



# Rent levels in the Norwegian rental market

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## **Abstract**

For many years there has been a growing interest and demand among users for more detailed rent levels existing in the Norwegian rental market. This paper analyses the heterogeneous Norwegian rental market and in particular the different rent levels. With the use of hedonic regression techniques, estimated rents for different geographical areas in Norway are established. There is a multitude of different factors affecting rents and this paper looks into the effects of variables such as location, tenant-landlord interaction, length of tenancy agreement, attributes of the dwelling etc. The hedonic model manages to explain about 62 per cent of the variation in the rents. The empirical results are based on a comprehensive Rental Market Survey where rents are collected directly from tenants, consisting of a sample of about 7 500 tenants each year.

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## 1. Introduction

Compared to many other European countries, Norway has a rather small rental market. According to the Norwegian Population and Housing Census 2011, the rental share is approximately 23 percent, that is, the same share as in 2001 when last census was completed. Even though Norway has a long and strong tradition of self ownership of homes, the rental market is especially important for certain demographical groups such as young people before they settle down and start a family, but also elderly people to some extent. The rental market is quite heterogeneous as regards both the stock of rented dwellings such as size and types of dwellings as well as distribution of different types of landlords. Due to the heterogeneity, the Norwegian rental market is characterised by large variations in rent level. There is a multitude of factors like geography, physical unit attributes, tenant-landlord relationship, period of tenancy, etc., all affecting the rent level.

The Norwegian Tenancy Act of 1999 makes it possible for landlords, every third year, to mark up the rent to an existing rent level of comparable objects – to a “fair” rent. The Act gave rise to a public discussion concerning what a “fair” rent is. It also gave grounds for disputes between tenants and landlords about “fair” rents, many of which had to be settled in rent committees. Back in 2003 and 2004 the Parliament issued a report that stressed the need for more knowledge of the rental market. How does the rental market work? What are the factors affecting rent? What is a “fair” rent? The increased focus on the rental market and rent levels resulted in several studies carried out by Statistics Norway and was the beginning of the Norwegian Rental Market Survey (RMS). In 2006 the RMS became official statistics publishing some aggregated mean values based on descriptive statistics according to different variables that are important for rent level. Gradually the response both from the general public and the authorities was that these figures were not detailed enough. They all wanted even more detailed rent figures than the survey was providing.

Due to the increased demand for detailed rent figures, Statistics Norway will for the first time, as part of the RMS, start publishing estimated monthly rents for detailed price zones of the country based on hedonic price regressions as of the 2nd quarter of 2013.

In this paper, the heterogeneous Norwegian rental market is examined and in particular the rent differences based on data from the comprehensive RMS. The survey provides us with rich and detailed information on all aspects connected to the tenancy agreement - physical unit attributes, general terms of tenancy agreement, tenant-landlord relationship etc. In this paper we will look into the different explanatory factors behind the rent and analyse how dominating these factors are. The paper also looks into some alternative data sources.

The paper is structured as follows; chapter 2 describes the Norwegian rental market while in chapter 3 the RMS is outlined, as well as the links to the CPI rent indices. In chapter 4 the hedonic price regression model is presented and the different explanatory variables and their magnitudes are examined. In chapter 5 some alternative data sources are presented, while in chapter 6 some concluding remarks are given.

## 2. Heterogeneous rental market

After deregulations of the rental and financial market in the 1980s, Norway ended up with a rental market almost without rent control<sup>1</sup>. The structure of the Norwegian rental market is therefore close to a free competition market. The influence of large suppliers or landlords is rather low and publically or semi-publically owned housing constitutes a rather small part of the market. The private rental market is therefore very important in Norway. The private market is dominated by private households acting as professional landlords letting out their dwellings, or parts of their own dwellings<sup>2</sup>. They may be temporarily absent from their ordinary dwelling or they may have an extra dwelling at their disposal, often acquired via inheritance. Many single-family houses in Norway are designed such that a secondary housing unit, normally situated in the first floor or in the basement, can be let out for hire. The private households constitute a market share of about 40 per cent according to the latest RMS. Private professional landlords, in terms of the professional agencies, also operate in the private, “non-subsidised” market. Based on the latest figures, the share of the

