this study for that reason. However, the study also examines the impact on rents of subsidised new construction in extensions section. It is worth noting that, not all buildings from final new building dataset are included in the analysis if there are no rental observations near them.

The initial rental data contained information on 1751 non-subsidised dwellings owned by large investors from the period 2021-2024 in Helsinki. The dataset included information on the age of the building, the exact address, the type of apartment, the rent per square meter and if there was a discount given to the apartment at some point. The data were on a monthly basis, so changes in rents are immediately visible without delay, regardless of when the rent was changed. The rental data was limited to make it more suitable for the study. First, the age of the building of the dwellings in the data was limited to a minimum of five years. This ensures that there are no existing buildings newer than 2020 that could be confused with the list of new buildings and that the dwelling is at least a few years older than the new building constructed nearby. Dwellings larger than four rooms were excluded due to their small sample size. After delimitation, the dataset contains a rent history of 815 dwellings and includes 29 517 monthly rent observations. It should be noted that not all of these dwellings are included in the analysis, if they are too far from the nearest new building.

The completed rental dataset was paired with a dataset of new construction buildings with the ArcGIS geographic information system software. Using ArcGIS software, both

datasets were geocoded as points on the map using street-level address information. After geocoding, a 1000-meter buffer zone was created around the new buildings to identify the dwellings to be included in the study from the rental dataset. The size of the buffer zone was selected on the basis of interviews with real estate professionals and previous research on the subject. In a previous study, Damiano and Frenier (2020) uses 800 meters as the furthest impact zone of new construction on surrounding housing, but based on the interviews, in Helsinki the impact zone is perceived to extend to one kilometre. The final dataset for the research for dwellings within one kilometre is then obtained, with 12 960 rent observation. Table 5 provides descriptive statistics for the final rental dataset.

In addition to the one-kilometre radius, a 400-meter buffer zone was created around new buildings to identify the impact of new construction. Dwellings within 400 meters form the treatment group in the study and those within 400-1000 meters form the control group as visualised in Figure 10. The choice of a 400-meter distance for the treatment group has also been chosen in accordance with interviews with professionals and previous research. It should be noted that if a dwelling was located in an area affected by more than one new building, the closest new building was always chosen in these situations. If there was more than one influencing new building at the same distance, the new building was selected according to the earliest date of completion.

Table 5. Summary statistics of the rents €/m2 and building age.

Rent €/m2	Mean	Min	Max	Std.	Obs. (N)
All	22,47	10,55	45,84	3,44	12960
Studio	25,95	20,57	31,27	2,84	1319
One bedroom	23,05	14,23	45,84	3,29	6681
Two bedroom	21,60	11,94	31,50	2,40	3155
Three bedroom	19,32	10,55	39,22	2,73	1804
Control group	19,61	10,55	45,84	2,68	4541
Treatment group	24,02	11,94	31,27	2,74	8418
Pre-construction	23,24	10,55	45,84	2,86	4546
Post-construction	22,06	13,66	31,27	3,65	8413
Building age (Years)	14,06	4,00	28,00	8,79	12960

The data analysis of the study was carried out using regression analysis. For regression analysis, the study required a dependent variable and independent variables. The dependent response variable was rent per square meter and the dependent explanatory variables are shown and explained in Table 6. Most of the variables were so-called dummy variables. They can only take values of one or zero, allowing examining differences between groups of observations. Finally, the variables used in the analysis were transformed into shape of panel data.

Figure 10. An illustrative example of geocoding and spatial distribution of the dataset.

Trustworthy data providers increased the validity of data, and the established methods and data processing techniques used in previous studies contributed to the reliability. However, there were limitations in the data used in the study. First, some of the apartments in the rental data are located in the same buildings, which limits the spatial distribution of the apartments. Secondly, due to the limited amount of data, the data does not perfectly represent the entire rental housing market in the City of Helsinki and there may be heterogeneity between regions and buildings which affect the average results. For example, the data do not include rental dwellings owned by private individuals which present a large proportion of the market. Third, the completion dates of new buildings

were estimated to the nearest quarter, which prevents an accurate estimate of the start of impacts. Finally, the study only covers areas on which have been built on in recent years, and they represent only a small proportion of the surface area of Helsinki. In summary, the main challenge to the study, and one that affects validity and reliability, is the limited availability of the past rental data at the exact address level.

Table 6. Definitions of variables.

Variable	Definition
Rent_per_m2	Dependent variable. Observations by month.
Date	Time period at monthly level.
Treatment_group (dummy)	Dwellings within 400 metres of a new building.
Post_construction (dummy)	The period after the completion of the new building.
Interaction (dummy)	Time period after completion of the new building and dwellings within 400 m of the new building.
Studio	Dummy for studio apartments.
One_bedroom	Dummy for one bedrooom apartments.
Two_bedroom	Dummy for large apartments.
Construction_volume	Dummy for being influenced by new buildings where more than 60 dwellings.
Project_area	Dummy for dwellings in the project area.
Expensive_area	Dummy for dwellings located in areas where rents are above average.
Building_age	Age of existing buildings.

3.3 Regression analysis

Data analysis of this study is inspired by the methods used in previous studies. Using methods that have been found to work in previous studies increases the validity and reliability of the study. The study is conducted using the quasi-experimental difference-in-differences (DiD) regression method, also used by Asquith et al. (2020); Damiano and Frenier (2020); Li (2022); Singh (2020) in their research. DiD is the oldest and most widely used quasi-experimental research design that assesses change in outcome before and after treatment, and change in the treatment group and in the control group (Goodman-

Bacon, 2021). The temporal and between-group interaction reflect the impact of the treatment. The assumption is that without treatment, the changes in both groups are of equal magnitude, which allows isolation of other influencing factors. This makes the method suitable for studies that assess the effects of treatment, in this case new construction. The mathematical formula of the method used in the empirical study is shown below, where Y is the dependent variable, Treatment, Post and their interaction are dummy variables explained in Table 6, and e stands for control variables.

$$\mathbf{Y} = \beta_0 + \beta_1 * Treatment + \beta_2 * Post + \beta_3 * Treatment * Post + \mathbf{e}$$

According to the law of supply and demand, the basic assumption is that rents will decrease as supply increases. However, as a result of increased services and the attractiveness of the area, the demand effect near a new building can also raise rents. Furthermore, the demand effects fade quickly as the distance increases. This can be examined by using a spatial comparison approach, i.e. comparing a treatment group within 400 meter and a control group within 400-1000 meter. The assumption is that without new construction, rents would have changed similarly in the treatment and control groups.

It is also possible that the profile of the area is becoming more attractive, and the amenity effects are spreading to a wider area. In this situation, the spatial comparison is not a suitable way to study the impact of a new construction, as both the treatment group and the control group benefit from the improvement of the reputation of the area. By examining the variation in construction over time, i.e. temporal comparison, it is possible to see how construction has affected rents even if the whole area is rising due to demand effects. The temporal comparison assumes that rents would have changed in parallel in the treatment and control groups before and after the completion of the new building. Combining the spatial comparison with the temporal comparison gives the difference-in-differences impact estimation which is the answer to the research problem.

Various efforts have been made to ensure the validity and reliability of the methodology used. One thing is that the data analysis has been carried out with the SPSS software designed for this purpose. The use of ArcGIS software, in turn, ensures the reliability of the categorisation of treatment and control groups by reducing the possibility of distance calculation errors. For the DiD method, it has been ensured that both treatment and control group had parallel trend assumptions, which is essential for reliable results. The heterogeneity of effects has been mitigated by control variables for dwelling type and regional differences. The study also identifies the potential hyper-locality of the impacts, which is why in the extensions section the results of the analysis are redone by reducing the size of the buffer zones. To ensure the reliability of the findings, additional robustness tests are also carried out.

