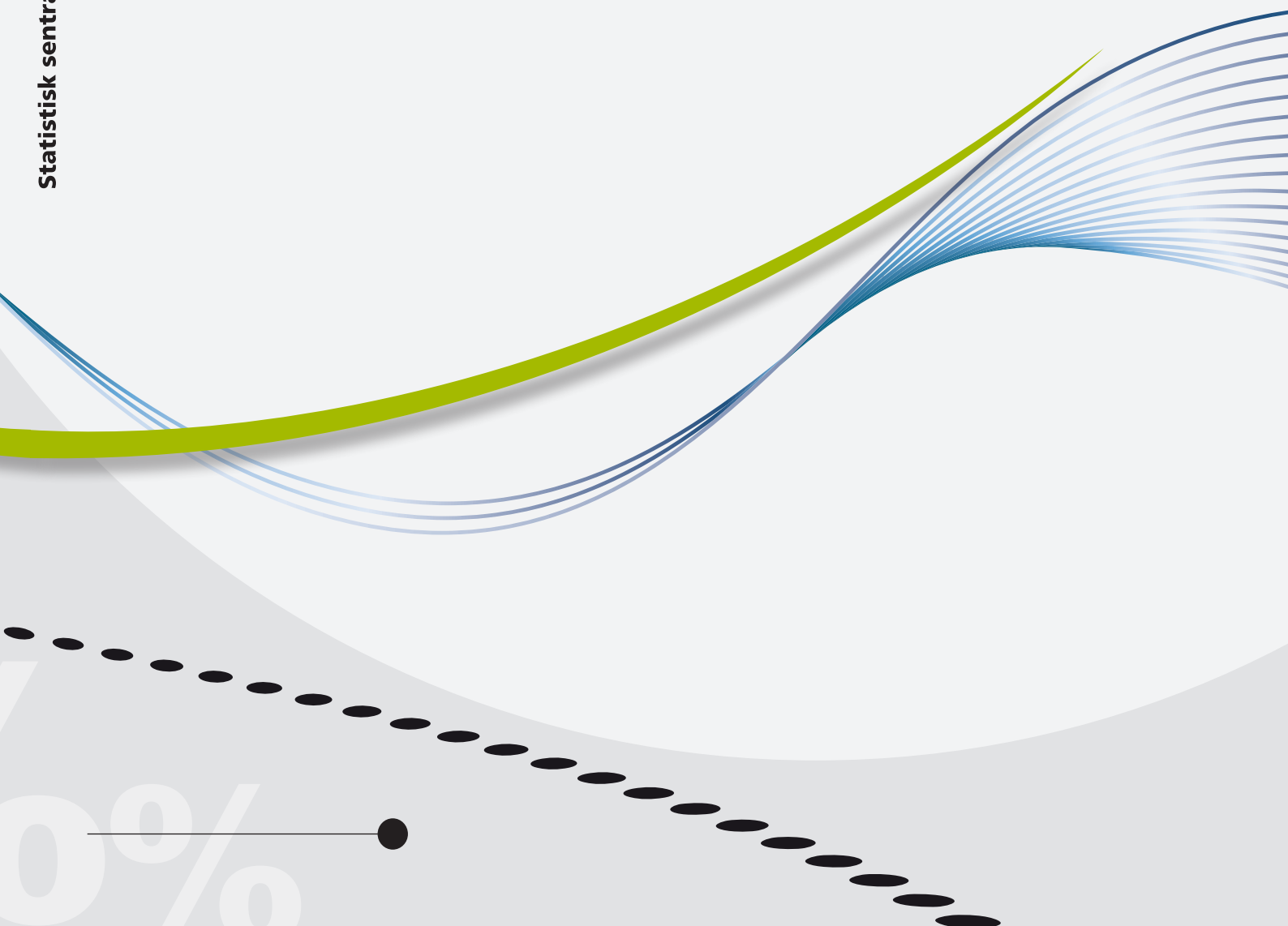




Anders Haglund, Trond Steinset and Mona Takle

House sales indicators

An overview of sources and possibilities



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In the series Documents, documentation, method descriptions, model descriptions and standards are published.

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Preface

The aim of this initiative was to set up procedures, data collection systems and technical solutions for establishing and developing complete quarterly house sales indicators.

The project has received funding from the European Commission, Eurostat, under the objective “Provide macroeconomic accounts and aggregates supplemented by satellite accounts and measures of social performance. Action 2: House transaction data – at least quarterly”. This report is the final project report to Eurostat.

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Statistics Norway, 14/5-2018

Lise Dalen Mc Mahon

Abstract

Review of existing statistics

Our review of the existing sales statistics revealed that the sales recorded as free market sales include a certain amount of sales to family members. These sales have a lower average purchase price. However, we do not have information about whether these are gifts, but there are strong indications that this is indeed the case. So far, we have chosen not to publish separate indicators for these in our statistics releases.

We have also devised a method for distinguishing dwelling sales to a non-personal buyer. These are recognisable by having a much higher purchase price on average than the dwelling sales to individuals. We will consider making this distinction in our statistics.

We have also looked at the possibility of simplifying and improving the existing production process. The most important aspect is to further develop the automatic alignment routines with the Cadastre. So far, we have only established alignments with the Cadastre in cases where registration data is missing.

Statistics on housing cooperative dwelling sales

As from Q1 2017, the statistics on housing cooperative dwelling sales are included in the ongoing quarterly release of property sales statistics. By linking to the Cadastre and other registers, we have improved the quality of some important variables, such as address, type of dwelling and type of property.

As from 2017, data for quarterly sales of housing cooperative dwellings can be part of the deliveries to Eurostat.

With statistics on freehold dwellings and housing cooperative dwellings in place, only one type of ownership is missing in order to make the statistics on dwelling sales complete. This ownership form, dwellings owned through shares or bonds, constitutes around 2 per cent of the sold dwellings.

New and existing dwellings

By using registration data for both housing cooperative and freehold dwellings we will have a more comprehensive source for sold dwellings. The paper presents some measures on how to distinguish between new and existing dwelling sales. When it comes to the *number* of sales, new detached houses are challenging to capture. The *value* of the dwellings is especially difficult for housing cooperatives where the shared debt is missing in the registration. Although some adjustments might be necessary in the future, Statistics Norway can start to produce indicators on house sales distributed by estimates of new and existing dwellings.