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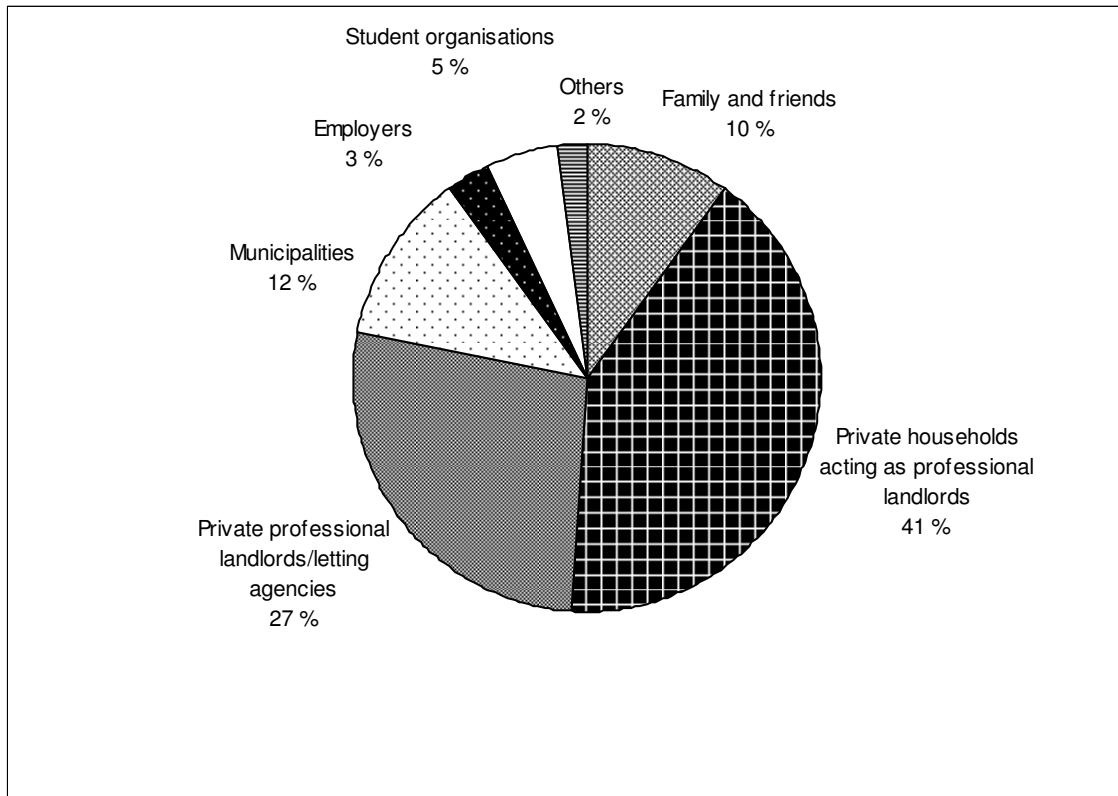
1 The last part of the old rent control was removed in 2010 affecting a small amount of pre World War II blocks of apartments in the cities of Oslo and Trondheim. The Norwegian Tenancy Act regulates the tenancy agreements to a certain degree. The Act does not set the actual rent level, but do restrict price increases. The Tenancy Act is explained further in chapter 3.

2 There are tax benefits for private persons letting out part of their dwelling. According to Norwegian tax regulations rental income is tax exempted if the rented unit does not exceed more than 50 per cent of the home.

rental market held by these professional landlords is roughly 25 per cent and they are mainly concentrated in the large cities. See figure 1 below for the distribution of landlords in the Norwegian rental market.

There are clear elements of “subsidised” tenancy agreements in the rental market. As private households acting as landlords are such a prominent factor, they may let out to family and friends at “subsidised” rents. We also see that the pricing of contracts among larger landlords like the municipalities and the student organisations may deviate from the pricing in the private market and the market rent. Employers (either in the private or the public sector) may also let out dwellings at a “subsidised” price to their employees. Compared to many other countries, social rental housing amounts to a rather low share in Norway.

**Figure 1. Types of landlords, market shares, Rental Market Survey, 2012**



In Norway it is primarily young people who rent dwellings. Renting dwellings has become a transitional phenomenon among mainly younger people before they start a family, buy their first home and decide where to live on a more permanent basis. According to Population and Housing Census figures, the share of younger tenants without children is predominant. A relatively high share of tenants is also found among the elderly. While younger tenants tend to live in short-term tenancy agreements, longer tenancies, or even lifelong tenancies, are more common among elder tenants.

### 3. Rental Market Survey (RMS)

Even though Norway has a rental market close to a free competition market, there is a system in place, however, that protects tenants from unreasonable rent increases. The Norwegian Tenancy Act restricts price increases in ongoing tenancy agreements. Rent increases on a yearly basis cannot exceed the increase in the Consumer Price Index (CPI). If the contract has been in force for three years, however, the landlord is permitted to make larger rent changes in accordance with the existing rent level of comparable objects in the market, a so-called “fair” rent. The regulation raises the question of what a “fair” rent is in a market as heterogeneous as the Norwegian one. The Tenancy Act increases the demand for more detailed official average rent figures.

The RMS was first carried out in 2005 as a study financed by the Ministry of Local Government and Regional Development and the government-regulated bank "Husbanken" and was based on the need for more detailed and improved rental statistics. In 2006 the survey became official statistics. The data behind the empirical analyses in this paper are based on this survey.

### 3.1 Data collection

The survey's sampling plan is rather complex. In Norway there are no complete administrative registers of rental units or tenants. We cannot simply make a sample of all addresses in Norway because owners are represented to a far greater extent than tenants. Different administrative registers must therefore be linked to create a potential population<sup>3</sup> of tenants' addresses; we exclude addresses of owners (freeholders) and owners in cooperative dwellings<sup>4</sup>. Institutional addresses where the residents do not pay rent are also excluded. We then link the addresses to the Central Population Register to find matching names for the addresses. The gross sample is selected randomly and consists of 22 000 potential tenants, including an overrepresentation of the main cities. The size of the net sample (the share of responded questionnaires and completed telephone interviews) is roughly about 11 000. In the net sample, we end up with about 7 000 tenants.

