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Danish real estate and housing market

An investor's market and risk analysis.

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ABSTRACT

The purpose of this thesis was to conclude whether investors should invest in the Danish real estate and housing market at the current price levels and with the risk currently involved. The data collected was solely based on second-hand data from a multitude of sources and based on said data, calculations as well as tables created.

It was found that the pricing levels, specifically in Copenhagen had reached borderline overpriced levels compared to the rest of Denmark. Owner-apartments in particular had seen the largest growth, while houses still remained under the rader until recently. Substantial risk from international economic and political situation could be found to have affected real estate investments alongside new mortgage laws limiting growth in major cities.

The findings suggest that investors should stay clear of Copenhagen real estate until a clearer image forms, as a correction is expected. Furthermore, houses is the type of real estate which data and experts suggest still has room for further growth in coming years, hence investors are recommended to look towards the surrounding areas of major cities, following the recent counterurbanization.

CONTENTS

GLOSSARY

DKK	Danish Krone
HPI	House Price Index
TR	The Triangle Region
GCA	Greater Copenhagen Area
NZ	North Zealand
P/I	Price-to-income

1 INTRODUCTION

Since the 1990's the Danish real estate market has been moving forward at an impressive rate year over year. The exception was the global financial crisis and real estate bubble in Denmark back in 2007. Since then, the real estate market is once again flourishing and has been growing every single year since 2013. (Boliga, n.d.)

Growth, however, cannot continue paving the way for profit on the Danish real estate market, which leads to experts and others alike wondering if another bubble is coming. If not that, at least a correction in real estate prices (Dansk Boligsikring, 2019).

Like many countries around the world, the real estate market is a big part of the Danish economy and it is therefore of great interest for companies and private investors to know how the market is performing.

For this thesis, I wish to analyze the market development since the 1990s but with a greater focus on present times and the future. I will also analyze the risks associated with investing in real estate at the current pricing levels and see how factors such as mortgage availability and rates play a factor in the development.

The thesis will split the Danish real estate and housing market into three main parts, namely the geographical locations Jutland, Funen and Zealand as an easier way to distinguish which areas drive more growth.

To explain these, several fundamentals will be considered such as the housing price index, price-to-income ratios and flow of people and ultimately the aim is to answer whether or not the Danish real estate market is currently interesting as an investment opportunity.

1.1 Methodology

The following section goes over the decisions and thoughts made when choosing source material as well as which data is important. It explains the primary source type and shows examples of what data will be used to explain certain sections of the thesis.

1.1.1 Choice of sources

This thesis is based primarily on second-hand sources from various real estate companies, banks and dissertations which will help gain insight into the past and current real estate market. Statistical data alongside articles on new developments on the real estatemarket is paramount for this paper. The real estate companies have data available showing the development of price per square meter in split up into different geographical sections (Udviklingen på boligmarkedet, n.d.). The banks are used to explain mortgage options and rates.

The dissertation provides a solid background on the topic and brought inspiration for what metrics to look out for as well as providing an additional list of sources.

1.1.2 Source validity and reliability

It is important to remain critical of the information found and that is why most sources will be from company reports or their public data. While a company is generally reliable, there is a chance that reports may be biased and it is, therefore, important to see if the data can be supported via a second source. At the same time, sources can't be too old, as they will no longer represent the current situation, hence newer data will be preferred for it to remain valid.

1.2   Aim and contribution

This thesis will focus on analyzing the Danish real estate market in 2019 and aims to find out if it is time to invest in the real estate and housing market with the current risks. In this thesis, background information on the housing market development, and mortgages are explained and analyzed to provide a basis for the thesis.

Aside from splitting Denmark into three geographical areas, the thesis will focus on how certain metrics affect the price development of real estate. Metrics that will be considered for this thesis are: Mortgage availability and rates, people flow as in how urbanization is affecting the current housing prices. Rental yield and capital gain and how these numbers are affecting where investors are looking for real estate and if that is inflating prices according to psychological expectations. Finally, the data will be organized and showcased using models and graphs, to create a better and easier understanding for the reader.

The thesis will be a basis for the commissioner Beyond Borders, to use in assessing whether to introduce Denmark as another investment opportunity, as the focus is currently on Asia due to geographical ease and booming opportunities.

1.3   Disposition

This thesis will be split into several parts. Chapter 1 introduces the thesis to the reader, explaining the general idea of the paper. At the same time, it will address the limitations set together with the thesis commissioner and introduce the scope and expectations for the thesis. Furthermore, it will explain the general methodology used in this thesis such as; Validity and reliability of sources and will also explain what sources will be used to complete the thesis. Finally, it addresses the aim of the paper as well as the potential use of the paper for the thesis commissioner Beyond Borders and draws an outline for the thesis.

Chapter 2 aims to explain what theories were put into place when analyzing the market development and risk in the Danish real estate and housing market. Chapter 3 touches on the historical development of the housing market since 1990 to provide a basis for the rest of the thesis.

Chapter 4 goes over some of the risks that are or may affect the Danish real estate market going forward, whether it be a national or foreign risk.
Chapter 5 will explain the availability of mortgages, as well as touch on the development of mortgage rates and in hopes of explaining the correlation between availability, viability and real estate investments.

Chapter 6 will be a substantial section touching on each of the geographical areas in Denmark that were identified for this thesis and each will have a subsection to identify whether there are differences in the real estate market and risks of said locations. It will also showcase calculations done based on the theoretical framework.

Finally, chapter 7 shall discuss the findings to draw a conclusion and will aim to answer if the Danish market is currently attractive for investors, native and foreign.

2 THEORETICAL FOUNDATIONS

The following chapter briefly covers the basics of several chosen metrics, used to analyze the real estate market. While there are several other possible metrics to use, these were chosen based on the goal of this thesis being to help investor's judge the market.

2.1 Price-to-rent ratio

The price-to-rent ratio refers to the annual rent at a chosen location and is often used to determine if there currently is a bubble existing in the housing market or if it is valued fairly. It can also be used in finding out whether one should rent or own a property in a given area. (Hargrave, 2019.)

$$Price-to-rent\ Ratio\ \frac{Median\ Home\ Price.}{Median\ Yearly\ Rent}$$

The formula can be used easily by investors, but there are limitations to this ratio. Indeed, it provides you with the information on whether you should be renting or buying at a given location, but it does not show if it is affordable to do so and two very different cities may have the same price-to-rent ratio. (Hargrave, 2019.)

As the ratio will be used several times throughout the paper, the different thresholds established by Trulia will be given here. Trulia created three different ranges to determine when to rent or buy a property. (Hargrave, 2019.)

- 1-15 indicates buying is better than renting.
- 16-20 indicates that it is generally better to rent than to buy.
- 21+ indicates that it is always better to rent than to buy.

2.2 House price index

The house price index is also known as HPI is a measure of single-family house price movement, often used in the US. It can however also be used as an indicator for estimating changes in mortgage defaults but most importantly also housing affordability, which the price-to-rent ratio does not. (Chen, 2018.)

