



# Rent indices, Oslo 1970-2008

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## Abstract

**Purpose** – Rents are both a very important cost variable in the housing market, having large welfare and distributional implication, and one of the most important variables in house price research. The aim of this paper is to construct rent indices for Norway's capital, Oslo.

**Design/methodology/approach** – This paper uses a unique dataset with 24,257 housing for rent advertisements, creating hedonic indices using the time dummy variable method.

**Findings** – In this paper, the author presents annual rent indices for Norway's capital, Oslo, over the period from 1970 to 2008. In addition to an aggregate index, they construct hedonic rent indices for different flat types.

**Originality/value** – Existing Norwegian rent indices start around 2000 or are constructed with the purpose of being a part of the CPI, and are therefore adjusted for change in quality. Since the author's indices are not adjusted for quality, they give new information about Norwegian rent for the past 40 years.

**Keywords** Rent, Rent index, Norway, Housing market, Housing

**Paper type** Research paper

## Introduction

In this paper, we present annual rent indices for Oslo from 1970 to 2008. We construct price indices for different dwelling types in Oslo and its immediate surrounding areas. The rent indices are constructed by the use of the hedonic method, and the aggregate index by weighting the indices with the number of dwellings of different types.

The rent indices presented in this paper are constructed using a unique dataset of 24,257 housing for rent advertisements. Housing for rent advertisements has previously been used to collect market rents, among others, by Gibb (1994) and Bailey (1999) in Scotland. Existing rent indices for residential homes in Norway cover only a short, recent time period. Since the index in this paper gives us new information about rent in Oslo, it also provides new insights into the rental market. A better rent index covering a longer time period also gives new opportunities to study the housing market. Finally, our new rent indices based on a large underlying dataset might provide a better understanding of the price-rent relationship and of the homogeneity in the rent market.

The longest data series on rent development in Norway comes from the CPI compiled by Statistics Norway (Appendix Figure A1). Rent is a large and important part of the CPI. The rent changes in the CPI are collected by interviewing tenants and landlords. The rent index from Statistics Norway (2012) contains information only about relative price changes. It therefore cannot be used to calculate price-rent in absolute values, only the change in the price-rent ratio. In addition, Statistics Norway tries to adjust the rents for development in quality. Since Norwegian house-price indices



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are not adjusted for change in quality, a rent index that is not adjusted for quality will make it easier to compare house prices and rents.

Statistics Norway also conducts two other surveys in which they collect nominal rents. In one, nominal rents are part of larger survey of living conditions in Norway. This survey (Levekårsundersøkelsen) is conducted every third year, starting in 1997. The total number of participants in this survey is 5,000, but this includes both renters and home-owners spread throughout the country. The demand for a nominal rent index pushed Statistics Norway to introduce another survey, Leiemarkedsundersøkelsen. This is a comprehensive survey in which 5,200 participants are interviewed about conditions and rent levels. It has been conducted every quarter since 2006. Norway being no different from other western countries, internet is now the main source to obtain rental housing information. Since 2005 Opinion for Boligbygg Oslo has used a hedonic method based on FINN.no advertisement data to create a rent index (NEF/EFF/FINN.no/ECON, 2012). FINN.no is an internet advertisement page similar to craigslist.org, was originally a spinoff among other newspapers *Aftenposten* and for a period you got the advertisements published both places with now or with a very low cost. The data from third quarter seems to be compatible with the rent index presented in this paper, and opens for even longer time series.

We use housing for rent advertisements from the newspaper *Aftenposten*. Advertised properties are believed to comprise a little more than a third of the total Norwegian rental market (Langsether *et al.*, 2003), and should therefore represent the whole market with sufficient precision. Other ways tenants find flats are through family and friends, student organisations, from social housing and through employment.

The remainder of this paper is organised as follows. The paper starts with an introduction to the Norwegian housing market in second section. Data are described in third section, while the empirical approach used to construct the indices is described in fourth section. The rent indices are thoroughly presented in fifth section, and sixth section concludes. The Appendix tabulates the nominal rent indices.

Background and context

*The structure of the Norwegian housing market*

Norway has a long tradition of home-ownership. The urbanisation that took place at the start of the 1900s represented a break with this tradition, as a large number of rental units were created in blocks of flats in the city centres. This main urbanisation period in Norway was followed by a strong political desire to make it easier for “common people” to own their own homes. This policy has been successful; with home-ownership at 77 per cent, Norway is now among the countries with the highest home-ownership rates. For the capital, Oslo, the figure is 71 per cent (Table I).