The final sample size of tenants demonstrates how complicated it is to carry out a good sampling plan in the absence of updated and suitable administrative information. It also demonstrates the high non-response rate. The non-response rate is normally more than 50 per cent. The tenants often constitute a very mobile group; tenants move much more frequently than owner-occupiers. We also see a tendency that longer tenancies are being replaced by shorter tenancies. The non-response is highest among the young (persons under 30 years old) and single, and among persons with a low level of education. If contact with the tenants is achieved, refusal to participate in the survey is not a major issue. Trying to get in touch with the tenants and tracking down new tenants is a complicated and time-consuming process. Compared to the owners, we see that tenants are also less likely to register new administrative information when they move to a new location.

The rents are collected by means of questionnaires (mostly web-based, but also postal) and by CATI (computer assisted telephone interviewing) directly with the tenants. It is important to use different data collection techniques such as the mobile telephone, including text messages, to get in touch with the respondents. Experience shows that it may be easier to get in touch with persons under 30 years of age by using online questionnaires and by offering both postal and electronic versions, we can reach out to the tenants without a known telephone number. Another challenge, when using different methods for collecting data, is that the different methods can provide different answers to the same questions. The effects on rent of different data collection modes are commented further in chapter 4.2.

The data set provided by the survey is extensive and very suitable for regression modelling purposes. Besides an extensive list of hedonic qualities and rent information for each unit, there is information about tenant-landlord interaction and the general terms and conditions of tenancy agreements.

### 3.2 Rent indices in the CPI and some implications

The RMS is closely linked to the monthly rent indices in the CPI and HICP (Harmonised Index of Consumer Prices) through data collection. The population of rental units is the same and the CPI sample is based on the RMS sample. Due to resource constraints in the CPI we are not able to survey all 7 000 tenants for rent information each month. We therefore construct a smaller sample of 2 500 tenants out of these 7 000 tenants. Information from the RMS is incorporated into the monthly CPI survey and in addition, the survey constitutes the price reference period for the rent indices. In the CPI survey, tenants provide rent information online and those who do not reply are contacted by telephone using computer assisted telephone interviewing.

Challenges in the monthly CPI indicator are the non-response rate and tracking down new tenants. When a tenant moves out of the rental unit, the new tenant shall be contacted. The statistical object is the rental unit itself, and not the tenant. Very often rent changes are the result of new contracts. All tenants are asked for owner/landlord information to make it easier to track down new tenants in the event of future tenant replacement. Each CPI sample is replaced annually with an overlap of one month.

By publishing both official average rent figures through the RMS and rent indices<sup>5</sup> in the CPI, the staff involved may encounter difficulties. Even though the RMS and the CPI indices are strongly linked with

<sup>3</sup> The population size is roughly 215 000 addresses in total.

<sup>4</sup> Shareholders in housing cooperatives constitute a market share of about 15 per cent of the housing market in Norway.

<sup>5</sup> The rent indices (both actual and imputed rentals are based on the same rental data as the rental equivalence method is applied in the Norwegian CPI) are calculated by stratifying the data by region and dwelling size. Unweighted arithmetic mean values are

each other, the surveys have different objectives. The CPI rent indices measure price development of identical objects over time, while the average price survey measures rent levels based on independent samples each year. This implies that the average price survey will frequently include quality components that are absent in the CPI rent indices. It is complicated and challenging to explain to the general public and the media that change rates in the CPI and change rates based on average prices are not meant to be the same and that different results may be reached. By using hedonic regression it will be possible to a greater extent to take into account the different variables impacting rent.

## 4. Estimating rents using hedonic regression

In this chapter we examine, with the help of hedonic price regression, the impact on monthly rent from hedonic attributes and other variables. We explain the relationship between the rent and its explanatory variables. Up until now Statistics Norway has published aggregated monthly rent levels based entirely on descriptive statistics. In 2013 we will expand the official statistics with estimated rent levels using hedonic regression. The official figures will be based to a large extent on the same model specifications as laid down in this paper.

### 4.1 Model specifications

In this analysis we choose to use a log-linear price model where the natural log of the monthly rent is specified as the dependent variable;

$$(1) \ln P = a + b_1 \ln x_1 + \dots + b_n \ln x_n + c_1 y_1 + \dots + c_n y_n + \varepsilon$$

