Statistics Finland

Developing data sources and methods for a Commercial Property Price Index in Finland

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Abstract

Finland is a sparsely populated Nordic country with the fifth largest surface area in the European Union but a population of only 5.6 million. Population development is increasingly centred to the Greater Helsinki region and other growth centres, leaving empty dwellings and buildings in declining areas for which buyers can no longer be found and resulting in decreasing house prices. There are no official statistics yet for the commercial property market, but efforts towards producing commercial property price indices have been made at Statistics Finland. This paper describes the measures taken and analyses the results achieved in two EU-funded projects, which have resulted in creating transaction-based hedonic indices for offices, retail premises and rental housing. Among the issues discussed are i) utilising data sources that cover four different types of property transfers in Finland, ii) dealing with a low number of observations, iii) challenges that arise from both portfolio sales and share deals. Compiling a CPPI for Finland in the conditions of extremely low transaction numbers means difficult decisions concerning regional stratification, timeliness and adequate quality adjustment. Especially indices for retail premises and offices remain quite volatile despite all the efforts made.

1 Introduction

Statistics Finland has developed the commercial property price index for several years in projects funded by Eurostat. Now, the work has resulted in the first experimental statistical publication. The EU prepares for a regulation on commercial real estate indicators based on the recommendation by the European Systemic Risk Board, and it aims for common indicators for EU Member States to cater for the needs of macro-prudential supervision. The commercial property price index developed by Statistics Finland strives to meet these needs. The development work has taken into consideration both the recommendations of the ESRB (2016, 2019) and Eurostat's statistical report on commercial property price indicators (2017).

Finland is a large and sparsely populated country where the most active property market is heavily concentrated in the largest cities of southern Finland and in the most densely populated areas (Figure 1). Internal migration has led to the segregation of the housing market: price growth has been concentrated in the three growth centres (Helsinki region, Tampere, Turku), and in other regions prices took a downwards turn around 2013. There are great differences in the vitality of the regions, which is expected to be reflected in the development of commercial property prices.
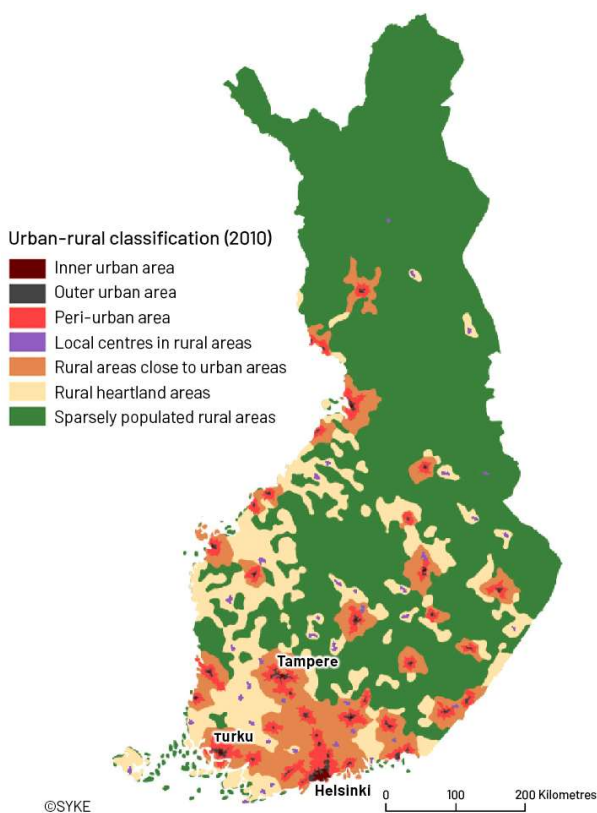

Figure 1 Map of rural-urban classification (MAKA) for all Finland (2010).

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The value of property transactions varies greatly in Finland depending on the year, as can be seen in Figure 2 developed by KTI Finland, a specialist organisation for the property market. In 2023, the transaction volume of offices and retail premises was record low compared to KTI's measurement history. The volume was roughly only a tenth of the peak year 2017, when more than EUR four billion were made in office transactions, and EUR 2.7 billion in retail transactions. (KTI Finland, 2024.)
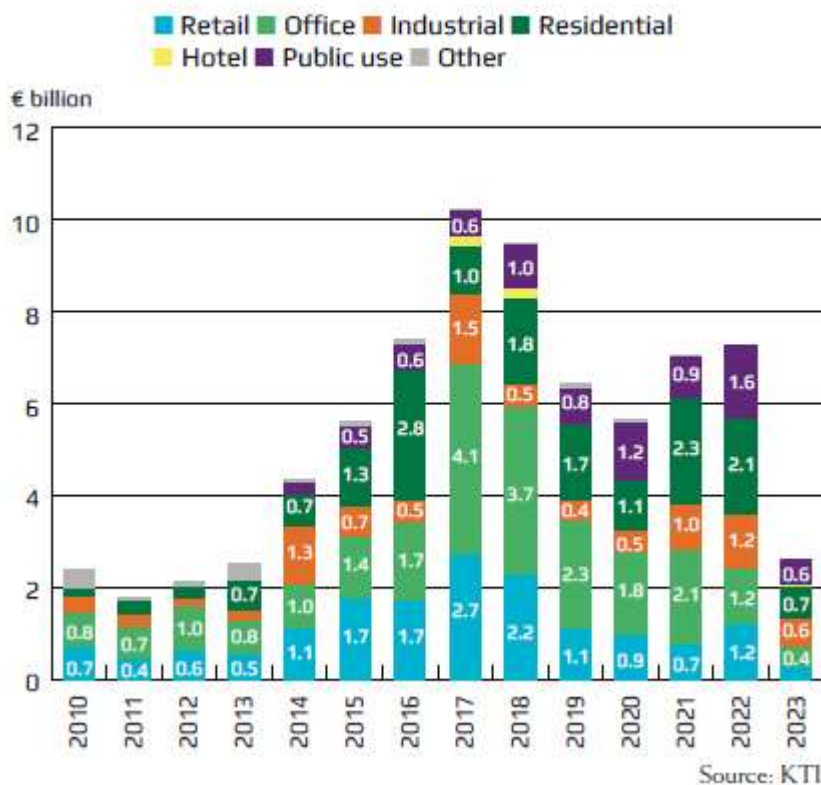