	1920	1970	1990	2001
Norway (%)	47	34	22	23
Oslo (%)	95	49	24	29

**Notes:** The table shows the percentage of the households in Norway and Oslo that are tenants; the households data presented in the table is from the censuses of population and dwellings in Norway done by Statistics Norway in the years 1920, 1970, 1990 and 2001

**Source:** Langsether *et al.* (2003)

**Table I.**  
Percentage of tenants

Lifelong tenancy has been replaced by short-term tenancy, and the professional, private landlord with many flats for rent by the nonprofessional landlord, who is either temporarily absent from his own dwelling or has an extra dwelling at his disposal, often acquired by inheritance. The percentage of households living in rented flats has also fallen steadily, but the long-term decline of the rental market came to a halt after 1990.

At the end of the 1970s, there were still a large number of elderly people in Oslo who had spent their entire adult life as tenants, but this changed during the 1980s. In 1978, the median period of residence among tenants was nine years; by 1987 it had fallen to two and a half years. This substantial change was a result of the deregulation of the housing market; many tenants in pre-Second World War blocks of flats got the opportunity to buy their flats at a low price. The result was that after this, the residential rental market came to be dominated by young people, who were tenants for a period before they became home-owners (Øia, 2007).

The fall in the number of flats owned by professional landlords is probably to a large degree the result of the same policy (Table II). The pre-Second World War blocks of flats were to a large extent owned by professional landlords. When many of these flats were sold to their tenants in the 1970s and 1980s as a consequence of political reforms, the number of flats held by professional landlords decreased. Large blocks of flats, which are not divided into separate legal entities, cannot easily shift between rental and owner-occupation. If an area is dominated by a type of housing suited only to renting, the connection between house prices and rents may be weaker. In our index, flats constitute the majority of the data.

In the late-1990s, professional landlords re-entered the market holding other types of property. Non-professionals also contribute a large share of the rental market, owning widely scattered flats.

### *Rent control*

The data series analysed in this paper start in 1970, while rent controls ended in 1982 (Act of June 11, 1982 no. 44). Rent control was enforced through a system of local rent committees that decided how much the rent could increase from one year to the next. The landlord could ask the committee to set a just rent on the dwelling, but for the most

	1973	1981	1988	1995
Flats rented out of non-professionals where they live	68	54	45	109
Rest of flats rented out by non-professionals	105	132	129	177
Company residence, public and private	86	51	31	33
Local authority owned	33	42	51	56
Professional landlords	104	67	45	41
Rest	6	4	6	1
Total number of rented residencies	402	359	307	418

**Notes:** The composition of the rental market in Norway, 1973-2001; all numbers in 1,000s; before the deregulation, professional landlords typically owned blocks of flats; these properties typically became divided into separate flats and sold to people that choose to take residence there themselves; after some time we see that professional landlords re-entered the market holding other types of objects; non-professionals contribute a large share of the rent market, these flats are well scattered

**Source:** Langsether *et al.* (2003)

**Table II.**  
The composition of the  
rental market in Norway

part the committee was not involved in the pricing. Landlords were free to set the rent but in accordance with the rent control. If the tenant did not accept the rent and it was in conflict with the rent control, he or she could bring the matter to court.

Norway got a new Rent Act in 1999, but since rent and rent control was not a part of the old Rent Act of 1939, the price control on most flats had been removed in 1982. The Rent Act of 1999 caused minor changes in the actual setting of rent. The Act accepts the existing market rents for new tenancies. According to the Act, market rent is never regarded as unfair. Only a rent that is unreasonably high compared to the market rent when the contract is agreed is unlawful. In existing contracts, rent increases are restricted to once every year, and should not be greater than the CPI. A larger revision is permitted every third year so that the rent on the flats follows the trend of the rental market (Table III).

Oslo

Oslo is the capital of Norway, and by far the country’s largest city, with a population of 487,363 in 1970 and 560,484 in 2008. Metropolitan Oslo has a population of approximately one million. In the second half of the nineteenth century, both the population and activity in the construction sector increased sharply. Construction boomed in the 1870s, 1880s and 1890s, when a large part of Oslo’s current inner city was built. Typically, the buildings were four- and five-storey brick apartments. The late nineteenth century also saw segregation between the rich western part of the city and the poorer eastern quarters. Large factories were located alongside the Akerselva a river in the east of the city, and around them a large number of high-density, low-standard rental blocks for workers were constructed. The pattern continued for several decades, and can probably explain much of the price difference between east and west today. The city boundary has been enlarged several times over the past century. With the enlargements of 1859 and 1878, many wooden residential buildings were included in the city’s housing stock. The biggest enlargement took place in 1948, when the Aker region was incorporated. After Second World War and up to the 1980s, construction of residential buildings in Oslo mainly took place in the new suburbs in the former Aker region.