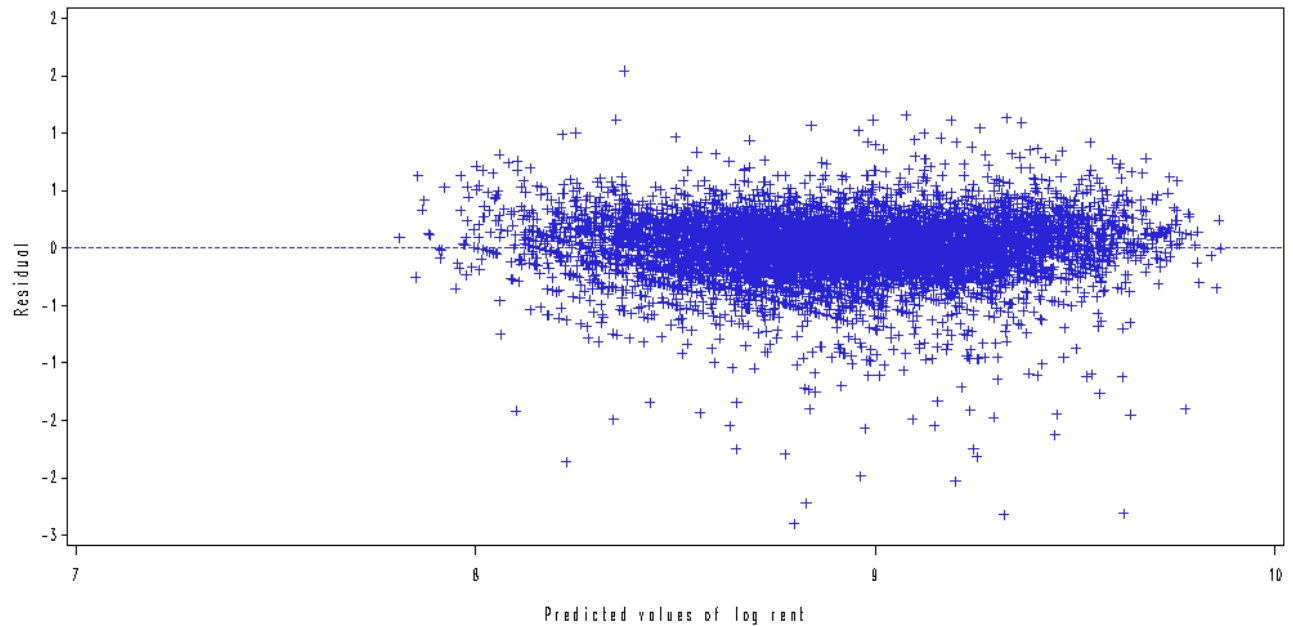
The regression coefficients or price coefficients  $b_1, \dots, b_n$  and  $c_1, \dots, c_n$  can be interpreted as the theoretical price of the characteristics in the model  $x_1, \dots, x_n$  og  $y_1, \dots, y_n$ . In other words, we determine how much the rent varies with a specific characteristic keeping all other characteristics constant. Coefficient  $a$ , the intercept term, can be interpreted as a starting point or a baseline rent before all the different characteristics are added to the rent. The residual  $\varepsilon$  is the difference between the observed, actual rent and the predicted value estimated by the model.

Most variables in the model are treated as dummy variables which take the value of “1” if the variable/characteristic is present. For instance, if the rented dwelling includes a garage space, it takes the value of “1”, whereas with the value of “0” the garage space is non-existent. Using a log form for the dependent variable, the effects of the explanatory variables are given in percent terms. To get the percentage effect of a dummy variable being present (value of “1”), we find the exponentiated value of the parameter estimate; the effect on log of rent of having a garage space is estimated at 0.0511, meaning a positive impact on rent of 5.2 per cent.

The square metre variable and the variable indicating housing quality standard are written in log form and the interpretation is somewhat different. Using the log form, we can interpret the parameter estimates as the percentage change in rent by a one-unit change in for instance square metre (holding all else constant). The different explanatory variables are explained in more detail in chapter 4.2 below.

The explanatory power of the model, measured by the  $R^2$ , is 62 per cent. In other words, the regression model manages to explain 62 per cent of the variation in the rents. We consider this as quite high given the heterogeneity of the Norwegian rental market. In general, the explanatory variables behave as anticipated with expected signs and with reasonable magnitudes. Other studies have been done based on the same data from earlier periods, and the empirical results in this paper are much in line with earlier results.

To measure the suitability of the regression model, we have looked at how the residuals - the difference between the observed and the predicted rent - behave. In figure 2 below, the residuals are plotted against the predicted values (log rent). The residuals seem to lie around 0 indicating randomness, and there is no sign of strong bias in either direction.

**Figure 2. Residual plot of the regression model**

#### 4.2 Framework

The hedonic price function in this paper has been tested on different data sets back in time. The empirical results presented in this paper are based on data from the 4th quarter of 2011 and 2012. We choose to put together the two latest data sets in the analyses in order to strengthen the data material. We see that the values of the different characteristics do not change much from period to period, but a dummy variable indicating the actual period is included as an explanatory variable in the model.

We seek to quantify the magnitude of the different explanatory factors. We therefore choose to exclude rents that are not market rents and are based on criteria other than supply and demand. “Subsidised” contracts such as tenancy agreements with friends or family are therefore excluded. Rents paid by tenants of social housing run by local government and student housing are also excluded because these rents may be politically or administratively determined and will therefore not necessarily reflect the actual market value. Also tenancy agreements between employer and employee are excluded. We end up with a total data set of about 8 000 price observations.

The oldest ongoing tenancy agreements are excluded, that is, agreements signed before 1980. The Norwegian rental market is characterised by rather short agreements and therefore the number of contracts left out is very small. Contracts that have been ongoing for many decades can be a result of very strong and special ties between tenant and landlord, and are likely to be less representative in the market.

Outliers, that is, extreme rent level observations, are removed. Also rental units under 10 and over 300 square metres as well as number of rooms exceeding 8 are excluded from the data set.

In the model the country is divided into detailed geographical price zones. We have chosen to use the same regression model for all zones. Analysis shows that the price coefficients are not priced very differently between the different price zones. Using the same model for all geographical zones provides us with a very robust data set, but it is a trade-off. We cannot expect that all variables are equally relevant throughout the country. For instance, the increase in rent added for having a garage space is clearly higher in Oslo compared to more sparsely populated areas. Using one single regression model forces the same pricing of the different characteristics for different dwellings and tenancy agreements. Still, we think it is more important to prioritize a robust model based on a rich data material that provides us with consistent rent estimates.