Figure 2 Transactions volume in Finland by property type 2010-2023. Source KTI Finland.

Direct property investments in Finland amounted to nearly EUR 96 billion in 2023. The value of the Finnish invested property market has increased steadily since the early 2010s (the value has more than doubled since 2010). Foreign investments and fund investments have especially increased over the last ten years or less. (KTI Finland, 2024.) Finland can be seen as an attractive country for foreign property investors for reasons such as stable social conditions and functioning administration. Despite the growth in the values of investments, the number of transactions has remained disappointingly low from the perspective of developing the price index.

This paper presents the challenging work that has been carried out to develop the commercial property price index. Separate indices have been created for offices, retail premises and rental housing. Rental

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housing refers to residential buildings or dwellings purchased by companies. Offices and retail premises are identified based on the main purpose of a building or unit in a housing or real estate company, without restrictions on the buyer. Premises purchased for one's own use are also seen as commercial property, so even small offices are included in the office index. Hotels are not included in the retail index.

2 Data sources and types of property transfers

In Finland, a commercial property transaction can be carried out in many ways, which leads to several different datasets in the price index being used. A commercial property can be purchased as a real estate, a building on a leased plot, a unit in a mutual real estate company (including housing companies) or via a separate company owning the property (later referred to as 'share deals').

Direct real estate transactions[1] and transactions of buildings on a leased plot are comprehensively recorded in the registers of the National Land Survey of Finland (NLS), including reliable price and location data. Details on the characteristics of buildings can also be combined with the data. Real estate transactions cover only a small part of the value of the entire commercial property market. Based on the data at Statistics Finland's disposal, real estate transactions for offices cover about three per cent of the value of all known transactions and about six per cent for retail premises (Figures 3 and 4).
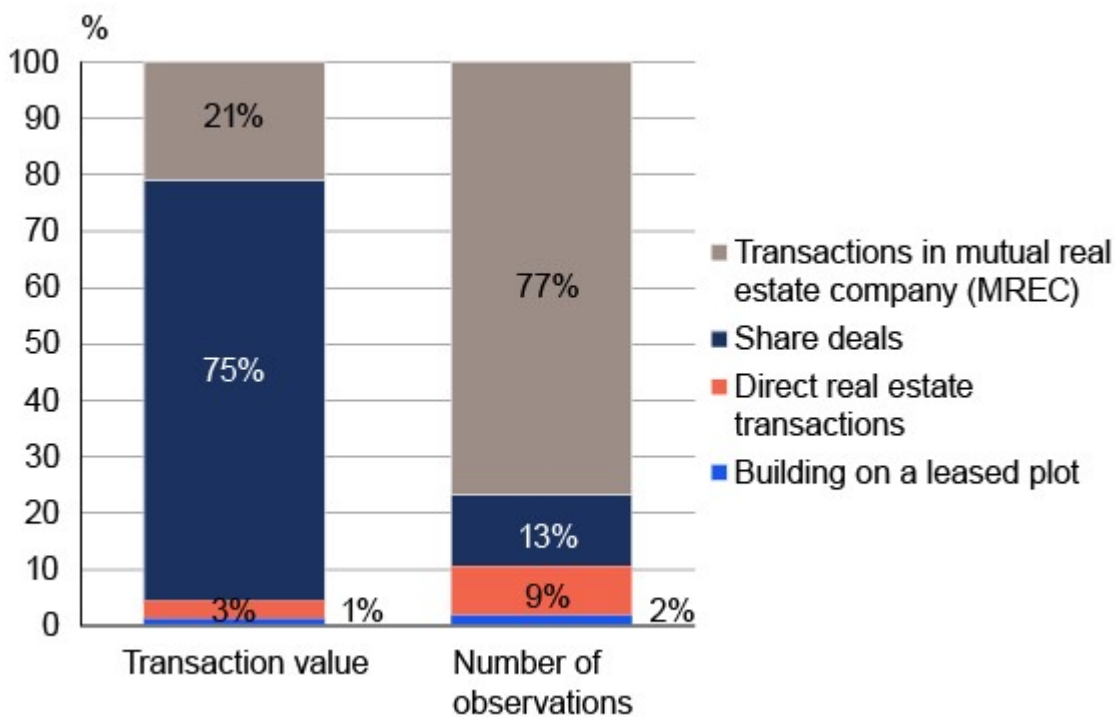