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1. Purpose of the project

Statistics Norway was awarded grants for the initiative entitled ‘House Transaction Data – At Least Quarterly’. The aim of the initiative is to set up procedures, data collection systems and technical solutions with a view to establishing and developing quarterly house sales indicators.

The project can be broken down into the following secondary objectives:

- Evaluate existing statistics and data sources
- Establish routines for using cadastral data on sales of housing cooperative dwellings
- Identify better data sources and/or improve existing methods for capturing new dwellings and calculating sales prices more accurately

2. Evaluate existing statistics and data sources

The first step will be an evaluation of existing statistics in order to improve the methodology and data quality. By merging the Register of Deeds with the Cadastre and other sources, we will be able to classify the different types of transactions. For instance: type of dwelling, type of ownership (owned site/leased site), type of transaction (free market/gift) or which sector the sale belongs to (household/commercial etc.).

During the first step we will also look for ways to simplify the existing statistical system.

2.1. Registration of real property

The existing house sales statistics are based on data from the national property registry held by the Norwegian Mapping Authority (NMA). The data is collected from the deeds for registered sales of real property and is stored in the Land Registry. The statistics include all registered sales of real property. Real property can be divided into three types: parcels (cadastral units), leaseholds and sections of buildings registered as freehold. Parcels are identified using a cadastral unit number and property unit number and, in simple terms, are defined as a delimited area on the ground surface. Leaseholds are identified using a leasehold number and are part of a parcel that is leased out for a long period, and is thereby registered. Sections of buildings registered as freehold are identified using a section number and are defined as a co-ownership share in a building with land, where exclusive right of use is associated with the property.

Registering a sale is not mandatory, but as far as we are aware, there are few cases where property sales are not registered. After Statistics Norway receives the quarterly data from the national property register, information about the cadastral units is retrieved from the Cadastre. The statistics did not previously cover registered sales of housing cooperative dwellings, which meant that the house sales statistics could not be used as a data source for all house sales. As part of this project, routines have been established for publishing quarterly statistics on housing cooperative dwellings (from Q1 2017).

In connection with the registration of property, the information given on the deed by the buyers of property includes the following:

- Type of sale (free market sale, gift, inheritance of decedent estate, undivided possession of an estate, compulsory sale, other, not specified)

- Whether the property is developed or not
- Type of property/use of land (dwelling, holiday home, agriculture, commercial etc.)
- Where use is specified as dwelling, the type of dwelling is specified (flat in a block, detached house, semi-detached house, row house, other, not specified)
- Type of sale (transfer of title, transfer of leasehold, new leasehold agreement)
- Purchase price, stamp duty, stamp duty base
- Buyers' details (personal identification number, organisation number)
- Sellers' details (personal identification number, organisation number)
- Number of cadastral units

NMA stores this data in the Land Registry for real property.

2.2. Quality-related challenges in the statistics

We list below some problems with the quality of the existing statistics:

- Some free market sales are actually sales to family members.
- No distinction is made between properties bought by private individuals and non-personal buyers.
- Some sales encompass more than one dwelling and have a high purchase price.
- Incomplete data on the deeds.

Sales to family members or non-personal buyers

By linking information about the buyers and sellers involved in the sales with information from the National Population Register, we have been able to determine if any of the buyers are family members of the sellers. Up to three sellers and two buyers from each sale were included in the assessment of whether the buyer is related to the seller.

The following relatives are included in the test:

- Spouse
- Parents
- Children
- Siblings
- Grandparents
- Aunts/uncles

Sales that are declared as free market sales should be placed in the 'gift' category if the price is lower than the market price. The guidelines for the statistics have not included any criteria for inclusion as a free market sale in terms of how the dwelling is sold or who buys the property. The only requirement has been for it to be sold at market price. This is often difficult to assess.

We have therefore examined how house sales to family members that are categorised as free market sales differ from the rest of the sales. We have only included sales with title transfers here. In Q1 2015, 18 900 of dwellings sold were reported as free market sales. A total of 950 of these were sales to family members. The average purchase price for dwellings sold to family members was significantly

lower than the average for all free market sales. The overall average was NOK 3 287 000, while the average for sales to family members was NOK 1 963 000. The low purchase price suggests that many of these dwellings were sold at a reduced price.

We have also linked data from the Business Register in order to find data on non-personal buyers. We based our search on one reference buyer (the buyer with the largest ownership share where there is more than one buyer).

We also looked at disparities in the average purchase price for sales to non-personal buyers compared to all completed sales. The average price of the 1015 dwellings sold to non-personal buyers was NOK 4 398 000. This group is also where we find the vast majority of the most expensive dwellings as well as the housing complexes with several dwellings that were registered as one sale. We find 24 dwellings with a purchase price of over NOK 20 million. The average purchase price for these properties is NOK 55 million. The remaining sales include 14 properties in this price group, and the average here is NOK 29 million. Most of the expensive multi-dwellings that are sold are purchased by non-personal buyers.

The official statistics show an average purchase price of all dwellings sold on the free market of NOK 3 288 000. If we remove the sales to family members and dwellings sold to non-personal buyers, the average is NOK 3 295 000. The figures show that sales to family members pull down the average, while sales of dwellings to non-personal buyers push the average up. These groups therefore offset each other in the official statistics, but the effects can of course be greater at a lower geographic level.

The sales statistics are not price statistics, but we should nevertheless consider whether non-personal buyers and sales to family members should be more clearly distinguished. This particularly applies to the sale of townhouse buildings etc. with several dwellings. These are currently included in the statistics in the same way as other sales, but they will often affect the average purchase price when the statistics are given at a lower regional level than the national level.

A certain percentage of the dwellings in Norway are situated on leased land. We have therefore performed the same assessment of house sales that include the transfer and creation of leasehold agreements. In Q1 2015, there were approximately 900 free market house sales where either a new leasehold agreement was signed or where a leasehold agreement was transferred. Thirty-six of these were family transfers at a much lower average purchase price (NOK 1 408 000) than the overall average. There were also 48 non-personal buyers. Here the average purchase price (NOK 9 697 000) was much higher than the overall average. The average for all leasehold transfers was NOK 2 895 000.