However, it is not possible to identify that all unobservable factors affecting rent to remain constant over time. For example, the data used in the study do not provide information on whether there have been any changes in the infrastructure of the areas studied over the period under study. There are also no control variables for macroeconomic phenomena affecting rents, but to mitigate their effects, the time period used in the study has been kept short. In addition, the regional nature of the housing market makes it difficult to generalise the results.

4 Results

This chapter presents the findings of the study. First, the results of the interviews are presented so that the findings are categorised according to the research questions. Hypotheses are then formed on the results of the findings. The main results consist of statistical testing of the hypotheses and the results observed during these tests. Finally, extensions and robustness tests are done to extent the results and to ensure the reliability of the results.

4.1 Impact of new construction on nearby rents

All interviewees agreed that new construction has an impact on rents in the surrounding area. The majority, three out of five respondents, think that new construction has a downward affect on rents. The main reason cited for the decline in rents is an increase in supply relative to demand, which, according to economic theory, reduces the price of a commodity in the market.

> *"It is the effect of supply and demand. That if there's a lot of supply relative to demand, then it will bring down rents. Or it makes it so that rents at least don't go up and may not go down that much, but the upward pressure at least disappears. When enough is built, they will probably start to decline as well." (Interviewee 1.)*

> *"Finland is producing more dwellings than it needs per year and that has changed the market quite a lot and it has been a tenant's market for the last few years and that has tended to lower the rent level." (Interviewee 4.)*

> *"If you look back over the last few years, so far rents have stagnated. In new contracts, zero comma something those rents have risen in these last few years and the biggest factor in that is record high supply. This kind of historical supply has been seen last in the sixties, when the suburbs were built, so it is currently quite clearly visible in Helsinki. If you look at the entire rental stock where you see index increases, rents have risen more than zero, but they have lagged behind inflation. So, if you look at the trend in rents adjusted for inflation, it has been negative." (Interviewee 5.)*

In addition to the rent-reducing affect, other observations emerged from the interviews. Interviewee 1 pointed out that if for some reason, despite new construction, occupancy rates in older housing remain high, rents should not be lowered. He also mentions that it cannot be ruled out that if the profile of the area changes radically due to major changes, this could increase the attractiveness of the area to such an extent that rents would rise. Interviewee 4 points out the impact of the prevailing market situation. He explains that compared to the present moment in the past, the rental housing market was a landlord's market, where, due to high demand relative to supply, landlords were able to price new housing independently. This dominance in rent setting meant that, for a long time, new buildings pushed up rents in the area. It is clear from his interview that, for example due to macroeconomic factors, recent years have reversed the situation, and the impact is a downward pressure on rents. As an example of the past market situation, he says:

> *"If you built a new building somewhere in an area where there was an old housing stock and then you had suddenly one-bedroom flats at 800€ a month and the old one-bedroom flats was 600€ a month, it's not 600€ for old ones anymore, it's 650€ all of a sudden, because that seemed cheap too." (Interviewee 4.)*

Interviewee 5 raises the social aspect of the rent-reducing impact of new construction. He explains the diverging interests of real estate investors and the City of Helsinki. Real estate investors seek to increase the net return on their investment, which often means raising rental yields through higher rents. The City of Helsinki, on the other hand, wants to increase availability of affordable housing. In other words, the amount of housing production that is currently considered historically high, is in line with the City of Helsinki's targets of housing production, interviewee 5 mentions. Enabling affordable housing requires high levels of housing production.

The answers of two interviewees differed from the others. Interviewee 2 saw two clear options and interviewee 3 leaned slightly more towards the rent-raising affect. Interviewee's 2 response related to the research question two on influencing factors as

opposed to the generalised response and interviewee 3 identified the possibility of a demand or supply effect but found the demand effect to be more dominant.

> *"I see two possible affects. If the difference in rent between new and old is small, the difference in the age of the housing stock will cause the prices of older rental housing in the area to fall. The new will be more expensive of course, but it will still be more modern than what the other supply there is. People will specifically want then newer and finer housing, and they will be able to afford it due small difference in rents." (Interviewee 2.)*

> *"The opposite phenomenon is also possible. That is, if the difference in rents is very large, it is possible that the rent level of the old housing stock around the new construction will rise because people will be more attracted to the area due to aggressive marketing of the new development. Thus, nearby properties that are less expensive than the new development may start to attract people from outside the area." (Interviewee 2.)*

Interviewee 2 suggests that the effect depends on the difference in rent between the new and the old dwelling. He says that rents in older housing stock should be lowered if the difference in rents is small, because this is the only way for older housing to compete for tenants against a modern apartment building built nearby. However, if the difference in rents is large, the old stock may start to look attractive at much lower rents than the new building, which may put upward pressure on rents as a result of increased demand. He sums it up as follows:

> *"If the rent difference is small, it means that the rent for existing tenants will be reduced. If it is very high, then it is possible that the rent will even increase in the old housing stock around the new building." (Interviewee 2.)*

Interviewee 3 discusses the issue from the perspective of the supply and demand effects identified in previous research.

> *"Positive impact on rents due to the development of the infrastructure in the area and the positive image of the new areas. At the same time, the attraction created (and of course enabled by the infrastructure) has attracted new services, continuing the virtuous circle. Assumption in brief: the demand effect is positive if the*

development improves the desirability/quality of the neighbourhood." (Interviewee 3.)

"Negative impact on rents. In some studies, the area may have been stigmatised as a rental area and interpreted as an undesirable development in terms of image. On the other hand, new construction is sometimes heavily concentrated on social housing projects. Furthermore, the demand effect can also reinforce the supply effect, under the assumption that the desirability and quality of the neighbourhood will decline. Congested services, lack of green spaces, lower quality of services and less amenity can also potentially lead to a decrease in desirability, leading to the same price effect." (Interviewee 3.)

These findings lead interviewee number three to lean towards a rent-raising affect. On the other hand, in his experience, new construction is concentrated in desirable areas or areas that are becoming attractive places where people want to live. He also notes that the housing market is local, which makes the findings difficult to generalise.

"The housing market is always local, but in principle, my own findings tend to translate into more positive effects. New construction is generally built in desirable areas, either in existing desirable areas or in areas that are being built, which is of course a good starting point for demand. Where there is a desire to move to and live in an area, the demand effect can be expected to be stronger than the supply effect. In other words, the answer tends to be that the effect in Helsinki has been upward." (Interviewee 3.)

In a statistical study, one hypothesis is needed where nothing significant happens (Knapp, 2017). According to him, the hypothesis for this failed experiment is called the null hypothesis. Despite the fact that the qualitative data suggest that new construction has an impact on rents of older dwellings nearby area, the null hypothesis is formulated as follows:

$H1_0$: New construction has no impact on the rents of nearby older housing.

Based on the experience and knowledge of the interviewees, an alternative hypothesis is formed. Responses varied slightly depending on which issues were given more emphasis. For example, responses about the effect of lower rents emphasised the current

market environment, while responses about the effect of higher rents emphasised looking at the issue at the sub-market level. All interviewees however agreed that new construction will affect rents of existing housing in nearby locations. The alternative hypothesis for first research question is therefore formulated as follows:

$H1_a$: New construction has impact on the rents of nearby older housing.