Figure 3 Shares of different transaction types in office transactions in Finland from 2015 to 2023 according to the value of transactions and the number of observations

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[1] In Finland, a real estate refers to a plot with one or more buildings, or just a plot without any buildings.
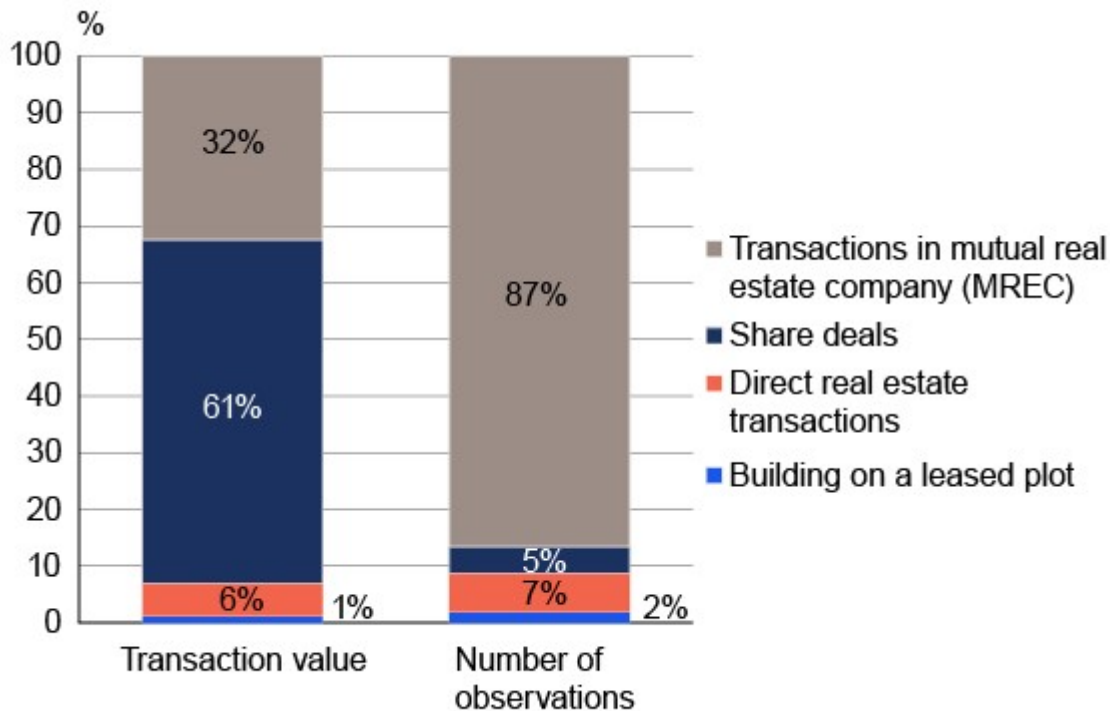
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Figure 4 Shares of different transaction types in retail transactions in Finland from 2015 to 2023 according to the value of transactions and the number of observations

A typical way of owning a commercial property in Finland is a shareholding in a mutual real estate company (MREC). Purchasing shares in a mutual real estate company (or in a housing company in case of rental housing) gives the right to control a certain unit, and purchasing all the shares gives the right to control the entire building or all the buildings owned by the company. From the perspective of statistics, the special feature of this transaction type is that there are various observation units in the data: individual units; bundles of several units; and entire buildings. For transactions of units in a housing company or mutual real estate company, administrative asset transfer tax dataset can be used, from where the sales price can be reliably derived. However, handling prices is challenging, especially in bundle transactions of several units.

In addition to mutual real estate companies, commercial property transactions take place through other types of companies. Producing statistics for commercial properties purchased through non-mutual real estate companies is more difficult, since administrative data sources with reliable price information are not available. In the Finnish tax system, certain arrangements allow asset transfer taxation to be avoided entirely. In addition, in cases where the transaction is subject to asset transfer tax, the tax base does not include the company loan unless the legal form is a mutual real estate company or housing company. Therefore, for other company forms, the actual sales price cannot be reliably determined for statistical purposes. In addition, identifying which transactions should be treated as

commercial property transactions is very challenging when using administrative datasets. Consequently, there is no administrative dataset in Finland from which all share deals can be identified, or their value examined. Information on share deals is scattered across private operators: property market specialists and companies used as advisors in transactions.

With the aid of project funding, Statistics Finland has obtained two private datasets (Datscha/MSCI, Reagle) to describe share deals for the commercial property price index. The Datscha dataset was found to be insufficient for developing the price index: price information is often missing from the dataset, and the information on the object of the transaction is not detailed enough for the purposes of a hedonic price index. The Reagle dataset more often includes price information, and the data on the purchased buildings is more extensive. The dataset also contains estimated object-level prices for portfolio sales of multiple buildings, whereas the Datscha dataset has one price per transaction, regardless of the number of buildings sold. In the test calculations presented in this paper, only the Reagle dataset is used as data source for share deals.

KTI Finland has estimated that the value of transaction in the Finnish commercial property market has ranged between EUR 1.2–4.1 billion for office properties and between EUR 0.7–2.7 billion for retail during the period 2015–2022. When all transaction types are included, the data sources available for Statistics Finland cover the commercial property market reasonably well compared to these estimates. In most years, Statistics Finland's data exceeds the figures reported by KTI, whereas in some years the coverage falls to as low as 42 per cent of KTI's estimated total transaction value. Differences arise from several factors, including different criteria for which transactions are included and, on the other hand, the fact that the data sources are not fully comprehensive.