Incomplete data and inconsistency

There are too many instances where data has not been supplied or where the category 'Other' has been used to indicate the type of dwelling and what the property is to be used for. We have therefore developed a system that checks sales where use and/or type of dwelling have been reported under the category 'Other' or 'Not specified' against data in the Cadastre. In the cases where we find dwellings/buildings for the cadastral units in the Cadastre, we change the category according to the type of building/dwelling we find. We have also attempted to identify dwelling type and use by linking to this data from the Cadastre. Ideally, the information on the deed and in the Cadastre should concur, but in some cases where the deed specifies that the property is to be used as a dwelling it transpires

after linking to the Cadastre that it is an agricultural property. There are also many examples where deeds specify that the purpose of the purchase is to use the dwelling as a holiday home when it is actually registered in the Cadastre as a dwelling property. We want these sales to be shown as holiday properties in the sales statistics.

In the figures from Q1 2015, there are 18 house sales with building that also have data showing that the dwelling property is undeveloped. The data that stems from the deed is provided by the new buyers, and can lead to errors in the statistics. We have therefore developed a test of the Cadastre, where we check whether property has residential buildings. This test should also be further developed to not only check whether information on dwellings is missing but also if a property is incorrectly reported as a dwelling.

We have also asked NMA to introduce better controls to establish whether the property is developed, so that the information we receive is as accurate as possible.

Table 2.1 Registered free market sales of real property with dwelling. Transfer of title. Q1 2015

	Average purchase price NOK	No. of sales
All sales	3 287 000	18 897
All excluding sales to family	3 357 000	17 948
All excluding sales to non-personal buyers and family	3 295 000	16 933
Sales to family	1 964 000	949
Sales to non-personal buyers	4 398 000	1 015

Source: Statistics Norway.

Time lags

Another problem is that registration takes place 2–3 months after the sale has been completed. Since the sales statistics are based on registration data, the statistics will always be slightly out of date. However, the average varies considerably. In some cases, it may take a year or more for a sale to be registered, and in other cases it can take less than two months.

2.3. Summary

Our review of the existing sales statistics revealed that those recorded as free market sales include a certain amount of sales to family members. These sales also have a lower purchase price. However, we do not have information on whether these are gifts, but there are strong indications that this is indeed the case. For the moment, we have chosen not to publish separate indicators for these in our statistics releases.

We have also devised a system for identifying dwelling sales with a non-personal buyer. These are distinct by having a much higher purchase price than dwelling sales to individuals. We will consider showing this distinction in the statistics releases.

We have also looked at the possibility of simplifying and improving the existing production process. The most important element is to further develop the automatic alignment routines with the Cadastre. So far, we have only established alignment with the Cadastre in cases where registration data is missing.

3. Dwellings owned through a housing cooperative

The next step will be to investigate and establish methods to use official data on registered transfers of housing cooperative dwellings. This data is administered by NMA. This is a crucial step in the initiative, since sales of housing cooperative dwellings represent a significant part of the housing market.

3.1. Test of files with sales of housing cooperative dwellings

Statistics Norway received the first test files with registered sales of housing cooperative dwellings at the end of April 2016. During the spring and summer, a preliminary production system was developed in order to publish the sales of these dwellings together with the other sales statistics for dwellings. The goal was to initially publish quarterly figures at county level.

There are a number of differences between housing cooperative dwellings and other dwellings, since the cadastral units are central to real property, but not to the housing cooperative dwelling. In the right of residence register, the physical connection is not quite as interesting; it is the ownership share that is interesting and not the actual dwelling. In a statistical context, however, it is the physical dwelling that is interesting. This has presented some challenges as regards correct addresses.

In Q3 2016, an arrangement was established whereby Statistics Norway can retrieve data on rights of residence every quarter via a Web API linked to NMA's database. The first test files had a number of shortcomings, especially in connection with addresses and house numbers. After we identified the shortcomings, we contacted NMA several times to try to improve this. NMA has now decided to establish a link between the rights of residence and the Cadastre. In principle, this refers to the linking of addresses, but if we get the correct addresses of the property units, we will also have a link to the building and the property unit. This will eventually improve the quality of the data.

One problem that we do not know the extent of, is how many of these dwellings that are reported as free market sales are actually sold at a reduced price, for example, sheltered housing. Some local authorities offer such dwellings at a reduced price. Statistics Norway has discussed with data owners whether it may be possible to get information about this via the title deed.

3.2. Establishing a routine for publishing sales of housing cooperative dwellings

As from Q1 2017, registered sales of housing cooperative dwellings are included in the sales statistics. Statistics Norway now publishes quarterly statistics on sales of housing cooperative dwellings broken down by county, but also plans to publish an annual table at municipality level. The statistics are broken down by type of sale as follows: free market sale, gift, compulsory sale, inheritance of decedent estate, undivided possession of an estate, other and not specified.

Total sales value and average purchase price, total shared debt, average shared debt and average total price per sale will be published for the dwellings that are sold on the free market. We also publish statistics by type of dwelling (flat in a block, detached house, semi-detached house, row house, other and not specified).

Links to other registers

Statistics Norway has also used the data held in our copy of the Cadastre to find the address and dwelling type where this was missing in the source data. Using various approaches, we managed to assign the vast majority of sales to the right municipality. For example, we used information about the buyer and seller. The organisation number of the housing cooperative was also used to see if we could find address details via the Business Register.

The portion of shared debt is not included in the source data we receive from NMA. We have included this in the publication using personal tax data, which specifies the proportion of shared debt in housing cooperatives. We receive the tax data from the Norwegian Tax Administration. Since the tax data is older than the sales data, we have used information about the sellers' proportion of shared debt.

Quality

In Q1 2017, 7 per cent of housing cooperative dwelling sales were sold by non-personal sellers. In cases where the seller is not a person, and in some other cases, we have not found data on shared debt. We have therefore estimated the shared debt by entering average values for the relevant municipality and/or county. In some areas of the country where many dwellings are sold in a new housing cooperative, the figures for proportion of shared debt will be quite uncertain. When we receive tax data for the year that the new buyers took over the property, we are then able to link to the correct proportion of shared debt for these sales as well. This can give us a good indication of the accuracy of the estimate.