The study also aims to explore impacts in a broader and in-depth way in addition to confirm the findings of previous studies on when and at what radius the impact is observed. According to previous studies, significant impacts have been observed in the year of completion of a new building, or at the latest one year after completion, and they continue for at least a few years. Earlier studies have shown that, the impact area is quite small, from 100 to 300 meters and the affects become insignificant after around one kilometre.

Interviewees were fairly unanimous that the impact will be noticeable as soon as new dwellings come on the market. In other words, this means that the affects start already at the time of construction when marketing of new housing starts. Based on the interviews, marketing of new apartments starts around 2—6 months before completion. Though, interviewee 2 mentioned that there has been a shift towards longer marketing periods in recent years. This is due to the fact that more time is needed to market and find tenants for the new homes because of the increased supply on the market. Interviewee 5 mentions that the strongest affects come only after the site is completed and that the impact also depends on the location and its supply and demand.

> *"I think it's just as soon as those apartments come on the market. And in practice it often happens a few months before the completion date." (Interviewee 1.)*

> *"As soon as an apartment is online then it affects the market. It's so easy to compare now that everything is online, it's like selling an overpriced TV is almost impossible because all the information is public. Once it's public it affects the overall market." (Interviewee 4.)*

"In the good times, it was enough to start marketing 3 months before the house was finished. Now we are aiming for 4 to 6 months." (Interviewee 2.)

"It certainly depends on the location and the smartness of the market. Of course, a smart market always looks ahead. But the market is not always smart, surely the clearest affects come as soon as the building is completed." (Interviewee 5.)

The difference in interviewees' perception compared to the later detection of impacts in previous studies is probably due to the fact that the interview question did not specify whether the impacts were for new tenants or existing tenants. The impact on new tenants is visible in the market as soon as marketing starts, but there is a delay for existing tenants due to lease conditions. For example, Li (2022) mentions in his study that the one-year delay is indeed due to the terms of the lease. Otherwise, the results were very similar to those of previous studies.

There was no equally clear answer on the duration of the impact. Examples of responses are as long as the supply of housing is too high for normal demand, as long as the price difference between new and old remains and depending on the area and how much is built in the future. In line with previous studies, it was agreed that within about two years the affects would fade away. According to interviewees in a few years, the market has already found a balance or new influencing factors have emerged.

The impacts were found to become insignificant after about one kilometre. The strongest impact radius was perceived to be around 400 meters. Thus, the survey uses 400 and 1000 metre impact zones. Additional comments included that in Finland construction is often done one area at a time, transport links are a major factor, and the influence distance must be walkable.

"I'd say it's something between 1-2 kilometres." (Interviewee 1.)

"Definitely less than a kilometre, that's when other factors come into play, and you start to think about proximity to services and proximity to transport links. 400 m in one direction and another it can still affect." (Interviewee 2.)

"For tram, the impact is 800 m (on the price of housing), so that's something of a benchmark. Also depends a lot on transport connections." (Interviewee 3.)

"I'm guessing it's something like kilometre at the most and here in Helsinki, that micro-location is so important. The fact that you live next to a tram or a kilometre away from it is significant." (Interviewee 5.)

"Carrying a heavy shopping bag is the distance, when you get the feeling that this is too long distance. But it shouldn't be too many 100 meters before it becomes too heavy. I would say impact radius is maybe 400 meters, but it has to be less than 500 meters." (Interviewee 4.)

4.2 Factors influencing the extent of the impact

The main factor influencing the extend of impacts is location, according to the interviews. As it was well foreseeable on the basis of the previous study and the spatiality of the rental housing market, location and region is dealt with in full in a separate section. This section discusses other possible factors that emerged from the interviews that have been found to have an impact on how new construction affects rents. As there are a myriad of possible factors, the semi-structured questionnaire did not include a direct question on the topic. Answers to this question will be sought from the answers to the other questions and from the last general question, which asks for further information on the topic of the study.

All interviewees referred to the current market situation in one way or another and this was already discussed a slightly in the previous chapter. The findings of the interviews and the literature review on the rental housing market together show the impact of the market situation and macroeconomic events on rents. Interviews suggest that in a different market situation, the impact of new construction on rents could be different. For this reason, the results of this study are difficult to generalise and are only valid over the time period studied. It should be noted that conducting a similar study in the future under different market conditions could lead to different results.

"The oversupply that came to Helsinki in the last 3—4 years will change very dramatically now that no one is granting building permits, and no one is building. It will be a completely different market environment and what the impact of a new construction project will be at a time when there is a lot of demand, but little supply could be different." (Interviewee 2.)

"The market situation has been quite different over the last 10 years, so it's probably good to be aware of that in the background". (Interviewee 3.)

Another factor highlighted by interviewees was the type of dwelling. Interviewees 2 and 4 mentioned that for smaller dwellings, especially studio apartments, the impacts are stronger and faster. Both cited the smaller amount of material possessions as making it easier for someone living in a smaller dwelling to move to a new dwelling. This lowers the threshold to move to a new, more modern dwelling, which may make the impacts of new construction on smaller dwellings more pronounced. The impacts are also apparent faster because it is possible to move without lengthy planning.

"Moving out of a studio apartment is quite easy. There's not a lot of stuff to move and if the moving distance is 100 meter and you get new one 50 euros cheaper and 2 months free, then yes, people will move." (Interviewee 2.)

"If we're talking about large apartments, families plan their move in a completely different way than singles in studio apartments who decide that now I want to move, and I'll move next month." (Interviewee 4.)

Interviewee 2 refers to “2 months free” in his answer on the ease of moving out of a studio apartment. Discount campaigns is a point that also came up in other interviews. According to interviewees, the current challenging oversupply situation in the rental housing market, also discussed in literature review, has led to the use of giveaways and discounts to attract tenants. Interviewee 3 and 4 points out that they are not included in the rental statistics, which reduces the reliability of the rental data. It must be considered in the results of this study, that any impact on rents may realistically be less increasing or more decreasing due to discounts given at the time of signing the lease. Offering the first month for free or giving a gift card may be more attractive to the landlord than lowering the rent, because the discount is a one-off, unlike lowering the monthly rent.

> *"Why the data is a bit difficult to interpret is that they usually only consider the rent requested per month. But then when someone gives you a free month or 2 free months, that's up to tens of percent cheaper rent in reality." (Interviewee 4.)*

Interviewees 3 and 5 highlighted the impact of the volume of construction. While their views on whether construction raises or lowers rents differed, both agree that the level of new construction has an impact on the extent of the affect. In addition, interviewee 3 was the only one to mention taking into account the contribution of subsidised construction. He mentioned that in Helsinki, Ara constructions have been done quite extensively in expensive areas, which could confuse the impacts in the area.

> *"Presumably there is also an impact at the level of new construction. One new building may not be enough to drive up the rent level of the old stock as strongly as several new buildings." (Interviewee 3.)*

> *"In Finland, and especially in Helsinki, there has been a significant amount of Ara construction, and this certainly confuses the effect. For example, Verkkosaari is one of the most expensive locations in Finland and there has been a lot of Ara construction. Considering the share of the subsidised construction would be good in the research." (Interviewee 3.)*

> *"The building capacity is one factor, more can be done in the project area than, for example, in the city centre." (Interviewee 5.)*

The majority of respondents mentioned population growth and migration as factors influencing the extent of the impact. According to interviewee 3, it would make sense to look not only at population growth but also at where the number of rental housing units is growing the most and because of migration chains, impacts may occur far from new buildings. The observation about the migration chain and long-range impacts is valid according to a study conducted by Bratu et al. (2023). Interviewee 4 states that if migration continues to grow strongly in Helsinki, at some point we may return to the days before oversupply, where demand for rental housing exceeds supply.