3   Challenges of compiling the Commercial Property Price Index

Creating the commercial property price index involves many challenges that differ from compiling the statistics for residential properties. Especially in smaller countries, the trickiest challenge is probably the extremely small number of transactions and their heterogeneous nature. In addition, other challenges differing from compiling the statistics for residential properties include portfolio transactions typical of commercial property transactions, as well as share deals.

The difficult situation in Finland is reflected by the fact that approximately 75 office observations, 270 retail observations and 1,500 rental housing observations were suitable for index calculations in a quarter. These are the total figures from the entire country and from all datasets.

Commercial property transactions are very heterogenic in terms of locations, sizes and architectural characteristics. For example, the floor area ranges from less than 10 square metres to 100,000 in

offices and retail properties. Offices include small offices used by entrepreneurs themselves, and they reflect a very different market than large head offices that attract investors. All kinds of retail premises, from small ground-floor retail units to shopping centres and big-box stores outside cities, are mixed into the same index for retail. Having separate indices would be preferable, as the price development of different types of retail or office premises may differ. Unfortunately, this is not feasible due to the small numbers of observations.

One major challenge in developing the commercial property index is to solve how share deals should be processed. Collecting data is one apparent issue, as no administrative datasets are available. To obtain data, it is necessary to rely on private property specialists and ensure that the purchase price of a sold company does not include other business operations apart from property ownership, i.e. that the transactions are comparable to property transactions. For Finland, private datasets are seen as necessary additions to administrative datasets because the proportion of share deals in the Finnish market is known to be remarkably high. The clear aim for the development work has been to cover the entire market.

Although transaction datasets were available for share deals, their use would still involve challenges. There are many factors dependent on e.g. the financial and tax-related circumstances of the trading partners influencing the choice of whether it is optimal to sign an asset deal or share deal. Nevertheless, there are certain types of property that are more likely to be traded as real estate transactions, while other types are more likely to be traded as share deals. According to the data sources available to Statistics Finland, very expensive properties such as head offices or shopping centres are often transacted via share deals. Meanwhile, small rural properties may be sold through direct real estate transactions. Because the data sources do not fully cover share deals, caution is required when interpreting the results. However, exceptionally large and expensive properties are involved in share deals in particular. The sites may be so exceptional and unique that quality adjustment is challenging, and the index becomes more volatile. Excluding these transactions due to difficulties in quality adjustment would result in an index that does not cover the whole market and is therefore not considered an option.

In addition to share deals, a typical way of carrying out transactions in the commercial property market is to combine several buildings to be sold together as a portfolio. Processing these portfolio transactions is a major challenge that has appeared in developing the statistics. An object-level price is needed for the quality adjusted price index, but it is not always available in the transaction datasets. When the actual information is missing, the price for each object must be estimated, and the selection of the appropriate estimation method depends on the available datasets, for example.

In Statistics Finland's project, a method was tested where the purchase price was distributed to the buildings according to their relative proportions based on their property tax value. Taxation of property

in Finland is based on separately determined taxable values for both the plot[2] and buildings, which, in theory, allows a rough accounting of price differences of buildings in different locations. Every building in the building stock has been valued in the tax authority's register based on its characteristics[3]. Property tax values do not necessarily reflect the actual market values that well, but they help in estimating the relative values of different properties and buildings and thus break down the prices of portfolio transactions by building. The quality and coverage of this register data determines how well the estimation method works. In the project, this method failed to estimate prices at the building level due to insufficient detail in the data on transacted buildings. Without more accurate information about the content of transactions, this method cannot be successful, even with the best property tax datasets.

Object of transaction is also a challenge that needs to be solved for statistics describing commercial properties. In Finland, different forms of transactions contain different object types. Especially transactions of mutual real estate companies have proved challenging, as the data source include both individual units and entire buildings. This is because the asset transfer tax notification policy allows a varied way to report either an individual unit or a portfolio at a time. The observation unit thus varies across the datasets, and unfortunately, due to the small number of observations, processing cases with differing observation units separately has not proved feasible.

4   Index calculation

For the price indices of residential dwellings Statistics Finland has used a method based on Eugen Koev's licentiate thesis (2003), which combines classification and hedonic repricing. Hedonic repricing was also the starting point in the preparation of the commercial property price index.

The idea of the method is first to classify the data based on factors that most affect the price and then apply hedonic regression to standardize the internal price variation of the classes.

The hedonic method used is the least squares regression, calculated by region and property type based on a three-year dataset. The dependent variable is the natural logarithm of the price per square metre. The quality adjustment factor is derived by calculating forecast prices for both periods using shadow prices from the hedonic regression and the average characteristics of the sold objects. The quality adjustment factor is the ratio of these forecast prices.

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[2] The taxable value of a plot is based on plot price maps where municipalities have divided their area based mainly on completed transactions. In the area division, the reasonable price level based on property transactions has been considered in addition to the distance from the centre, transport connections, and zoning plan information such as purpose and building rights.

[3] A building's taxable value is influenced by the building type, year of construction, the area in square metres, and various technical features such as the level of fixtures and fittings and the heating system.