While it is primarily used in the United States, where the data is published by the Federal Housing Finance Agency (FHFA), using data gathered by Fannie Mae or Freddie Mac (Chen, 2018). Companies such as Moody's provide an HPI on Denmark using data from Statistics Denmark which is a government-owned entity publishing various forms of information ("Denmark House Price Index", 2019).

2.3 Price-to-income ratio

As the house price index, the price-to-income is used to determine the affordability of houses in a given area ("Definition of price-to-income", 2015). The use of the price-to-income ratio by itself to determine affordability is often insufficient and a look at mortgages and mortgage rates are often a needed supplement (Gudell, 2012).

Like the price-to-rent ratio, this ratio also uses the median home price in its calculation but instead of the median yearly rent uses the median annual household income ("Definition of price-to-income", 2015).

$$Price-to-income \; Ratio \frac{Median \; Home \; Price}{Median \; Annual \; Househould \; Income}$$

To understand the results of the price-to-income ratio, when the ratio goes down that means houses are becoming more affordable and opposite when the price-to-income ratio goes up, that means houses are becoming less affordable ("Definition of price-to-income", 2015).

2.4   Capital gain

Capital gain is what you make after selling an asset at a higher value than what you purchased it at. A property can be bought for 1,000,000 DKK and sold for 1,300,000 DKK resulting in a 300,000 DKK capital gain. Likewise, selling the property for less than the initial purchase price will have you incur a capital loss. (Chen, 2018)

2.5   Yield

Yield is the gain made on an investment made over the course of time. When investors are looking to invest in real estate, they often use the yield of a property to decide if it will be a good investment. (Chen, 2019.)

Investors will often easily be able to determine the gross yield, however calculating the net yield may prove more problematic. To calculate the gross yield of a property, divide the price of the property by 12 months of rent. (Chen, 2019.)

$$Gross\ Yield = \frac{Property\ Price}{12\ months\ of\ rent}$$

A property with a price of 1,000,000 DKK and with a monthly rent of 5000 DKK would, therefore, have a gross yield of 6.00%. The gross yield does however not take costs into account and investors will need the net yield to show if the investment can pay off itself, compared to the cost of the possible mortgage.

2.6   Discounted cash flow analysis

A discounted cash flow analysis can be used in many different cases but is in this case used to determine the value of a real estate investment. Certain metrics that are needed for the calculation may, however, be hard to predict (Maverick, 2018).

Some of the variables that can be hard to predict are for example repair and maintenance costs of the property, increases/decreases in rent and more. These are generally predicted based on other similar properties in the area, to give an idea of how the numbers will turn out. (Maverick, 2018.)

These metrics compliment each other, as each metric makes up for the weakness of another. It can however, prove difficult to find the needed data as certain variables are not easily available to the public and only to corporations and as such assumptions are needed to be made when using the various metrics.

3   PRICE DEVELOPMENT SINCE 1992

Since 1992, the Danish housing market has experienced a near constant growth year over year. However, while nearly every year resulted in an increase in prices, the years leading up to the global financial crisis and housing crash were greater than most years that came before (Figure 1).
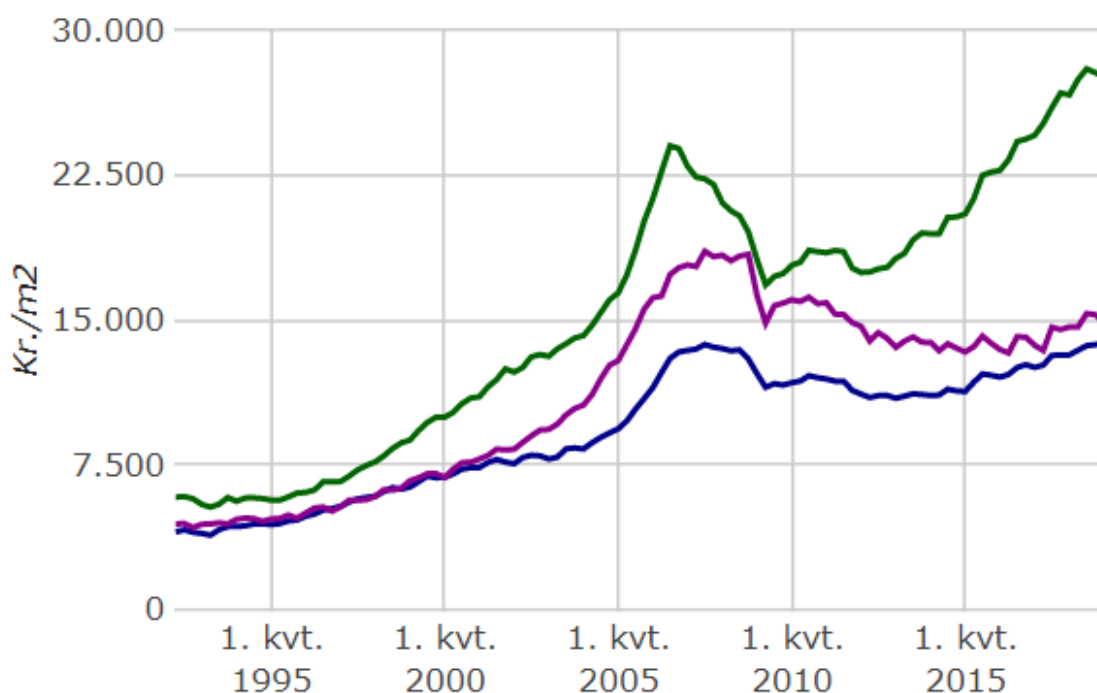
FIGURE 1. Graph depicting the price development on the Danish Real Estate Market since 1992. (Udviklingen på boligmarkedet, n.d.).

The graph shows three price developments between three different types of properties. The green line shows the price development for apartments, the purple for holiday homes and the blue line shows the price development of villas and townhouses. The price is shown in DKK per square meter and is highlighted in the first quarter of the year every fifth year up until the last quarter of 2018.

Like many western markets, Denmark has seen a boom in real estate investments from private investors and corporate entities alike. Unlike shares, real estate is a tangible asset, with the possibility to not only provide a monthly rental income but also a capital gain once sold. This has made it attractive for many to

use real estate as a way of hedging. Combined with a low rate, private investors got the chance to join the market makers in their goal for growth (Sommer, 2018).

The housing market in Denmark had a slow beginning since the available data of 1992, but since the second quarter of 1995, took off and offered investors growth up until the crash in 2007 (Udviklingen på boligmarkedet, n.d.).

While apartments had seen the largest growth, they also saw the biggest decline during the housing crash. Prices for apartments peaked during the second quarter of 2006 with a price per square meter of 23.990 DKK and fell to a low of 16.799 DKK during at the first quarter of 2009 (Udviklingen på boligmarkedet, n.d.). This means property owners on average lost 29.97% on the value of their property and would only see prices get back on peak levels during the beginning of 2016.