> *"The impact may not even be greatest where you build. Indeed, the impact may be elsewhere, as the impact of migration chains can be significant. So, building in an*

> *expensive area may well extend to low- and middle-income areas. It might also make sense to examine the background where the number of rental housing units is growing the most." (Interviewee 3.)*

Interviewee 5 summarises that in the short-term rent growth is based on supply and demand, where population growth is essential, and in the long-term rent growth is based on changes in fundamentals such as the attractiveness of the area, improvements in services and infrastructure. The importance of infrastructure projects is also mentioned by interviewee 1. According to him, the impact of a large infrastructure project on rent levels in the area might exceed the impact of new housing construction.

> *"An infrastructure project such as the Kruunuvuori bridge, for example, which people are already waiting for, will probably have a greater impact than new construction. And because it's a couple of years before any train or anything moves, it's already baked into the price." (Interviewee 1.)*

A null hypothesis and an alternative hypothesis to second research question is formed based on the interviews. The findings from the interviews identified that in addition to location, other influencing factors include market situation, housing type, discount campaigns, construction volume, share of subsidised construction, population growth, migration and infrastructure. These factors are illustrated in the word cloud in Figure 11. The alternative hypothesis is based on the fact that the interviews identified several factors influencing the extent of the impact.

$H2_0$: There are no factors that influence the extent of the impact of new construction on rents for older dwellings at different distances.

$H2_a$: There are factors that influence the extent of the impact of new construction on rents for older dwellings at different distances.

Figure 11. A word cloud of interview responses on the factors influencing the extent of impacts.

4.3 The impact of the region

All interviewees felt that there are differences between regions. The clearest divide in the areas was seen between project areas and infill areas. Project area refers to the construction of a completely new residential area and infill development refers to the construction in an existing residential area. The impact of the area has already been discussed in previous responses, but the findings culminate in the fact that the project areas allow for a lot of new construction, which affects the supply and demand balance. Infill construction can only be done on a smaller scale. Here are some quotes from interviewees on the subject:

"If you build a lot and especially new residential area you can see that the first buildings are at a certain price level and when you build more, price level comes a little lower easily." (Interviewee 1.)

"There is a clear dichotomy in the impacts, and it depends on whether the site is an infill building in an area with a lot of old buildings or a new building in a new area." (Interviewee 2.)

"The very high supply situation in the metropolitan area has made it challenging to assess the impacts in this timeframe. But I am fairly confident of regional variation in impacts. It can't be irrelevant what and where new housing is built and what kind of people it attracts." (Interviewee 3.)

"If you have a larger area that is being built, the first house that is completed will be next to the construction site for a long time. So how much does a development of this kind of large new area affect rent levels, rentability and occupancy. Then when the last house is completed, the area will be ready and only then will you get the full potential out of it. We have one example where the properties are on different sides of the street, and one is a finished block and the other is an unfinished block and the occupancy rates are 15% different." (Interviewee 4.)

"The Helsinki city centre has been built on a narrow peninsula, and if the city centre is to be expanded, it must then be geographically distributed to somewhere where it is possible. The natural direction where you can build a lot is new project areas." (Interviewee 5.)

"If you look at house prices in the 2000s, prices in the city centre have tripled at some point. So, it just reflects the fact that when there is no opportunity for more construction as significantly as elsewhere, then it is reflected in housing prices. However, in the project areas, when demand has not grown at the same pace as supply, this has created challenges." (Interviewee 5.)

The response of interviewee 1 above reveals the sensitivity of project area rents to increased supply. This finding is in line with the dichotomy of interviewee 2. As already mentioned, he presents the dichotomy from two different perspectives: a small or large difference in rents and building on the project area, or infill on an existing area. In the project areas, differences in rents are generally small, due to the recent nature of all housing in the area. This will easily lead to a decrease in rents, especially as construction continues. In an extreme situation, new builders could face a price war to attract tenants,

says interviewee 2. However, according to interviewee 2, in the case of infill development, downward pressure on rents is eased by more established rent levels in the area.

Interviewee 3 raises in his above-mentioned answer the impact of the population profile. When talking about the region, population profile can have a big impact. The population profile of a neighbourhood is also linked to safety. Interviewee 4 mentions safety, but at the same time notes that its impact in Finland is very small in different regions due good overall safety. In Finland, attractiveness is more relevant than safety when talking about differences between regions. The attractiveness of project areas is reduced by the fact that they are construction sites. As mentioned by interviewee 4 above, the proximity of the construction site affected occupancy rates by up to 15% and lower occupancy rates mean downward pressure on rents.

> *“The construction site is not very attractive when there is a lot of noise for a long time and people work remotely so you are more at home. You also don't know what the end result will look like. Also, that families are afraid of traffic and children can't go out to play.” (Interviewee 4.)*

The attractiveness of the area is also greatly influenced by transport links. The difference between project areas and already built areas is that transport links may not be as well developed in new residential neighbourhoods.

> *“If you compare Kalasatama and Postipuistoa, Postipuisto is no such an attractive area. It's not a downtown area in the same way as there's no tramway.” (Interviewee 1.)*

> *"If you think about Pasila as a location on the map, it is really central, so all the trains go through Pasila, so it's kind of the hub. And then when the Mall of Tripla shopping mall announced its arrival, it looked pretty good with housing prices, so these kinds of fundamentals changed quite substantially, and people started packing more into the area." (Interviewee 5.)*

The interviews show that the impact of the region is ultimately linked to supply and demand. Supply and demand, in turn, determine the rent of the area. Factors such as

attractiveness, safety and accessibility were highlighted as influencing the demand for the area. The supply factor was the building capacity of the area. Differences in these factors lead to differences between regions in terms of the research problem. These findings form the basis for the hypotheses of the third research question.

$H3_0$: Region does not have an impact on the effect of new construction on rents.

$H3_a$: Region does have an impact on the effect of new construction on rents.

4.4 Main results of the regression analysis

The main results are obtained using the final rental dataset presented in the methodology section and in the Table 5. The variables used in the analyses are presented in Table 6. Monthly rent per square meter is used as the dependent variable, difference-in-differences variables are used to examine the impact of new construction, and building age, housing type and regional variables are used as control variables. The study uses a 95% confidence interval, so the used level of significance in the analyses is 0,05.

Table 7. Model summary.

R	R Square	Adjusted R Square	Std. Error of the Estimate
0,835	0,697	0,697	1,89330800

First, the model summary presented in Table 7, indicates that the independent variables in the regression model explain almost 70% of the variance of the dependent variable with the R square of 0,697. It can be presumed that the model describes the relationship between the variables relatively well. When the p-value of 0.001 for the F-test of the ANOVA table is compared to the 5% significance level of the survey, the sample data also provide sufficient evidence that the regression model effectively explains the variation

in the dependent variable. The accuracy and reliability of the model is also supported by the normal distribution of the rental data, as can be seen in Figure 12. The skewness of the data is close to zero at 0,085.