Within each stratum, price ratios are calculated from geometric means, which gives a quality unadjusted mean price index, or in practice a simple mean index. When this mean index is multiplied by the quality adjustment factor, a quality-adjusted price index is obtained.

The purpose of quality adjustment is to ensure that the buildings sold at different times are comparable, and that the price development can be reliably tracked, even though different types of properties and units are sold at different times.

The method should consider the most relevant features that affect the price (e.g. location, year of construction, size and type of building), but not all the features affecting the price are available in the datasets. In addition, a reliable estimation requires enough observations, which is very challenging for commercial real estate, especially in a country as small as Finland.

Finland is a highly divided country in terms of regions, and apart from larger towns, the prices of residential dwellings have been decreasing in many regions for years. Therefore, the aim was to address the regional perspective in the development of the commercial property price index, even though the number of commercial property transactions in Finland does not enable any highly detailed stratification. When stratifications were planned, the sufficiency of observation numbers for quarterly and semi-annual indices was examined. The stratifications were selected based on classifications useful for users, the sufficiency of observations and the different development of prices between regions.

After testing different stratifications, offices and retail premises were divided into three geographic categories: the Helsinki region, cities outside the Helsinki region (cities according to the DEGURBA[4] classification excluding the Helsinki region) and the rest of Finland.

Size-based stratification was also considered because, for example, small offices may be rooms used by self-employed individuals, meaning that they represent a very different market segment compared to office properties bought by investors. However, the number of transactions involving large office properties is so small that no reliable regional index can be produced. Furthermore, the prime market cannot be represented accurately due to the small number of observations. For offices and retail premises, the prime market is represented by the index for the Helsinki region.

The classification of rental dwellings is a classification of the nationally published prices of new dwellings in housing companies. In this classification, Finland is divided into 12 regional classes. Unlike in the statistics on prices of new dwellings, a size-based stratification was not, however, used due to the small number of observations, even though this would be the preferred option considering the quality of the index.

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[4] https://ec.europa.eu/eurostat/web/degree-of-urbanisation/information-data

A more detailed stratification based on region and commercial property type would be significant for the quality of the statistics, but the observation volume is insufficient for more detailed stratification. Even with the current stratification, the observation volumes are sometimes quite low for the index calculation. In the Helsinki region, there are approximately just under 50 office transactions and nearly 100 retail property transactions. The stratification therefore cannot be specified further, meaning that the same stratum for retail properties includes small ground-floor units, big-box stores and shopping centres, which creates significant challenges for quality adjustment.

After carrying out the stratification, the project developed and selected separate variables for each property type in the hedonic model. After experimenting, the variables ended up being quite similar across property types. Common variables include logarithmic floor area, distance from the nearest city centre, dummy variables based on the year of construction, the percentage of highly educated residents in a postal code area, a dummy variable to reflect the location in the city centre or commercial centre, a dummy variable for offices and retail properties of an exceptionally large area in square metres, and for rental housing, the area in square metres of retail properties in the postal code area.

Regression coefficients are calculated from datasets covering three years because especially for offices, the datasets covering one year have very little observations for reliable estimation. The coefficients are updated every year. The models work varyingly depending on the time, area and property type. The coefficients of determination vary from 0.3 to 0.5 for offices, from 0.3 to 0.4 for retail properties and from 0.4 to 0.75 for rental housing.

5   Results

As the development work progressed, Statistics Finland published experimental statistics for the price index of commercial properties in December 2024. In the experimental statistics, indices are produced quarterly, biannually and annually. Apart from rental housing, the quarterly index in the experimental statistics is only published for the entire country, as regional indices proved too volatile, especially for offices. The challenges in compiling the statistics are reflected by the fact that biannual indices also show considerable changes in regional review.