Followed by ever decreasing rates and costs associated with Danish real estate, the market continued reaching new heights as investors rushed to get on the field alongside international investors who got a taste for the Danish market (Sommer, 2018). The housing market for the country peaked in the second quarter of 2018 before seemingly consolidating again, as various international political and economic situations combined with experts voicing their concerns began rising (Dansk Boligsikring, 2019).

In 2019, experts are arguing on whether a simple correction in the market is ongoing or if a bigger problem is lurking. One potential concern and point for discussion is the increased influx of international investors over the past 6 years, who seem to drive up rent and housing prices by renovating the properties, specifically in Copenhagen. (Sommer, 2018.)

As such, the Danish real estate market has for many years seen an impressive growth, but with the growth came a larger amount of risk as well as foreign investments which has boosted the pricing levels even further.

4   RISKS IN THE DANISH HOUSING MARKET

After the global financial crisis subsided, markets once again started booming. This brought along with it, risk at both national and international levels. The following chapter touches on select issues investor's may wish to look into before investing in the Danish real estate market.

4.1   Increase in international invesments

Since 2012, international investors have increasingly decided to invest in Danish real estate, primarily in Copenhagen. In 2012 international investors invested a total of 4.4 billion DKK into the overall Danish real estate market and this number grew year over year until international investors in 2017 made up most real estate investments in Denmark totaling 49.3 billion DKK (Sommer, 2018).

Alone in Copenhagen, international investors made up 71% of all investments in 2017. Investments in properties are generally 75 million DKK and up, properties in that price range are tricky to find outside of major cities such as Copenhagen, Aarhus, and Odense (Sommer, 2018).

International investments have primarily come from the US, Germany, and Sweden with Swedish Heimstaden in 2018 being the biggest institutional investor in Danish real estate with a total of 20.1 billion DKK invested (Sommer, 2018).

4.1.1   Risks and opportunities of rental increases

With the increasing international interest in the Danish real estate and housing market, experts and politicians are concerned about potential quick renovations of properties. Properties in Denmark are under the property regulation law, preventing drastic increases in rent to protect the renter, however, if substantially renovated the property is no longer subject to the property regulation law (Sommer, 2018).

To investors, this is a gateway to a higher rental yield at a low cost and while the rent is still subject to certain standards by comparing similar properties in the area, a renovation would still make for an increase in rent of around 50-70% (Sommer, 2018).

Two sides seem to arise. On one side, the investors, looking for a quick turna-round and profit maximization. On the other hand, we have renters and politicians wanting to secure reasonably priced apartments for students and people with less paying jobs.

Prices have, however, at this point surged to a point where investors are taking a break, and this has resulted in a decrease in foreign investments in Denmark from 2017 to 2018, which seems to indicate a slight decrease in rent (Dynamisk Analyseværktøj, 2019).

4.2   Anxiety in financial markets

The past years since the recession has been a party for most investors whether they were invested in real estate, bonds or equities (Cushman & Wakefield, 2019). Markets have, however, in recent times seen a sense of anxiety as the trade war between USA and China barged through the door as well as lower projected growth in China have been subjects to a great discussion (Aslam, 2019).

To further confirm the market anxiety, looking at the difference between the US 10-year and 3-month year interest, shows it heading toward a negative rate, which previously has been seen negative prior to recessions (Cushman & Wake-field, 2019).
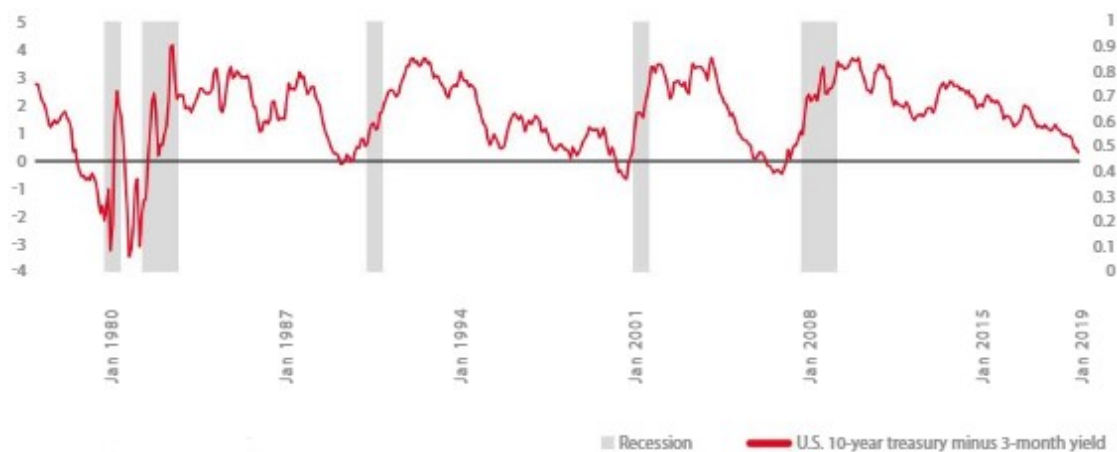
FIGURE 2. U.S. 10-year treasure minus 3-month yield 1978-2019 (Cushman & Wakefield 2019, 19)

While this did play a factor in the real estate investment decline in Denmark it may have proven to pave way for a period of healthy consolidation. Does this mean that real estate is becoming less attractive? Global capital is being allocated differently for commercial real estate, showing an increasing amount of capital available, which draws a picture of investors that are still very much interested in opportunities while simply waiting for the right oppertunity. (Cushman & Wakefield 2019, 18.)

While increasing amounts of capital are allocated in North America, the European market and Denmark especially is still attractive due to the low-interest rate (Cushman & Wakefield 2019, 19).

4.3   New public assessment

Danish media outlets have been diligent in pointing out exactly how much everyone will be affected by the new public assessment of land and properties (Offentlige Ejendomsvurdering, 2018). Certain properties, such as multi-story housing in the Copenhagen area are indeed currently priced too low and will possibly see a rather big increase in taxation, however, most will see their level of taxation stay the same or only increase slightly (Cushman & Wakefield 2019, 74).

4.4 Harder for private investors to enter major cities

One reason for the market's current stagnation, specifically in the major cities of Denmark, is due to the Danish Financial Supervisory Authority. In 2016, they tightened the law regarding lending money to aspiring property owners (Cushman & Wakefield 2019, 78). The law limited prospective housing owners to a loan only 4 times the amount of the yearly household income and came into effect on January 1st, which matches the time prices started stagnating (Rasmussen, 2018)

The law does not impact lower-growth areas and will primarily affect buyers looking to enter the market in Aarhus or Copenhagen. As a result, the demand for rental properties was kept up as prospective first-time buyers saw themselves unable to gain access to proper financing and therefore had to continue renting apartments (Cushman & Wakefield 2019, 78).

There has been a substantial increase and diversity in the risks affecting the Danish real estate scene. These risks are both coming from within the border but also outside of Denmark. Most important are perhaps the very high increases in rent, that may look attractive, but will also make it harder to find a tenant who can afford the rent in areas such as Copenhagen but also the changes to mortgages targeting high profile areas.