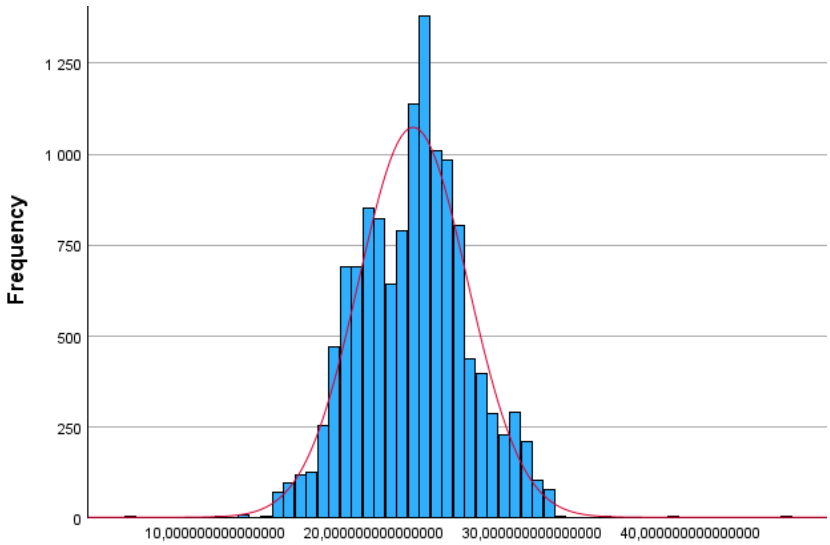

Figure 12. Normal distribution of rents.

The results in Table 8 establish that the null hypothesis of the first research question is rejected at the 0,05 level of significance meaning that the impact of new construction on existing dwellings close to it compared to those further away is statistically significant. Treatment group variable shows that rents in the treatment group are on average 0,608 €/m2 higher than in the control group, based on a spatial comparison.

Table 8. Difference-in-differences main results.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Treatment_group	0,608	0,133	4,588	<0,001
Post_construction	-0,599	0,087	-6,873	<0,001
Interaction	1,374	0,096	14,248	<0,001
Dependent Variable: Rent_per_m2				

The percentage change is calculated using logarithmic values of the rent. Table 9 shows that rents in the treatment group are on average 4,7% higher. The results suggest that a dominant demand effect may occur near new building. This could also be the result of the large difference in rents between new and old dwellings. As interviewee 2 mentioned in the interviews, the large difference in rents between new and old housing may lead to a higher rent being charged for an older dwelling because that seems to be affordable compared to a new one that is much more expensive. As a practical example, the average rent level in rental advertisements in the region is rising in search results due to more expensive rents requested for new apartments, which is pushing up real rents for older apartments as well. However, this cannot be verified as the data in the study do not include rents requested for apartments in new buildings.

Table 9. Logarithmic main results.

	Unstandardized Coefficients			
	B	Std. Error	t	Sig.
Treatment_group	0,047	0,006	7,702	<0,001
Post_construction	-0,027	0,004	-6,617	<0,001
Interaction	0,058	0,004	13,048	<0,001

a. Dependent Variable: Log_Rent_per_m2

On the other hand, post construction variable illustrates that rents are on average 0,599 euros per square meter or 2,7% lower after the completion of a new building based on the temporal comparison. Taking into account the market trend during the period of the study, the result is in line with the expectations. The oversupply situation in the Helsinki rental housing market, fuelled by the recent macroeconomic events, has constrained rent increases and put downward pressure on rents.

Interaction variable estimates the difference-in-differences effect. In other words, it is the most important variable for the study and reflects the real impact of new construction. Estimate indicates that new construction has rent increasing effect in the nearby

area of the new building. After completion of the new building, the average rent in the treatment group within 400 meters is 1,374 €/m2 higher than those in the comparison group 400-1000-meter away suggesting dominant demand effect. In percentage terms, this means 5,8% increase as Table 9 shows.

Figure 13 shows how the impacts are distributed between the different price ranges. The red line represents the median rent for the whole dataset and as a result of the construction it can be observed that the normal distribution moves to the right of the median. This reflects a 5,8% increase in rents. However, when comparing the histograms, it can be seen that the distribution of rents in lower and higher rented dwellings is increasing and that the average range dwellings are reduced. This finding suggests that the impact of new construction creates upward pressure on medium-range dwellings, pushing them into the higher price category, while some medium-range dwellings experience downward pressure, but with a higher proportion moving into the higher price category. Despite these changes, the overall shape of the distribution remains similar, indicating that new construction affects all price categories relatively evenly.

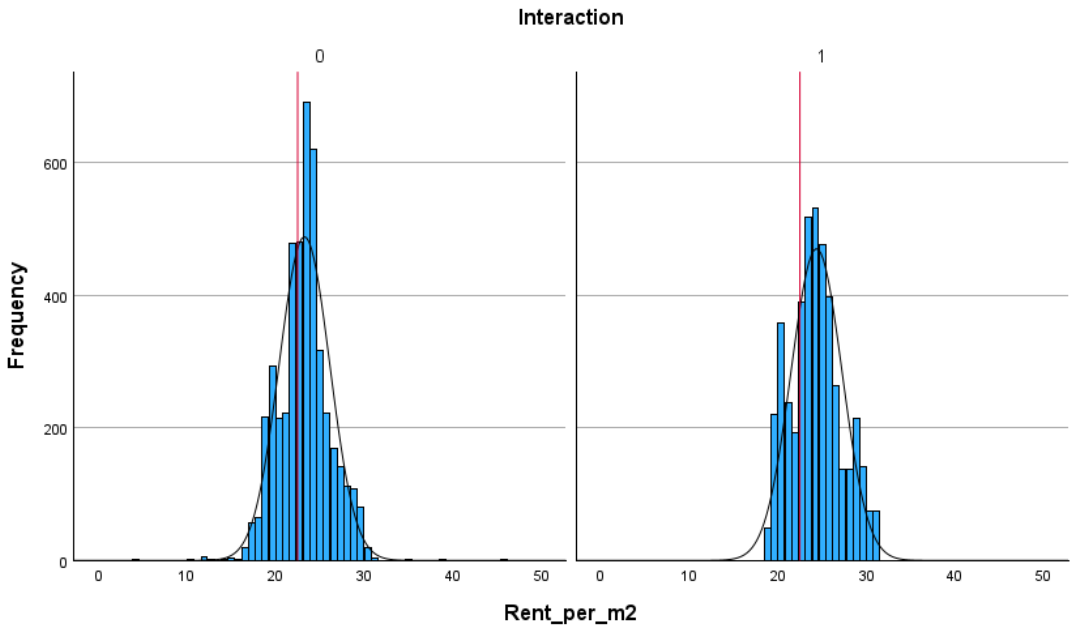

Figure 13. Distribution of impacts across different price ranges.

However, what DiD estimate does not reveal is the effect of discount campaigns. In the current market situation, landlords have been reluctant to offer permanent rent reductions but have instead offered one-off discounts to help finding tenants as interviewees stated. The research data does not allow for a precise calculation of the impact of a discount campaign. However, for instance, the impact of a one-month rent reduction in the average-priced apartment in the data is over 8%. This means a net rent reduction of 8% in the year of the discount given. The most common discount given in the data was one month's free rent, but some discounts were also smaller in amount. Of the 815 dwellings in the study, 154 in the treatment group had received a discount, but only 54 in the control group. Considering this factor, it can be concluded that the net impact of the new construction on rents of nearby older dwellings is less than 5,8% rent increasing.

The precise timing of the impact was not examined due to the lack of an exact completion date for the new building, but in the analysis the impact on rents is seen at the year of completion of new construction or at the latest within year of completion. The effects lasted until the end of the period covered by the study, which was at least one to two years. This is in line with the perceptions expressed by interviewees and the results of previous studies

The second research question of the study addresses the factors influencing the extent of the impact. Based on the interviews, influencing factors were identified, and this information was used to formulate the null hypothesis:

$H2_0$: There are no factors that influence the extent of the impact of new construction on rents for older dwellings at different distances.