We estimate that about 15 per cent of the sales lack data on dwelling type in the registration data. After we have linked to this data from the Cadastre, this share is generally below 2 per cent.

Since the figures for sales of housing cooperative dwellings are based on registration data, there is every reason to believe that the quality is good in terms of completeness. However, a challenge is that the registration date will be later than the sale date. On average, it can take 2–3 months for sales to be registered. Thus the quarterly figures do not show actual sales for the quarter.

3.3. Summary

The statistics on sales of housing cooperative dwellings are included in the running quarterly publication of property sales statistics as from Q1 2017. Using links to the Cadastre and other registers, we have improved the quality of some key variables, such as address, type of dwelling and type of property.

As of 2017, data for quarterly sales of housing cooperative dwellings can form part of the data supplied to Eurostat.

With statistics on sold freehold dwellings and housing cooperative dwellings in place, only one type of ownership is missing. Sales of dwellings owned through shares or bonds cannot be registered. Buyers of dwellings through the share option buy a share in a housing association which entitles them to use a particular property. Similarly, a bonded flat is where the tenant has paid rent/a deposit for the right to rent. These forms of ownership are similar to housing cooperatives, where buyers do not own the property, but are members of the cooperative society that gives them the right of use to a defined property. It is no longer possible to form a housing share association, but such properties are still found on the market as existing properties. It is also no longer possible to establish new bond properties.

In the source data of dwelling sales in 2016 from Real Estate Norway (the trade organisation for Norwegian estate agencies), there were 1 766 dwellings owned through shares or bonds. In total, 83 070 dwellings were sold, which means that this form of ownership accounts for around 2 per cent of all dwellings sold.

4. Distinguishing between new and existing dwellings

The next step will be to find a way to identify the number of sales of new dwellings and their purchase prices. Statistics Norway's current building statistics comprise data on the number of building start permits of dwellings and the number of dwellings completed by type of dwelling and region. These give us some indication of the number of new dwellings. However, the building statistics do not state the time of the actual sale of the dwelling and the register data does not give us exhaustive records of the value of new dwellings. Therefore, we expect to launch a methodical approach combining register and survey data to quantify the value of these types of transactions.

There are several reasons for wanting to identify new dwellings in the registration data:

- It will improve the quality of property sales statistics if we can break down the sales into new and existing dwellings.
- The statistics on new dwellings, which are currently based on survey data, can be quality checked, possibly completed and optimally replaced by registration data.

As there are two different registers – one for freehold dwellings and one for housing cooperative dwellings – the methods will be slightly different.

4.1. Registered freehold dwellings

There are two options for distinguishing between new and existing registered freehold dwellings:

1. Through a reduced stamp duty base.
2. Through dating the building that accompanies the sale of the cadastral unit.

The first method is based on the stamp duty regulatory framework distinguishing between new and existing dwellings when determining the stamp duty base. For new dwellings, i.e. those under construction or being used for the first time,¹ it is the plot value that is used as a stamp duty base. Registrations where the stamp duty base is significantly lower than the total sales price can therefore be assumed to refer to the transfer of a new dwelling. 'Significantly lower' is defined as below 75 per cent. Dwelling sales are limited here to the registration of developed cadastral units that are for residential purposes. We therefore do not include the sale of plots where the construction of dwellings has not started or is not planned. The method also excludes sales of dwelling plots where the sales price only includes the value of the plot, since the sales price in such cases is equal to the stamp duty base. Table 4.1 shows the distribution of all registrations in 2016 by dwelling type and whether they are considered new or not according to this method.

¹ Upon initial transfer of an independent and, in its entirety, newly constructed building that is not used, and transfer of buildings under construction, stamp duty is only paid on the sales value of the plot if title transfer is registered for this.

Table 4.1. Estimated sales of new freehold dwellings, using stamp duty base. 2016

	All	New	New, %
All	82 300	16 420	20.0
Detached houses	33 448	2 076	6.2
Small houses	13 996	3 523	25.2
Flats in blocks	34 855	10 821	31.0

Source: Statistics Norway.

The other method is based on the dating of the building that is linked to the cadastral unit being sold. This method requires linking registration data with the cadastral unit and then linking from the cadastral unit to the building. A single registration can contain several cadastral units and one cadastral unit can be made up of several buildings. One building can also contain several dwellings. This complicates links and analyses somewhat. If we delimit the target population for registrations in 2016, we find 82 300 dwelling sales that can be linked to an active cadastral unit. These contain a total of 88 055 unique cadastral units. Of these, 79 284 have at least one active building registered. In order to simplify the analysis, only the main building is kept, i.e. garages etc. are removed in cases where there are several buildings on the cadastral unit. Furthermore, only one cadastral unit and one building are kept per sale, enabling us to compare the date of registration with the age of the building. We are then left with 78 293 sales/buildings. When we compare the date of building completion and date of registration, we see that the building may have been completed after the registration date. This is because we have retrieved building data from January 2017 for comparisons with registrations in 2016. If we assume that the sale of new buildings and buildings under construction are all sales where the building is completed no later than 12 months prior to the registration date and up to 13 months after the registration date, the result will be as shown in Table 4.2.