5   MORTGAGES

Price development on the real estate market and the availability and rates of mortgages often show a strong correlation. Previously the 30-year mortgage has been the preferred choice for private investors and at the same time, it has been the standard used when evaluating the credit of prospective homeowners. (Nordahl 2013, 14.)
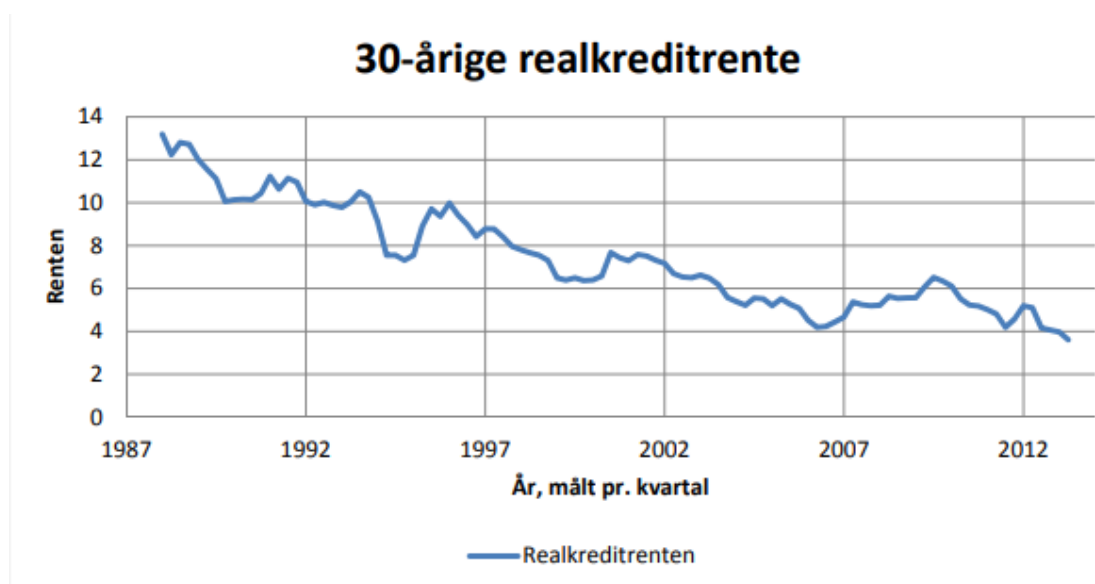
FIGURE 3. Development of the 30-year mortgage interest rate (Nordahl 2013, 15)

The 30-year mortgage interest rate has since 1987 almost continuously dropped, making it more viable for future homeowners to get a mortgage and realize their dreams. In 2012 the rate had fallen to 3.52% but continued to drop further in 2017 where the rate reached all-time lows at 2.24% until in 2018 it once again started rising. (Rasmussen, 2018)

During these years with falling mortgage interest rates, housing prices, on the other hand, rose, as people became able to afford more expensive properties, which in return also helped drive increased demand (Nordahl 2013, 16).

The correlation between housing prices and the 30-year mortgage interest rate becomes further apparent when looking at the increase in the interest rate, which happened simultaneously with falling property prices (Nordahl, 2013).

When the global financial crisis had slowly subsided in most countries, the 30-year mortgage interest rate once again began to drop while housing prices, though primarily apartments soared (Figure 1).

5.1   Mortgage availability

To the private investor, mortgages are still in many cases openly available. The restrictions which new legislation have brought, mainly target the high growth areas, such as Copenhagen and Aarhus, hence a prospective house owner looking to purpose a property in Esbjerg should experience no major problems (Sommer, 2018).

The new legislation regarding loans did however also bring a less known effect. Homeowners with already high debt and mortgage ratio would see their options for further financing limited. (Sommer, 2018.)

5.1.1   New mortgage opportunities

As the 30-year mortgage interest rate, started rising in 2018 and financial anxiety in markets created pressure on interest rates Nykredit, a Danish mortgage institution, opened for an even cheaper mortgage option for the populous (Kastberg, 2019).

The new mortgage is now the cheapest option when looking for a housing loan and compared to previous mortgages, this will provide a saving of 128.000 DKK over 30 years. This saving will then make it more possible for house owners to apply for the loan as their finances will look better on paper due to the saving (Kastberg, 2019).

5.2 Mortgage availability for foreigners

Mortgages are also available to foreigners wishing to purchase a property in Denmark and the rules and regulations, are the same to that affecting Danish citizens and it is generally possible to borrow up to 80% of the property value (Buying property in Denmark, n.d.).

5.2.1 Acquisition of Danish real estate

While getting the financing needed to acquire a property in Denmark, is one of the easier steps for foreigners, there are stricter rules in place regarding the actual acquisition of Danish real estate.

When a foreigner outside of the EU or EEA wishes to purchase a property, they must first obtain a permit from the Danish Ministry of Justice. This also applies to EU or EEA citizens wishing to purchase Danish real estate, but exceptions exist where EU or EEA citizens do not need to apply for a permit (Foreign citizens acquisition, n.d.).

This is also applicable to companies with subsidiaries or agencies that already have or aim to set up services in Denmark. (Foreign citizens acquisition, n.d.).

In case, a foreigner has been living in Denmark for 5 consecutive years, it is no longer needed to apply to get permission to purchase a property, as rules are far more lenient if one aim to make Denmark the center of their life (Buying property in Denmark, n.d.).

In Denmark the seller is usually represented by an agent, taking care of most paperwork, so the buyer is left alone. It is, therefore, recommended for the buyer to get a lawyer in Denmark, who can deal with paperwork and legalities. (Buying property in Denmark, n.d.). Finally, like property purchases in other countries, an additional cost is associated with the purchase, which as a rule of thumb is between 4-8% of the property price (Rasmussen, Jensen & Sode, 2017).

As a foreign investor, the Danish market is ideal to enter, due to applying for mortgages on the same principles as a Danish national. At the same time, historically low mortgage rates, alongside new and cheaper mortgage options make for good financing options. The downsides now involved are new regulations aiming to lower investments in major cities, which may put off investor's looking to enter previous high growth areas such as Copenhagen. At the same time, investor's need to aquire a permit from the Danish ministry of Justice before they can move forward and purchase a property in Denmark, which may prove to be more difficult.

6 THE DANISH REAL ESTATE MARKET

Denmark is split into three main geographical areas, Jutland, Funen and Zealand. Each area is filled with its own dialects, businesses, attitude and investment opportunities. For each area, several municipals and sub-geographical areas were chosen to depict differences and shine light on different opportunities that were found.

6.1 Jutland

Jutland is split into several areas, such as North-, south- and west Jutland, however, all areas do not drive the same amount of growth. In Jutland specifically, the municipals Aarhus and Aalborg, as well as the triangle region consisting of Vejle, Fredericia, and Kolding are where most of the growth and opportunities over recent years has been located (Gregersen & Baltzer, 2019).