The hypothesis is tested by using housing type variables and a variable controlling for the volume of construction. For this purpose, the difference-in-differences interaction variable was combined with the housing type variable and the construction volume variable. This allows to interpret how these factors have affected the rents of the treatment

group after the completion of the new building. The impact of all the factors identified in the interviews are not being studied due to lack of data and, for example, the study on migration chains has already been carried out by Bratu et al. (2023). The null hypothesis is accepted if the changes are similar between the variables or none of them is statistically significant.

Table 10. Coefficients results of factors influencing the extent of impact.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Interaction_construction_volume	-1,518	0,087	-17,514	<0,001
Interaction_studio	0,091	0,156	0,585	0,558
Interaction_one_bedroom	-0,310	0,119	-2,594	0,009
Interaction_two_bedroom	-0,180	0,127	-1,424	0,155

a. Dependent Variable: Rent_per_m2

The results in Table 10 confirm that at least the volume of construction and certain types of dwellings influence the extent of impacts. Therefore, the null hypothesis of the second hypothesis is rejected at a significance level of 0,05. The table shows that if the old apartments are located near a new building with a large number of apartments, their rents are on average 1,518 €/m2 or logarithmically calculated 6% lower after the completion of the new building than those in the treatment group with smaller new construction build nearby. The impact of new construction on the rent of one-bedroom apartments is negative by 0,310 €/m2 or 3%, compared to the reference groups of smaller or larger apartments. The results suggest that the large increase in supply has a downward effect on rents, and in the case of one-bedroom apartments this is probably due to their large share in the data and also in the market. No statistically significant effects are observed for studio apartments or larger housing types.

The third research question concerns differences between regions. The differences between regions will be examined by two variables reflecting the characteristics of the

regions. The variables describing the characteristics of the area were selected on the basis of the findings of the interviews. The first variable indicates whether the dwelling is located in the project area or not and the second variable distinguishes between areas with higher or lower rents than in average. The null hypothesis is accepted if there are no differences in treatment group between regions after new construction is completed or results are not statistically significant.

Table 11. Coefficients results of the regional differences.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Interaction_project_area	-0,890	0,100	-8,869	<0,001
Interaction_expensive	-0,175	0,088	-2,003	0,045

a. Dependent Variable: Rent_per_m2

Table 11 shows that there are differences in the impact of new construction between different regions and findings are statistically significant. Average rents per square meter in project areas are 0,890 €/m2 and around 1% lower than in areas where construction is infill. In the study, the average impact of new construction on rents in more expensive areas is 0,175 €/m2 or 1% less compared to less expensive areas. As a result of these findings, the third null hypothesis is rejected at a significance level of 0,05. This result is consistent with interview findings that project areas are less attractive which affects the demand, and previous studies from Damiano & Frenier (2020) and Li (2022) have found that the impact of new construction is more negative in expensive areas than in cheaper areas.

When examining the main results of the study, it is important to consider the impact of macroeconomic events on the data as a whole. Rents of dwellings at all distances from new construction, may have been distorted by factors such as the sharp rise in energy prices, rising interest rates, inflation and their pass-through to rents. In addition, economic uncertainty typically increases demand for rental housing and therefore indirectly impact rents. Increased flexibility in leases in response to unpredictable macroeconomic

risks may also have an indirect impact on rents. Further research with longer term data is needed to identify and to better generalise the long-term effects of construction on nearby rents and to identify impacts in different market environments.

4.5 Extensions of results with Ara construction and hyperlocal effects

The results of the study are extended by conducting an DiD analysis using a different rent dataset. The main results were obtained using rent data from rental apartments around non-subsidised new constructions. In the extension, rental apartments are selected around new subsidised Ara buildings. The same constraints are used for the selection of subsidised buildings as for the selection of non-subsidised new buildings. Following the restrictions outlined in chapter three, the number of selected new subsidised Ara buildings is 23.

Table 12. Summary statistics of the rents €/m2 around new Ara construction.

Rent €/m2	Mean	Min	Max	Std.	Obs. (N)
All	23,17	11,94	31,25	3,39	8429
Studio	25,98	21,28	31,02	2,14	2070
One bedroom	24,03	17,25	31,25	3,11	3542
Two bedroom	20,35	11,94	27,86	2,72	1953
Three bedroom	19,25	15,61	25,53	2,91	864
Control group	23,21	18,29	31,17	2,81	1191
Treatment group	23,16	11,94	31,25	3,62	7238
Pre-construction	22,56	11,94	30,50	3,60	4263
Post-construction	23,79	15,61	31,25	3,04	4166
Building age (Years)	6,03	4,00	10,00	2,35	8429

Table 12 provides descriptive statistics for the rental data used in the Ara extension. The number of rent observations is 8429 and it is noteworthy that the control group is very small in the dataset which may affect the results. The mean rent is slightly higher than in the main data, likely due to the fact that the dwellings in the extension data are newer.

The standard deviation of rents is slightly smaller in this dataset compared to the main one.

Table 13. Ara extension model summary.

R	R Square	Adjusted R Square	Std. Error of the Estimate
0,168	0,028	0,028	3,612436021300000

In the model summary in Table 13, R square 0,028 so the independent variables in the regression model explain only around 3% of the variance of the dependent variable. This means that the independent variables in the model do not effectively explain the variation in the dependent variable and validity is decreased.

Table 14. Ara extension difference-in-differences results.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Treatment_group	0,166	0,162	1,020	0,308
Post_construction	1,522	0,210	7,263	<0,001
Interaction	-0,342	0,226	-1,514	0,130

Table 14 coefficients results are obtained by performing the analysis in a similar way as the main results. The dependent variable is rent per square meter, the DiD variables estimate the impact of new construction and the control variables are apartment types, building age and regional differences. The result of the spatial comparison indicates that the rents in the treatment group are 0,166 €/m2 higher than in the control group. Result is not statistically significant at the significance level of 0,05. However, the result of the temporal comparison is statistically significant and shows that rents are 1,522 €/m2 higher after the completion of the new building.

The interaction variable reflecting the impact of new construction on rents in the nearby area is -0,342 €/m2. Recalculating the result using logarithmic values reveals that rents for existing dwellings near new Ara buildings are only on average 0,9% lower than in the control group further away. A differing outcome from the main results may be due, for example, to the fact that the rents of Ara apartments are lower than those of market-rate, and the completion of lower-rent apartments in the surrounding area leads to downward pressure on rents in market-rate apartments nearby. However, it is noteworthy that the result is not statistically significant at the 5% significance level. The finding also does consider possible discounts given.

Table 15. Summary statistics of the rents €/m2 using smaller buffer zones.

Rent €/m2	Mean	Min	Max	Std.	Obs. (N)
All	24,03	11,94	31,27	2,74	8466
Studio	26,31	20,86	31,27	2,75	1175
One bedroom	24,64	18,08	31,25	2,60	4192
Two bedroom	22,67	11,94	27,86	1,43	2299
Three bedroom	21,30	18,63	25,75	2,18	800
Control group	25,32	19,60	31,25	2,41	2764
Treatment group	23,40	11,94	31,27	2,67	5702
Pre-construction	23,63	11,94	30,49	2,54	4038
Post-construction	24,39	18,63	31,27	2,86	4428
Building age (Years)	8,06	4,00	13,00	3,17	8466

The results of the study are also extended by changing the size of the buffer zones. Although the main results are based on a zone size of 400 and 1000 meters, the possibility of hyperlocal effects is also identified. In some earlier studies, the size of the near buffer zone is only a few hundred meters. Therefore, the analysis is repeated with main dataset using a 200-meter buffer zone for the treatment group and a 600-meter buffer zone for the control group. Table 15 shows the descriptive statistics for the data used in this extension. The table shows that rents around the smaller buffer zones are on average more expensive than in the main data, and the average dwelling is 6 years newer. The amount of data has declined by about a third from main dataset.