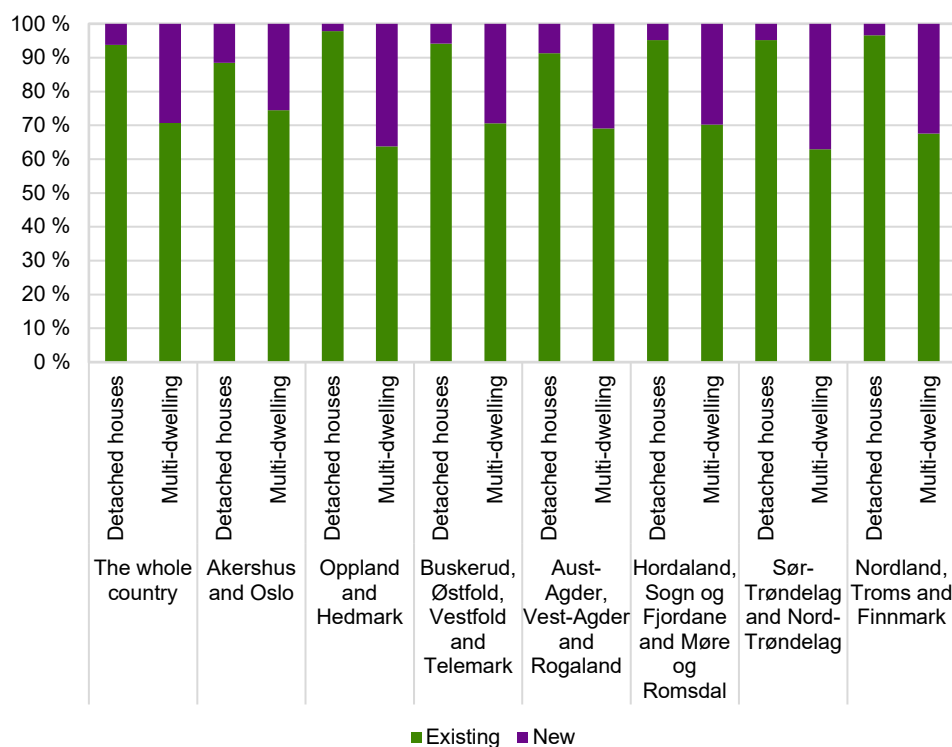
Table 4.2. Estimated sales of new freehold dwellings, using date of completion. 2016

	All	New	New, %
All	78 293	16 308	20.8
Detached houses	32 427	2 618	8.1
Small houses	13 538	3 478	25.7
Flats in blocks	32 328	10 212	31.6

Source: Statistics Norway.

The results from the two different methods concur well if we look at the breakdown of new dwellings by dwelling type. With the first method it was sufficient to use only registration data, and no need to link to the cadastral unit. The simplicity of the method is the reason why it will be used in the further work.

In figure 4.1, we have broken down these figures regionally, according to NUTS2. Row houses, semi-detached houses and flats in blocks are merged into multi-dwellings.

Figure 4.1 Sale of dwellings on the free market, share of existing and new buildings

Source: Statistics Norway.

4.2. Registered housing cooperating dwellings

In order to form a complete picture of all dwellings that are registered, we must also include housing cooperative dwellings. As explained in chapter 3, we have now established statistics for the registration of rights of residence. It is therefore desirable to look at the possibility of distinguishing between new and existing housing cooperative dwellings in the same way as for freehold dwellings.

Unlike for freehold dwellings, no stamp duty is payable when purchasing a housing cooperative dwelling. This means that it is not possible to use the stamp duty base to see whether a dwelling is new or not.

Linking registered rights of residence to the Cadastre enables us to retrieve the dating of the dwellings. The same rule can then be applied as for freehold dwellings; sales of new buildings and buildings under construction are all sales where the building is completed no more than 12 months prior to the registration date and up to 13 months after the registration date. The resulting figures are shown in the table below.

Table 4.3. Estimated sales of new housing cooperative dwellings, using date of completion. 2016

	All	New	New, %
All	25 206	857	3.3
Small houses	2 493	117	4.7
Flats in blocks	17 245	612	3.5
Other	5 468	128	2.3

Source: Statistics Norway.

Approximately 4 000 rights of residence cannot be linked to the Cadastre, and thus lack the construction date in 2016. The share without link to the Cadastre is lower in 2017.

Another method that can capture new housing cooperative dwellings is to look at who is selling the property. It is unlikely that new housing cooperative dwellings will be sold by private individuals. If an enterprise is registered as the seller of the dwelling, it might indicate that it is a new dwelling. However, we see that among the enterprises listed as sellers of housing cooperative dwellings, there are also local authorities, county authorities, foundations and non-governmental organisations (NGOs). It is unlikely that these are new dwellings. If we restrict ourselves to limited companies and housing cooperatives, there is a greater chance of finding contractors and developers who are behind new housing projects. If we assume that all of these dwellings are new, the breakdown of new and existing housing cooperative dwellings is as shown in table 4.4.

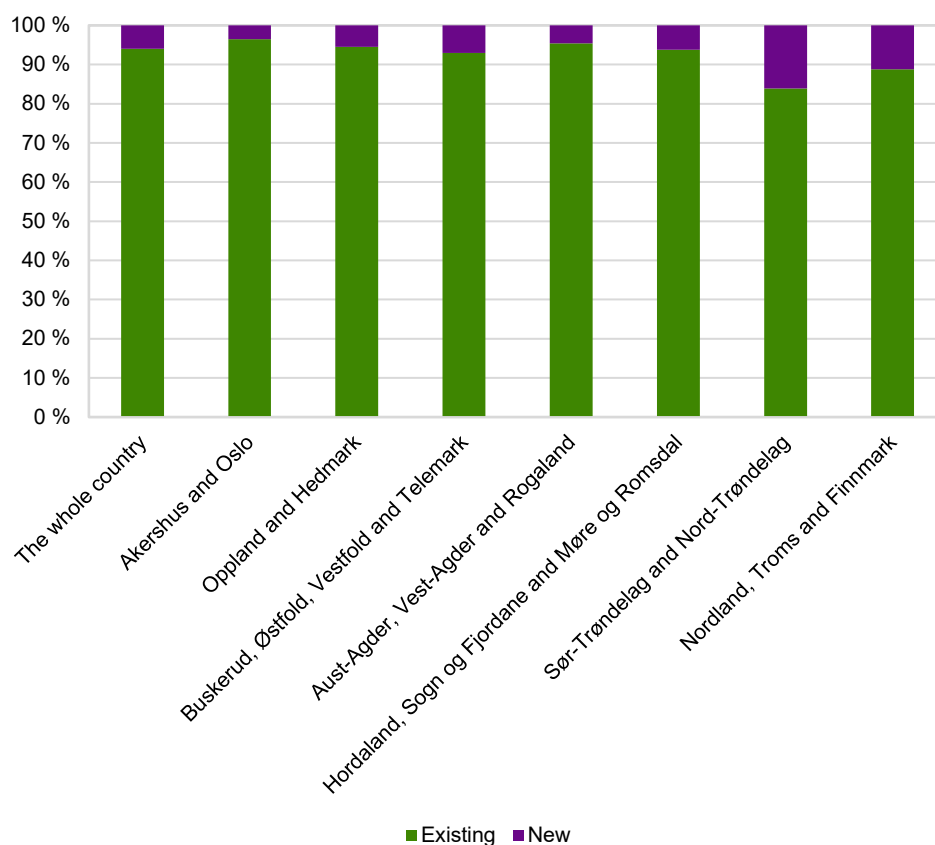
Table 4.4. Estimated sales of new housing cooperative dwellings, using information on seller. 2016

	All	New	New, %
All	29 298	1 683	5.7
Small houses	2 989	113	3.7
Flats in blocks	20 083	1 377	6.9
Other	6 226	193	3.1

Source: Statistics Norway.