6.1.1 Aarhus

In Jutland, Aarhus municipal as well the surrounding municipalities have been the primary growth drivers in recent years. Like other growth areas, Aarhus municipal has been in near constant growth since mid-2011. In total, property owners and investors have on average been able to harvest a 24.76% gain (Gregersen & Baltzer, 2019).

Aarhus is the second largest city in Denmark as well as a highly attractive and popular city for students, driving a continuous demand for housing, driving up the prices. The difference between Copenhagen and Aarhus is however that foreign investors still see better opportunities in the capital area, as foreign investors only made up 27% of institutional investments in Aarhus during 2018 and just in 2016, that number was only 4% (Dynamisk Analyseværktøj, 2019).

In Aarhus, investors can expect a current average yield of 4.26%, an observed high yield of 9.25% and a low of 0.11%. These yields are based on 201 yield observations by Cushman & Wakefield (Dynamisk Analyseværktøj, 2019).

6.1.2 Aalborg

With Aalborg being the fourth largest city in Denmark, there are plenty of opportunities for investors in the residential sector, which in 2018 made up 64% of all real estate investments in the area (Dynamisk Analyseværktøj, 2019).

While the price level in Aalborg is lower, it has seen no shortcomings in price development, boasting an increase of 30.96% between the years, 2011 to 2017 (Gregersen & Baltzer, 2019). Reasons for the lower price development may be as Aalborg is seen as a less attractive city for students, as well as the lack of foreign institutional investors, as Danish institutions made up 100% of the investments in 2018 leaving the door open to new investors (Dynamisk Analyseværktøj, 2019).

Furthermore, during the housing crash, the real estate and housing market in Aalborg held up better and only had decreased 8% in property prices, which is half of what Aarhus lost, due to the bigger run-up till then (Gregersen & Baltzer, 2019).

Based on 102 yield observations by Cushman & Wakefield, real estate investors looking to enter the housing market in Aalborg can expect an average yield of 4.55%, with the highest observed yield being 11.18% and lowest observed yield as low as 0.14% (Dynamisk Analyseværktøj, 2019).

6.1.3 The Triangle Region

The Triangle region, consisting of Vejle, Fredericia, and Kolding has had a slightly bumpier road since the crash of 2007/2008, Kolding being the area with the least growth since its low point. The real estate market in the Kolding area reached its

lowest point during 2012 and then continued with a somewhat gradual growth till the beginning of 2018 and gave a total increase of 13.8% in price per square meter (Gregersen & Baltzer, 2019).

Unlike Kolding, Vejle and Fredericia showed a different price development since the crash and while the previously mentioned cities had their low point around 2011, Fredericia experienced it's low in 2014 and Vejle in 2013 (Gregersen & Baltzer, 2019).

Since their low, Fredericia surged 31.75% and Vejle came out with less overall growth at 18.81%, as prices here also declined during the first quarter of 2018 (Gregersen & Baltzer, 2019). Unlike, Aalborg, the Triangle region has seen a growth in foreign institutional investors since 2016 and in 2018, foreign institutional investments made up 41% of the total investments. Furthermore, while the previously mentioned cities and areas have a much higher ratio of residential investments as well as office, the triangle region had most investments been in retail and industry (Dynamisk Analyseværktøj, 2019).

The final area of interest, the triangle region shows an average yield of 6.52%, the highest observed yield at 13.37% and the lowest yield being 1.54% (Dynamisk Analyseværktøj, 2019). These numbers are the average for the whole region and investors may find differences between in the three municipalities, Kolding, Fredericia, and Vejle.

6.1.4 People flow

In 2017, 20.127 people moved to Aarhus with the vast majority being between 20-29 years of age. Most people came from various places on Jutland, but Aarhus still saw a big amount of new people coming from both Odense and Copenhagen. (Rysgaard & Nielsen, 2018.)

While this does seem like an impressive number, the increase is only of 983, as during the same year, people from larger cities have begun moving to nearby municipals instead (Goll, 2018).

Aalborg also saw an increase of new inhabitants, people who however primarily came from the upper and middle regions of Jutland, whereas Aarhus, attracted people from western and southern Jutland as well (Rysgaard & Nielsen, 2018). Aalborg, like Aarhus, also incurred a net positive of new inhabitants, though only one-third of Aarhus' amount, with the net positive being 358 people in 2017 (Goll, 2018).

The Triangle region has in both Vejle and Fredericia seen a net growth in new-comers, numbering 194- in Vejle and 252 people in Fredericia. Kolding however, had a net negative and a total of 309 people left the municipality in 2017. (Goll, 2018.) This may also be the explanation for why Kolding had seen slower growth in real estate prices compared to Vejle and Fredericia.

6.1.5 Model

The following table was created to showcase the difference between yields, growth as well as the price level in the chosen research areas in Jutland (table 1).

TABLE 1. Jutland Area Comparison.

Jutland	Growth since the low point	Price pr. m2 2018 (DKK)	avg. Yield	high yield	low yield
Aarhus	24.76%	21.656	4.26%	9.25%	0.11%
Aalborg	30.96%	11.849 (2014)	4.55%	11.18%	0.14%
The Triangle Region	23.12% (avg.)	11.545 (avg.)	6.52%	13.37%	1.54%
Kolding	13.80%	11.548	See TR	See TR	See TR
Vejle	18.81%	11.117	See TR	See TR	See TR
Fredericia	31.75%	11.972	See TR	See TR	See TR

(Dynamisk Analyseværktøj, 2019); (Gregersen & Baltzer, 2019).

The important distinction to make between the investment is the price per square meter. While growth was higher in Aalborg in the given period chosen after the global financial crisis of 07/08, the price level is half that of Aarhus (table 1).

This can, however, create varying opportunities for investment. While going for the bigger and more popular cities can often be safer, especially if renting out the property is the goal, the capital needed to enter the market is also higher. There-fore, it may be easier to invest in less popular areas, which still show growth to first enter the market and later go to the bigger cities, with larger capital available.

However, if capital is not a problem, Aarhus is still the better choice when inves-tors look at opportunities that are more likely to be stable. In addition, as there is an increasing amount of people moving to Aarhus, finding tenants will not be a cause for concern.

6.2 Funen

Funen with its smaller geographical area compared to Jutland or even Zealand has less diverse opportunities for investments and most growth seen in this area is coming from Odense (Gregersen & Baltzer, 2019). In many ways Odense can be very similar to Aarhus as many students seek to enter one of the major uni-versities in the city, driving a continuous demand for apartments and jobs (Berg-mann, 2017).

6.2.1 Odense

Compared to the market, the Odense area has since the housing and financial crisis performed slightly above the country average price per square meter. With the property prices dropping to their lowest at the end of 2011 and since then climbing almost consistently every year, prices have reached new heights com-pared to pre-bubble prices and by 2018 had a total increase of 31.13% (Gregersen & Baltzer, 2019).

Since 2012, there have been years with high amounts of foreign investments in the city and area. Furthermore, these investments are almost evenly spread out between residential, retail and office investments each taking around one third the total investments. (Dynamisk Analyseværktøj, 2019.)