Table 16. Coefficients results with smaller buffer zones.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Treatment_group	-0,957	0,089	-10,699	<0,001
Post_construction	1,107	0,094	11,837	<0,001
Interaction	-0,454	0,114	-3,982	<0,001

a. Dependent Variable: Rent_Per_m2

After reducing the buffer zones, the results change substantially. Table 16 and Table 17 shows the results of the DiD regression analysis using the main dataset, excluding dwellings outside 600 meters and some of those previously classified as treatment group dwellings are now part of the control group. It should be noted that the narrower dataset explains the variation in the dependent variable by the independent variables worse than in the main results with an R square of only 0,196.

Table 17. Coefficients results with smaller buffer zones logarithmically.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Treatment_group	-0,045	0,004	-12,225	<0,001
Post_construction	0,042	0,004	10,953	<0,001
Interaction	-0,015	0,005	-3,085	0,002

a. Dependent Variable: Log_Rent_per_m2

The results in Table 16 and in Table 17 suggest that there is a downward impact on rents very close to the location of new construction. Rents very close to a new building are 0,454 €/m2 and 1,5% lower than within 200-600 meters. The results are statistically significant at the 0,05 level of significance. Results suggest dominant hyperlocal supply effects around new construction. However, it should be noted that the dwellings in the extension data are newer than in the main results and on average more expensive.

Table 18. Regional differences between datasets.

	Main	Small zone	ARA
Project_area	28%	44%	18%
Expensive_area	48%	71%	41%

To help understand the differences between the main results and result obtained in the extensions, Table 18 shows the regional differences between the datasets. The dataset for the main results and the small area extension is the same, but as can be seen in Table 18, the data set for the small area extension consists of a larger share of dwellings in the project area and a larger share of dwellings in the more expensive area. In particular, the project area was found to have a downward effect on rents according to Table 11, which may help to explain why the impact of new construction has been downward in a small area and upward in the main results. The Ara dataset is not as comparable as the others, because the new construction buildings are completely different ones. However, the lower share of more expensive housing is in line with the assumption that subsidised housing lowers the average rent level in the region.

4.6 Robustness of the regression analysis results

The robustness of the main results is tested in two different experiments. First, regression analysis is performed without control variables. Second, an additional year variable is added to the model to control for temporal trends. The results are not robust if the interaction variable representing the difference-in-differences effects is very different from the original result. The extensions have shown the results to be sensitive to changes in the data, but this does not yet prove the results to be not robust.

Table 19. Coefficients without control variables.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Treatment_group	3,506	0,124	28,197	<0,001
Post_construction	-0,608	0,124	-4,887	<0,001
Interaction	1,305	0,138	9,485	<0,001

a. Dependent Variable: Rent_per_m2

The results in Table 19 are in line with those in Table 8 showing the main results. The values are not the same, but this is due to the lack of control variables. The most important interaction variable of 1,305 is very close to the main results value of 1,374 which suggests the success of this robustness test. The results are statistically significant at the 5% level of significance with significance values of less than 0,001.

Table 20. Coefficients with fixed year variables.

	Unstandardized Coefficients		t	Sig.
	B	Std. Error		
Treatment_group	1,223	0,138	8,897	<0,001
Post_construction	-1,488	0,113	-13,132	<0,001
Interaction	1,189	0,099	12,023	<0,001

a. Dependent Variable: Rent_per_m2

The results of the second robustness test are also in line with the main results. The values in Table 20 are different from the main results, but the value of the treatment variable is positive, and the value of the post construction variable is negative, as in the main results in Table 8. The value of the interaction variable 1,189 is also close to the value of the main result 1,374. The second robustness test is also successful and statistically significant at the 5% level of significance.

5 Conclusion

The impact of construction on rents in the surrounding area has been studied in previous studies, and there have been divergent results across the cities, which has made it difficult to generalise the effects. No corresponding study has been carried out in a Finnish city, and this study fills this gap. In addition, this study responds to the need of the property management company to identify the impact of new construction on rents based on a distance between new and existing housing, which has been difficult to model without appropriate research. In addition, in the current market environment shaped by major macroeconomic events and the oversupply of rental housing, understanding the impact of new construction on rents in the area is valuable information for market participants.

The research problem was examined through three research questions. The first research question, how does the construction of new housing affect rents at different distances between new and old housing, was the most relevant and answers the research problem. The second research question, what factors influence the extent of the impact of new construction on rents for older dwellings at different distances, addressed the research problem in more depth, by examining the factors that influence the magnitude of the impact. The third and final research question, does the region have an impact on the effect of new construction on rents, examined the impact of the region in terms of the research problem. Given the regional nature of the rental housing market, it was important to take this into account in the research.

The results of the study were obtained using qualitative and quantitative data. The qualitative data for the study was collected by interviewing five professionals working in the real estate sector. Based on the information gathered from the semi-structured interviews, hypotheses were created for each research question and practical knowledge was acquired to increase the depth of understanding of the research problem, which allowed for a more accurate interpretation of the numerically analysed data. The quantitative data of new construction and rental data for dwellings in Helsinki from the years 2021-

2024 was provided by KTI Kiinteistötieto Oy and Retta management. Using accurate address level data for new buildings and past rent data, a quasi-experimental difference-in-differences regression method was applied. These datasets and methods were used to analyse the impact of new construction on rents in the rental housing market over a short period of time, and to test hypotheses to confirm interviewees' findings.

The findings of the empirical study reject the null hypothesis of the first research question, as new construction increases rents on average by 5,8% or 1,374 €/m2 in euro terms within 400 meters of a new building compared to a control group 400-1000 meter away suggest a dominant demand effect. However, the result does not include discount campaigns, which have been given more near new construction, meaning that the average increase in rents is in reality lower than the result of the study. The impact was very similar across the different price ranges, but with some middle-priced dwellings moving to lower price ranges while larger proportions moved to higher price ranges.

This finding is in line with Damiano and Frenier (2020) previous research which discovers that the effect can be a 6,6% rent-increasing, and the findings of two interviewees who estimate the dominant impact of the demand effect. This means that new construction is taking place in desirable areas, and it increases the number of amenities in the area, leading to higher demand and rents. The rise in rents in the area is also explained by the difference between rent level for new apartments and those for older apartments. Thanks to the large amount of information available to market participants, rents for new apartments can increase the average rent level of rental advertisements in the area, leading to higher actual rents requested for all dwellings in the area.

The null hypothesis for the second research question was rejected because the volume of new construction and the type of housing were found to have a statistically significant influence on the extent of the impact. New buildings of over 60 apartments had a 6% downward impact on rents compared to rents near smaller new buildings, indicating that the supply effect is becoming dominant around larger building projects. Among the types

of dwellings, the average effect for one-bedroom dwellings is 3% reduction in rents compared to other types of dwellings. The weaker rental growth of one-bedroom apartments is explained by their supply relative to demand, as they represent almost half of the sample of rental dwellings in the study. The interviews revealed also other factors affecting the magnitude of the impact that could not be statistically tested for significance with the available data.