The share of new dwellings is clearly higher in table 4.4 than in table 4.3, especially for new flats in blocks. One reason for this might be that new dwellings often are sold before the building work has started, thus they cannot be linked to the Cadastre. By this reason it is preferred to use the information in the registration, and not wait until the information is in the Cadastre. In the further work, using information about the seller is used to estimate new dwellings.

Figure 4.2 shows the regional distribution of new and existing housing cooperative dwellings using the information about the seller.

Figure 4.2. Sales of housing cooperative dwellings on the free market, share of existing and new buildings

Source: Statistics Norway.

4.3. Comparing number of dwelling sales with current set of weights

Statistics Norway currently provides weight data to Eurostat, which reflects the value of dwelling sales broken down into new and existing. The number of new dwellings is based on the building statistics and is an average between started and completed dwellings. Ideally, the figures should reflect the actual date of sale, i.e. the contract date, but we assume them to be somewhere in between.

It is interesting to see whether the weights that Statistics Norway currently report to Eurostat correspond with the alternative sources described in the project. The current set of weights uses information from different sources, as explained below.

Sales of existing dwellings

Information on existing freehold dwellings is currently retrieved from the Land Registry, but new dwellings have not been excluded. We have removed entries where the buyer and seller are the same person (5 100) and where the buyer is an organisation number or is incorrect (8 600). As we can see in table 4.5, we have thus operated with 78 372 sales of existing freehold dwellings in 2016. When we use the new method, where we remove the dwellings that are assumed to be new (the 16 420 estimated new in table 4.1), we get a much lower number of 65 880. The percentage distribution between dwelling types is nevertheless quite similar in the old and new methods.

Table 4.5. Existing freehold dwellings, by type of dwelling. Current method and new method

	Used in current weights	New method	% distr. current weights	% distr. new method
All	78 372	65 880	100	100
Detached houses	36 421	31 369	46.5	47.6
Small houses	13 566	10 473	17.3	15.9
Flats in blocks	28 385	23 919	36.2	36.3

Source: Statistics Norway.

The current system for weights for housing cooperating dwellings uses data from Real Estate Norway. The purchase information from Real Estate Norway is based on the contract date, and is therefore captured at an earlier date than the registration, where we only have a date for completed registration. We have also assumed that data from Real Estate Norway has had a lower coverage of dwelling sales than data from the registration. Based on experiences with freehold dwellings, and the relationship between registration data and estate agency data from Real Estate Norway, we have seen that around 80 per cent of registered sales have been reported by the brokers. In the current method, we have therefore magnified the figures on housing cooperatives by a factor that assumes that the number of housing cooperative dwelling sales from Real Estate Norway also accounts for 80 per cent of the registered dwelling sales.

Table 4.6. Existing housing cooperative dwellings, by type of dwelling. Current method and new method

	Used in current weights	New method	% distr. current weights	% distr. new method
All	34 877	20 758	100	100
Small houses	3 187	2 722	9.1	13.1
Flats in blocks	31 690	18 036	90.9	86.9

Source: Statistics Norway.

The number of housing cooperative dwellings sold in today's weights is well above the new estimate. One of the explanations may be that in the same way as for freehold dwellings, new dwellings are not distinguished and removed in the current method. Another explanation may be that different dates for recording the sale and registration may lead to anomalies. As mentioned in section 3.3, a small proportion, 1 766, of the housing cooperative dwellings owned through shares or bonds is also included in the current set of weights, but not captured in the registration.

Nevertheless, it may appear that housing cooperative dwellings are represented in the estate agent data to a greater extent than freehold dwellings. It may also be envisaged that there has been a development in which more sales are reported by the estate agents, both for freehold dwellings and housing cooperative dwellings. We want to follow the development of the two sources over time in order to see if the disparities level out.

Sales of new dwellings

For new dwellings, Statistics Norway has so far used the building statistics as an estimate. These measure, among other things, registered start-up permits and registered completion of dwellings. The number of dwellings that are granted a start-up permit is an indication of the number of actual new dwellings. However, we do not know the number of *new dwellings sold*. We assume that this figure is somewhere between the start-up and completion figure, and therefore use the average of these. We cannot distinguish between freehold dwellings and housing cooperative dwellings in the building statistics, so we will deal with total figures here.

Now that we have established ongoing statistics for housing cooperative dwellings, we have received a new source that can supplement the profile of dwelling sales in Norway. As we have seen, we have also explored new ways to distinguish between new and existing dwellings. The results of the new methods compared to the current method are summarised in table 4.7.

The number of new dwellings is considerably lower when using the new method compared to using the building statistics. The number of registered start-up permits for dwellings in 2016 was record high: 14 per cent higher than the year before. It is uncertain how many of these dwellings were actually started. The time lag here with regard to the registration can also play a role. Where building was started in 2016, these dwellings may be sold and registered in 2017.

Table 4.7. New dwellings, by type of dwelling. Current method and new method

	Used in current weights	New method	% distr. current weights	% distr. new method
All	29 764	17 910	100	100
Detached houses	8 240	2 076	27.7	11.6
Small houses	7 828	3 636	26.3	20.3
Flats in blocks	13 696	12 198	46.0	68.1

Source: Statistics Norway.

It is clear from table 4.7 that the number of new detached houses captured using the new method is very low. In 2016, the average between the number of started and completed detached houses was 8 240, i.e. considerably higher than the number of registered new detached houses, which was 1 798. There are clear challenges associated with capturing new detached houses through registration. The main reasons for this are that the cadastral unit and the building are not as closely linked for this type of dwelling. The cadastral unit may be sold without building several years before a detached house is erected on the plot, and is consequently not recorded as a new detached house in the registration. We will elaborate more on new detached houses in section 5.2.