The average yield to expect when investing in Odense is at 5.39% with the highest documented yield being 17.21% and the lowest being 2.00% as of early 2019. The rest of Funen is looking at an average yield of 6.84%, with the highest being 9.90 and the lowest being 1.90% (Dynamisk Analyseværktøj, 2019). While the average yield for the rest of Funen is higher, it is important to note that the data for the rest of Funen is based on less observation, which may be the cause for a higher average yield as well as a lower price level, compared to that of Odense.

6.2.2 People flow

Odense, like Aalborg, had a similar number of new inhabitants, as 10.650 people move to Odense in 2017 (Rysgaard & Nielsen, 2018). The net number of added inhabitants in 2017 was 230 (Goll, 2018).

People who move to Aarhus are primarily already from other areas on Funen, but people from South Jutland as well as Copenhagen, also migrated to Odense and like in cities on Jutland, newcomers were primarily between the age of 20-29 years old (Rysgaard & Nielsen, 2018).

6.2.3 Model

Table 2 was created to showcase the difference between yields, growth as well as the price level in the chosen research areas in Funen.

TABLE 2. Funen Area comparison.

Funen	Growth since the low point	Price pr. m2 2018 (DKK)	avg. Yield	high yield	low yield
Odense	31.13%	15.387	5.39%	17.21%	2.00%
Rest of Funen	19.49% (avg.)	8.674 (avg.)	6.84%	9.90%	1.90%

(Dynamisk Analyseværktøj, 2019); (Gregersen & Baltzer, 2019).

Funen with a smaller geographical area has seen low interest when looking at the whole area, with Odense, being the single area driving growth (table 2). Investors, looking for the best likely investment in this area are therefore best off, simply focusing on Odense. Outside of Odense is many smaller cities and areas, which for living and vacation, could prove to be of interest in case of using the real estate as a part-time vacation home, when visiting Denmark.

6.3 Zealand

Zealand has been the geographical area which for years has been driving most of the growth when it came to Danish real estate. This is primarily due to the capital Copenhagen as well as the surrounding area, being a popular area of investment for foreigners and Danes alike, who all have enjoyed the growth of recent years. (Sommer, 2018.)

These areas are split up into three main areas. Copenhagen, the Greater Copenhagen area, consisting of multiple municipalities in surrounding the capital as well as Northern Zealand, which also consists of several municipalities.

6.3.1 Copenhagen

Copenhagen, the Capital of Denmark is the financial powerhouse of the country. This is where most international jobs are located as well being the most popular city for students, with universities such as Copenhagen Business School being a prestige to be attained. This popularity constantly drives demand forward as students and job seekers arrive in the city. It is even driving demand so much that further apartments are needed, and a new area is therefore in development on an artificial island, with the expected housing capacity of 35,000 inhabitants (Ankerstjerne, 2018).

With the price per square meter in Copenhagen reaching lows in mid-late 2008 (Gregersen & Baltzer, 2019), the growth since then has been driving more and more investors to enter the market afraid of missing out.

Since its low, prices in Copenhagen has gone up by a total of 84.18% in the fourth quarter of 2018 surging far past the previous high which was seen back in late 2006 (Gregersen & Baltzer, 2019).

The primary real estate sectors in Copenhagen which have been the primary source of investment for foreign- and national institutions alike are residential, which makes up 42% of the total investments, with offices being at 26% and finally retail at 15%. At the same foreign institutions have in both 2017 and 2018 were the majority of investors focusing 65% of their investments in the residential sector. (Dynamisk Analyseværktøj, 2019).

With Copenhagen being the focus of investments, prices are high and expected yields are thus lower percentage wise. The average yield in Copenhagen based on 516 observations is 4.27% with the highest observed yield value at 10.40% and lowest at -0.10%. (Dynamisk Analyseværktøj, 2019.)

6.3.2 Greater Copenhagen Area

The municipalities that make up the Greater Copenhagen area some have shared very similar price movement making it likely that there is a positive covariance in certain municipalities (Gregersen & Baltzer, 2019).

As the Greater Copenhagen is made up of more than 8 independent municipalities (Dynamisk Analyseværktøj, 2019), the focus has been laid on the best as well as the worst performer in growth in the past 10 years, while the yield will be shown as an average for the entirety of the area.

The best performer but also the most volatile municipality within the Greater Copenhagen Area has been Frederiksberg with a total of 105.65% by the end of 2018. During that time the biggest drop in prices occurred in the third quarter of 2011 falling 32.31% in just a single quarter (Gregersen & Baltzer, 2019).
On the opposite spectrum is Greve which during the same time had a growth of 40.25% from it's low during the end of 2011 till 2018 (Gregersen & Baltzer, 2019). This is by no means bad growth and it surpasses the growth seen on both Jutland and Funen.

As the central area of Copenhagen becomes more expensive, investors look to the outskirts, hence, driving up prices in the surrounding areas.

Foreign institutional investors have also, like in Aarhus and Copenhagen been present and compared to Aarhus, foreign investors both money and percentage wise make up a bigger piece of total investments (Dynamisk Analyseværktøj, 2019).

Furthermore, offices have since 2012 been the biggest segment for investments making up 36% of total investments (Dynamisk Analyseværktøj, 2019), likely as more people arrived near the capital area and more jobs were being created, therefore creating a circle of investments in new offices.

Based on 169 observations, investors can generally in the Greater Copenhagen Area expect an average yield of 5.89%. On the high end of the spectrum, a yield

of 16.26% was observed as well as a low of 0.43% (Dynamisk Analyseværktøj, 2019).

6.3.3 North Zealand

Municipalities that making up the are of North Zealand have shared similar growth. Municipalities here are made up of medium price level as well as medium-high level municipals.

In this section, the best and worst performer in terms of price per square meter growth has been chosen. The worst being Halsnæs, which has shown subpar growth when taking into account previous price levels and Fredensborg, which has seen the best and most stable growth (Gregersen & Baltzer, 2019).
Halsnæs has had the longest continuous downtrend of the analyzed area so far dropping 53.62% from the peak in 2007 till the lowest point of 2014. Price has since 2014 again climbed up 48.80%, but considering the long drop, investors have had better luck in other areas when looking at the 10-year mark, as prices in Halsnæs in 2018 are still not up at 2007 levels. (Gregersen & Baltzer, 2019.)

Fredensborg, while also not yet back at pre-crisis pricing had a smaller drop in prices as well more options for a quick capital gain as unlike Halsnæs, Fredensborg has had period growth and downturn, with an overall growth since the low point being at 43.36% (Gregersen & Baltzer, 2019).

North Zealand is largely barren of foreign investors and while in 2017 they did make up 23% of the total invested amount, in 2018 that number was merely 2%. Furthermore, while retail and offices together make up nearly 50%, the residential segment is the main segment for investment with 40% of all investments. (Dynamisk Analyseværktøj, 2019.)