Data

The Norwegian National Library has a microfilm archive of all newspapers published in Norway. These microfilms make it possible to go back in time and read old newspaper advertisements for housing for rent and housing required. We chose the *Aftenposten*, which

Type of housing	Period	Type of regulation
Rental homes	1916-1935	Rent control on some types of flats
	1940-2010	Rent control on some types of flats
	1976-1983	Condominium conversion forbidden
Owner-occupied homes	1940-1954	Price freeze
	1954-1969	Price regulations
Housing co-operatives	1940-1954	Price freeze
	1954-1982/1988	Price regulations on new/old flats
	1976-1983	Condominium conversion forbidden

**Table III.**  
Regulations of the  
Norwegian housing  
market

**Note:** Description of the regulation and deregulation in the Norwegian house marked  
**Source:** Eitrheim and Erlandsen (2004)

is by far the largest daily newspaper in the Oslo area, and dominates the advertising market for housing for rent. By printing the advertisements from the microfilm, we were able to read and record price information, deposit, type of house, number of bedrooms, square metres, address and identification information (phone number of landlord and advertisement number) for 27,907 flats and houses advertised for rent in Oslo. The identification information included in the advertisements made it possible to avoid double counting.

It was necessary to carry out all the operations by hand because of the low quality of the prints and how the advertisements were written. Since this method of data collection was very time-consuming, it was necessary to limit the number of newspaper days studied. We therefore included only advertisements that were registered in August, except in years with too few advertisements, for which July and September were included as well. These months are the moving season in Norway. The period was chosen because of this characteristic, as August has the largest number of observations. The price varies during the year, and the chosen months normally have somewhat higher prices than the year average. This should be a consistent bias, so that we do get a good price index over residential rent levels.

Observations that appeared to have data entry errors or data that could bias the indices were excluded from the analysis. These included:

- Properties identified as neither a flat nor a house.
- Properties located outside the Oslo area, defined here as more than 30 km or 30 minutes from the city centre.
- Dwellings with more than three bedrooms. (Norwegian advertisements often describe the number of rooms instead of the number of bedrooms; in such cases we count one as a living room and the rest as bedrooms).
- Repeated rent advertisements with no time interval between tenancies.
- Short-term contracts of less than six months.
- Dwellings without a bath, inside toilet or cooking facilities.
- Side payments such as babysitting, renovation, etc.; the asking price should be the only form of payment required.
- Advertisements without a quoted rent.
- Fake advertisements that were not based on real dwellings.

Although a criterion for registration was that the price should be given in the advertisement, it was not necessary for all the other information to be given. This left us with 24,257 observations.

We have defined a bedsit as a unit where the tenant shares at least one of the following functions with other tenants or with the landlord: kitchen, living room and bathroom. A studio flat is a dwelling where the living room also serves as bedroom, but the tenant does not share any functions with other tenants or with the landlord. A one-bedroom flat is a dwelling where the tenant has one bedroom in addition to the living room, and so on.

The residential rent data covers Oslo in the period 1970 to 2008. Due to the data collection process, the observation points are quite evenly distributed over the period, with a cluster around the end of the 1980s when housing prices fell. Most of the observations are small flats, ranging from bedsits to four room flats. The dataset also includes a significant number of large flats and houses. Most of the observations are from areas in

Oslo with high housing density, but there are also a number of observations from suburban areas. In the areas with the highest housing density we typically find apartment buildings with five floors. Large parts of Oslo consist of areas of mostly detached houses. These are close enough to the city centre with good public transportation. Because of this, it is common to find small rentals in these dwellings, something that becomes clear from our dataset. There are no areas in Oslo where we find strictly either rented or owner-occupied homes. The mix varies, but the main difference between a rented home and an owner-occupied home in Oslo is size. Owner-occupied homes are on average larger than rented homes, and typically suitable for more established families.

The use of newspaper advertisements only allows us to collect asking prices and not rent contract price. Although we believe that the asking price ends up as the rent contract price, we possibly lose some valuable rent information. Given the long time period our dataset is covering, it is also possible that there are issues of time series nature of the data where it might have been structural breaks over the period that are not captured by either size or location. Another obvious weakness with using advertisement data is that we are restricted to using the data available in the advertisements, this make it impossible for us to control for quality in a degree that we otherwise would have wanted.

