Rentals in Greater Copenhagen

Quick market insights

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What kind of accommodations are available on the market?

As of 21 February 2023, there were just over **3,000 rentals listed** in the Greater Copenhagen area ("Storkøbenhavn" in Danish)[1]. The vast majority of these were apartments (82%) and single rooms (12%). Rooms were mostly **located** in the city (⅔ of all rooms), while houses were mostly located in the suburbs (92% of all houses).

Fig 1. Rentals by type

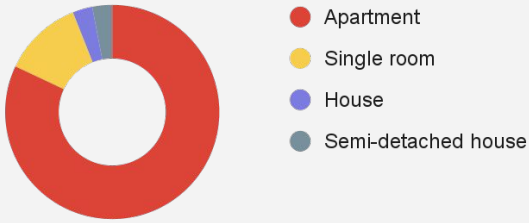
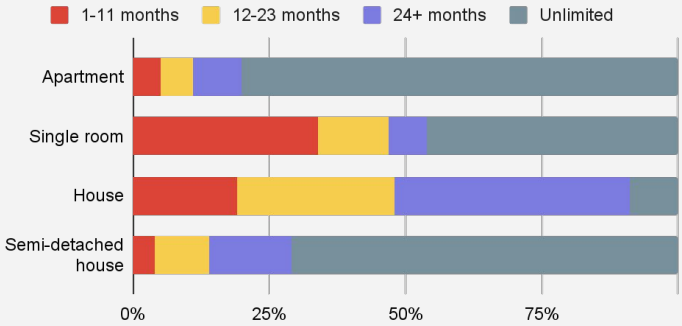


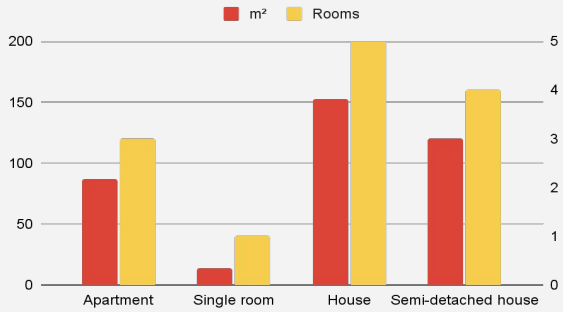
Fig 2. Lease length by type



Overall, **73% of all** accommodations were available for rent for an **unlimited time period**, however, with significant variation by type. For example, 4 out of 5 apartments were available for an unlimited period, while less than half of all single rooms were available for an unlimited time period (for regular houses, this number was as low as 1 out in 10).

When it comes to **size**, regular houses are the rental type with the largest **median area** (153 m²), followed by semi-detached houses (120 m²) and apartments (87 m²). If we measure size by the median **number of rooms** instead, the conclusion is pretty similar, with houses leading (5 rooms), followed by semi-detached (4 rooms) and apartments (3 rooms).

Fig 3. Rentals by size



Other rental facts

44% have parking available (highest is 60% for semi-detached houses)

58% prohibit keeping pets (highest is 95% for single rooms)

28% have high energy efficiency (A-level) (34% in the city vs. only 23% in the suburbs)[2]

10 is the maximum number of rooms you can get in a house (8 in an apartment)

How much does it cost to live in the Greater Copenhagen area?

Looking at the price of **rent per square meter**, we see that for the vast majority of accommodations, you'd be expected to pay between **150-200 kr.** per m². That being said, in some cases the price can be as low as 67 kr. per m² or as high as 894 kr. per m². In 75% of all cases, you can furthermore expect to pay below 13.22 kr. per m² in relation to the monthly fixed acconto payment.