The project areas and the above-average priced areas were found to have a 1% rent-reducing effect compared their peer groups, leading to the rejection of the null hypothesis of the third research question. The finding of the data analysis is in line with the findings of the interviews, which mentioned that the noise and security degradation of the project site leads to a reduction in the attractiveness of the area, which ultimately leads to weaker rent growth. Consistent with previous studies, the impact of new construction is less increasing in more expensive areas. The effect of lower rent growth in more expensive areas is due to the fact that the new building is likely to be closer in quality to other housing in the area, making it a comparable substitute leading to increased competition.

Extensions of the study's findings found that subsidised new buildings lead to a slight 0,9% decrease in rents for nearby dwellings. The result suggests that the construction of subsidised affordable housing lowers the level of rents, which is the fundamental objective of building such housing. However, this result was not statistically significant. Another finding from the extensions is that when the area of influence around a new building is reduced to 200 meters from the original 400 meters, the effect changes from increasing rents to decreasing rent by 1,5% on average or 0,454/m2 in euro terms. This result was statistically significant. The result indicates a dominant hyperlocal supply effect near the new building.

The main results of this study show a rent-raising effect, contrary to several previous studies. Asquith et al. (2020) found rents to fall by 5-7%, Li (2022) by 1,6% and

Pennington (2021) by 2%. Differences between the studies include, for example, a focus on a certain price range of housing or on housing in a certain profile of area, but the clear difference between these studies is the size of the area of impact. In this study, the area of influence was chosen to be 400 meters based on the responses of real estate professionals, while in the above-mentioned studies the area was between 100 and 250 meters. When the impact area was reduced to 200 meters, the results were in line with previous studies with rent reduction of 1,5%. On the other hand, the main results can be considered relevant for Helsinki, as they reflect the experiences of market stakeholders in the area and the ultimate purpose of the study is to provide information specifically for them.

The results of the study will help property management companies and private investors to take the impact of new construction into consideration in the rents of nearby apartments. The result of the study gives an average impact for an apartment within 400 meters of a new development, so when signing a new lease or reviewing the rent of dwelling in the 400-meter radius, it is worth increasing the rent by a few percent, as the average rent level is likely to increase in the area. On the other hand, if the new construction is less than 200 meters away, has more than 60 new dwellings and is in a project area, the rent increase should be more moderate. The tenant in turn can predict how the rent could change if a new building is constructed in the area. For example, if the tenant finds the current rent too high already and a new apartment building is built nearby, the rent increase may be higher than average, and it could be time to start thinking about searching accommodation in another area. From the developer's point of view, the study helps to assess the impact of new construction on rents in the area. If the aim of the new construction is to help make rents in the area more affordable, the focus should be on building larger apartment buildings and the influence is more likely to lower rents if the rent level in the area is already above average.

According to the previous study and the current market situation, the results of the study could be expected to be rent reducing. Macroeconomic and economic events in the 2020s have mainly led to an increase in housing supply which in many cases means a

stagnation of rent increases. The slow or non-existent increase in rents is reflected in market surveys and statistics, but this study shows that rents have actually risen more than average in the vicinity of new construction. On the other hand, it is not easy to generalise the impact because this and previous studies show large differences between regions and depending on the context.

This study is the only one on the subject that has been done with recent data from 2021-2024 and provides an interesting insight into the demand effect around new construction that is putting upward pressure on rents despite the weak overall price trend in the market. What makes the data in this study unique is the information on the discount campaign given, which shows the reluctance of landlords to reduce rents in the long term despite the difficult market situation. This study also used new variables that have not been used in previous studies. The construction volume variable and the project area variable provide further detailed information on the research problem, showing their rent-reducing effect in the context of the study.

Ensuring the consistency and repeatability, as well as the accuracy and relevance of research results is an essential part of a study. The reliability and validity of this study has been ensured by interviewing several professionals from different companies and roles, and by using the same clear questions for all of them. Reliable tools have been used to record the interviews, and the answers have been carefully translated and categorised to ensure that the content of the answers remains unchanged. The reliability and validity of the quantitative data and methods were enhanced by using data provided by trusted sources and by exploiting methods that have been established in the previous literature. The use of statistical research software was also used to ensure the reliability of the study. External factors affecting the results were controlled by control variables and consistency of the main results was ensured by carrying out robustness tests.

Despite ensuring the reliability and validity of the study, the findings have several limitations. Firstly, the size of the rental data was not large enough to be said with certainty

that it represented the entire rental housing market in the City of Helsinki. Rent data does not include privately owned rental dwellings, which represent a large proportion of the rental housing market in Helsinki. In addition, the findings of the study do not cover areas in Helsinki that have not been built on in recent years. Secondly, the average result may have been affected by the heterogeneity of the regions and buildings in the data. There can be differences and non-linearities in amenity effects depending on the context. Finally, the study does not include variables such as the impact of possible infrastructure projects in the area. So not all factors affecting rents might remain constant over the period of the research.

The limitations of this study provide interesting topics for future research. Similar research using more comprehensive rental data could improve the accuracy of the findings of this study. A larger dataset could help to mitigate the influence of heterogeneity between regions and also allow for more accurate comparisons between different submarkets. Secondly, the inclusion of new variables, such as the completed infrastructure projects, in the regression analysis would provide useful findings that would help to get a broader picture of the actual impact of new construction.

The theoretical part of the study identified a sharp drop in the number of building permits and building starts during and after the end of the period studied. In addition, macroeconomic events in the early 2020s are identified as having direct and indirect effects on the data for the period of the study. Therefore, further research after the next five years would provide valuable information on the long-term effects and impacts in a different market environment. As the topic of the study is little studied in Finland, further studies in other Finnish cities and over different time periods would be relevant in the future. Globally, the rental housing market has been extensively studied and thus provides a good toolset for future research, but at the same time the local nature of the housing market provides an opportunity to make new observations and conclusions when investigating new areas.

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Appendices

Appendix 1. Interview questions in Finnish

1) Haastateltava
    - Ikä?
    - Työvuodet kiinteistöalalla?
    - Kuvaile lyhyesti kokemustasi alalta?

2) Tutkimusongelma
    - Miten uudisrakentaminen on vaikuttanut lähialueen asuntojen vuokriin Helsingissä kokemustenne perusteella?
    - Oletteko havainneet eroja vaikutuksissa eri alueiden välillä?
    - Milloin vaikutus on havaittavissa rakennuksen valmistumisen jälkeen tai ennen valmistumista, ja kuinka kauan se kestää?
    - Pystyttekö arvioimaan etäisyyttä, jolla vaikutus muuttuu merkityksettömäksi?

3) Lisätietoja
    - Onko Helsingin vuokra-asuntomarkkinoilla mielestänne vielä jotain, mitä pitäisi ottaa huomioon tutkimuksen aiheeseen liittyen?

Appendix 2. Interview questions in English

1) Interviewee
    - Age?
    - Years working in the real estate sector?
    - Briefly describe your experience in the sector?

2) Research problem
    - How new construction has impacted on rents of nearby dwellings in Helsinki based on your experiences?
    - Have you noticed differences in impact between regions?
    - When will the impact be noticeable after or before the building is completed and how long will it last?
    - Can you estimate a distance at which the impact becomes insignificant?

3) Additional details
    - Is there anything else you think should be considered in the rental housing market in Helsinki in relation to the topic of the study?