### **Empirical analyses**

#### *Empirical approach*

Different methods are applied in the literature for constructing house price and rent indices. This is due both to the characteristics of houses, which are heterogeneous and infrequently sold, and data availability. Hargreaves and Chen (2000) study different methods for constructing rent price indices. They look at and compare the median, hedonic, repeat rent, weighted repeat rent and the hybrid method. The median index simply uses median rents over time. The hedonic index typically uses a standard multiple regression methodology. The repeat rent method uses the repeated transactions. The weighted repeated rent index again uses just repeated tenancies and down-weights the index for length of time between tenancies, a technique first developed in Case and Shiller (1987). The hybrid index combines aspects of the hedonic method with the repeat rent method.

Technically, Hargreaves and Chen (2000) find that the most appropriate is the hybrid method, but it is more costly than other techniques in terms of operator time and data requirements. The repeat rent method is relatively simple and has low administrative costs. They find the median method very easy to use but prone to both seasonal and constant quality difficulties. They also find the hedonic method costly in terms of time and data requirements. On balance they find the hybrid method preferable.

When choosing which method to use, the most important criteria will be what datasets are available. The hedonic method allowed us to make use of all of the complete dataset of 24,257 single rent observations, while the hybrid or a repeat-rent method could make use of only 575 repeated rent pairs. To be confident of advertisements being repeats, we need either full address or telephone number in the advertisement. Most of the advertisements used the newspapers advertisement number instead. The advertisements keep it advertisement number within the same year, but if the same dwelling is advertised the next year it would have gotten a new advertisement number. This means that our data loses a lot of the repeats that probably is there.

The larger available dataset from using the hedonic method gives us many more observations and possibilities to study sub-samples, this compensates for the positive



qualities of using the hybrid method. As a result, we chose to construct our dataset using the hybrid method.

### *The hedonic model: time dummy variable method*

Since each house has idiosyncratic characteristics that make it unique, estimating demand or prices from real estate data can be challenging. Rather than pricing a given house or property directly, a researcher can decompose it into its value-adding components such as location, number of bedrooms, square metres, type of housing, neighbourhood qualities and so forth.

The hedonic method is a widely used technique to control for the heterogeneous nature of properties when constructing house price indices. It recognises that properties are composite products: although attributes are not rented separately, regressing the rent of dwellings on their various characteristics yields the marginal contribution of each characteristic. A well-specified hedonic model will estimate the contribution to the total price of each of these features separately. Many of the neighbourhood and location variables are often not available (Case *et al.*, 1991).

The hedonic pricing model, dating to Court (1939) and having Rosen (1974) as its basis in theory, is customarily employed to measure the contribution of individual house characteristics to the overall composite value of the housing asset.

One of the hedonic models is the time dummy variable method. The time dummy variable method is sometimes referred to as a direct method because all the price information it is using comes from the hedonic function: no prices come from an alternative source. Direct methods require estimation of a hedonic function for every index separately.

We estimate the rent, with an approach often referred to as the “additive model”. The way the regression is specified, the method become similar to the median/average/modus price model adjusted for different qualities.

We estimate a hedonic equation of the form:

$$r_{it} = \gamma_0 + \delta_t + \sum_k \alpha_k c_{kit} + e_{it} \quad (1)$$

where  $r = \log R$  and  $R$  is the rent,  $c$  is a set of explanatory variables for presence of certain characteristics ( $t = 1, \dots, T$ ),  $t$  and  $i$  denote the period and the dwelling, respectively. The dummy variables we use in our regression are the dwelling size, city centre location, large deposit and the use of the real estate agency Utleiermegleren. The term  $\delta_t$  represents the time dummy coefficients defined as changes with respect to the base year intercept  $\gamma_0$ , so that  $\delta_t = \sum_{s=1}^T \delta_s d_{sit}$  where  $d_{sit}$  takes the value 1 when  $s = t$  and 0 otherwise. In total  $(T + 1)$  periods are observed. As for functional form, the log-linear form is usually preferred, in particular because coefficients can be more easily interpreted and because it mitigates some statistical problems (Malpezzi, 2003).

Norwegian for rent advertisements do not usually give the number of square metres, but instead use the number of bedrooms and type of dwelling. To solve this problem, we controlled for change in size over time (see Appendix Tables AIII and AIV). Even though it may appear that there has been a change in the preferred type of dwelling, the different types of dwelling seem to be of the same size. We have used bedsit, studio flat, one-, two-, three- and four-bedroom flat and two-, three- and four-bedroom house to denote the different dwelling sizes. The time period covered is 1970-2008. For location, we discriminate only between city centre and suburban locations because we want to limit the number of variables. In Appendix Figure A2 we divide Oslo into seven city districts.