There are fewer yield observations in North Zealand, making it likely that numbers are less accurate compared to those of the Greater Copenhagen Area or Copenhagen as only 64 cases were observed (Dynamisk Analyseværktøj, 2019).

The average yield in these areas is at 6.73%, the highest at 13.55% and the lowest observed being 0.08% (Dynamisk Analyseværktøj, 2019). Reasons for higher average yield may be due to a generally lower level of price per square meter, compared to the previous two mentioned areas, while rent in many cases can be at similar levels.

6.3.4 People flow

Copenhagen has been the area which saw the largest influx of new inhabitants with a total of 46.640 people (Rysgaard & Nielsen, 2018), the actual data shows that net negative of 337 people, as the trend for entirety of Denmark all show people moving from the larger cities and out to the surroundings and smaller municipals (Goll, 2018).

More than half of the municipalities that make of the Greater Copenhagen Area also saw a loss in net inhabitants, while municipalities in North Zealand largely saw a net increase in people, from everywhere between 13 to 313 (Goll, 2018).

Frederiksberg, a municipality part of the Greater Copenhagen Area, saw the largest decrease in net inhabitants, the area lost 1.313 people in the year 2017 (Goll, 2018). Currently, Frederiksberg is the most expensive area to purchase properties in Denmark and that may have had a big effect on the number of people living in the area (Gregersen & Baltzer, 2019).

6.3.5 Model

Table 3 was created to showcase the difference between yields, growth as well as the price level in the chosen research areas in Zealand

TABLE 3. Zealand Area comparison.

Zealand	Growth since the low point	Price pr. m2 2018 (DKK)	avg. Yield	high yield	low yield
Copenhagen	84.18%	38.355	4.27%	10.40%	-0.10%
Greater Copen-hagen Area	55,06% (avg.)	25.275 (avg.)	5.89%	16.26%	0.43%
Frederiksberg	105.65%	51.565	See GCA	See GCA	See GCA
Greve	40.25%	21.299	See GCA	See GCA	See GCA
North Zealand	43.55%	19.839	6.73%	13.55%	0.08%
Fredensborg	43.36%	23.154	See NZ	See NZ	See NZ
Halsnæs	48.80%	12.437	See NZ	See NZ	See NZ

(Dynamisk Analyseværktøj, 2019); (Gregersen & Baltzer, 2019).

Like many countries the world over, the capital area has been the primary choice for real estate investments, due to large numbers of people, business opportunities and internationalization.

Prices here also vary, and the cheapest areas are around the same level as the triangle region on Jutland, while others, such as Frederiksberg, require such a high capital that many are now moving from the area (table 3).

Real estate pricesc have since the end 2018 found a plateau and are seeing a slight decline in prices alongside the decline in transactions (Dansk Boligforsikring, 2019).

Growth inside the Greater Copenhagen Area also varies as Frederiksberg leads the way with 105.65% growth in the chose period, while Greve could see 40.25%. Greve, while experiencing low growth in comparison to Frederiksberg still

trumped all chosen areas on both Jutland and Funen, showing that the area has proved highly profitable (Gregersen & Baltzer, 2019).

Ultimately, the Greater Copenhagen Area average was calculated based on all 21 municipals that make up the region, with most areas seeing growth around 60-70% (Gregersen & Baltzer, 2019).

6.4 Key metrics

The real estate market has experienced growth in many areas, with the capital area seeing the most explosive growth. Metrics chosen from the theoretical framework will further be able to show the risks that are currently associated with investing in Danish real estate.

6.4.1 Price-to-rent ratio

There are two primary real estate investments in the residential sector in Denmark. A price-to-rent ratio is calculated for houses both for overall Danish real estate market and the Copenhagen area.

End 2017, housing prices were on average at 2.024.597 million DKK (Klærke, 2018).

For the sake of staying within the scope, we will compare rent of houses over 85 square meters as well as houses below 50 square meters to get both ends of the spectrum with the assumptions that houses exist in that price range for both sizes. In 2017 the median monthly rent for houses larger than 85 square meters was 6.140 DKK (Landsbyggefonden, 2017), making it 73.680 DKK yearly.
This gives a price-to-rent ratio of 27.47, which means that according to the thresholds established by Trulia on average is better to rent than to buy a house of that size (Hargrave, 2019).

For houses below 50 square meters, the average monthly rent is 2.908 DKK (Landsbyggefonden, 2017), making it a yearly rent of 34.896 DKK and a price-to-rent ratio of 58.01, indicating that it is much more worthwhile to rent than to purchase a property around 2 million DKK with a low-level rent.

In Copenhagen, the average housing price at the end of 2017 was at 4.892.563 million DKK (Boligsiden, 2019).

The median yearly rent for houses larger than 85 square meters in Copenhagen was in 2017 at 83.328 DKK and houses below 50 square meters had a yearly rent of 38.004 (Landsbyggefonden, 2017).

A house larger than 85 square meters results in a price-to-rent ratio of 58.71 and for a house smaller than 50 square meters a price-to-rent ratio of 128.73. Since the numbers are calculated based on the assumption that a house exists for both size houses, the price-to-rent ratio varies greatly and in this case shows, that the Copenhagen area is topping and suggests overvaluation.

While the price-to-rent ratio is similar for big houses in Copenhagen as smaller houses on average in Denmark, it does not mean that it is as affordable, as seen with the average housing prices, being more than twice as high in the Copenhagen area than the rest of Denmark (Boligsiden, 2019).

6.4.2 Price-to-income ratio

As there is a great difference in the pricing levels between Copenhaguen and the other regions, two price-to-income ratios are calculated to show the observed differences. Note that for the sake of simplicity, the median yearly wage for the entire country is used, despite differences in the average when looking at Copenhagen and the rest of the country, and the wage median only accounts for people that are employed and not self-employed individuals and entrepreneurs.

In 2017 the median yearly wage was 388.000 DKK, which has continued to rise more than costs, resulting in people, in general, having a higher disposable income (Danmarks Statistik, 2018).

For Denmark as a whole, this results in a price-to-income ratio of 5.21 and for the Copenhagen area a price-to-income ratio of 12.60.

House prices have now exceeded previous 2007 highs and with wages generally increasing more than the costs, thereby increasing the disposable income, suggesting it has become more affordable for the average Dane to buy a house in Denmark overall, with the exception being Copenhagen, due to the extremely high growth since the housing bubble (Ring, 2019).

6.4.3 House price index

Based on the HPI, prices have now exceeded previous highs just before the crisis in 2007. The HPI only considers houses and does not account for the price development of owner- or share-apartments in Denmark (Home, 2019).

FIGURE 4. Danish House Price Index (Home 2019, 2)

As the graph shows, house prices since 2011/2012 have grown year by year, based on statistics from three different official sources (Figure 4). This may seem extreme as the climb since 2011 has been substantial. However, the house price

index is not adjusted for inflation, and the increase in prices may look very different if done.