Regional segregation is evident in the published retail and office indices in the experimental statistics. For retail, the indices of the Helsinki region and other large cities remain quite close to each other, but the price development of retail premises elsewhere in Finland deviates from these two regions, and it shows a clear downward trend.
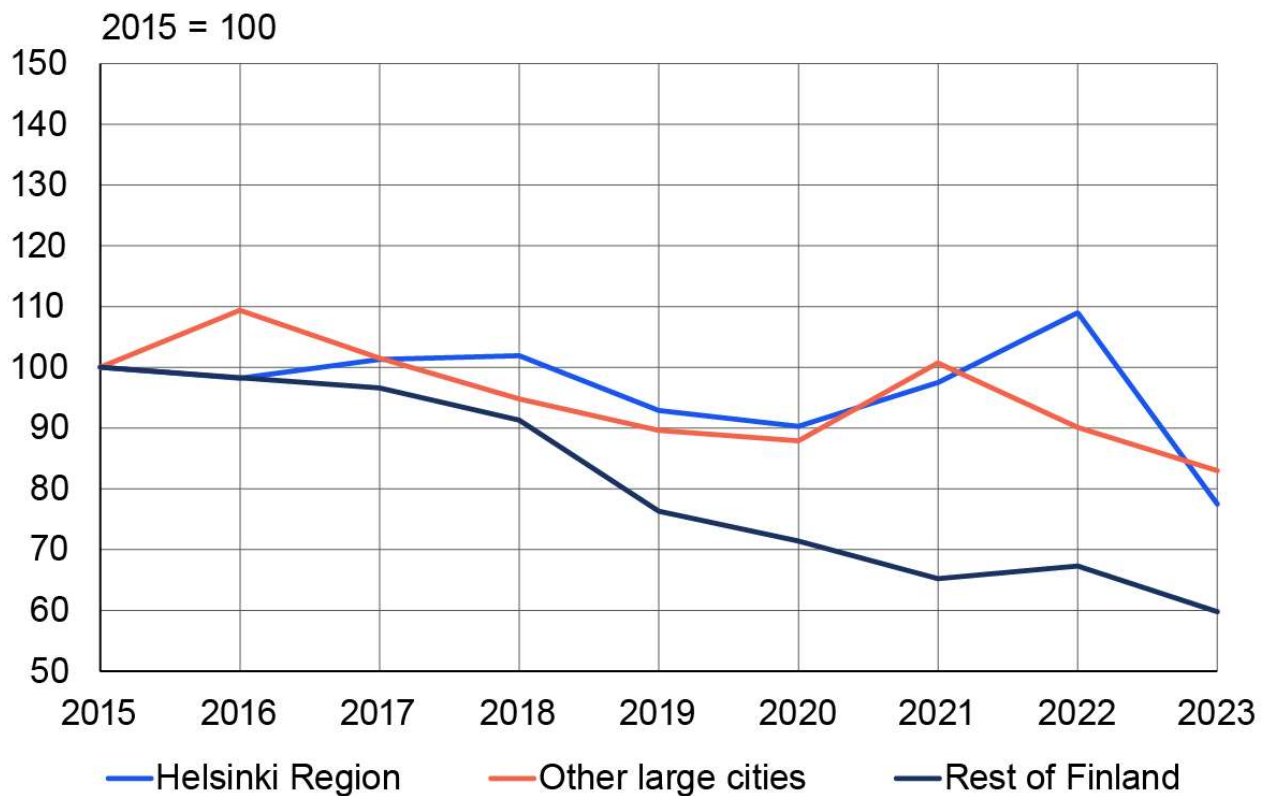
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2015 = 100

Figure 5 Retail price index by area 2015=100, yearly

When interpreting the results, the challenges of the statistics should be kept in mind, as they influence the results. The downward trend in the price development of retail properties in Rest of Finland is unsurprising, as empty retail properties in municipalities with migration loss are reported in Finland, and house prices in these areas have also been in decline for years. Yet the halving of retail property prices since 2015 is such a drastic result that it demands careful interpretation.

This significant drop in the price index may be because transactions in the market have focused on certain types of properties, and the hedonic model is unable to take sufficiently the differences in retail properties into account. For example, shopping centres with a more expensive price per square metre and empty retail premises in rural areas may be weighted differently in the datasets at different times, which affects the index development. The aim is to improve the model further in this regard before the production of official statistics.

Especially for offices, the indices with higher frequency are extremely volatile, and regional differences in price development are best reflected by the annual index, as Figure 6 shows.
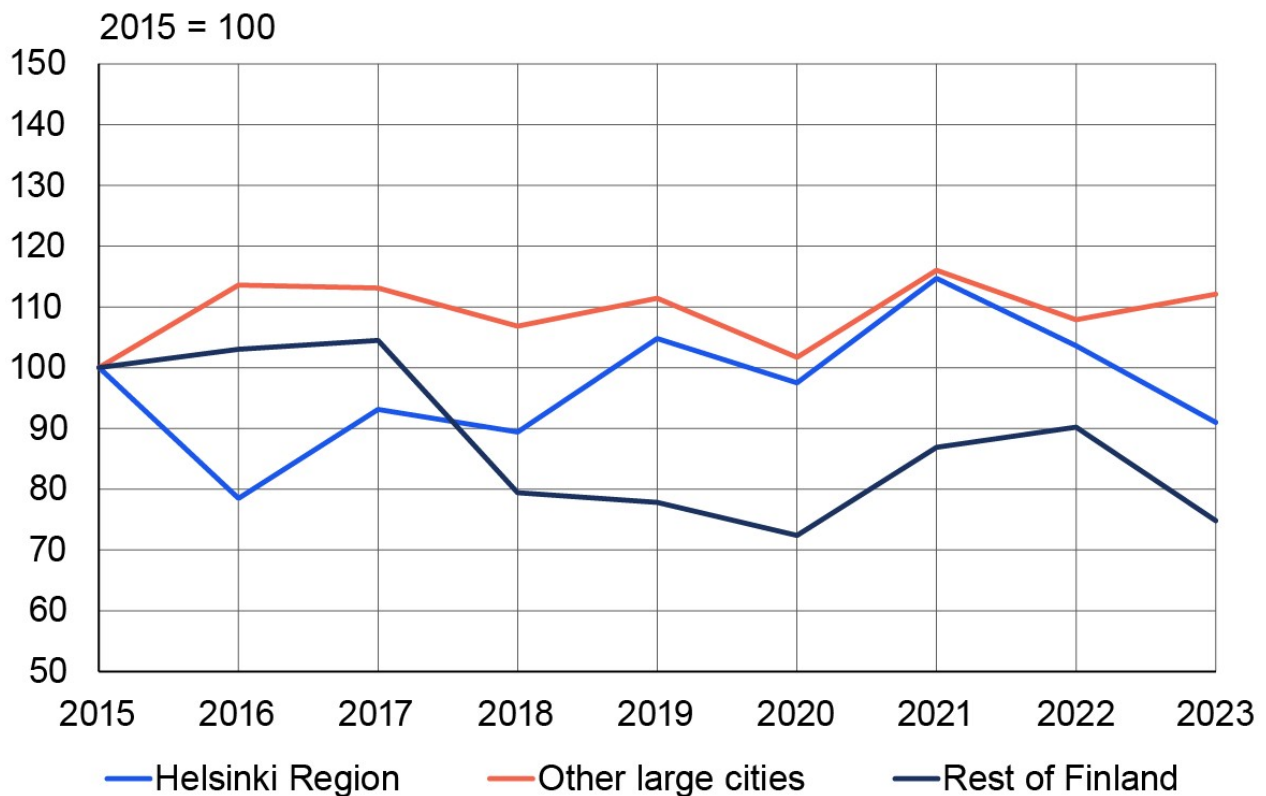
2015 = 100