A large deposit was defined as a deposit higher than five times the monthly rent. In the first years of our dataset, it was quite common to require very high deposits or bonds (the bonds were often interest-bearing). Such high deposits or bonds must in some degree be looked on as a substitute for rent, or at least as reducing the expected rent. In some cases, the high deposits may hide a larger problem. Sometimes the deposit is on the same level as the expected purchase price. Even though there is a clear legal difference, there is clearly some confusion between rented and cooperative flats. Flats that seem to have been purchased in this way, instead of simply rented, have been excluded from our sample.

Towards the end of our sample period, internet advertisements became common. As a result, the real-estate agency Utleiemegleren provided a very large part of our sample, without having the same importance in the total population.

Our main rent index is constructed by weighting eight sub-rent indices for our dwelling types with the number of total rent observations for each dwelling type. The numbers of rent observations that are used in the weighting are listed in Table IV.

**Rent indices, Oslo**

*The aggregated rent index*

Our time period from 1970 to 2008 includes two full business cycles, and ends at the top of the third boom, or close to this top. As we can see from Figure 1, the nominal rent indices increase continuously from 1970 to 1988. During the 1970s, the Norwegian economy became increasingly influenced by large petroleum investments. The prospect of large petroleum income in the future increased public spending, and there were several attempts to help industries in the traded sector through the international bust cycle. Norwegian economic indicators show the country performing well, despite high inflation and problems abroad. Even if real rents had not increased by the end of the decade, high inflation caused a high and steady increase in nominal rents.

Optimism, high oil prices after OPEC II and a deregulation of the financial market created a strong boom from 1984 to 1987. The combination of the boom cycle and high inflation resulted in a sharp peak in rents.

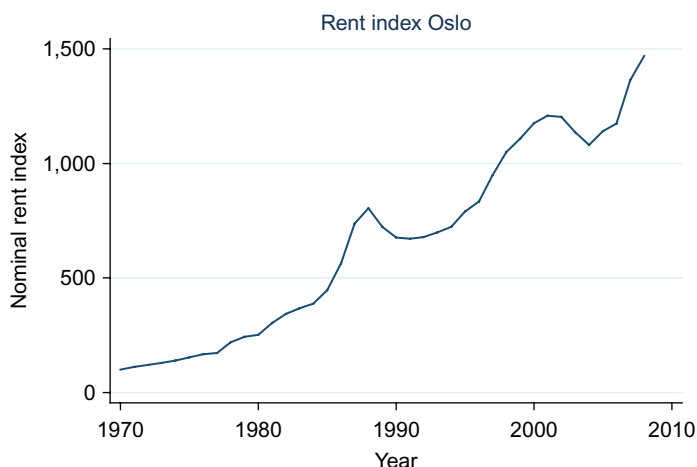
The optimism ended on Black Monday: 19 October 1987. Although the nominal rents did not peak until one year later in 1988, Norway's economic problems had already started in 1986 with the negative oil price shock. Lower public spending, high interest rates and a Norwegian Bank crisis that lasted from 1988 to 1993 created problems in the housing market.

**Table IV.**  
Total number  
of observations

	Number of advertisements
Bedsit	5,112
Studio-flat	5,553
1 bedroom flat	6,069
2 bedroom flat	4,302
3 bedroom flat	1,731
4 bedroom flat	364
2 bedroom house	249
3 bedroom house	760
4 bedroom house	486
Sum	24,626

**Note:** The total number of observations of different dwelling types used to construct the rent indices





**Notes:** Aggregate nominal house rent index 1970-2008 for Oslo; the nominal rent index peaked in 1988 and again in 2001, followed by representative bottoms in 1991 and 2004; the index starts at 100 in 1970

**Figure 1.**  
Aggregate nominal  
house rent index  
1970-2008 for Oslo

The number of housing for rent advertisements increased sharply and nominal rents dropped by 17 per cent, although this drop was lower than the drop in the house prices.

After several years of problems the housing and rent market started to improve again after 1992 as Norway experienced a strong recovery after the banking crisis. Political reforms and an increasing influence from the petroleum sector produced high economic growth, and by 1996 nominal rents had already regained the level they were at the top of the peak in 1988. Other prices did not increase at the same speed as before 1987, however, meaning lower inflation and therefore higher increases in real rents.