Fig 4. Rent per m² frequency count

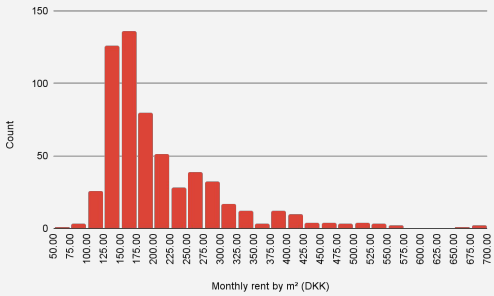
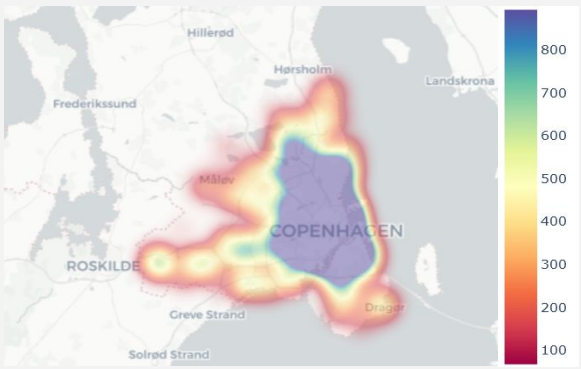


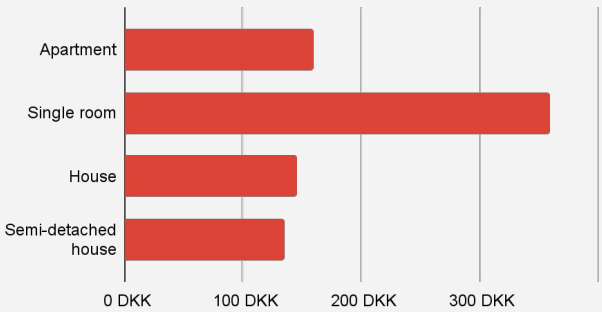
Fig 5. Rent per m² by location



Rent prices differ depending on the geographical **location** of the accommodation. For instance, the median price per m² is 184 kr. in the city but only 150 kr. in the suburbs.[3] The **most expensive** municipalities to live in are **Frederiksberg** (204 kr. per m²), followed by Gentofte (192 kr. per m²), Gladsaxe (189 kr. per m²) and Copenhagen (184 kr. per m²). The **cheapest** ones are Brøndby (137 kr. per m²), followed by Egedal, Glostrup and Vallensbæk (all three landing at 136 kr. per m²).

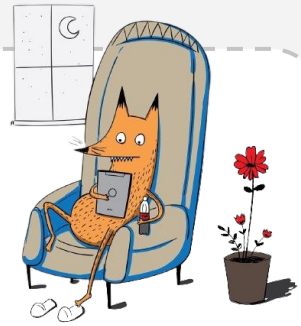
When it comes to the **type of accommodation**, it turns out that semi-detached houses are the **cheapest option** with a median price per m² of 135 kr. Apartments, which form the majority of all rentals available (82%), have a median rent of 160 kr. per m². These prices are likely also affected by the geographical distribution of the rentals, with the suburbs hosting the overwhelming majority of all available houses (92%) and semi-detached houses (77%).

Fig 6. Rent per m² by rental type



Some advice for the single souls

If you are single or you just want to live by yourself, then you might be better off by renting a one-room apartment (e.g. a studio) rather than going for a single room in a shared accommodation. Based on median price, one-room apartments are **43% cheaper** than single rooms. In fact, if we look at the bottom 75% of all one-room apartments, prices will not exceed 245 kr. per square meter, whereas if we look at the bottom 75% of all single rooms, the price per square meter can be as high as 463 kr. (a difference of 89%).



Which factors have an impact on rent prices in the area?

To find an answer to this question, the relationship between rent prices and **accommodation properties** were examined via linear regression.[4] Based on the analysis, here are some tips on how to save money when looking for your next rental place:

Go big or go home

If you want to save money on rent, you can **use either of two strategies**: go for a smaller-sized accommodation to save money in absolute terms (you can save 140 kr. for each m²) or go for a larger-sized accommodation to save money in relative terms (each 10 additional m² will bring down the rent per m2 price by 11.3 kr. on average).

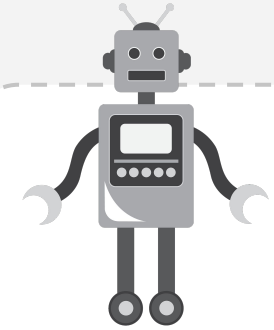
Avoid busy locations

Carefully consider the **geographical location** of the rental. You can save about 53 kr. per m² on average by opting for living in the suburbs rather than in the city. Another way of saving could be to move further away from Nørreport (rent per m² can be 29 kr. cheaper on average if you only move 5 km away from Nørreport). Moving further away from a metro stop can also spare you some cash (an effect per m² similar to that of moving away from Nørreport), that is, if being close to public transport is not that important to you.