Figure 6 Office price index by area 2015=100, yearly

The price development in the Helsinki region has had an upward trend since 2016, whereas in other larger cities, prices have remained almost the same since 2016. Elsewhere in Finland, prices have dropped significantly since 2017 (Figure 6). As with retail, interpreting the office price index requires caution due to the challenges in the statistics. The index calculation for offices is difficult due to the low number of sold buildings and their high variation. The quality adjustment model cannot take all factors affecting prices into account, so the hedonic model does not fully explain the quality differences between the buildings sold.

During the project, quarterly indices were also produced for offices and retail properties because the aim has been to produce information about economic cycles. Figure 7 shows the quarterly price index for retail at the national level, as well as an adjusted version of the same index. The adjustment has been carried out as the average of two consecutive times.

The index shows a slightly declining trend, but the changes between the quarters in the original index especially are significant (Figure 7).
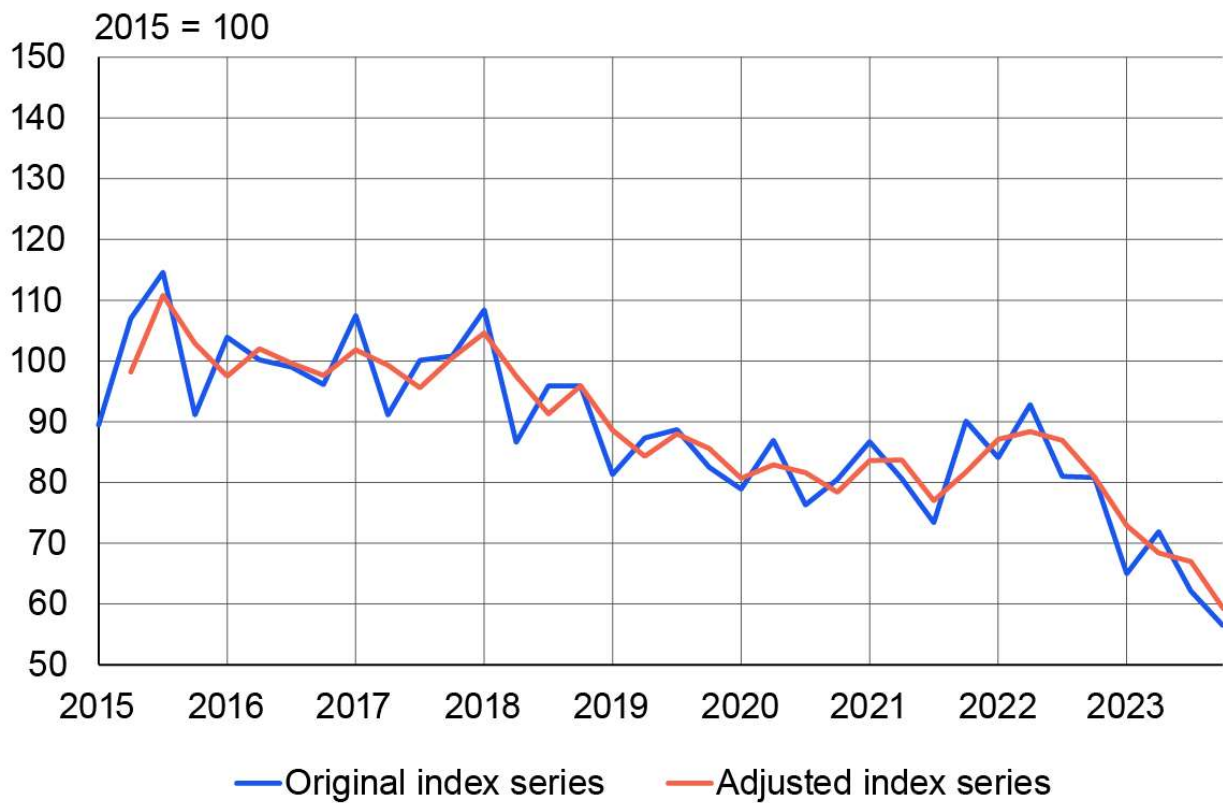
Figure 7 Retail price index for whole Finland, original index and adjusted index 2015=100