On the other hand, the real house price index is more accurate. It takes the house prices and divides it by the consumer price index as a way of taking inflation into account.
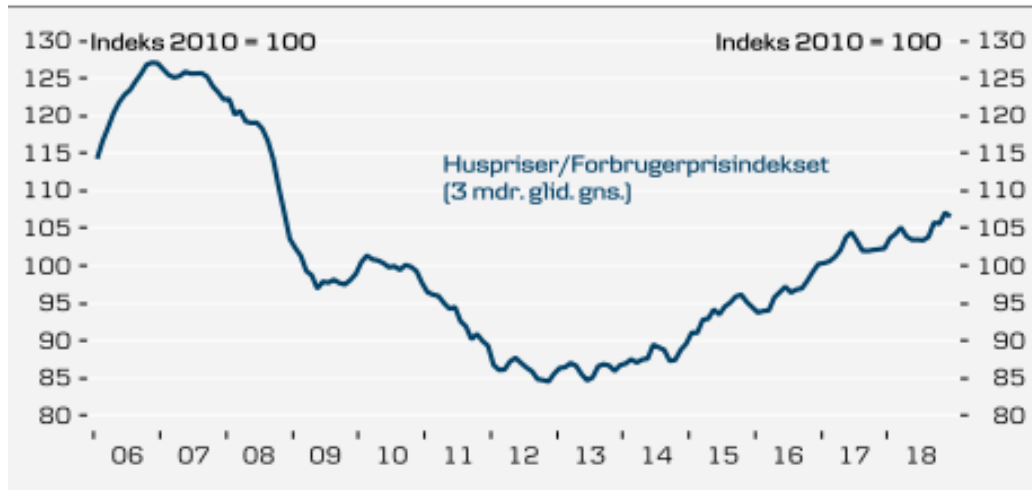

FIGURE 5. Real Danish House Price Index (Home 2019, 5)

Looking at the real house price index shows a different picture. Prices didn't climb much until the beginning of 2013 and were at a lower level, than one would think, making it highly affordable for investors to enter the Danish real estate market at that time (Figure 5).

It is true that housing prices have gone up. However, there is a long way to go if prices are to reach pre-crisis levels again, as there still exists a 16% gap-up (Home, 2019).

Most major areas in Denmark has seen growth and some more than others. In particular the owner-apartments in major cities and especially in the Copenhagen area has been a major source of growth over the past years. Other areas in Denmark, have seen growth but not on the same levels as the Copenhagen area, which has proved to be the favorite choice of national and foreign investors alike.

It was proven as expected that certain metrics would be hard to find, and as such, calculations were made under with the assumption that the average values were close to the median. It does seem like certain assumptions do hold, while others such as the average rent, may prove to be of the mark as higher levels of rent has personally been observed looking at current available properties for rent.

Certain metrics, models and growth numbers indicate various areas, but primarily Copenhagen will see a correction in prices, while the housing market in the overall country still shows room for growth. This is also is also backed by the numbers showing a recent movement of counterurbanization, which may continue till housing prices correct.

7 CONCLUSION AND DISCUSSION

This thesis analysed the past, current and expectations for the future of the Danish real estate and housing market. To better gauge expectations, a look into possible risks, mortgages as well as the geographical areas in Denmark and key metrics was done.

Since 1992, the Danish real estate and housing market has been in near constant growth and apartments in particular have seen explosive growth. During the financial crisis, they were the property type that saw the biggest decline in prices, but it has also shown to be the preferred investments in the years after, particularly in the Copenhagen area. This growth did not come without risk and due to the great influx of foreign institutional investors prices and rent in the Copenhagen area has reached a level where low-income citizens are struggling to afford living in the area. The newfound anxiety in the market, alongside an explosive year over year growth has however, started to slow markets. Specifically owner-apartments in major cities have started slowing or losing value, while the housing market is still up and coming, as it still shows room for growth when comparing it to 2007 highs.

Mortgages have since the financial crash become more available and the increasing availability and lower rates as well as new mortgage options helped the market grow. At the same time, foreigners are able to apply for loans on the same terms as a Danish national, with the only struggle being the permit that is required of foreigners who wish to invest in Danish real estate. In 2018, a new legislation was put into play making it harder for people with already existing mortgages to take up another one, as well as limiting how much prospective house owners can loan. This was specifically targeted at the bigger cities of Denmark, to stabilize markets as well as securing the economy by not overlending.

It was assumed there would be a difference in price levels as well as growth in the three chosen geographical areas of Denmark which proved true. While both Jutland and Funen did see growth between 20-30% in general, the Copenhagen area was where most growth as well as investments were located.

In 2017, foreign investment made up around 70% of all real estate investments in the Copenhagen area as well as making up majority of all real estate investment in all of Denmark. Meanwhile, Copenhagen experienced growth of around 80%, while the largest growth was seen at Frederiksberg with a total growth of 105.65%. As a result, many can not afford living in the areas anymore and counterurbanization has in a minor degree begun, as people move to the surrounding municipals, rather than staying inside the major cities.

The price-to-rent ratio calculations, suggest that at current levels it is better to rent than to buy. In Copenhagen especially as prices only now have started stabilizing. Calculations may however prove misguiding, as they were done under the assumption that the average and median are very similar, as the median rent could not be found in public databases. This is likely not the case, as the data used covered properties over below 50 and above 85 square meters, and properties lager than 100 square meters can often be seen with a higher rent, than the average which was used. The same can be said for the property price, as the average was used, as the median was not publically available.

The price-to-income ratio show a fairly healthy result, but also draws a clear line between Denmark and the Copenhagen area, as the P/I was more than twice as high in Copenhagen compared to rest of Denmark. Numbers are once again likely not fully accurate as the same average housing price was used, as the median was not publically available.

At a first glange, the HPI showed that house prices were at the same level, if not higher than pre-crisis levels. The index is not adjusted for inflation, and the real house price index showed a different picture, as house prices still were 16% lower than the highs of the housing bubble.

The research conducted, draws a picture of a market with major investments being thrown into the Copenhagen area and as such, prices have skyrocketed more than in any other parts of the country. When looking at possible investments, the distinction should therefore be between Copenhagen and everywhere else. Owner-apartments are in major cities but mostly in Copenhagen, nearing overpriced levels and investors should wait and keep their capital for now, specially if

the wish is to invest in Copenhagen real estate. The research suggests, that the real estate market overall is set to either decline or begin consolidation, that is with the exception of the housing markets which include, villas, rowhouses and family housing. As seen on the real house price index, house prices have not yet reached previous highs, leaving room for growth. At the same time, experts believe the housing market to be where moderate growth can be found in the coming years, while the market for apartments slow down.

Ultimately, the market has seen a lot of growth and investors looking to enter the Danish real estate market, are late to the game and during riskier times, with international economic and political issues affecting how investors are using capital alongside mortgage changes aimed to lower growth in the biggest cities. Investors should look to see if the the counterurbanization movement continues, as it is likely to affect housing prices in the surrounding areas of major cities, where houses are more promiment and await the situation in Copenhagen and the Greater Copenhagen Area, as markets are at a standstill after major growth and a minor downturn is expected.

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