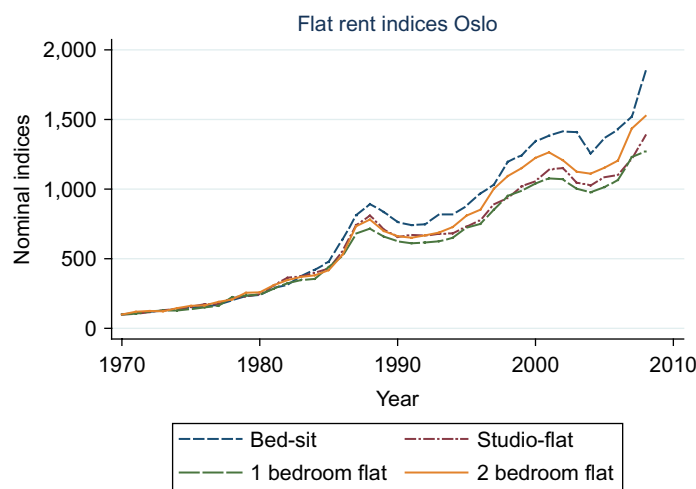
Rents reached a new peak in 2001, and from 2002 to 2004 nominal rents were decreasing. This time the drop in rents was not followed by a fall in the house prices. The period from 2002 to 2004 was dominated of two factors: problems in the Norwegian traded sector and low interest rates.

After 2004 nominal rents started to increase again and were still increasing in 2008. Rents were increasing even though we were starting to see economic decline and a fall in nominal house prices. Again we have to remember that the rents are measured in July, August and September. During the winter rents were falling, but they recovered fairly quickly.

### *Rent indices dwelling types*

Looking at the underlying developments in the different house and flat types, we see that for the most part they follow the same pattern. One interesting observation here is that rents for bedsits were increasing more than those of other flats in the first boom cycle from 1984 to 1987. In the following bust cycle from 1989 to 1992, the decline in bedsit rents was on the same level as those of other types of flats. In the next boom cycle, 1998-2001, the rent increase was again higher for bedsit flats, but in the following bust cycle fell back to the same level of before 1998 (Figure 2).

The way we define a bedsit, as a unit where the tenant shares at least one of the following functions – kitchen, living room or bathroom – with other tenants or with



**Figure 2.**  
Nominal rent indices flat  
types 1970-2008

**Notes:** Nominal rent indices 1970-2008 for bedsit flats, studio flats, one- and two-bedroom flats in Oslo; all indices start at 100 in 1970

the landlord, sets this type of accommodation apart from the rest of the dwelling types in our dataset. This might explain why there has been diversity in the way that bedsit rents have developed compared with the other dwelling types.

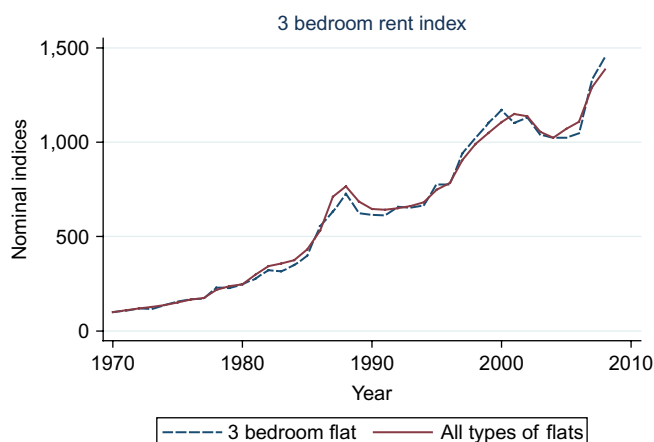
When we compare different periods, it appears that rents on bedsits tend to increase more during our two booms. Both in the period from 1984 to 1987 and 1998 to 2001, the rent on bedsit flats seems to increase more than on other types of flats. While the rents on bedsits also dropped more during the bust cycle after the boom of 1998-2001, this was not the case in the first boom-bust cycle. But the reason remains unknown. One-bedroom flats also differ somewhat from the two other flat types. Our conclusion is that the bedsit flats should be included in the index, but we have included an index without the bedsit dwellings in the Appendix (Figure 3).

From Figure 4 we can see a much larger variance in the rent indices for houses than for the smaller flats. This is probably noise caused by the small number of observations spread across many years and different flat and house types. The different flat and house types are important qualities, and it is important to include these dwelling types in the hedonic regression. On the other hand these are obviously too noisy to constitute an index by themselves. We have added them in this paper to give a better and broader picture of what is included in the main index.