In the regression model which will be used for the official estimated figures, the model specifications will be the same as in this paper, but only characteristics related to location, the dwelling and variables connected to the tenant-landlord relationship will be included. Tenant characteristics such as income and education level, age and place of birth will not be included, although this administrative information is included in the data

set. In this paper we try to include several of these variables. Tenant characteristics have been tested earlier in different studies based on the same material. Earlier conclusions show that these variables are likely to increase the explanatory power of the model, see for instance Beatty, Sommervoll (2012) and Nesbakken (2008).

### 4.3 Explanatory factors - empirical results

Geographical location is a key factor behind rent differences. We divide Norway into 17 different price zones. The different zones must be as homogeneous as possible according to rent level. The RMS has already shown that the more populated a location is, the higher the rent. The largest cities in Norway are split into different districts.

The estimation results show that the western part of Oslo (reference category) has a significantly higher rent level compared to other parts of Oslo. For instance, the coefficient for the south-eastern part of Oslo is minus 0.15 - indicating that rents in this part of Oslo, *ceteris paribus*, are close to 15 per cent lower compared to the western part of Oslo. For more empirical results, see table 1 in the appendix.

All main cities are classified as separate price zones while the remaining parts of the country are grouped together according to population density;

Urban settlements with 20 000 inhabitants or more

Urban settlements with between 2 000 and 19 999 inhabitants

Urban settlements with between 200 and 1 999 inhabitants and sparsely populated areas

There are many other factors affecting the rents besides geography. The signs of the remaining price coefficients turn out to be expected and reasonable, i.e. the factors that we expect to contribute to higher or lower rents also do so in the regression model;

#### *Dwelling size*

Another important factor affecting the rents is, of course, the dwelling size – measured as square metres. The log form is used in the estimation to be able to measure the effect that the rent increases at a diminishing rate when the size increases. The result is strongly significant (t-value 16.99). The parameter estimate is about 0.15. One way of interpreting this result is that if we increase the size of the rented dwelling from 50 to 60 square metres the monthly rent will increase by 2.7 per cent while an increase from 110 to 120 square metres will add about 1.3 per cent<sup>6</sup> to the monthly rent.

Adding an extra room, and keeping the number of square metres constant, is expected to increase the rent since it increases the flexibility in the dwelling. We find that the number of rooms (i.e. number of rooms with a window, excluding the kitchen, bathroom and toilet) is highly significant. Unlike the square-metre variable, the number of rooms is defined as a dummy variable in the model. The model yields the following parameter estimates; compared to a two-room dwelling (reference category) the rent discount for a one-room dwelling is about 15 per cent, on a *ceteris paribus* basis. The parameter estimates for increasing the number of rooms to respectively 3, 4 or 5 rooms or more are 0.16, 0.27 and 0.37, all other factors held constant.

#### *Material standard*

Physical characteristics of the dwelling unit capture a large share of the variation in log price. The data set is based on a very comprehensive questionnaire with a lot of factors involved. We see that variables that capture high material standard provide a positive effect on rent. We have created a variable that captures the number of these quality standard characteristics. The higher the number of quality standard characteristics the tenants has marked in the questionnaire, the higher the housing quality standard. These quality factors are for instance parquet floor and an open fireplace in the living room. We have included this variable in log-form assuming that the impact on price is nonlinear. In other words, we assume that the effect of an extra quality characteristic will increase at a diminishing rate with the number of characteristics. The strong positive impact of material standard is very expected. A parameter estimate of about 0.15 and with a t-value of 17.17 indicates that material standard is a statistically significant factor in explaining rent.

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<sup>6</sup>  $P_{120}/P_{110} = e^{0.14678(\ln(120) - \ln(110))} = 1.01285$



### *Length of tenancy agreement*

The official statistics based on the RMS have shown that length of the contract is also an important factor for rent level. In the model, we choose to stratify the contracts by the signing year. Tenancy agreements that are signed within the same year as the year the survey is conducted are compared to contracts that started two, three, four or more years back in time. In accordance with earlier analyses, the results give significant values. The longer the tenancy agreement - the lower the rent *ceteris paribus*. The tenant-landlord relationship is very important and it is likely that a landlord will highly value a good relationship with a trustworthy tenant who pays rent on time. A good relationship can result in the landlord preferring to keep the tenant rather than raising the rent and having a new, unknown tenant that may involve an element of risk. Rises in rents are often combined with a change of tenants. According to the Norwegian Tenancy Act, the ongoing contracts are to a large extent restricted to follow the yearly CPI movements, while landlords with new contracts are freer to follow the principle of supply and demand when determining the rent level.

### *Dwelling type*

The tenants supply information on the type of dwelling they are renting – detached houses, terrace houses, flats, lodgings etc. According to Population and Housing Census figures, the flat segment dominates the rental market; the share of tenants in detached houses, that is, those renting the entire house, is much smaller. The analysis shows that renting independent lodgings or lodgings in detached houses/terrace houses has a negative impact on rent of about 6 per cent, all other factors kept constant. Renting a detached house or a terrace house also turns out to have a negative effect on rent, again all other factors kept constant. The explanation may be found in the location of the rental units. Tenants are often young people who prefer a centrally located rental unit as opposed to renting a house in less central areas. The interpretation may be different if we were to analyse this from an owner-occupiers' perspective and not that of the tenant.