4.4. The value of sold dwellings

So far, the focus has been on *the number* of dwellings sold. By using registration data for both freehold and housing cooperative dwellings we will also be able to establish the exact value of the dwellings. For housing cooperative dwellings, as mentioned in chapter 3, we must estimate the missing data in the percentage of shared debt and add it to the purchase price. Since tax data from the previous personal owner is used, this method does not work for new dwellings. For new dwellings in housing cooperatives, the current sources are not suitable for calculating values.

Using the method for distinguishing new and existing dwellings, we can now retrieve values from registration data for freehold dwellings. For existing freehold dwellings, we have previously also used registration data, both quantity and price. For new dwellings, we have used average prices from the surveys we have regarding detached houses and multi-dwellings.

In table 4.8, the average prices of the new method have been compared with prices included in the current weight calculation method.

Compared with the current set of weights, we see that the greatest differences are for new dwellings. For new multi-dwellings, this may be due to a bias in the sample used in the current price survey. Regarding the disparity for new detached houses, this may be due to the problem mentioned in section 4.3.2. The method that

was outlined to distinguish new detached houses mainly captures so-called turnkey detached houses. The prices of these may seem to be somewhat lower than detached houses that are built on plots that are already owned (from the paper “House sales. An outline of compilation and methodological aspects”).

Table 4.8. Average prices in NOK for different types of dwellings. Freehold dwellings.

	Existing dwellings		New dwellings	
	Used in current weights	New method	Used in current weights	New method
Detached houses	3 316 192	3 361 109	5 499 058	5 024 495
Row houses	3 499 523	3 524 058	3 278 127 ²	3 721 900
Semi-detached houses	3 586 082	3 594 653		3 856 353
Flats in blocks	3 408 739	3 388 907	4 344 266	3 969 666

Source: Statistics Norway.

4.5. Summary

Using registration data for both housing cooperative dwellings and freehold dwellings will give us a more comprehensive source for dwellings sold. In spite of the fact that the registration takes place on average 2–3 months after the actual transaction, we believe it gives a good indication of the transactions that take place. A key challenge when it comes to using registration data, is the breakdown by new and existing dwellings. Especially the capturing of new detached houses has proven difficult.

In this chapter methods to distinguish between sales of new and existing dwellings has been presented. The results have been compared to the weights currently being transferred annually to Eurostat. It is clear that there are some discrepancies, especially when it comes to the number of sales. As discussed here, both procedures have weaknesses, but it is difficult at this point to say which method is the most correct.

We suggest that Statistics Norway start reporting quarterly sales indicators using the methods described. At the same time, we continue to deliver data on annual weights with the same procedures as before. Adjustments may be done when we gain more experience on the subject.

5. Registration data as a supplement to house price indices

Statistics Norway currently uses sources other than registration information for its price indices for new and existing dwellings. We will initially look at opportunities to link different sources and analyse the results. If the results indicate that we should proceed with using registration data to replace or supplement the survey of price statistics in a hedonic model, we also need to look at how to supplement the registration information with the necessary quality characteristics of the dwelling. We are particularly interested in replacing the survey for new detached houses, but as we have seen earlier, it is precisely here that the registration data is weakest.

² For new dwellings, we estimate a common average price for small houses (semi-detached houses and row houses).

5.1. Price index for new detached houses

About the survey

The price index for new detached houses is a form-based survey, where Statistics Norway sends out questionnaires to all households who have erected a new detached house in the previous quarter. The population is retrieved from the Cadastre by extracting all buildings encoded as detached houses that are registered as taken into use in the previous quarter and owned by the household sector. Detached houses that have been completed, but where the title holder is part of the business sector are excluded. We also exclude detached houses where other dates in the Cadastre indicate that the construction process has taken an abnormally long period of time and where we may suspect that the date of completion may be incorrect. In total, approximately one-third of the registered completions are excluded from the survey for various reasons.

As the survey is sent to the household sector, compulsory fines are not levied, which means that the response rate is somewhat lower than the average for our surveys. In 2016, 5 084 questionnaires were sent out, and we received a response from 4 164, which corresponds to an 80 per cent response rate.

The questionnaire distinguishes between two main types of constructions:

1. Construction of detached houses, i.e. the dwelling is built on owned/bought land by a construction company/carpenter, with some degree of self-build.
2. Purchase of a turnkey dwelling. In principle, this is where a plot and a finished dwelling are bought together for an agreed price.

Questions are also posed concerning various aspects of the dwelling as well as price and financing. In the case of a turnkey dwelling, only the total price is requested, while owners who have participated in constructing their detached house are asked for a cost breakdown.

Sales data from the registration

As previously mentioned, Statistics Norway receives data on registered properties on an ongoing basis, but the time lag between the sale and the completed registration can vary from less than one month to one year, with an average delay of 2–3 months.

The registration of new detached houses is complicated by the fact that the dwelling is not necessarily registered as a total package where the total cost of dwelling plus plot is included. It may be that the plot is bought in advance, given as a gift or has been in the owner's possession for a long time. In such cases, the detached house built on the plot will not be registered.

Linking the price survey for detached houses to data from the registration

Our starting point is to:

1. Analyse the total construction cost specified in the questionnaire with registered sales
2. Analyse the plot cost specified in the questionnaire with the registered plot

As previously mentioned, the survey data is based on cadastral units owned by the household sector where the construction of a new detached house is completed during the previous quarter. The survey is a full census and the source for the sample population is the Cadastre. Dwellings that are excluded are removed pursuant to a well-defined regulatory framework and there is thus no point in

supplementing the sample with new dwellings from the registration. We therefore do not want to add more observations to the survey, but only to supplement for non-response in the survey.

As we want to control both house prices and plot prices, we link the survey data to a total extraction of the registration data. We have therefore used registrations from 2000 and beyond for properties that were sold on the free market (advertised on the free market).