Plan for the long run

If you can, opt for accommodations which are **available to rent for a longer time period**, ideally ones you can get for an unlimited time period. By choosing them, you can get a price reduction of about 81 kr. per m² on average relative to rentals that are only available for a period of less than 1 year.

Can we predict rent prices?



Several machine learning models were tested to determine the extent to which we can create reliable predictions for rent.[5] Based on everything from rental type, size and geolocation, it was possible to create a model that could predict monthly rent with an **84% accuracy**. The most influential factors when determining rent prices proved to be the size of the accommodation, whether the latter was furnished, how far from Nørreport it was located and how recent the ad was.

Technical footnotes

1. Data on rentals was collected from the BoligPortal website (Denmark's largest accommodations portal) using web scraping tools. The search was limited to rentals in the "Storkøbenhavn" area and took place on 23 February 2023. Details on all available entries at that point in time were collected and put together in a single dataset.

2. The Danish energy ratings system assigns all accommodations within the following groups, with energy efficiency decreasing with each subsequent rating level: A20, A15, A10, A5, B, C, D, E, F. For more information on the system, please visit this website.

3. In this analysis, all municipalities except for "Copenhagen" and "Frederiksberg" were classified as suburbs, while the two central municipalities were referred to as the "city".

4. To arrive at the insights presented, a total of 12 hypotheses were tested using linear regression analysis (OLS). Results were considered statistically significant when $p<0.05$. R^2 ranged between 5-60%, with most models being somewhere in-between. The coefficients, p-values and R^2 associated with the insights presented are as follows:

   - Y = Monthly rent, X = Accommodation size in m^2: β=139.5, $p<0.01$, R^2=67%
   - Y = Monthly rent per m^2, X = Accommodation size in m^2: β=-1.1, $p<0.01$, R^2=28%
   - Y = Monthly rent per m^2, X = Location in the suburbs: β=-53.1, $p<0.01$, R^2=7%
   - Y = Monthly rent per m^2, X = Distance from Nørreport in km: β=-5.7, $p<0.01$, R^2=11%
   - Y = Monthly rent per m^2, X = Distance from nearest metro station in km: β=-5.8, $p<0.01$, R^2=9%
   - Y = Monthly rent per m^2, X = Rent duration, unlimited time period: β=-81.2, $p<0.01$, R^2=6%

   In some cases, potential violations of the Gauss-Markov assumptions were found; no insights based on these potentially problematic models are presented in here.

5. When attempting to build a predictive model for monthly rent size, a series of random forest (RF) regression models were utilized. The data was split into an 75% training set (which the model used to learn patterns in the data) and a 25% test set (which was used to evaluate the accuracy of the model on unknown data). The results showed a deviation of the predictions from the average value of 16% (or 84% accuracy on average).

   More specifically, the selected model had an R^2 of 88%, MAE = 1,356 kr. (9% deviation from the mean observed value) and RMSE = 2,383 kr. (16% deviation from the mean observed value). The mean value of observed rent was 14,477 kr., while the mean value of predicted rent was 14,602 kr. The model was subjected to automated parameter hypertuning, which helped select the most optimal configuration of its parameters. Specifically, a total of 50 estimators (decision trees) were used, with each estimator having a maximum depth of 10.

Legal disclaimer

Please note that this is not a commercial product and that the data sourced from BoligPortal and other disclosed websites has been used purely for educational purposes.

A complete list of all external resources used is provided below:

- Data on accommodations: www.boligportal.dk
- Data on municipalities' economic development: www.mikonomi.dk
- Data on post codes: www.postnord.dk
- Illustrations and icons: www.pixabay.com and www.freeicons.io
- Jupyter Notebook, Google Workspace apps & Google's Geolocation API
- Python packages: pandas, numpy, matplotlib, seaborn, plotly.express, statsmodels, sklearn, googlemaps, gmaps, geopy.distance, datetime, math, locale, re, requests, urlib, lxml.html, bs4, os, google.colab

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