### *Landlord status*

This paper has focused mainly on the private "unsubsidised" market. We also try to see whether there are significant changes in rents according to type of landlord in this market. Or in other words, are there significant differences in rent between the private households acting as professional landlords and the professional agencies? We find that there is no statistically significant difference in rent level between those two types of landlord. This result differs from previous analyses and results based on earlier data sets. One could argue that in an efficient, non-regulated rental market, the rents determined by private households and agencies will eventually come closer to each other.

### *Services included*

We see that some tenants make agreements with the landlords entailing that different types of work should be done - such as gardening, snow clearing, cleaning etc. In cases where such agreements exist this seems to affect the rent level. *Ceteris paribus*, tenant-landlord agreements such as these have a negative impact on rent amounting to about 3 per cent.

### *Other important explanatory variables*

The majority of tenants do not seem to have costs for electricity and heating included in the rent. A minor segment of the tenants seem to have these costs included. Holding other things constant, adding these costs yields an impact on rent of about 5 per cent.

Rental units may be rented furnished, partly furnished or unfurnished. We find that it is most common to rent dwellings unfurnished. The estimation results show that, *ceteris paribus*, a furnished rental unit adds about an additional 3 per cent to the rent. Everything else kept constant, access to garage space will increase rent by about 5 per cent, and this is statistically significant.

The particular location of the rental unit within a larger dwelling also seems to have a significant impact on the rent. We find that the rent is higher when the unit is situated on the fourth floor or higher compared to being situated at a lower floor. The increase for having a rental unit higher up in a multi-dwelling house is estimated at about 6 per cent. A pleasant view and maybe access to a lift may be a reasonable explanation for this.

### *Tenant characteristics*

If we include administrative information about the tenants in the model, we are able to increase the explanatory power. This demonstrates very clearly how complex it is to provide good average rent figures. Even though rental units may possess the same hedonic attributes and may be situated in the same street, tenants may still experience different rent levels. The inclusion of gender and educational level in the model

does not yield any significant differences in rent. Testing for income level and place of birth, however, has a significant effect on rent. Tenants with higher income pay higher rents, everything else kept constant. Tenants born in Norway, as opposed to those born in a foreign country, seem to get a discount. This is in accordance with other analyses looking into the effect of place of birth.

#### *Data collection methods*

Different data collection modes may provide different answers to the same questions. The hedonic regression analysis shows significant differences in rent level depending on whether the respondent reports data online or by paper questionnaire and by telephone interview. There are small rent differences between those who report by post and by telephone. In general, about 40 per cent of the tenants choose the online version, while interviewing constitutes a share of about 30 per cent. The share of postal questionnaires seems to be diminishing over time with a current share of about 5-10 per cent. A closer look into this phenomenon shows that the respondents answering online are the “easy” respondents who seem to answer straight away. These respondents have higher educational level, better jobs with higher income and they seem to live in rental units of higher material standard. All other factors kept constant, the data show us that rent reported by post or telephone seems to lie about 4 per cent below the rent reported online and is statistically significant. We know that the elderly are overrepresented among those who prefer to report on paper. Even though there are significant effects from using different data collection modes, these effects seem to be smaller compared to other surveys with more sensitive information.

## **5. Alternative data sources**

The main advantage of the RMS is the scope of information obtained and therefore it is suitable for hedonic techniques. On the other hand, the RMS is also a very resource demanding survey in terms of the way data is collected. On several occasions Statistics Norway has been urged to consider alternative data sources.

### **5.1 Internet announcements**

The importance of the Internet as a means by which to purchase consumer goods and services is growing continuously and Internet technology has increased the availability of price information, including rents. A widely used Internet portal in Norway is the [www.finn.no](http://www.finn.no). The portal was established in 2000 and specialises in adverts, purchases and sales between private persons and businesses. The market place is divided into different areas such as, for instance, real estate, which covers the buying, selling and renting of property. The portal covers most of the real estate offers<sup>7</sup> in Norway with a market share of about 60 per cent of all the real estate transactions on the open market. The quarterly published House Price Index is entirely based on this data. Data are easily accessible and all the major cities in Norway are represented. Data on both rented and purchased dwellings are easily accessible. However, there is a major difference in the information provided. While the actual transaction and the actual price are reported for the purchased dwellings<sup>8</sup>, only the asking price of the advertised dwelling is reported for the rented dwellings.

The [www.finn.no](http://www.finn.no) material provides a variety of variables such as rent value, tenancy period, dwelling type, number of bedrooms, size and location. Additional information on facilities such as furnished dwelling or not, balcony/terrace, Internet access etc. are not compulsory information and therefore often omitted.

When analysing data quality of other sources it is important to also take into consideration CPI purposes. There is today a close link between the RMS and the rent indices in the CPI. The RMS include both new and ongoing contracts, the [www.finn.no](http://www.finn.no) data only provide data on new contracts. Whether we aim to measure the existing rent level or the price development of rentals, it is important to include ongoing contracts.