House prices

There are 5 084 dwellings from the 2016 survey that are still linked to a valid cadastral unit. Of these, 3 361 are registered once or more since 2000. Of these, it appears that 1 071 registrations are linked to the transfer of one cadastral unit that includes a dwelling. There are properties here that have been transferred several times, and we keep the most relevant and are left with 1 039 property sales broken down as follows:

1. 788 sales where the sales price can be compared with the total costs from the questionnaire
2. 251 sales where there is non-response in the survey data

For the 788 homes where total costs from the survey data can be compared with the registration data, we find that 308 homes have exactly the same values, 250 have values within the range +/- 5 per cent, while the remaining 230 have a difference of more than 5 per cent.

Plot prices

Furthermore, the 1 039 sales can be divided into registrations where the stamp duty is based on total cost of the dwelling and where the stamp duty is based on the plot price. The regulations require the stamp duty for dwellings that have been taken into use before being sold to be based on the total cost of the dwelling, while for unused dwellings or dwellings under construction, it is the plot price that serves as the basis for the stamp duty. For the latter group, we can therefore find both house prices and plot prices (market value). Of the 1 039 sales, there are 63 where the stamp duty base is the same as the cost of the dwelling and 976 where it is based on the plot price. By comparing the stamp duty base of the 976 dwellings with the survey data, we can control how the plot prices from the different sources are harmonised. There are a total of 788 dwellings/plots where we have both registration data and survey data. The plot prices from the survey data are largely calculated according to fixed rates as these are mainly turnkey houses where we do not ask for a breakdown of costs. The result shows that there are only 10 per cent where the different sources give the same result within the +/- 5 per cent range. A comparison with registration data shows that half of the plots have a higher value in the survey data and the other half are lower. We see that there is a particularly high cost ratio for plots in areas with the lowest prices. Here, the stamp duty base is lower than the calculated plot prices for two-thirds of the dwellings.

We want to find plot prices for more than the 976 dwellings where the stamp duty base gives us a plot price. For the 4 106 (5 084 - 976) dwellings where we still lack a plot price, we find 2 788 unique matches from the registration. These are then sorted so that the most recent sales are used if a dwelling has been sold several times. After a delimitation of the matches for sales from 2012 and beyond, we are left with 2 155 plots.

There are 1 410 plots for which we also have survey data, and the link shows that for 30 per cent, the different sources give the same result within the +/- 5 per cent

range. This group mainly includes dwelling constructions, i.e. the plot is purchased separately and the plot prices are reported in the questionnaire by the respondents. Here there is a clear skewed distribution, with over 81 per cent having a higher plot value in the survey data than in the registration.

If we look at the differences between the price zones, we see that the lower zones are overrepresented, i.e. the survey data indicates a higher plot price than the registration data in the zones with the lowest house prices.

Results of the analysis on detached houses

We can only compare the construction costs from the survey data of about 15 per cent of the dwellings in the sample with the sales prices from the registration. Of these, 39 per cent have an equal value, 32 per cent have a virtually equal value and 29 per cent have a different value from the different sources. We should review the group with different values in order to explain the disparities.

Analysis of plot cost from survey data compared with sales of registered plots

With regard to plot costs, data from the survey is either calculated according to fixed rates (turnkey dwellings) or specified by respondents (construction of dwelling). The analysis will therefore give an indication of the plot rates we use for different price zones in the country, and highlight the disparities between completed questionnaires and registration data.

For turnkey dwellings, we see major discrepancies between plot prices from the different sources, but there is no clear skew in the result. Therefore, we cannot conclude that our distribution rates are incorrect. The result suggests that we overestimate the plot prices for the lowest price zone.

For non-turnkey dwellings, we see that plot prices from the registration data are clearly lower than those stated in the survey data. One reason for this may be that the plots have been sold from 2012 and beyond while the survey data is from 2016. Another reason may be that even though we have restricted the registration data to free market sales, many plots may be transferred between a seller and a buyer who have a strong affiliation with each other, and the price will therefore be below the normal market price. This could/should have been reflected in the questionnaire. The lowest price zones are overrepresented in this group.

5.2. Price index for new multi-dwellings

A quarterly survey is carried out which collects prices of sold new multi-dwellings. The respondents are a sample of housing constructors and property developers. The cadastral unit number and property unit number of the new dwellings are requested, but these are often not available at the time the dwellings are sold. Even where a cadastral unit number and property unit number are specified for the dwellings, this is not sufficient in order to link the data to the registration data of the dwelling. By this reason the registration data cannot be used directly to supplement the data from the survey.

However, information on limited companies and housing cooperatives that sell new dwellings can be valuable when constructing the survey sample for new multi-dwellings.

5.3. Price index for existing dwellings

We have also briefly mapped the possibilities of using registration data for freehold dwellings as an additional source for the price index for existing dwellings. The

link between registration data and data from Real Estate Norway shows that of the 61 985 existing dwellings (78 293 - 16 308) we find a match of 47 916 or approximately 77 per cent in the period 2015–2016. Of these, 96 per cent have the same sales price in both sources. This means that if both sources show the same information, there is a good match in the price data, which suggests that the quality of the information from the estate agents is good. Therefore, there is not much to gain from supplementary registration data. The information we receive from estate agents is more suitable for use in a hedonic pricing model, primarily because they also report a number of other characteristics of the dwellings.

However, it could be interesting to investigate which observations are not included in the data source from Real Estate Norway. In particular, it is important to capture any systematic deviations, e.g. whether housing cooperative dwellings in a specific region are underrepresented in the brokers' data, or if, for example, particularly expensive dwellings are missing from their data.

Mapping has shown that there are some challenges associated with linking data from the two sources. One problem is the time lag, which results in the same period containing different observations. The same dwellings can also be sold several times, which means that the periods that are linked cannot be too different. Moreover, the units are not always equally well identified in the two registers. All occupancy units in the Cadastre should, in principle, be linked to their own section, but this is not always the case. There may also be incomplete location information in the data from the brokers (Real Estate Norway). It is outside the scope of this project to report on which observations are not represented in each of the two sources.

5.4. Summary

The possibility to use the registration data as a supplement to the house price indices has proven difficult. The main reason is the challenges of linking the different registers. Still, the registration data can give us some indications on the level of the prices of plots and dwellings. It can also be a valuable source when it comes to selecting units for the survey samples.

It seems clear that Statistics Norway has to continue comparing the different sources and monitor the development in case of bias.

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