Figure 8 shows the quarterly price index for offices at the national level, as well as an adjusted version of the index series. The quarterly index series shows considerable fluctuations between different times, and the price development does not show a clear trend, even though the adjustment reduces the most significant fluctuations (Figure 8).
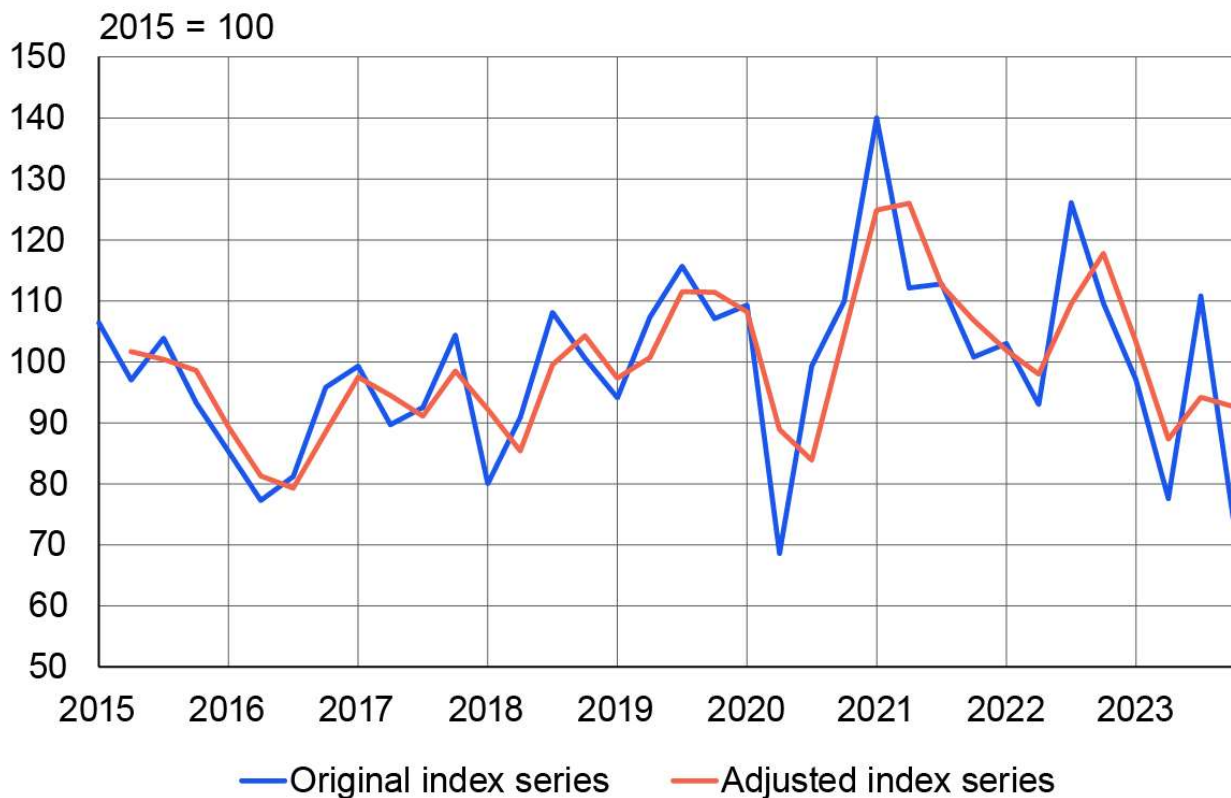
Figure 8 Office price index for whole Finland, original index and adjusted index 2015=100

6 Conclusions and discussion

Producing the commercial property price index and other commercial property indicators has proved extremely challenging, and improvements are needed in the statistics after the publication of the experimental statistics. Indices are very volatile, especially when reviewed by quarter, and caution should be exercised in interpreting the results.

However, development possibilities are limited, especially in relation to transaction-based indices. Hedonic models can be developed further to improve quality adjustment, but its potential impact on the indices is limited because there are very few transactions in Finland. Getting new datasets may improve the situation for share deals, as the current datasets covering them are insufficient. There is still no guarantee of this, as the number of missing transactions is unknown, and the scope of the current datasets cannot be accurately estimated for share deals. Statistics Finland has not explored valuation-based indices due to missing datasets (with the exception of the SPAR method, which was examined, but it is also partly based on transactions). Valuation-based indices would probably help with the volatility issue, but valuations involve other challenges such as delay and the quality of the valuations.

Despite the challenges, Statistics Finland has taken a significant step forward in representing the commercial property market, as before the publication of the experimental statistics, only private

market operators have been representing the commercial property market in Finland. Transaction-based information has been unavailable for the price development of commercial properties.

A regional perspective is essential in the Finnish market for the prices of both residential and commercial properties. For commercial properties, the price development in different regions has been successfully represented with the annual index. However, the aim has also been to produce information faster, which is why information at the national level is produced quarterly in the experimental statistics. For offices especially, the quarterly index is very volatile and requires careful interpretation from its users. Yet it offers a faster insight into price changes than the annual index. Publishing transaction volumes and values in connection with the price development would give users better tools to interpret the price index and its quality, but it was decided not to publish this information for now, as the current datasets do not allow for the production of comprehensive information on transaction values.

This paper presents the observations made during Statistics Finland's research projects about producing commercial property indicators and practical solutions that have helped produce information about price development in the commercial property market of a small country. The development work is ongoing, but the first step in compiling commercial property statistics has now been taken in Finland, and we hope that our experiences will encourage other small countries produce statistics on this subject.

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