### Concluding remarks

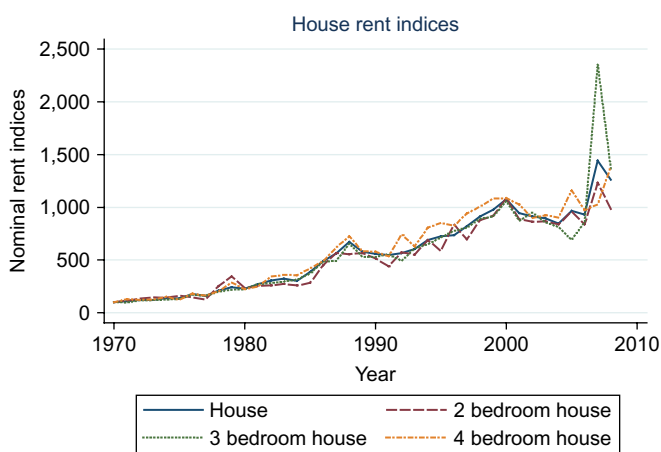
In this paper we have presented estimations of nominal rent indices for Oslo for the period between 1970 and 2008. To our knowledge, this is the first attempt to construct continuous rent indices for Oslo or any other Norwegian city for this time period. The nominal rent indices seem to fit well in with historical events and the available house price indices.

The indices are nominal and our time period from 1970 to 2008 includes two full business cycles. These new indices provide a lot of new information about the development in nominal rents on dwellings in Oslo, and create new research opportunities.



**Notes:** Nominal house rent indices 1970-2008 for three-bedroom flats and all types of flats; all indices start at 100 in 1970

**Figure 3.**  
Nominal rent indices  
three-bedroom flats  
1970-2008



**Notes:** Nominal house rent indices 1970-2008 for two-, three- and four-bedroom houses in Oslo; in 2007, the outlier, there is only one observation in the three-bedroom house category; for these dwellings there are fewer observations, but still we can recognise the same development in the prices as for flats; all indices start at 100 in 1970

**Figure 4.**  
Nominal house rent  
indices 1970-2008

The indices can be used to study the CPI measurements, the development in nominal living cost, to study the deregulation of the Norwegian rent market and to study house price development in the case of rent.

The rent indices in this paper are constructed using the hedonic time dummy method. Because of data availability, we do not control for changes in dwelling standards. However, this might be considered as advantage when comparing with Norwegian

house price indices, since these are not adjusted for quality either. If we believe that the standards of rented and owner-occupied dwellings develop similarly, then we actually need this property for any analyses including both house and rent prices.

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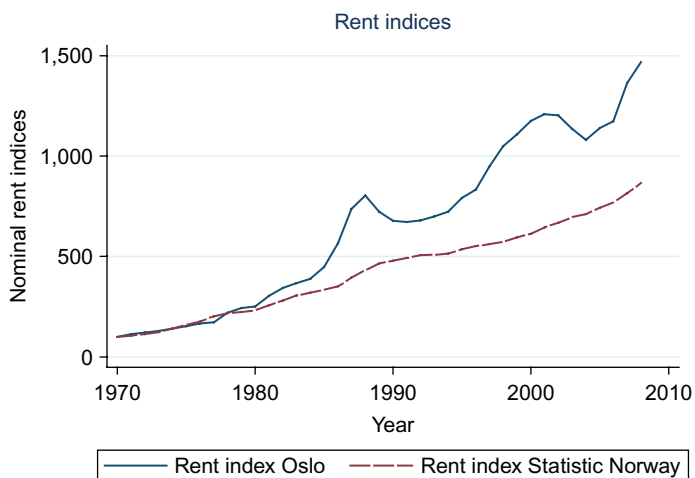
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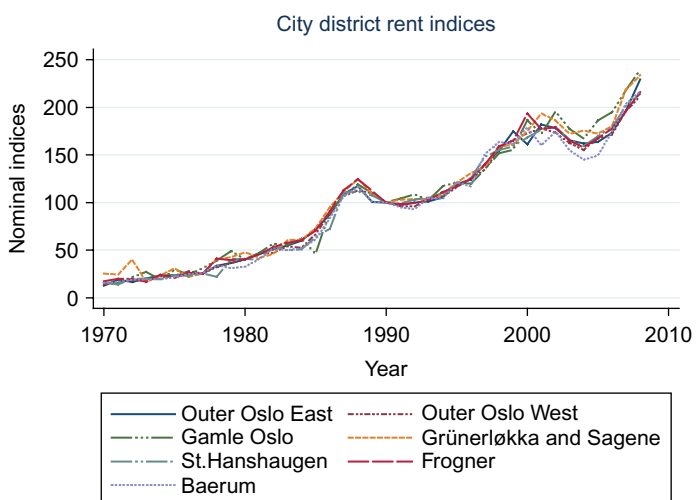
### About the author

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**Notes:** The figure shows our rent index and the rent index from Statistics Norway; statistics Norway compiles its index by interviewing tenders in both new and old contracts, and adjusts for changes in quality caused by renovation; all indices start at 100 in 1970