In order to test the suitability of the Internet data, Statistics Norway has received advertised rented dwelling data for 2010 and 2011 and has tested the data using the same regression model. This resulted in a clear decrease in explanatory power. An interesting factor was the number of duplicates in the material indicating that rented dwellings may be advertised for quite a long time on the Internet without resulting in an actual contract and an actual price that can be measured. As data are based on advertisement and not actual transacted dwellings and prices, one must be aware of potential bias. We see that the data set is strongly affected by contracts published on the Internet, but which do not represent actual contracts, and this, in a CPI and in other statistics context as well, will be unacceptable.

<sup>7</sup> If we consider the owners' market.

<sup>8</sup> Co-operation has been established between [www.finn.no](http://www.finn.no) and the real estate association in that the agents report back the actual transaction price. Statistics Norway receives this information as well.

We may expect that the number of advertised dwellings and the time the dwellings are advertised on the Internet will be influenced by the business cycles. The number of rented dwellings put on the Internet may go up and the time they remain unrealised on the Internet may increase when the business cycle is low.

The RMS has been confronted with the claim that the average official figures are systematically lower than other statistics provided by private competitors based on [www.finn.no](http://www.finn.no) data. An important weakness of announced contracts is that the asking price is not an actual transacted price. It is uncertain whether a landlord in fact receives the rent that is announced. With an attractive, popular rental unit the landlord may increase the asking price while landlords with unpopular rental units may have to reduce the rent. Studies performed on the Internet data have shown that the actual rent often appears to be lower than the asking price.

## 5.2 Electronically reported data from larger suppliers

Data collected electronically directly from large suppliers or large landlords can also be an alternative data source for rent information. In the RMS we do receive and incorporate in the official figures electronically registered data from the largest municipalities and student organisations. From a resource perspective, it may be efficient to collect electronically registered data. A huge amount of data may be easily accessible, free of charge<sup>9</sup>. The landlords may also have better knowledge of the dwelling characteristics, for instance the exact square metre area, compared with the tenants.

Making use of this kind of data, however, has turned out to be challenging. Professional landlords, that is, the agencies only represent a market share of about 25 per cent and the private households acting as landlords, which is the most dominant element in the market, will be excluded. One can, however, argue that in a free market the rents represented by large private agencies ought to represent the total “non-subsidised” market. We also see that price regression model indicates no statistical differences within this market. Statistics Norway has earlier made attempts to collect data among the professional private landlords. This has proven to be a difficult task as this data really complicates the sampling plan. It is difficult to avoid selective sampling and sample bias. Another complicating factor is that professional agencies are situated almost solely in the larger cities of Norway. Both for CPI and average price survey purposes, it is important to cover the pricing in the remaining parts of Norway as well.

## 6. Concluding remarks

For a long time there has been a great demand for rental statistics in Norway. Up until 2006 the only official rental statistics that existed were the rent indices prepared for CPI purposes. Neither regional indices nor figures on average price level were available. Like other housing statistics, rental statistics get a lot of attention among the general public, financial analysts and the media in order to understand the different markets and the economy of the country. The purpose of this paper has been to look closer into the Norwegian rental market and the different rent levels existing in the market. There have been other studies based on the same data and in general, the findings in this paper are in accordance with earlier analyses based on earlier period data. This indicates robustness in data over time. The paper examines the different elements affecting the rent level and how dominating the different factors are.

We see that there is a wide range of elements affecting rent. Location and pure hedonic variables have a large impact, but also other factors such as tenant-landlord interaction and even tenant characteristics are important elements in understanding the different rent levels. The analyses made underscore the complexity of understanding pricing in the rental market and how challenging it is to provide good official average figures based on this data. The publication of more rental statistics and more detailed figures is in high demand in Norway, but this entails difficulties. Different surveys may provide different results, which in turn can create misunderstanding and confusion about official rental statistics.

The heterogeneous Norwegian rental market is not an easy market to cover. The RMS provides a very rich and interesting data set. Even though the survey is very resource demanding in terms of the way the data are collected, we see that the survey cannot be easily replaced by more accessible alternative data sources. It is also important to consider data sources from a CPI perspective. Statistics Norway is planning to reduce the

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<sup>9</sup> The Norwegian Statistics Act of 1989 permits Statistics Norway to collect business information needed to compile statistics without having to pay for it.

data collection costs of the RMS by cutting down on telephone interviewing and instead increasing the share of online responses. The findings of the regression analysis show that data collection modes affect the results, so this transition must be done carefully to avoid possible bias.

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## Appendix

**Table 1. Estimation results, 4th quarter 2011 and 2012, Rental Market Survey**

Variable Name	Parameter Estimate	Standard Error	T-value	P-value
<i>Intercept</i>	8.34961 <sup>10</sup>	0.03812	219.01	<0.0001
<i>Oslo<sup>11</sup> (City centre, Frogner, Ullem, St. Hanshaugen)</i>	<i>Reference category</i>			
<i>Oslo (Grünerløkka, Gamle Oslo, Sagene, Nordre and Vestre Aker)</i>	-0.06293	0.01126	-5.59	<0.0001
<i>Oslo (Østensjø, Nordstrand, Bjerke)</i>	-0.11675	0.02068	-5.64	<0.0001
<i>Oslo (Søndre Nordstrand, Grorud, Stovner, Alna)</i>	-0.14777	0.02229	-6.63	<0.0001
<i>Bergen City centre</i>	-0.16032	0.01630	-9.84	<0.0001
<i>Bergen (Fana, Fyllingsdalen, Laksevåg, Åstad)</i>	-0.30863	0.01810	-17.05	<0.0001
<i>Bergen (Arna, Ytrebygda, Åsane)</i>	-0.37715	0.03606	-10.46	<0.0001
<i>Trondheim (City centre, Østbyen, Nedre Elvehavn)</i>	-0.16608	0.01677	-9.90	<0.0001
<i>Trondheim (Lerkendal, Heimdal)</i>	-0.23963	0.02498	-9.59	<0.0001
<i>Municipality of Stavanger</i>	-0.15309	0.02036	-7.52	<0.0001
<i>Municipality of Kristiansand</i>	-0.33442	0.02416	-13.84	<0.0001
<i>Municipality of Tromsø</i>	-0.28996	0.02336	-12.41	<0.0001
<i>County of Akershus (Municipalities close to Oslo)</i>	-0.17440	0.02290	-7.61	<0.0001
<i>County of Akershus (Municipalities further away from Oslo)</i>	-0.34733	0.01673	-20.76	<0.0001
<i>Urban settlements, 20 000 inhabitants or more with the exception of municipalities mentioned above</i>	-0.39465	0.01388	-28.44	<0.0001
<i>Urban settlements between 2 000 -19 999 inhabitants with the exception of municipalities mentioned above</i>	-0.51010	0.01463	-34.86	<0.0001
<i>Urban settlements between 200 – 1 999 inhabitants and sparsely populated areas</i>	-0.72296	0.01738	-41.61	<0.0001
<i>Square metre (log)</i>	0.14678	0.00864	16.99	<0.0001
<i>Number of room 1</i>	-0.15944	0.01236	-12.90	<0.0001
<i>Number of room 2</i>	<i>Reference category</i>			
<i>Number of room 3</i>	0.15889	0.00806	19.72	<0.0001
<i>Number of room 4</i>	0.26688	0.01070	24.95	<0.0001
<i>Number of room 5 or more</i>	0.36543	0.01204	30.36	<0.0001
<i>Year 2012 quarter 4</i>	<i>Reference category</i>			
<i>Year 2011 quarter 4</i>	-0.06143	0.00638	-9.62	<0.0001
<i>Centrality<sup>12</sup> (Central municipalities)</i>	<i>Reference category</i>			
<i>Centrality (Quite central municipalities)</i>	-0.10441	0.01194	-8.75	<0.0001
<i>Centrality (Less central municipalities)</i>	-0.13189	0.02085	-6.32	<0.0001
<i>Centrality (Least central municipalities)</i>	-0.19328	0.01858	-10.40	<0.0001
<i>Housing quality standard (log)</i>	0.14576	0.00849	17.17	<0.0001
<i>Start tenancy agreement, present year</i>	<i>Reference category</i>			
<i>Start tenancy agreement, 1 year before</i>	-0.03179	0.00875	-3.63	0.0003
<i>Start tenancy agreement, 2 year before</i>	-0.10347	0.00979	-10.57	<0.0001
<i>Start tenancy agreement, 3 year before</i>	-0.14268	0.01198	-11.91	<0.0001
<i>Older tenancy agreement</i>	-0.22127	0.00891	-24.82	<0.0001
<i>Services for landlord</i>	-0.03316	0.00726	-4.57	<0.0001
<i>Electricity/heating</i>	0.05142	0.00724	7.10	<0.0001
<i>Flats</i>	<i>Reference category</i>			
<i>Detached houses/terrace houses etc.</i>	-0.04551	0.01270	-3.58	0.0003
<i>Lodgings</i>	-0.06075	0.00814	-7.46	<0.0001
<i>Balcony</i>	0.04614	0.00675	6.84	<0.0001
<i>Floor- higher</i>	0.06019	0.00835	7.21	<0.0001
<i>Garage space</i>	0.05110	0.00797	6.41	<0.0001
<i>Furnished</i>	0.03121	0.01191	2.62	0.0088
<i>Private households acting as professional landlords</i>	<i>Reference category</i>			
<i>Professional landlords/agencies</i>	0.00942	0.00694	1.36	0.1746
<i>Tenant income-low</i>	<i>Reference category</i>			
<i>Tenant income-high</i>	0.04071	0.00779	5.23	<0.0001
<i>Place of birth-born in Norway</i>	<i>Reference category</i>			
<i>Place of birth-foreign country</i>	0.02679	0.00669	4.00	<0.0001
<i>Data collection mode-web</i>	<i>Reference category</i>			
<i>Data collection mode-post/phone</i>	-0.03896	0.00627	-6.21	<0.0001

10 Transforming the parameter estimate to NOK value of monthly rent gives us:  $e^{8.34961} = \text{NOK } 4\,229$  (about 565 euro). This amount in NOK is the baseline rent before adding the effects of the explanatory variables like location, size etc.

11 The price zones in the model are based on the administratively divisions (city districts) of the main cities.

12 We have included Statistics Norway's Classification of centrality (2008). Centrality is a measure of a municipality's geographical position seen in relation to a centre where higher order of functions (central functions as bank, post office etc.) are found.