**Figure A1.**  
Rent index from statistic  
Norway



**Notes:** Nominal rent indices for different city districts in Oslo 1970-2008; outer Oslo East consists of the following districts; Bjerke, Grorud, Stovner, Alna, Østensjø, Nordstrand and Søndre Nordstrand; outer Oslo West consists of the following districts; Ullern, Nordre Aker and Vestre Aker; the indices are all set to 100 in 1990

**Figure A2.**  
Nominal rent indices for  
Oslo city districts

**Table AI.**  
Rent indices Oslo  
1970-1989

Year	Sum index	Index without bedsit	All types of flats form
1970	100	100	100
1971	112.292456	112.292456	109.334051
1972	121.003199	121.003199	119.606237
1973	128.727992	128.727992	127.29917
1974	140.334223	140.334223	137.728504
1975	152.844152	152.844152	151.356697
1976	166.979623	166.979623	167.018433
1977	173.044534	173.044534	173.283224
1978	219.571405	219.571405	218.000681
1979	243.42091	243.42091	237.684767
1980	251.759681	251.759681	247.830262
1981	303.085876	303.085876	298.613826
1982	343.295017	343.295017	342.4697
1983	367.763543	367.763543	357.941006
1984	388.451447	388.451447	375.753817
1985	447.529826	447.529826	432.013218
1986	564.936416	564.936416	532.529974
1987	736.464612	736.464612	710.397865
1988	804.311946	804.311946	765.662281
1989	724.028811	724.028811	685.180417

**Table AII.**  
Rent indices Oslo  
1990-2008

Year	Sum index	Index without bedsit	All types of flats
1990	677.33243	677.33243	645.638782
1991	671.42491	671.42491	643.060742
1992	679.056399	679.056399	649.380081
1993	699.640188	699.640188	661.772728
1994	722.600265	722.600265	682.697038
1995	791.34275	791.34275	749.426454
1996	833.46123	833.46123	784.675445
1997	946.964103	946.964103	906.96983
1998	1,048.66813	1,048.66813	990.890651
1999	1,108.51015	1,108.51015	1,050.36834
2000	1,175.51566	1,175.51566	1,105.96572
2001	1,208.33685	1,208.33685	1,149.50327
2002	1,202.56877	1,202.56877	1,137.63996
2003	1,135.4453	1,135.4453	1,055.46339
2004	1,080.86312	1,080.86312	1,024.82402
2005	1,140.69178	1,140.69178	1,070.5429
2006	1,174.19394	1,174.19394	1,108.87158
2007	1,364.13825	1,364.13825	1,291.71386
2008	1,469.33352	1,469.33352	1,386.01525



	Mean	Obs	SE	Rent indices, Oslo 1970-2008
<i>Bedsit</i>				
2000-2004	18.25	143	0.57	
1990-1994	19.04	139	0.57	
1980-1984	19.42	36	1.27	
1970-1974	18.59	17	2.04	
<i>Studio-flat</i>				
2000-2004	36.7	391	0.48	
1990-1994	39.27	649	0.44	
1980-1984	43.19	118	1.03	
1970-1974	40.76	54	54	
<i>1 bedroom flat</i>				
2000-2004	56.34	466	0.55	
1990-1994	61.45	615	0.51	
1980-1984	67.22	94	1.45	
1970-1974	65.35	17	4.26	
<i>2 bedroom flat</i>				
2000-2004	80.71	252	1.24	
1990-1994	84.72	345	0.89	
1980-1984	83.84	58	1.9	
1970-1974	96.93	30	4.16	
<i>3 bedroom flat</i>				
2000-2004	109.73	94	3.17	
1990-1994	114.01	139	2.09	
1980-1984	118.38	40	4.3	
1970-1974	119.78	23	6.78	

**Notes:** The table shows the different sizes of different flat types in different periods of time; the data in the table is from the main dataset

**Table AIII.**  
Flat size

	Mean	Obs	SE
<i>3 room house</i>			
2000-2004	91.32	22	3.54
1990-1994	95.46	24	4.18
1980-1984	97.92	12	7.3
1970-1974	85.4	5	10.68
<i>4 room house</i>			
2000-2004	123.25	52	5.5
1990-1994	129.75	64	3.64
1980-1984	125.27	37	5.61
1970-1974	128.21	34	6.07
<i>5 room house</i>			
2000-2004	166.13	32	8.17
1990-1994	156.98	41	5.97
1980-1984	153.8	25	7.6
1970-1974	145.7	23	4.01

**Notes:** The table shows the different sizes of different house types in different periods of time; the data in the table is from the main dataset

**Table AIV.**  
House size